

International Marketing and International Trade of Quality Food Products



105TH Seminar of the European Association of Agricultural Economists

Seminar organised
under the auspices of



Promoted by the
BEAN-QUORUM project



Building a Euro-Asian Network
for
Quality, Organic and Unique food Marketing
TH/Asia-link/006

Project funded by

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DEPARTMENT OF AGRICULTURAL
ECONOMICS AND ENGINEERING
ALMA MATER STUDIORUM
UNIVERSITÀ DI BOLOGNA

March 8-10, 2007
Bologna, Italy

Editors

***Maurizio Canavari, Domenico Regazzi
and Roberta Spadoni***



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PREFACE

The Workshop on International Marketing and International Trade of Quality Food Products was held at the Faculty of Agriculture in Bologna on March 8-10, 2007. It was endorsed as the 105th seminar by the European Association of Agricultural Economists (EAAE), organized by the Department of Agricultural Economics and Engineering, and reflected the framework of the activities foreseen by the BEAN-QUORUM project (Building a Euro-Asian Network for Quality, Organic, and Unique food Marketing - TH/Asia-Link/006).

The BEAN-QUORUM was funded by the European Union's Asia-Link Programme. This program is dedicated to the promotion of regional and multilateral networking between higher education institutions in European Union Member States and South Asia, South-East Asia and China.

The BEAN-QUORUM consortium is composed by 5 Asian and European Universities, aiming at setting up long-term relationships and enlarging the initial network to other higher education institutions, companies, governmental bodies, and others in the food industry who are interested in the topic of marketing for quality food.

The EAAE Seminar was held in concurrence with the third meeting of the BEAN-QUORUM consortium.

The main motivation for this workshop initiative was the increasing relevance for agricultural and food products specific to the proposed keywords “Marketing”, “Quality”, and “International Trade” in the scientific debate among agricultural economists.

Marketing and quality are perceived to be intimately linked. Additionally, specificities within the food industry have highlighted the need to develop a conceptual approach to be more consistent with the specifications of the food supply and distribution sector and the demands of food product consumers. In this respect, many controversial issues may be raised by the three keywords.

Marketing may be interpreted in many ways depending on the context in which agricultural and food marketing is emphasized.

Quality improvement of agri-food products is another strategic task for agriculture and rural economic development and has become a policy priority. Presently, key words used when talking about agriculture and food products are “quality” and “safety”.

These two terms are often used together, although some consider safety to be part of the quality concept.

However, it may be argued that safety is not linked with marketing, but this may be true only at a national level. On an international level, the existence of different safety standards may play a role both in marketing and in international trade issues.

In this respect, Europe has drastically reformed its Agriculture Policy with the aim of guaranteeing quality standards, sustainability of production, and safety for consumers.

This topic is also important outside of the European borders and increasingly important for developing nations. Under the pressure of increasing international and EU demand for safe, high-quality and environmentally-friendly food products, developing countries are beginning to open the doors to new concepts such as organic and EU geographically-labelled foods.

The domestic and international marketing of quality food products generates significant import and export opportunities, both in Europe and abroad.

These opportunities - in addition to the growing opportunities created by world trade flows and markets for organic and quality foods – have increased the need for specific competencies and skills in the marketing and trading of specialized food products.

Currently, a great debate exists regarding geographically-indicated foods and the push towards the globalization of markets. Some discussions regard the ability of these marketing tools to increase consumer welfare, induce local development, and provide benefits for producers and local communities. However, the marketing of quality food products may be more demanding than traditional agricultural and food commodities.

In this respect, the adoption of food value enhancement tools (such as, EU food quality marks and regulations, or Thailand's OTOP- "One Tambon One Product" initiative) may play a key role, in guaranteeing food safety and quality, as well as promoting traditional food specialities which stimulate the development of rural areas and local markets.

The requirements for setting up successful initiatives regarding opportunities in the quality food markets are high.

The Italian market has been an important local arena for this kind of issues. For example, the adoption of food-value enhancement tools such as EU-food quality marks and regulations has certainly been successful in some cases, but has been frustrating and disappointing in others. The reason for these mixed results may be due mainly to the lack of a comprehensive marketing strategy which is considered necessary for managing such kinds of tools.

Moreover, the adoption of common food-value enhancement tools increases the scope of the food supply networks in international markets and affects consumer confidence and subsequent willingness-to-pay. For this reason, it becomes necessary to explore new methodologies and techniques regarding consumer preferences, purchase intentions, and willingness to pay, as well as to analyze food network behaviours in contexts that may be unfamiliar to the company management. It may be in these instances when a different cultural environment may create problems with the usual way of conducting business.

The seminar has raised a good deal of interest and many proposals consistent with the theme have been submitted. More than one hundred scholars from twenty-five countries attended program sessions, and approximately sixty contributed papers and posters were presented.

The scope of the seminar concentrated mainly on differentiated foods and related management issues. Submitted papers analyzed a broad range of research issues that have been raised by the global commerce of Quality Food Products (QFP).

Focal areas resulting from the final program include organic food, local and traditional food specialities, functional foods, branding of quality food, and many other topics, most of them framed in an international perspective.

The variety and range of the topics, methods from different countries and geographic areas provided us with interesting and lively discussion. Moreover, it was the occasion for networking among researchers who are involved in the same broad area of interest.

Hopefully, some of the papers will be further developed so that they may be published in international journals, possibly taking advantage of the comments and the questions raised during the paper presentation and discussion.

We are grateful to all of our colleagues who contributed to the success of this seminar and to the institutions that gave a tangible support to the initiative; namely, the European Commission, the Italian Ministry of Agricultural, Food and Forestry Policies, and the Alma Mater Studiorum-University of Bologna.

Many thanks also to the Italian Society of Agricultural Economics and to its President's representative, Gervasio Antonelli, and to the delegate of the United Nations Food and Agriculture Organization, Prabhu Pingali, who opened the seminar and made an introduction to the general topic. We also gratefully thank the members of the International Scientific Committee and several other external referees who reviewed and evaluated the extended abstracts and helped us to select

interesting proposals for papers and posters, as well as the colleagues at the Department of Agricultural Economics and Engineering who helped us in the seminar organization. Finally, we wish to thank Elisabetta Iogna and the entire staff of Avenue media for their professional services and the patient and reassuring assistance during hectic days of the seminar. We hope this event will be the starting point for the creation of a fruitful and long-lasting network of scholars, willing to contribute, exchange, and disseminate knowledge on this intriguing and challenging topic.

The editors
Maurizio Canavari, Domenico Regazzi and Roberta Spadoni

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PAPERS

Food quality and product export performance. An empirical investigation of the EU situation

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Summary

The relationship between product quality (as indicated by unit value) and export performance, both measured in absolute (per capita) and relative terms, is investigated. Five EU countries (DE, UK, FR, ES, IT), three product categories (cheese, meat preparations and wine), three export destinations (intra EU, extra EU and world) and two time periods (1995-1999 and 2000-201) are analysed. The estimation results show that the connection between quality and export performance is positive for Italy, Spain and France but depends on the product category (but not on the period), and differs (but not in all cases) according to the export destination. While the signs of the estimated slope coefficients are stable, the obtained statistical significance levels for these parameters depend on the measure used (relative or absolute) and on the estimation method (OLS or GLS). The main implication arising from this analysis is that it may be justified to introduce 'marketing of high-quality products' as a new academic discipline, teaching students and professionals in it and thus to contribute to the enhancement of EU agribusiness competitiveness in increasingly liberalised markets.

KEYWORDS: Food quality, international trade, EU.

1. Introduction

Food quality has become an increasingly important topic during the last decades. In developed countries, driven by aging populations and growing diet-related health concerns, consumer demand now seems to shift towards higher quality, more natural and healthier food (Regmi, 2001). Given today's globalised markets, it can be assumed that – in line with rising consumption – international trade of quality food products (QFPs) is increasing.

Yet, the concept of food quality is elusive. Overall, quality may be seen as an abstract construct, multidimensional in nature. More specifically, in the literature, at least four different quality definitions are discussed. It is either referred to as "excellence or superiority", as "value", as "conforming to specifications" or as "meeting or exceeding customer expectations" (Verdú Jover et al., 2004; Reeves and Bednar, 1994). The first approach defines quality as 'best in class', judged on some to-be-specified criteria. The "value" approach is an economic one (higher monetary value reflects higher quality), while the "conforming to specifications" is a technological one (a quality product is a product which fulfils some pre-defined technical standards however low they may be). The fourth approach defines quality from the point of view of the final consumer: as long as s/he is happy with it, it is a quality product. Either way, in order to measure quality objectively, a generally accepted reference system is necessary, otherwise "the term quality is very subjective and means very little" (Satin, 2002). Ninni et al. (2006) state that the quality difference between competing products can be easily analysed for measurable characteristics such as reliability, durability, various indicators of performance and health and safety. However, it becomes more subjective when it refers to intangible characteristics such as design, taste and flavour. Here the boundaries of vertical and horizontal differentiation are blurred. Obviously, the intangible characteristics are of particular importance for food products. Therefore, for these products, it may perhaps be most useful to accept them having different qualities rather than one quality.

Despite its increasing importance, and probably partly due to the difficulties of objectively defining quality, not much research has been done so far on the particularities of the

international trade of QFPs. Thus, for example, it is unclear whether the nature of the international trade of QFPs is similar or potentially structurally different as compared to the one of low or average-quality food products. Since many QFPs may be more perishable, more sensitive to external influences (e.g., temperature, vibration, light etc.) and often of higher (monetary) value, more demanding logistics and insurance issues may affect the international trade of these products, potentially resulting in different export patterns.

The objectives of the following analysis are threefold. First, to review the recent literature dealing with international trade in QFPs. Second, to generate empirical insights into the export patterns (levels and destinations) of food products, depending on their quality level. Third, based on the obtained results, to derive at conclusions of what this could potentially mean for agribusiness management and/or policy making.

This paper's structure is as follows. After the introduction, section two reviews the previous literature related to the topic. Section three describes the procedure of the empirical investigation. Section four discusses the obtained results. Section five concludes by summarising and pointing at some implications which arise from the findings. Annex A provides a technical treatment on the generalised least squares estimation method used in this study.

2. Previous studies

The literature on the relationships between quality and trade performance is sparse. The few existing studies have in common that they investigate inter-country quality competition in the sense that they try to find out whether a country's exports of certain products have higher quality vis-à-vis other countries producing similar goods.

Aiginger (1997) suggested a method of how to use unit values (UV) in order to discriminate between price and quality competition in international markets, using the case of German exports of industrial goods. Gelhar and Pick (2002) applied Aiginger's framework to US food trade flows and found that almost 40% of US food exports could be characterised as dominated by quality competition. For imports, the share amounts to 60%. However, the results for bilateral trade flows are much lower, which points to problems involved when using unit values and net trade figures of economic aggregates. Ninni et al. (2006) explore the role of quality of Italian food products in international markets. They regress relative market shares of the Italian products in the import market of several different countries on a quality indicator based on UVs and other variables. The obtained results suggest that "the quality image of Italian goods offers protection for some traditional products, but that this protection is not strong enough to counteract price competition" (p. 2).

No previous studies (to my knowledge), however, have addressed the issue of intra-country product export performance. That is, whether a country tends to specialise in exporting QFPs or rather in low and/or average products among the whole range of highly differentiated products it manufactures. In other words, within a nearly defined product category (e.g., cheese), is a country a high-quality exporter (which indicates that the country's high quality products are internationally appreciated and sought after) or that the country is rather a low or average/quality exporter (implying that its QFPs are more regionally preferred but that international demand for them is weak).

3. Procedure

The general research approach is an inductive, empirical investigation. That is, international trade data are analysed econometrically and conclusions are drawn from the findings.

The operationalisation of the variables under consideration is as follows. First, food quality (within a homogeneous product category) is measured by price (i.e., unit value as a price proxy). In other words, it is assumed that among similar products quality is positively related to price. Thus, the above mentioned "value" approach is adopted here for defining

quality. Second, trade performance is assessed by per capita exports and by relative export shares.

3.1 Measuring quality

As price proxies, UVs (in €per kg) are used, obtained by dividing export values by export quantities. UVs are known to be imperfect price indicators (King, 1993; Shiells, 1991; Holmes, 1973). Their main problem is related to the fact that an observed change in the unit value may not necessarily be a result of an underlying price change, but may simply reflect a change in the composition of the goods within the class of exports under consideration. Another problem relates to invoicing practices. The existence of a lag between the time of contract and the delivery of goods can result in differences between the contract value (i.e., the real price) and the UV calculated from customs declaration when a good is actually delivered, in cases where the exchange rate changes in between. However, the magnitude of these measurement problems is not clear. For instance, while Shiells (1991) finds that for US trade data import UVs are good import price proxy, Holmes (1973) shows for Canada that domestic UVs (national production values divided by output quantity) do not well represent industrial selling prices obtained by means of manufacturer surveys.

Despite these shortcomings, UVs have been suggested and used as an indicator of quality content (Aiginger, 1997; Gehlhar and Pick, 2002). Since the UV is output per units of input (material measured in kilograms), for homogenous and comparable goods the value can indicate differences in quality if unit production costs can be assumed to be equal across the considered countries. However, the UV will also reflect differences in costs and thus high UVs can indicate relative high product quality and/or relative high unit costs. In order to distinguish between these two cases, Aiginger (1997) suggests looking at the net trade position of the good (aggregate) under consideration. If within a country a good's UV is high and the good's net trade position is positive, cross-country UV differences must then be due to superior quality. However, if a good's UV is high but the corresponding net trade position is negative, this indicates a cost disadvantage. One problem with this approach is that it requires aggregate data (e.g., 'cars', 'cheese', or 'ice cream') or trade data on commodities (i.e., homogenous, undifferentiated goods) such as 'meat of sheep, frozen', 'flat fish, fresh or chilled', etc. in order to be able to calculate net trade positions. For highly disaggregated data of certain agricultural products (e.g., Gorgonzola cheese, Bordeaux red wine, etc.) no such trade balance can be calculated (because no other countries produces such goods and thus no imports can exist). Thus, in general, the higher the level of disaggregation, the more accurate UVs may be as price proxies, but the more difficult it is to determine whether high UVs reflect high quality or high production costs. Yet, if exports of products with high UVs are comparatively high, then this may nonetheless be an indicator of quality (due to an apparent international willingness to pay relative high prices for goods with many close substitutes).

UVs are calculated in absolute terms, and in relative terms (RUV) as symmetrised and normalised deviations from a category's mean unit value. That is,

$$UV_{cpt}^k = \text{Export value}_{cpt} \text{ (in €) / Export quantity}_{cpt} \text{ (in kg)} \quad (1)$$

$$RUV_{cpt}^k = \left(\left(UV_{cpt}^k / \frac{1}{n_{ck}} \sum_{p=1}^{n_{ck}} UV_{cpt}^k \right) - 1 \right) / \left(\left(UV_{cpt}^k / \frac{1}{n_{ck}} \sum_{p=1}^{n_{ck}} UV_{cpt}^k \right) + 1 \right) * 100 \quad (2)$$

where k refers to the category (i.e., cheese, wine or meat products, see below), c to the country, p to a particular product within k (e.g., Roquefort cheese), t to the period (1995-1999 or 2000-2005, see below) and n_{ck} is the number of products in a particular category for a certain country. Note that the range of RUV is $[-100; 100]$, where positive (negative) values indicate above (below) average UVs.

3.2 Measuring export performance

Trade performance is assessed by per capita exports and by relative export shares. The latter measure is a modified version of Balassa's index of revealed comparative advantage. It is defined as the deviation from the expected export share of a product within a product category, again symmetrised and normalised as suggested by Laursen (1998).

The index of revealed comparative advantage (RXA) was defined by Balassa (1965) as a measure for "the export performance of individual industries in a particular country..." (p. 105) which can be evaluated by "... comparing the relative shares of a country in the world exports of individual commodities [...] where the data have to be made comparable through appropriate 'normalisation'". Thus, the original index was constructed in a form such as

$$RXA_{ct} = \left(x_{ct} / \sum_c x_{ct} \right) / \left(X_{ct} / \sum_c X_{ct} \right), \quad (3)$$

where x_{ct} stands for the exports (in €) of the food processing sector of a country c in year t , and X_{ct} stands for total country exports of country c in year t . $\sum_c x_{ct}$ designates total sector exports, while $\sum_c X_{ct}$ refers to total aggregate exports in a particular year t . The RXA, therefore, is an index of the share of a country in the international market of a particular economic sector, corrected (i.e., normalised) for the size of the country to which the sector belongs. The correction is necessary since larger countries can a priori be assumed to have larger market shares simply due to their size. Bowen (1983) showed that Balassa's RXA may also be interpreted as the deviation of actual exports, x_{ct} , from expected exports, $E(x_{ct})$, where $E(x_{ct})$ can be defined as $\sum_c x_{ct} * (X_{ct} / \sum_c X_{ct})$, assuming that all countries engage in all economic activities in equi-proportional shares.

The (theoretical) range of the RXA index is from $[0; \infty[$, with scores $\in [0; 1[$, indicating a comparative disadvantage and scores $\in]1; \infty[$ showing a comparative advantage of an economic sector of a particular country relative to the other sectors within this country. Thus, the RXA allows determining the strong and weak sectors within one country, by ranking them by descending RXA scores. Unfortunately, however, the RXA may fail to reliably indicate comparative (or competitive) advantages within the same sector relative to other countries. The main problem in cross-country comparisons is the different frequency distribution of the RXA scores in each country.¹ In addition, De Benedictis and Tambari (2001) show that the effective upper bound of the RXA for each country is different. This upper bound is equal to world total trade divided by total trade of country c ($\sum_c X_{ct} / X_{ct}$), and thus is in general relative small for large and very high for small countries. Consequently, the >1 index scores can not directly be compared across differently sized countries (implying the above mentioned normalisation for country size does not work perfectly in the standard notation of the RXA). Thus, because the conventional RXA range is inconvenient for interpretation, a "symmetrisation" has been suggested by Laursen (1998), which yields a range for the RXA $\in [-1; +1]$ with values below (above) zero indicating below (above) average relative exports:²

$$SRXAct = (RXA_{ct} - 1) / (RXA_{ct} + 1). \quad (4)$$

The main problem with using the RXA in the context of this research is again that it can only be applied to aggregate data or trade data on commodities (i.e., homogenous, undifferentiated goods) in order to be able to calculate 'world sector exports'. However, for highly disaggregated data of certain agricultural products (e.g., Gorgonzola cheese, Bordeaux red wine, etc.) no such sums can be calculated because these products are only produced in one single country and thus country exports equal 'world sector exports'. For this reason, a modified version of the RXA is used in the following, which is related to

¹ See Hinloopen's and Van Marrewijk's (2001) study on the empirical distribution of the Balassa Index and the problem of the incomparability of RXA scores across countries.

² However, it should be noted that despite symmetrisation the problem of unequal distribution and different country specific upper bounds remains.

Bowen's (1983) interpretation of the Balassa index. Here the relative export performance (REP) is assessed by the share of the exports of a particular product p in category (k) exports as deviation from the expected export share ($1/n_{ck}$, where n_{ck} is the number of p in k for a particular country c), assuming that preferences for all products p are equal. That is,

$$\text{REP}_{cpt}^k = \left(\left(\frac{x_{cpt}^k}{\sum_{p=1}^{n_{ck}} x_{cpt}^k} \right) / \left(\frac{1}{n_{ck}} \right) - 1 \right) / \left(\left(\frac{x_{cpt}^k}{\sum_{p=1}^{n_{ck}} x_{cpt}^k} \right) / \left(\frac{1}{n_{ck}} \right) + 1 \right) * 100$$

(5)

where t refers to the period (1995-1999 or 2000-2005, see below). Note that the range of REP is also $[-100; 100]$, where positive (negative) values indicate above-(below-)average relative export performance.

3.3 Data

The raw data were taken from Eurostat's COMEXT "EU25 Trade Since 1995 By CN8" database and combined with Eurostat population figures. The trade data are at the highest available level of disaggregation (8-digit level).

The export data (€ values and kg quantities) are factored in four dimensions. First, reporters: the five largest EU countries (DE, ES, GB, FR and IT) were selected. Second, as destination area three different locations were chosen: within the EU-15, outside the EU-15 and world (i.e., the sum of the former two). Third, three product categories (cheese, meat preparations and wine) were selected. Each category contains a large number of individual products. The maximum types of products for each category is: cheese 66, meat preparations 54 and wine 70.³ However, the actual number of types included into the analysis depends on the individual country (see next paragraph). The categories were selected based on their importance to the EU food industry (meat, beverages and dairy products are the three most important sub-sectors as measured by their shares in total sector value added, see Lienhardt (2004)). The fourth dimension is time. The years 1995 to 2005 were included into the analysis. Since the used trade data are volatile, the 11-years were averaged over two periods (1995-99 and 2000-05). The first covers the period before the Euro introduction as a general currency, the second the period after its introduction. Overall, some 26,804 observations were used in the analysis. For the UK, the wine category was not analysed because the country is not a significant wine producer. For Spain, no (or only a few) wine export quantities for the second period were available, thus only period-one exports could be included into the analysis. Despite these few missing values, the dataset covers a whole target population rather than being of sample nature. This needs to be kept in mind when interpreting the statistical significance (i.e., deviations from zero larger than those to be expected due to sampling error) of the estimation results later in this paper.

Data preparation involved the removal of re-export data and of outliers.⁴ Unfortunately, the raw data also included export flows of products which could not have been produced in a certain country (e.g., Navarra red wines in German exports, or Gorgonzola cheese in French exports). These re-exports were removed from the original data set where possible.

³ The covered product codes are: cheese: 4061010–4069099; meat preparations: 16010010–16029099 and wine: 22041011–22042199. The exact description of the individual products can be found on the internet through the Eurostat Comext database or be obtained on request by the author.

⁴ Only two product types (16022011 and 16022019: preparations of goose or duck liver) were removed in the meat preparations category. In almost all countries, these products displayed extremely high unit values and very low export performance, thus making them very influential outliers.

However, for many products (e.g., processed cheese, uncooked sausages, etc.) where the production is not restricted to a certain geographical area, no potentially existing re-exports could be eliminated. Table 1 lists the actual number of products included in the empirical analysis for each category and country (the n_{ct}) [Table 1 around here].

3.4 Estimation methods

The relationship between export performance and food quality was estimated using regression analysis. First, ordinary least squares (OLS) estimators of the slope coefficients were obtained separately for each country and product category, controlling for a potential period effect. Second, all data were pooled and feasible generalised least squares (GLS, which allows for heteroscedasticity across and correlation between different panels, see Cameron and Trivedi, 2005) was used to estimate the (nested) fixed effect of food quality on export performance, controlling for country, product category and time. A more detailed description of the GLS estimation procedure is provided in Appendix A.

4. Results

The estimation results are displayed in Figures 1 to 10 (OLS) and in Tables 2 and 3 (GLS). Overall, it emerges that the direction (and the significance) of the relationship between food product quality and its export performance is not systematic but depends on the country, the product category and the export destination. However, the direction (i.e., the sign of the slope coefficient) is in most cases independent of the measurement approach (per capita or relative), yet the significance levels are not.

In the OLS estimations, export performance (per capita and relative) was regressed on unit values (absolute and relative) and a dummy variable was included in all cases (except for wine in Spain), in order to control for a potential period effect. However, in no case the dummy coefficient turned out to be significant at least at the 95% confidence.

4.1 Country-specific results

In Germany (Figures 1 and 2), for all investigated product categories and export destinations, the relationship between product quality and export performance is negative. The slope coefficient is statistically significant (at least at the 95% confidence level) for total and intra-EU per capita cheese exports and in addition for wine exports to all three export destinations using relative export performance measurement. There does not seem to be a major difference between the intra- and extra-EU situation, except for perhaps the case of meat preparations where the slope coefficient seems to be slightly larger than for intra and total exports. Overall, it appears that Germany exports relatively very few high-quality food products, where high quality is meant relative to the other products in the respective categories [Figures 1 and 2 around here].

In Italy (Figures 3 and 4), the situation is almost completely different as compared to the one of Germany. The estimated slope coefficients are positive for cheese and meat preparations and negative for wine to all export destinations. Here the significance levels depend on the applied measurement approach: in the case of per capita exports the slope coefficients are statistically significant (at least at the 95% confidence level) for cheese and meat preparations to all destinations but not for wine. In the case of relative measurement, they are significant for cheese extra-EU exports and for wine exports to all destinations. Overall, it appears therefore that Italy is predominantly a quality exporter, except for wine [Figures 3 and 4 around here].

The situation in France (Figures 5 and 6) is the exact mirror image to the one in Italy: a negative quality-performance relationship for cheese and meat preparations and a positive one for wine. For intra-EU per capita exports of meat preparations there seems to be a slight positive relationship. However, when measured in relative terms, the relationship comes out as slightly negative. As for the significance levels, both measurement approaches yield significant (95% confidence level) slope coefficients for extra-EU exports of meat preparations and wine exports to all destinations. Overall, France seems therefore

to be a quality exporter of wine only. In the other product categories, export performance is highest for low- and average-quality products [Figures 5 and 6 around here].

In Spain (Figures 7 and 8), the results are less uniform. There appears to be a difference in the direction of the quality-performance relationship between the intra- and extra-EU export situation for cheese and meat preparations. For cheese, the relationship is negative for the total (but slightly positive in per capita terms) and intra-EU situation, but positive for extra-EU exports. For meat preparations, the situation is almost vice versa: a positive relationship for the total and intra-EU situation, and a neutral (or only slightly positive one) for extra-EU exports. For wine, the slope coefficients are (except for the relative measurement of the intra-EU situation) positive in all cases. As for statistical significance levels, only the per capita coefficients for extra-EU cheese exports and total and intra-EU wine exports exceed the 95% confidence-level threshold. Overall, Spain clearly seems to be a high-quality wine exporter, a high-quality exporter of meat products and a high-quality exporter of cheese to extra-EU destinations [Figures 7 and 8 around here].

The UK situation (Figures 9 and 10) finally, is also different according to the export destination. For cheese, the estimated slope coefficients are negative or only slightly positive for total and intra-EU exports, but definitely positive for extra-EU exports. For meat preparation, the situation is vice versa: a positive relationship for total and intra-EU exports and a negative one for extra-EU exports. However, none of the coefficients turned out to be statistically significant (again 95% confidence level). Thus, the UK appears to be a high-quality exporter for cheese to extra-EU countries and for meat preparations to intra-EU countries only [Figures 9 and 10 around here].

4.2 Results from the pooled estimation

As the previous section has shown, there does not seem to be a systematic relationship between product quality and export performance. The signs of the estimated slope coefficients vary widely across countries and sometimes even across export destinations. The only exception is perhaps for meat-preparations exports to extra-EU destinations, where the slope coefficients are mostly negative. Thus, regressions run on the overall (i.e., pooled) dataset can be expected to not perform well. Nonetheless, the results from these GLS estimations are reported in Tables 2 and 3.

For the absolute (per capita) measurement approach (Table 2), the tests for fixed effects show that there are significant differences between the included factors (country, category and period). This implies that the absolute level of per capita exports is significantly different across all three factors which makes the pooling of the data problematic. As a result, the estimates for the included covariates (here unit value) may be biased. From the fixed-effect parameter estimates it can be seen that relative to the reference category Italy, France has (across all included product categories and the two periods) the highest per capita exports, followed by the UK, Spain and Germany. As compared to the reference category wine, the per capita exports of meat products are (across all countries and the two periods) the smallest, followed by cheese. Given a total dataset size of 744 observations, the differences between the two included periods turn also out to be statistically highly significant. The absolute level of per capita exports is higher in the latter period, which can perhaps be explained by inflation-induced increases (neither export nor unit values were deflated) or the trade-enhancing effect of the common market from 1999 onwards. The overall effect of quality (unit value) comes out as being positive for all three analysed export destinations, however it is only statistically significant (95% confidence level) for extra-EU exports (but the estimate may not be reliable as argued above). All variance components were estimated as statistically highly significant. There seems to be a considerable difference between the error variance of the first and the second period, implying that heteroscedasticity may be present in the data. Residual autocorrelation also seems to be present. Thus, on statistical grounds, the use of feasible GLS seems to be justified. The overall fit of the model is not very high, as can be seen from the comparatively high values of the information criteria restricted $-2 \log$ likelihood,

AIC and BIC (see Appendix A for a theoretical discussion of these measures) [Table 2 around here].

For the relative measurement approach (see Table 3), only the results from the final estimated model are reported. Since deviations from means are used in the relative measures, differences in levels across countries or periods are no longer present in the data. However, there is still a significant difference in levels between the analysed product categories. Relative to wine, meat products seems to be structurally exported least (although the difference is only statistically significant for total and intra-EU exports). Given these differences in levels, the unit-value slope coefficient were estimated in nested form, i.e., as category-specific. The results show that for cheese exports, the slope coefficient is negative for all export destinations (but it is not statistically significant). For meat preparations, the unit-value slope coefficient is negative for total and extra-EU exports but positive for intra-EU exports. It is highly significant (and largest in magnitude) for extra-EU export only. For wine, the situation is exactly vice versa as compared to the one of meat preparations: positive unit-value slope coefficient for total and extra-EU exports, but a negative one for intra-EU ones. However, none of these coefficients is statistically significant at the 95% confidence level. As for the estimated variance components, the degree of heteroscedasticity seems to be less severe, but autocorrelation is still present across the two panels. All information criteria statistics have comparatively high values which indicates that overall model fit is low [Table 3 around here].

6. Conclusions

This paper has investigated the relationship between product quality (as indicated by UV) and export performance, both measured in absolute (per capita) and relative terms. The estimation results show that the connection between quality and export performance clearly depends on the product category and country (but not on the period) and differs, but not in all cases, according to the export destination. While the signs of the estimated slope coefficients are stable, the obtained statistical significance levels depend on the used measures (relative or absolute) and estimation methods (OLS or GLS).

Overall, it emerges that in Italy export performance is positively related to product quality (i.e., exports of higher-quality products are relatively higher) for cheese and meat preparations, but not for wine. In France, the situation is exactly vice versa: a negative relation for cheese and meat preparations but a positive one for wine. In Spain, relative export performance rises with quality for meat products and wine, but decreased for cheese (however, it increases for extra-EU exports). In the UK, for both analysed product categories, meat preparations and cheese, the slopes are only slightly positive, indicating that export performance is roughly the same for all quality levels (although there are differences between the intra and extra-EU export situation). Finally, in Germany, there is a negative connection for all three product categories, implying that high-quality products only play a minor role in the country's exports.

The findings from this analysis suggest that while there does not seem to be a systematic relationship between food quality and export performance high-quality products clearly play a considerable role in the food exports of at least some countries (here Italy, France and Spain). This underlines the point that it is justified, and even necessary, to give special attention to this sort of trade. One possibility to do this, for instance, could be the introduction of specialised courses in 'marketing of quality products'. Today, a few other highly specialised post-graduated management courses already exist (e.g., Essec Business School in Paris offers an MBA in Luxury Brand Management while the University of South Australia offers a Master of Wine Marketing), which may serve as a model. Another possibility would be to offer specialised short courses (or other training programmes) to already practicing agribusiness professionals. Given that the issue seems to be of relevance for several EU countries, an integrated, pan-European teaching/training programme and thus the pooling of the expertises from different countries may perhaps be most useful. In any case, such specialised capacity-building initiatives for current and/or future agribusiness leaders can clearly be expected to contribute positively to the enhancement of

the competitiveness of EU food companies, which operate in increasingly liberalised markets.

Future research may investigate why some countries in some product categories perform better in exporting high-quality products than others. One possible reason could be that exports simply reflect production proficiency, i.e., that countries which produce relative more high-quality food products also export more of these. However, this hypothesis needs empirical confirmation.

Appendix A

Given the special nature of the data (i.e., a short unbalanced panel, or, more accurately, a nested cross-section with one repeated measurement), a general linear model (GLM) was fitted for estimating the slope coefficient of product quality with regard to product export performance. Formally, the GLM (i.e., a fixed-effects specification which is assumed to be linear in parameters; Verbeke and Molenberghs (1997)) can be specified as

$$y_{ckt} = \mu + \phi_c + \phi_k + \phi_t + \sum_l \left(\gamma_{(c,k,t)}^l \cdot x_{ckt}^l \right) + \varepsilon_{ckt} \quad (\text{A.1})$$

μ is the overall (grand) mean (a fixed parameter, equivalent to the usual intercept); ϕ_c the fixed main-effect parameter for the three categorical predictors (i.e., 'factors') country ($c = 1, \dots, C$), category ($k = 1, \dots, K$) and time period ($t = 1, \dots, T_{ck}$); $\gamma_{(c,k,t)}^l$ the fixed parameters of l included (non-stochastic) covariates x_{ckt}^l ($l = 1, \dots, L$); and ε_{ckt} the random error (disturbance) of y_{ckt} . (In this case, $C = 5$, $K = 3$ and $T_{ck} \in [1, 2]$, depending on the country and category; and L can potentially be high, since nested effects were considered.) In the given specification, product categories (level one) are nested in countries (level two), and covariate parameters $\gamma_{(c,k,t)}^l$ are allowed to vary by included factor, i.e., across countries, categories or periods. (If the parameter is estimated and presented as not factor-specific, then it represents the overall mean effect across all countries, categories and periods, i.e., γ^l .) In this way, eq. (A.1) can also be seen as a two-level hierarchical linear model (HLM) (Cameron and Trivedi, 2005).

Equation (A.1) can be simplified to $y_{ckt} = \mathbf{x}'_{ckt} \boldsymbol{\beta}_{(c,k,t)} + \varepsilon_{ckt}$, where \mathbf{x}'_{ckt} denotes a (row) vector of m inputs (factors, covariates and interactions) and $\boldsymbol{\beta}_{(c,k,t)}$ the (column) vector of corresponding parameters (including the ϕ). Rewritten in full matrix notation, eq. (A.1) becomes

$$\mathbf{y} = \mathbf{X} \boldsymbol{\beta}_{(c,k,t)} + \boldsymbol{\varepsilon} \quad (\text{A.2})$$

where \mathbf{y} is a $\sum_{c=1}^C I_c T_c \times 1$ response vector, \mathbf{X} is a $\sum_{c=1}^C I_c T_c \times m$ input matrix, $\boldsymbol{\beta}$ is a $m \times 1$ parameter vector, and $\boldsymbol{\varepsilon}$ is a $\sum_{c=1}^C I_c T_c \times 1$ disturbance vector.

Given the panel structure of the data, where the different product types are treated as subjects, $\mathbf{E}(\mathbf{y}) = \mathbf{X} \boldsymbol{\beta}_{(c,k,t)}$, and $\text{Var}(\mathbf{y}) = \text{Var}(\boldsymbol{\varepsilon})$ is assumed to be i.i.d. $N(0, \sigma_t^2)$,

thus disturbances in the two panels may be contemporaneously correlated and potentially heteroscedastic (i.e., displaying non-constant variance). As a consequence, $\hat{\beta}_{(c,k,t)}$ in eq. (A.2) cannot efficiently be estimated by pooled ordinary least squares (OLS) regression. Instead, a method that takes into account autocorrelated and non-constant residual errors needs to be used. One such method is feasible generalised least squares (FGLS), where:

$$\hat{\beta}_{\text{FGLS}} = [\mathbf{X}'\hat{\mathbf{V}}^{-1}\mathbf{X}]^{-1}\mathbf{X}'\hat{\mathbf{V}}^{-1}\mathbf{y} \quad (\text{A.3})$$

(see Cameron and Trivedi, 2005), and where implementation requires the consistent estimation of \mathbf{V} , the variance-covariance matrix of disturbances $\boldsymbol{\varepsilon}$. In order to consistently estimate \mathbf{V} , one usually needs to make explicit assumptions about the underlying structure of its variance components, but it is possible (and was done in this case) to treat \mathbf{V} as being

$$\begin{bmatrix} \sigma_1^2 & \sigma_{12} \\ \sigma_{21} & \sigma_2^2 \end{bmatrix}$$

completely unstructured, i.e.,

The estimation of variance components can be done in different ways. Under the i.i.d. multivariate normal assumption for $\boldsymbol{\varepsilon}$, maximum likelihood estimation methods are usually employed, with two possible options: maximum likelihood (ML) or restricted maximum likelihood (REML). A weakness of the ML method is that the estimates are biased in small samples (Cameron and Trivedi, 2005). Moreover, since REML does explicitly take into account the loss of the degrees of freedom involved in estimating the fixed effects, it is the recommended option in models containing many fixed-effect parameters (Verbeke and Molenberghs, 1997). The -2 times log-likelihood of REML is (Cameron and Trivedi, 2005)

$$-2\ell_{\text{REML}}(\mathbf{V}) = \ln|\mathbf{V}| + (NT - p)\ln(\mathbf{r}'\mathbf{V}^{-1}\mathbf{r}) + (NT - p)\left[1 + \ln\left(\frac{2\pi}{NT - p}\right)\right] + \ln|\mathbf{X}'\mathbf{V}^{-1}\mathbf{X}| \quad (\text{A.4})$$

where $\mathbf{r} = \mathbf{y} - \mathbf{X}[\mathbf{X}'\mathbf{V}^{-1}\mathbf{X}]^{-1}\mathbf{X}'\mathbf{V}^{-1}\mathbf{y}$, $|\mathbf{V}|$ denotes the determinant of \mathbf{V} , N the number of subjects, and p is the rank of \mathbf{X} . The variance components of \mathbf{V} can be computed by maximising eq. (A.4), however in general, there are no closed-form solutions. Therefore, Newton and scoring algorithms are usually used to find the solution numerically, starting with some initial value for residual error variance σ^2 . Assuming i.i.d. $N(0, \sigma^2)$, residual sum of squares from OLS regression usually yields $\hat{\sigma}^2$ to be used as starting value.

Once \mathbf{V} has been estimated, original data \mathbf{X} and \mathbf{y} are then accordingly transformed and OLS regressions are run on the adjusted data, yielding autocorrelation and

heteroscedasticity-adjusted $\hat{\beta}_{(c,k,t)}$ and respective panel-robust standard errors. For the significance tests of the included factors, ANOVA (i.e., 'method of moments'-type) estimators, which equate quadratic sums of squares to their expectations and solve the resulting equations for the unknowns, are used. Baltagi et al. (2001) showed that ANOVA methods perform well in estimating the regression coefficients in unbalanced nested error-component regression models. Given that the dataset in this paper is unbalanced, and that I am interested in the significance of the remaining differences in the factor category (or marginal) means, Type III sums of squares are used (Hill and Lewicki, 2006).

In maximum likelihood-based FGLS regressions, conventionally only the final value of the (restricted) -2 times log-likelihood function and derived information criteria (such as the Akaike information criteria, AIC, and the Bayesian information criteria, BIC) are calculated (see Cameron and Trivedi, 2005 for a discussion), on the basis of which appropriate (nested) models are selected. However, for assessing the overall fit of a model to the underlying data, these statistics are less useful, since they cannot be compared across different non-nested models.

7. References

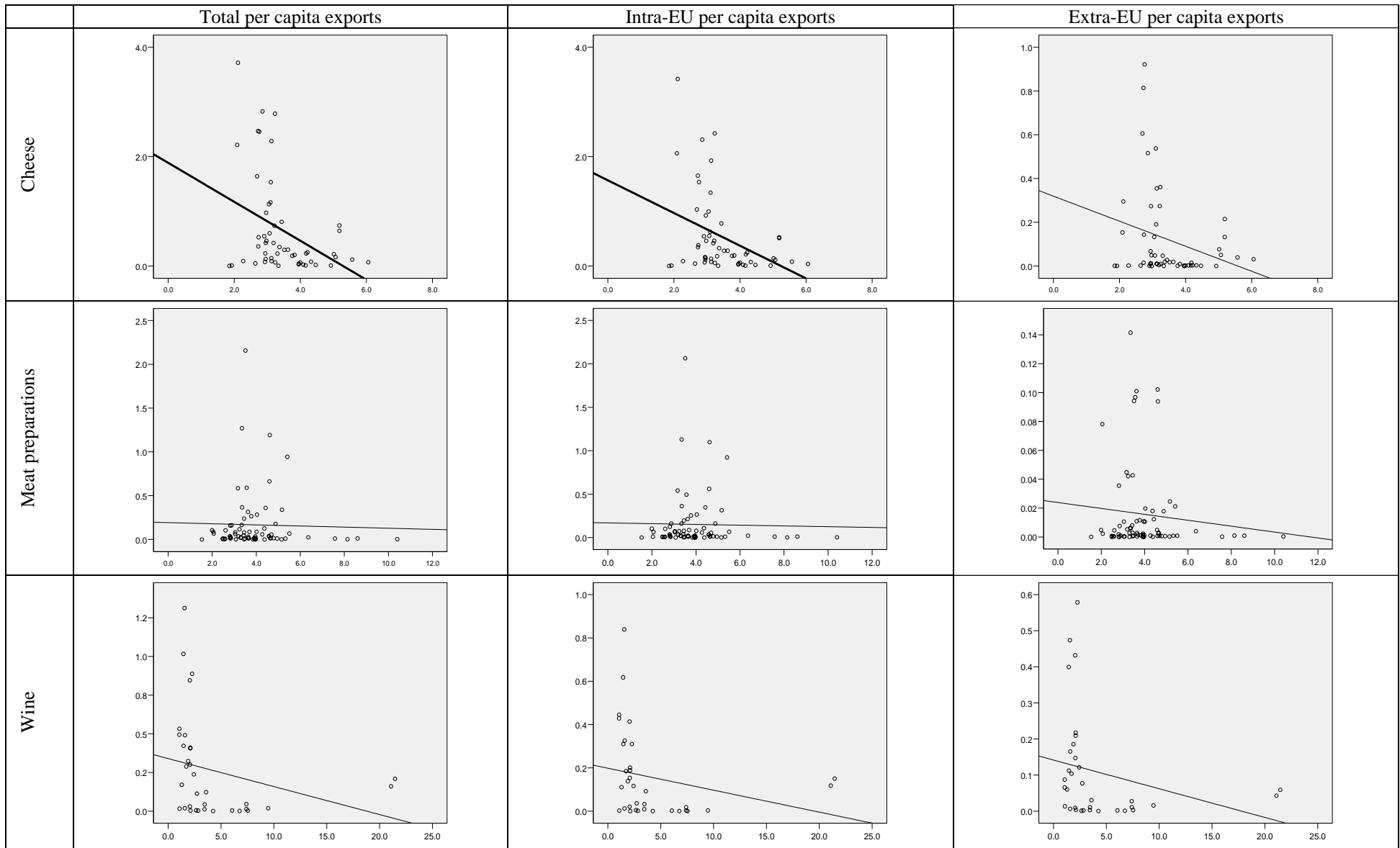
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Tables and Figures

Table 1. Number of product types included in the empirical analysis for each product category and country (n_{ck})

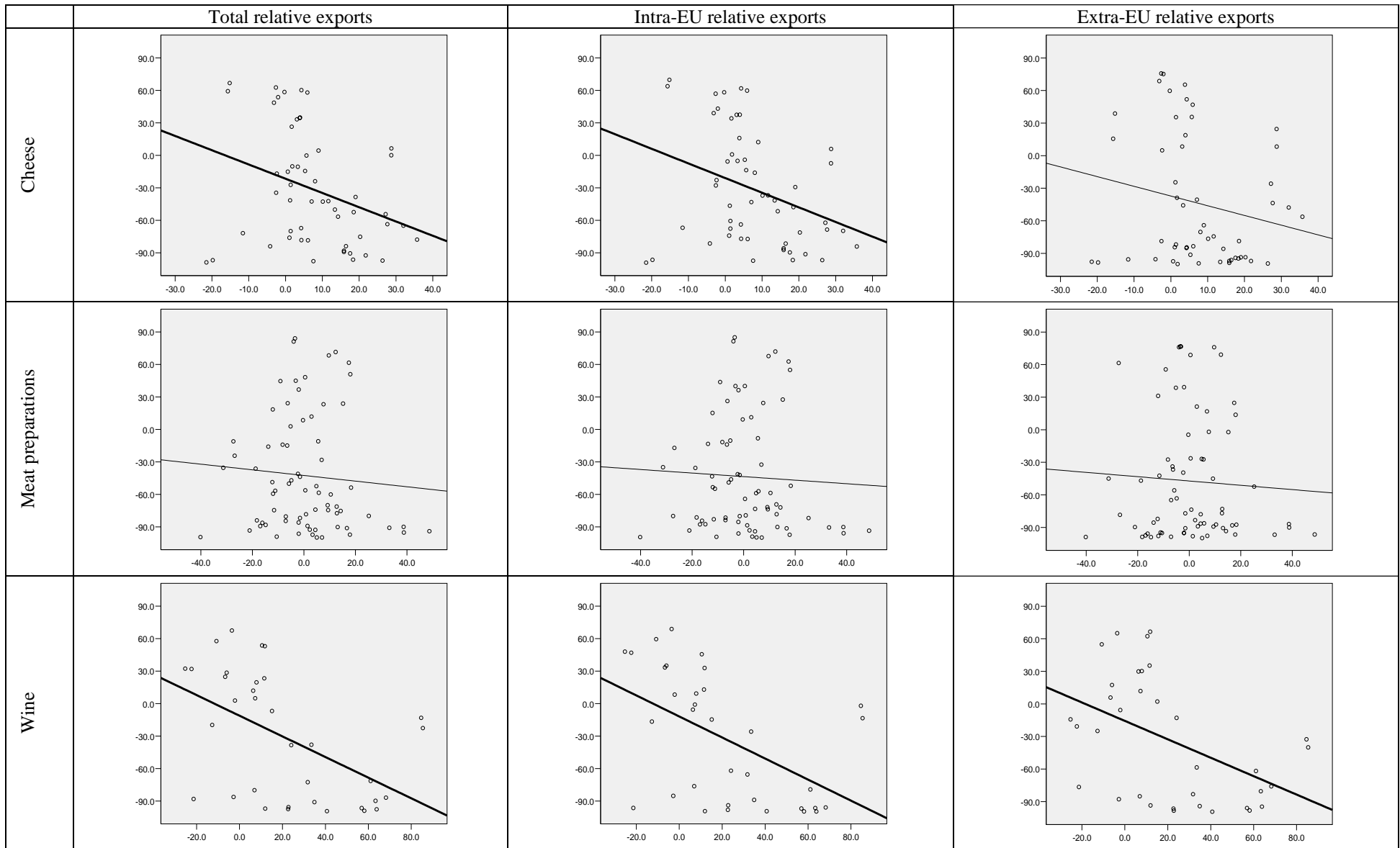
	DE	IT	FR	ES	GB
Cheese	27	25	31	13	15
Meat preparations	36	35	41	34	36
Wine	17	25	25	24	–

Figure 1. Germany, absolute measurement (per capita exports in €(y-axis) versus unit values €/kg (x-axis))



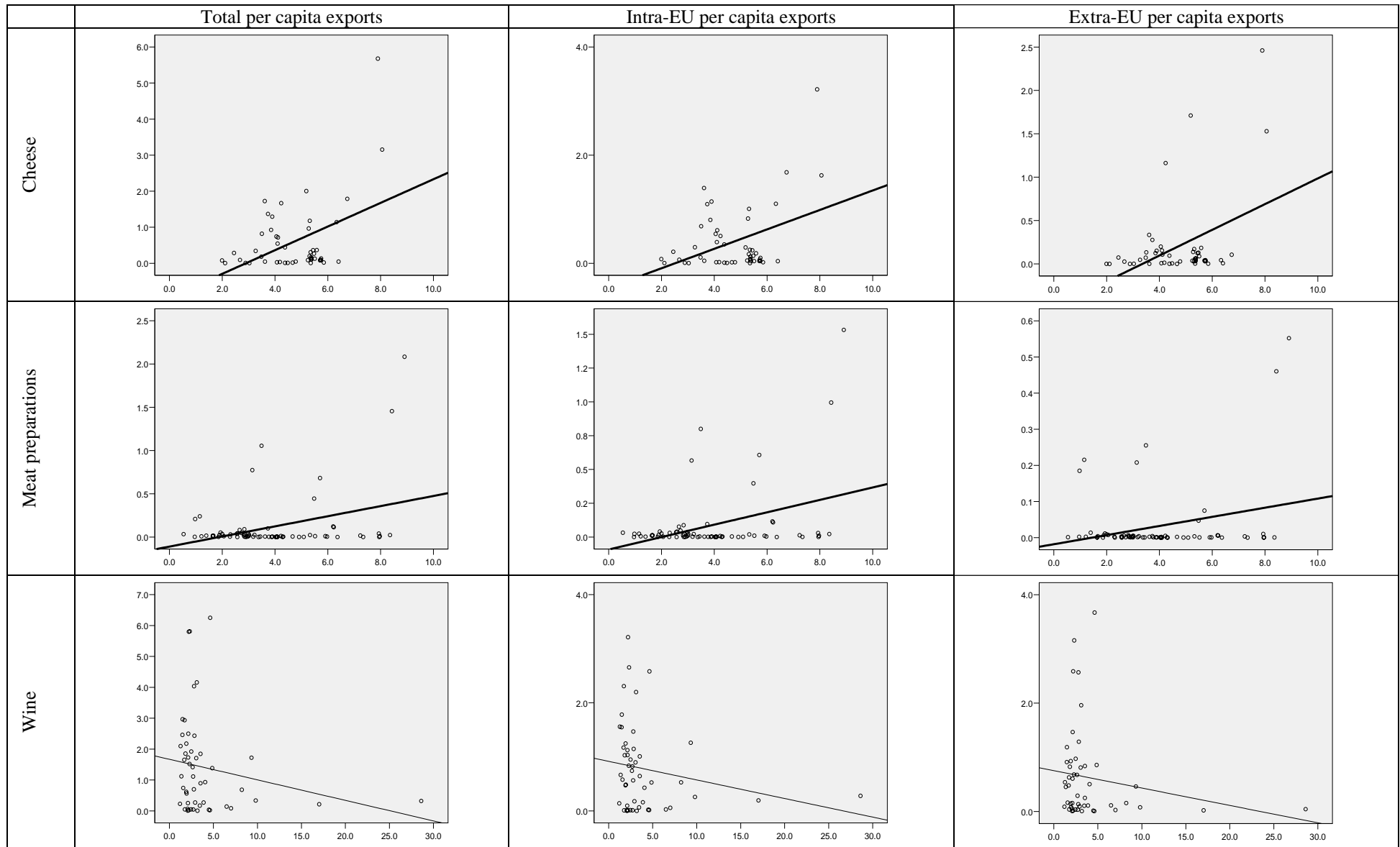
Note: **bold** regression lines indicate that the slope coefficient is statistically significant at the 95% confidence level.

Figure 2. Germany, relative measurement (deviations from expected values (y-axis) versus deviations from average unit values (x-axis))



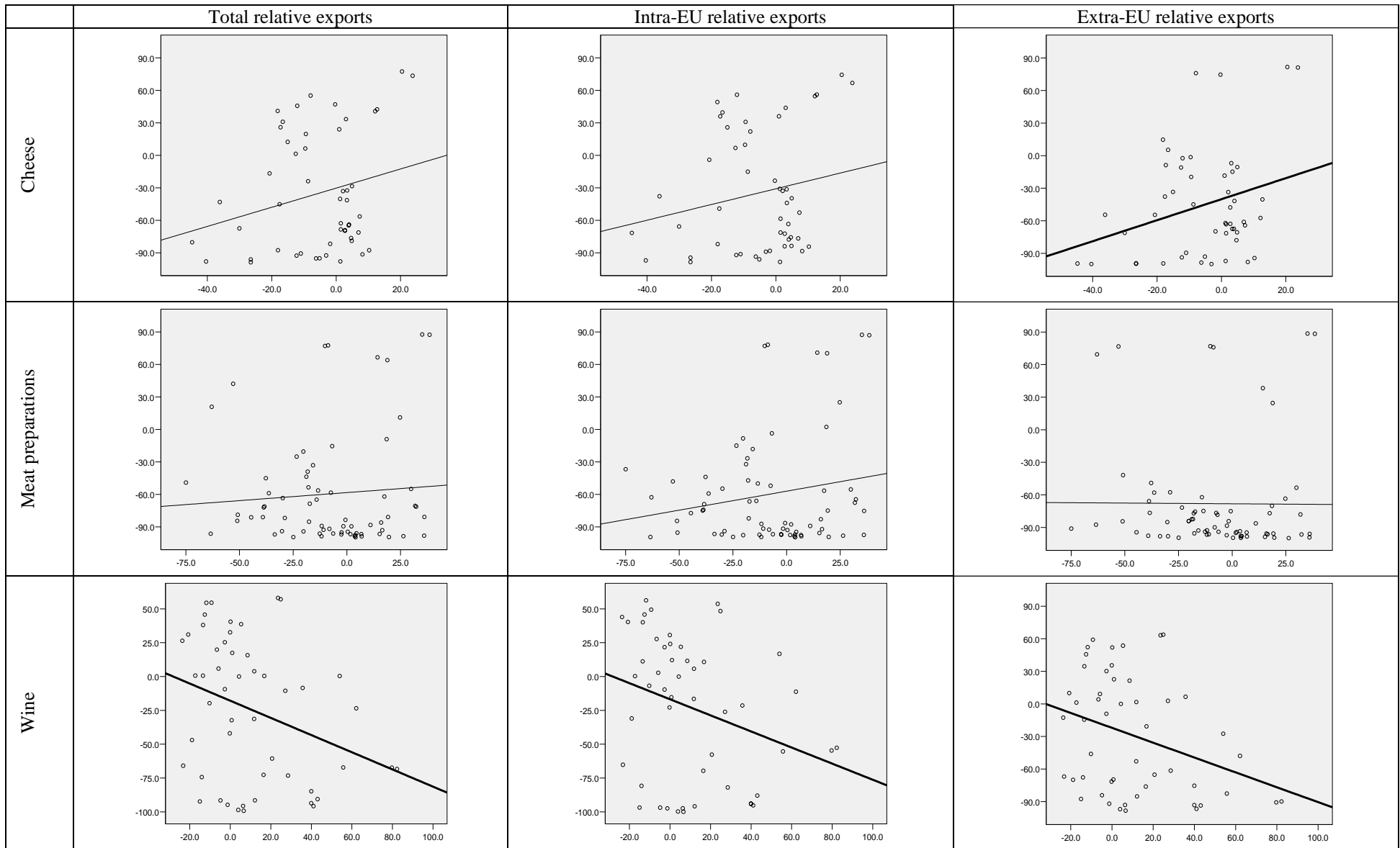
Note: **bold** regression lines indicate that the slope coefficient is statistically significant at the 95% confidence level.

Figure 3. Italy, absolute measurement (per capita exports in €(y-axis) versus unit values €/kg (x-axis))



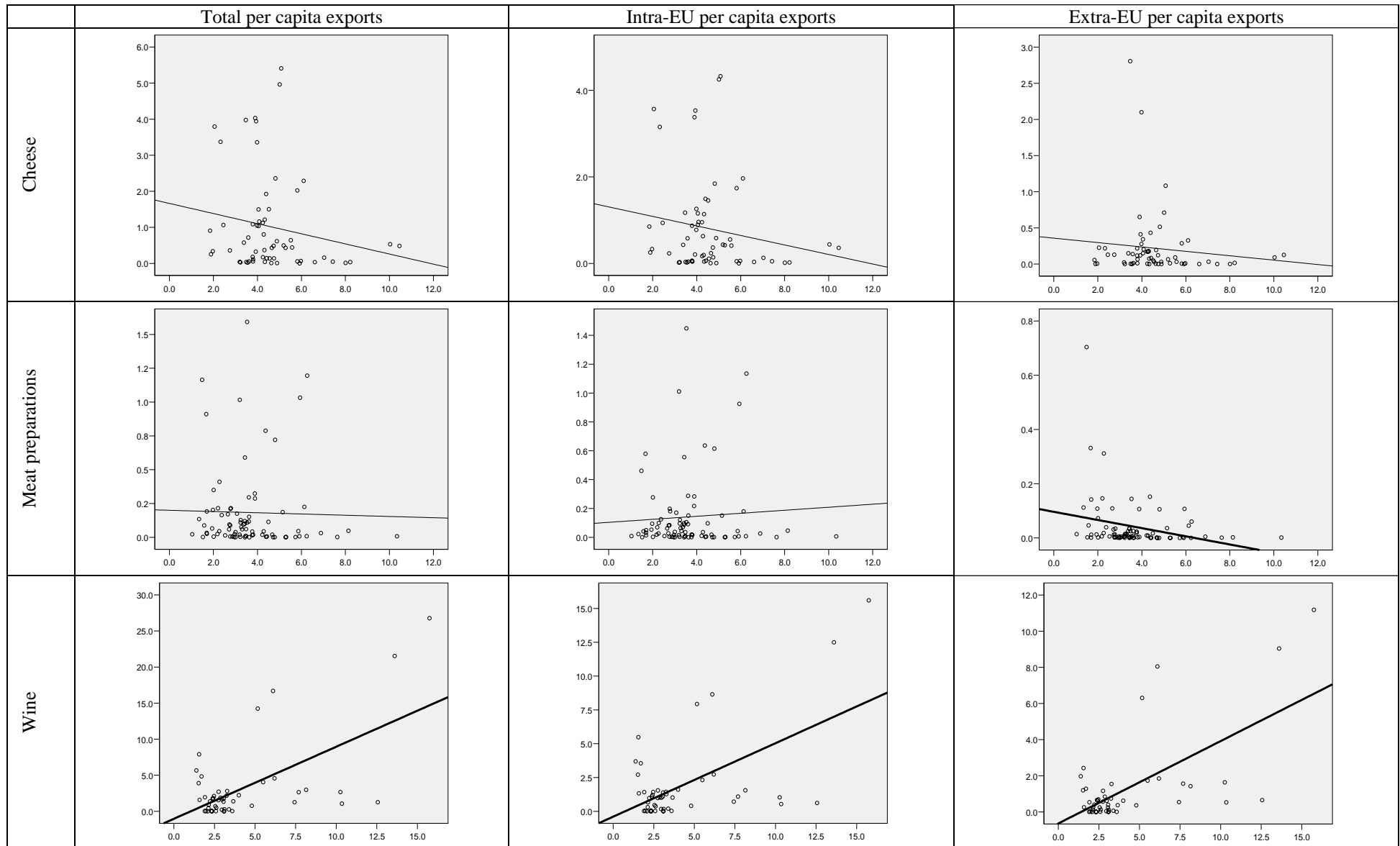
Note: **bold** regression lines indicate that the slope coefficient is statistically significant at the 95% confidence level.

Figure 4. Italy, relative measurement (deviations from expected values (y-axis) versus deviations from average unit values (x-axis))



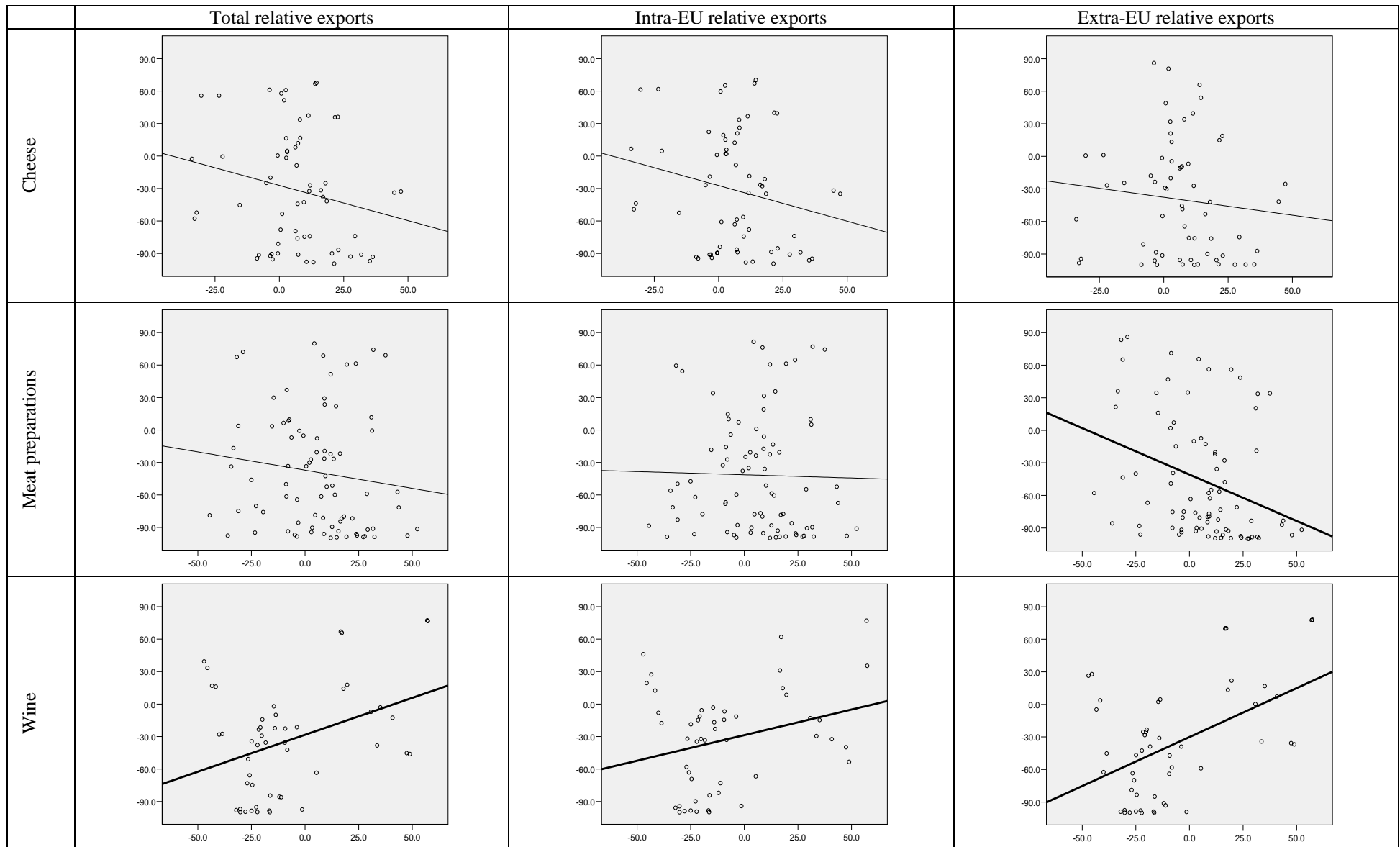
Note: **bold** regression lines indicate that the slope coefficient is statistically significant at the 95% confidence level.

Figure 5. France, absolute measurement (per capita exports in €(y-axis) versus unit values €/kg (x-axis))



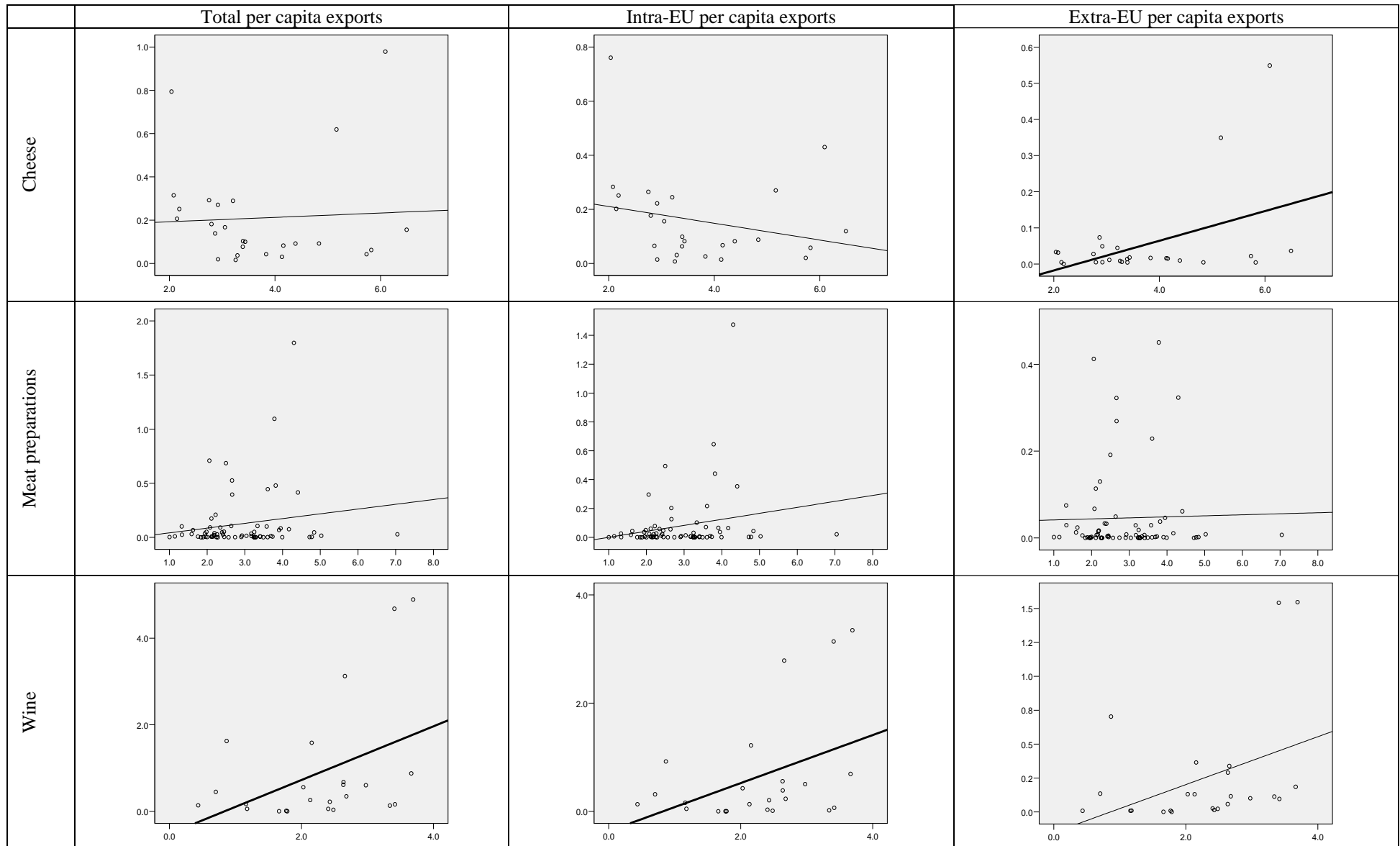
Note: **bold** regression lines indicate that the slope coefficient is statistically significant at the 95% confidence level.

Figure 6. France, relative measurement (deviations from expected values (y-axis) versus deviations from average unit values (x-axis))



Note: **bold** regression lines indicate that the slope coefficient is statistically significant at the 95% confidence level.

Figure 7. Spain, absolute measurement (per capita exports in €(y-axis) versus unit values €/kg (x-axis))



Note: **bold** regression lines indicate that the slope coefficient is statistically significant at the 95% confidence level.

Figure 8. Spain, relative measurement (deviations from expected values (y-axis) versus deviations from average unit values (x-axis))

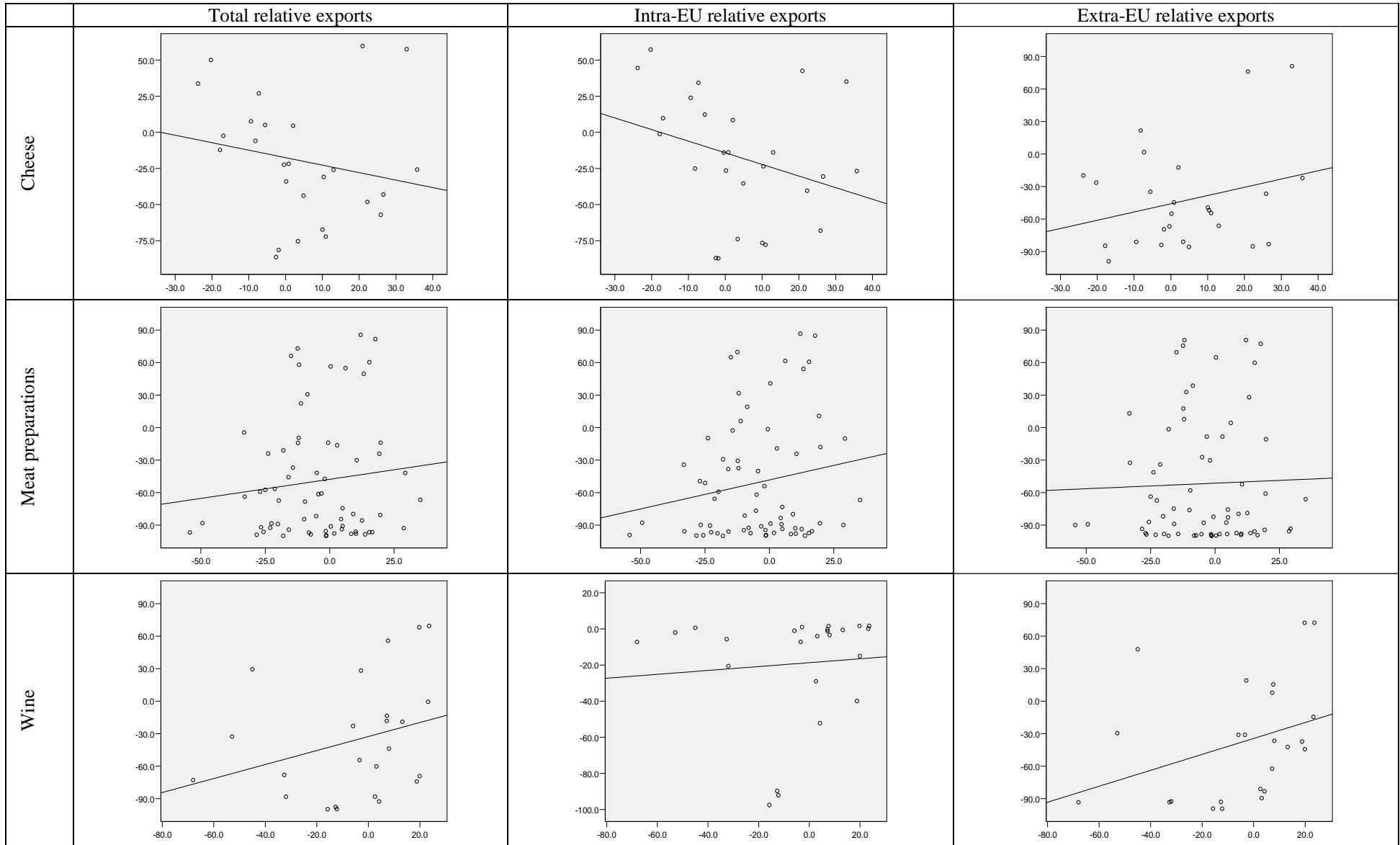


Figure 9. UK, absolute measurement (per capita exports in €(y-axis) versus unit values €/kg (x-axis))

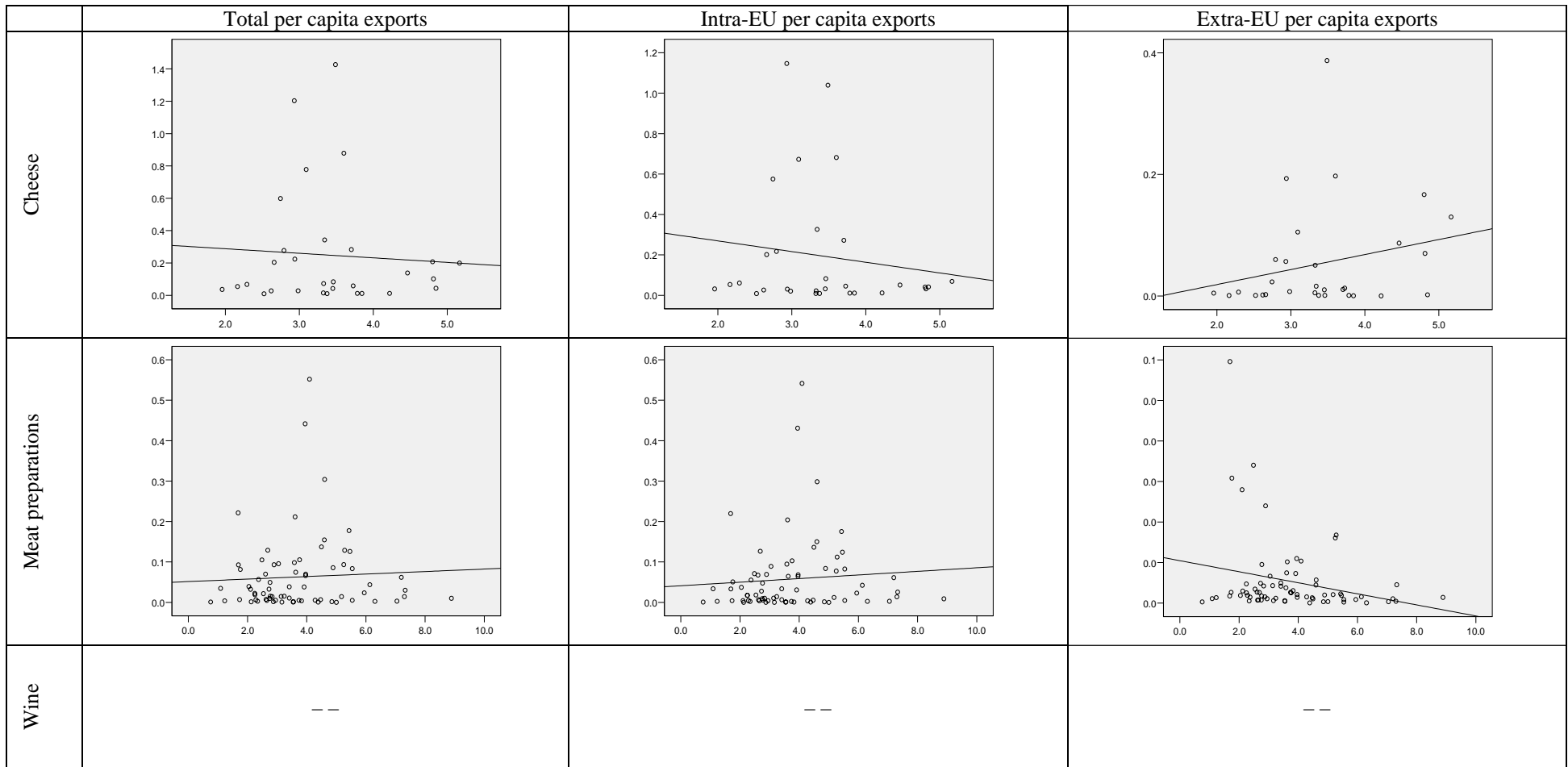


Figure 10. UK, relative measurement (deviations from expected values (y-axis) versus deviations from average unit values (x-axis))

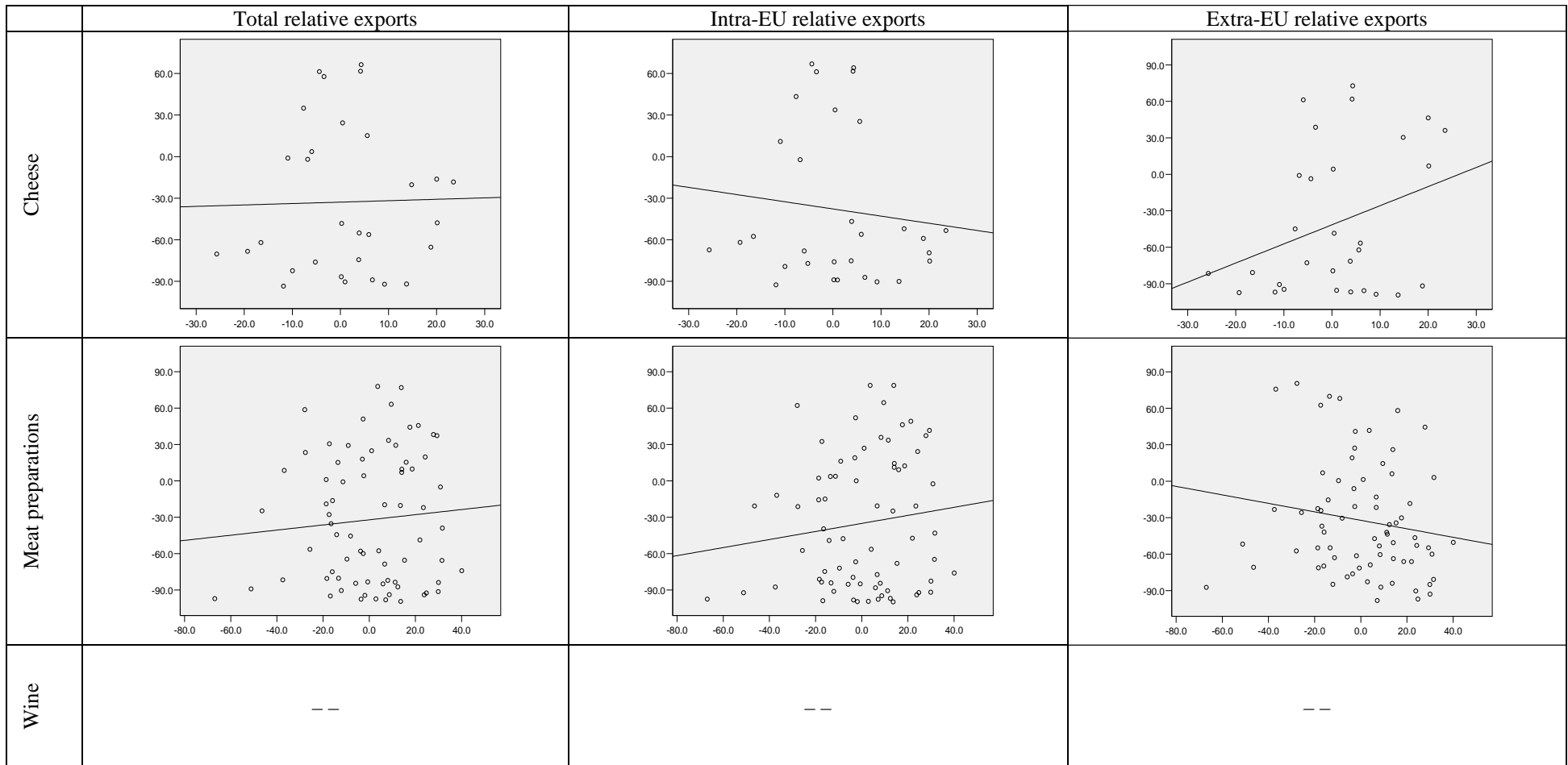


Table 2. Summary regression results (feasible GLS estimates) for a two-level hierarchical linear model with one repeated measurement; absolute measurement

Regressors	Dependent variable: per capita exports		
	Total	Intra EU	Extra EU
<i>Tests of fixed effects (F-values)</i>			
Intercept	33.5**	45.2**	10.5**
COUNTRY	7.9**	7.3**	5.0**
CATEGORY	6.4**	15.5**	3.0*
PERIOD	29.2**	33.3**	10.3**
Unit value	2.3	1.6	5.6**
<i>Fixed effect parameter estimates</i>			
Intercept	.646**	.638**	.137
Country = DE	.141	-.020	.094
Country = ES	.254	.037	.149
Country = FR	.786**	.451**	.301**
Country = UK	.271	.117	.104
Country = IT	0 ^a	0 ^a	0 ^a
Category = CHEESE	-.361*	-.354**	-.140*
Category = MEAT PR	-.510**	-.526**	-.154
Category = WINE	0 ^a	0 ^a	0 ^a
Period = 0 (1995-99)	-.142**	-.094**	-.043**
Period = 1 (2000-05)	0 ^a	0 ^a	0 ^a
Unit value	.020	.011	.017*
<i>Variance/covariance matrix components[†]</i>			
σ_1^2	2.17**	.787**	.382**
σ_2^2	3.46**	1.22**	.646**
σ_{12}	2.69**	.957**	.482**
<i>Model statistics</i>			
# of obs.	744	744	744
Restr. -2 log lik.	1,650.0	996.0	581.8
AIC	1,656.0	1,002.0	587.8
BIC	1,670.0	1,015.8	601.6

Notes: ** statistically significant at least at 99% confidence level;

* statistically significant at least at 95% confidence level.

Significant levels are based on panel-robust standard errors.

^a Reference category.

[†] Restricted maximum likelihood estimate.

Source: author's calculations from Eurostat data.

Table 3. Summary regression results (feasible GLS estimates) for a two-level hierarchical linear model with one repeated measurement; relative measurement (non-significant factors removed)

Regressors	Dependent variable: relative export performance		
	Total	Intra EU	Extra EU
<i>Tests of fixed effects (F-values)</i>			
Intercept	158.5**	155.9**	219.5**
CATEGORY	3.2*	5.5**	2.2
Relative unit value	1.0	.4	5.4**
<i>Fixed effect parameter estimates</i>			
Intercept	-31.38**	-26.13**	-34.923**
Category = CHEESE	.776	-4.92	-7.45
Category = MEAT PR	-13.13	-19.80**	-14.20*
Category = WINE	0 ^a	0 ^a	0 ^a
Relative unit value (CHEESE)	-.161	-.156	-.040
Relative unit value (MEAT PR)	-.113	.024	-.356**
Relative unit value (WINE)	.017	-.111	.048
<i>Variance/covariance matrix components[†]</i>			
σ_1^2	2,922.5**	2,785.4**	2,966.6**
σ_2^2	2,826.8**	2,725.5**	2,961.7**
σ_{12}	2,666.1**	2,516.1**	2,662.0**
<i>Model statistics</i>			
# of obs.	744	744	744
Restr. -2 log lik.	7,313.9	7,344.6	7,453.0
AIC	7,319.9	7,350.6	7,459.0
BIC	7,333.7	7,364.4	7,472.8

Notes: ** statistically significant at least at 99% confidence level;

* statistically significant at least at 95% confidence level.

Significant levels are based on panel-robust standard errors.

^a Reference category.

[†] Restricted maximum likelihood estimate.

Source: author's calculations from Eurostat data.

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Home Bias in U.S. Beer Consumption

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Summary

We apply the Berry, Levinsohn and Pakes (1995) market equilibrium model (BLP) to data from 30 brands of beers sold in 12 U.S. cities over 20 quarters (1988-92) to estimate the consumers' taste for beer characteristics (price, alcohol content, and calories) as well as for the cultural region of origin (USA, Anglo-European, Germanic, and countries bordering the U.S.). Consumer heterogeneity is allowed with respect to age, income and gender. Overall we end up with 7,200 beer brand observations (30x12x20) and 13,920 (58 random draws x 12 x 20) consumer observations. Empirical results indicate that indeed there is home bias with respect to European beers and somewhat less so with respect to beers from bordering countries (Mexico and Canada). Home bias is more accentuated among older males who are more affluent. Furthermore, the own-price elasticities and the cross price elasticities of demand are higher for foreign beers, indicating a higher degree of loyalty and differentiation for domestic beers.

KEYWORDS: Home bias, beer, country of origin, demand, differentiated products

1. Introduction

We apply the Berry, Levinsohn and Pakes (1995) market equilibrium model (BLP) to 30 brands of beers sold in 12 U.S. cities over 20 quarters (1988-92) to estimate the consumers' taste for beer characteristics (price, alcohol content, and calories) as well as for the cultural region of origin (USA, Anglo-European, Germanic and bordering countries). Overall, we confirm the existence of a home bias effect, but also decompose it by consumer types. For instance, older males with higher income tend to be more loyal to U.S. beers and be turned off by Germanic beers, regardless of price, promotion, alcohol content or calories. Thus, the results provide a detailed picture of the American consumer home bias toward home vs. foreign made beers.

2. Background

A growing trade literature finds that nations trade far less internationally than they do within their borders, an empirical regularity that has been commonly referred to as the border or home bias effect. Empirical studies on home bias employ the highly successful gravity equation using rather aggregate levels of data and asserting supply-side causes by relating this phenomenon to, e.g., transportation costs, co-location of intermediate inputs, and increasing returns (Davis, 1998; Hillberry and Hummels, 2002; Head and Ries, 2001). Yet, such studies tend to ignore domestic consumer preferences for the products in question, let alone the fact that consumer preferences in a country like the United States are not monolithic as there is a large variation in consumer characteristics which might influence the degree of home bias.

3. Objectives

This paper examines the effects of domestic consumer heterogeneity on choices of foreign and domestic beers using data at the product brand level. Beers provide an interesting case study for examining home bias. First, the country of origin can be easily identified by

consumers. Second, beer comes in differentiated brands. Third, consumer heterogeneity can play a crucial role in shaping home biases. Fourth, foreign beers play a growing role in terms of their share in the American beer market. Last, home bias has not been tested at the product brand level for beer or any other product.

4. Data and methodology

In the BLP model (summarized here for expository purposes), the consumer, in choosing a beer brand among competing products, maximizes utility driven by the brand characteristics as well as his/her own characteristics. The indirect utility of consumer i from buying the brand j is given by

$$U_{ij} = \beta_i x_j + \alpha_i p_j + \zeta_j + \varepsilon_{ij}, \quad i = 1, \dots, n; j = 1, \dots, J \quad (1)$$

where x_j is a vector of the *observed* characteristics of brand j (excluding price), p_j is the price of the brand j , ζ_j denotes *unobserved* (to the researcher) product characteristics, α_i and β_i are parameters that depend on individual i 's taste, and ε_{ij} represents the distribution of consumer preferences around the unobserved product characteristics with a probability density function $f(\varepsilon)$.

Following BLP, let $\alpha_i = \alpha + \lambda D_i + \gamma v_i$ and $\beta_i = \beta + \phi D_i + \rho v_i$, where D_i denotes observed consumer characteristics (i.e., demographics) with a probability density function $h(D)$, v_i denotes the unobserved consumer characteristics with a probability density function $g(v)$ assumed to be normally distributed; and $\theta_1 = (\alpha, \beta)$ and $\theta_2 = (\lambda, \phi, \gamma, \rho)$ denote fixed parameters. Substituting into (1) yields:

$$U_{ij} = \underbrace{\beta x_j + \alpha p_j}_{\delta_j} + \underbrace{\zeta_j + \phi D_i x_j + \rho v_i x_j + \lambda D_i p_j + \gamma v_i p_j}_{\mu_{ij}} + \varepsilon_{ij}. \quad (2)$$

The indirect utility given in equation (4) is decomposed into two parts: a mean utility term δ_j , which is linear (common to all consumers), and a brand- and consumer-specific deviation from that mean μ_{ij} . Let $k = 0$ denote an outside good if the consumer decides not to buy any of the J brands in the set of brands ($j=1, \dots, J$). As each consumer purchases a unit of the brand that yields the highest utility or the outside good, aggregating over consumers, the market share of the j^{th} brand corresponds to the probability the j^{th} brand is chosen. That is, $s_j(\delta, x, p, \theta_2) = \int I\{(D_i, v_i, \varepsilon_{ij}) : U_{ij} \geq U_{ik} \forall k = 0, \dots, J\} dH(D) dG(v) dF(\varepsilon)$, (3) where $H(D)$, $G(v)$ and $F(\varepsilon)$ are cumulative density functions for the indicated variables and are assumed to be independent.

The price elasticities of the market shares for individual brands are:

$$\eta_{jk} = \frac{\partial s_j}{\partial p_k} \frac{p_k}{s_j} = \begin{cases} \frac{p_j}{s_j} \int \alpha_i s_{ij} (1 - s_{ij}) dH(D) dG(v), & \text{for } j = k, \\ -\frac{p_k}{s_j} \int \alpha_i s_{ij} s_{ik} dH(D) dG(v), & \text{otherwise.} \end{cases} \quad (7)$$

We use data from 30 brands of beer in 12 cities over 20 quarters (1988-1992). In total, 7,200 beer brand observations are used (30 brands x 12 cities x 20 time periods). The cities are: Atlanta, Buffalo, Chicago, Cincinnati, Cleveland, Columbus, New Orleans, New York, Omaha, San Antonio, San Diego and St. Louis. The data consist of two types of information: product characteristics and consumer characteristics.

The product characteristics data include the brand-level market share, the retail price and percent volume sold under promotion. These data came from the Information Resources, Inc. (IRI) Infoscan database at the Food Policy Marketing Center of the University of Connecticut. The potential market size for each was computed by multiplying the state-specific per capita consumption of beer in a given quarter (from the Brewer's Almanac) times the population. Market shares were then computed by dividing brand dollar sales by the potential market size. The retail price (dollars per case of 24-12 oz. containers) was deflated by the city or region specific Consumer Price Index (December 1992=1). In addition, the percent calorie and alcohol contents as well as the region of origin were obtained online. Four regions of origin are considered: USA, Germanic (Germany and the Netherlands), Anglo (Great Britain and Ireland) and border countries (Canada and Mexico).

Observable consumer characteristics were obtained from 58 random draws from the Current Population Survey for each city market and quarter (National Bureau of Economic Research, 2002). These variables are age, income, and gender. Another 58 draws from a normal distribution with zero mean and unit variance are obtained for the unobservable characteristics.

Instrumental variables are used to control for potential endogeneity of retail prices arising from their correlation with product characteristics (e.g., imported beers tend to be more expensive). Following Nevo (2001), 120 interactions between 30 brand dummies and four input prices are used as instruments. Input prices include the city-specific wages for supermarket workers, petroleum prices, 3-month interest rates and the price of malt. In addition, state taxes on beer and ale/lager dummies are used as additional instruments.

For estimation purposes, we define a market as a city-quarter combination, resulting in 240 markets, each with 30 brands of beer and 58 consumer observations. Overall we end up with 7,200 beer brand observations and 13,920 consumer observations. We adapt the MATLAB algorithm of Nevo (2000) to the beer case. This algorithm minimizes the distance between observed and estimated market shares, using the Generalized Method of Moments. The results are presented in the following section.

5. Results

Table 1 shows the BLP parameter estimates and their distribution statistics. One should keep in mind that we obtain a distribution consisting of 13,920 parameters, one for each individual consumer in the sample (58 draws x 20 periods x 12 cities). Thus, the 'standard errors' represent standard deviations rather than the usual interpretation for fixed point estimates. The parameter estimates of the mean utility (δ_j), which are common to all individuals, are (jointly) statistically significant at the 5% level and most have the expected

signs. Price has a negative effect independent of consumer characteristics and promotion has a positive effect on the mean utility, as expected. The mean utility results clearly point to a home bias in U.S. beer consumption with respect to Anglo and bordering countries' beers but not with respect to Germanic ones.

Taking into account consumer heterogeneity, the taste parameter for price becomes smaller (less price elastic) with age, higher income and for the male gender. Higher income consumers tend to view beers less favorably that are high in calories or alcohol content. On the other hand, alcohol content and calories follow exactly opposite patterns with respect to age and gender. While older males tend to appreciate a higher calorie content, these same consumers tend to stay away from high alcohol content.

In terms of the cultural region of origin of the beers, although the mean consumer tends to prefer USA beers (a la par with Germanic ones), this preference tends to be accentuated as consumers get older and wealthier, particularly among males. This group of consumers is generally turned off by foreign made beers, particularly those of European origin.

Overall, we calculated 10,800 price elasticities of demand for beers (the square of 30 brands x 12 cities), side-stepping the problem of dimensionality that plagues differentiated product demand estimation. As Table 2 shows, all the estimated own-price elasticities are negative, as illustrated for the city of Chicago, Illinois. The own price elasticities seem a bit high for most beers relative to estimates in the literature, although most estimates are done at a more aggregate level. Nonetheless, domestic beers tend to have much lower price elasticities than foreign ones.

The elasticities of substitution with respect to the price of Budweiser (the leading beer) are lower for domestic than for foreign beers. The elasticities of substitution with respect to Harp (the most similar beer to Budweiser in terms of alcohol content, calories and lager type) are much lower in spite of its similarities to Budweiser which is a domestic beer. Also note that the cross price elasticities of substitution are higher for foreign beers than for domestic ones, attesting that in the eyes of the Chicago consumer, foreign beers are closer substitutes among themselves than with respect to American ones.

6. Final remarks

Although the presented results are preliminary, the methodology of Berry, Levinsohn and Pakes (1995) seems promising in analyzing consumers' taste for home vs. foreign products. Applying such methodology to a large data set involving 12 cities and 30 brands of beers, the results point to home bias with respect to U.S. beer consumption. Furthermore, this bias appears to be more accentuated in male consumers who are older and have higher income. The estimated price elasticities of demand further attest that American consumers are less sensitive to the prices of domestic beer and that they more easily switch to domestic beers than foreign ones in spite of common physical beer characteristics. This shows that the payoff to go beyond the common aggregate studies of home bias in international trade is potentially high as one tests not only for home bias, but also gets a detailed insight into consumer behavior and consumer heterogeneity with respect to home bias.

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Table 1. Demand Parameter Estimates

Variable	Notation	Parameter	BLP		Logit	
			Estimate	S.E.	Estimate	S.E.
<i>Mean Utility</i>						
Price	p_j	α	-1.333	0.831	0.054	0.019
Alcohol	X_{1j}	β_7	0.317	0.730	-0.016	0.211
Calories	X_{2j}	β_2	1.866	8.463	-2.438	0.026
Ale	X_{3j}	β_3	-0.601	16.043	-0.210	0.460
Promotion	X_{8j}	β_8	8.180	0.445	6.868	0.239
USA	X_{4j}	β_4	-6.694	4.375	-7.772	0.313
Anglo	X_{5j}	β_5	8.628	14.799	-10.793	0.279
German	X_{6j}	β_6	-6.6511	4.849	-9.212	0.277
Border	X_{7j}	β_7	-8.221	7.860	-9.72	0.085
<i>Deviations</i>						
Age	D_{1i}	λ_{11}	-0.605	329.091		
Age x Price	$D_{1i}p_j$	λ_{12}	0.330	1.7698		
Age x Alcohol	$D_{1i}X_{1j}$	φ_{11}	-0.163	2.1609		
Age x Calories	$D_{1i}X_{2j}$	φ_{12}	0.003	38.3673		
Age x Ale	$D_{1i}X_{3j}$	φ_{13}	0.086	32.312		
Age x USA	$D_{1i}X_{4j}$	φ_{14}	1.161	23.7919		
Age x Anglo	$D_{1i}X_{5j}$	φ_{15}	1.212	31.183		
Age x German	$D_{1i}X_{6j}$	φ_{16}	-0.280	3.695		
Age x Border	$D_{1i}X_{7j}$	φ_{17}	-0.591	6.9092		
Income	D_{2i}	λ_{21}	-1.305	NA		
Income x Price	$D_{2i}p_j$	λ_{22}	1.571	0.4103		
Income x Alcohol	$D_{2i}X_{1j}$	φ_{21}	-0.379	0.5773		
Income x Calories	$D_{2i}X_{2j}$	φ_{22}	-2.825	4.9781		
Income x Ale	$D_{2i}X_{3j}$	φ_{23}	0.267	NA		
Income x USA	$D_{2i}X_{4j}$	φ_{24}	0.247	NA		
Income x Anglo	$D_{2i}X_{5j}$	φ_{25}	-2.286	NA		
Income x German	$D_{2i}X_{6j}$	φ_{26}	-1.789	NA		
Income x Border	$D_{2i}X_{7j}$	φ_{27}	-0.786	11.383		
Male	D_{3i}	λ_{31}	-0.466	NA		
Male x Price	$D_{3i}p_j$	λ_{32}	0.085	1.660		
Male x Alcohol	$D_{3i}X_{1j}$	φ_{33}	-0.185	1.5424		
Male x Calories	$D_{3i}X_{2j}$	φ_{32}	0.544	22.6878		
Male x Ale	$D_{3i}X_{3j}$	φ_{33}	-0.366	NA		

Male x USA	$D_{3i}X_{4j}$	φ_{34}	0.031	NA
Male x Anglo	$D_{3i}X_{5j}$	φ_{35}	-0.471	NA
Male x German	$D_{3i}X_{6j}$	φ_{36}	-0.669	NA
Male x Border	$D_{3i}X_{7j}$	φ_{37}	0.226	7.466
Unobserved	v_i	γ_1	0.654	2.5084
Unobs. x Price	$v_i p_j$	γ_2	-0.012	0.1981
Unobs. x Alcohol	$v_i X_{1j}$	ρ_1	-0.080	0.2154
Unobs. x Calories	$v_i X_{2j}$	ρ_2	0.511	2.2845
Unobs. X Ale	$v_i X_{3j}$	ρ_3	0.474	0.9532
Unobs. x USA	$v_i X_{4j}$	ρ_4	-0.885	3.67
Unobs. x Anglo	$v_i X_{5j}$	ρ_5	-0.699	2.2773
Unobs. x German	$v_i X_{7j}$	ρ_6	-0.941	2.9821
Unobs. x Border	$v_i X_{7j}$	ρ_7	-0.359	4.4523

Table 2. Price Elasticity Estimates for Beer Brands in Chicago

Brand	Country of Origin	Own Price Elasticity	Cross Price Elast. w.r.t. Budweiser	Cross Price Elast. w.r.t. Harp
Amstel Light	Holland	-17.945	0.540	0.339
Bass	England	-21.001	0.574	0.308
Becks	Germany	-15.798	0.499	0.301
Budweiser	USA	-8.267	-	0.097
Budweiser Light	USA	-8.761	0.166	0.126
Busch	USA	-9.256	0.169	0.094
Colt 45	USA	-8.647	0.168	0.097
Coors	USA	-8.642	0.195	0.095
Coors Extra Gold	USA	-8.761	0.219	0.122
Coors Light	USA	-16.185	0.278	0.223
Dos Equis	Mexico	-21.651	0.273	0.314
Guinness	Ireland	-19.978	0.228	0.307
Harp	Ireland	-16.141	0.237	-
Heineken	Holland	-18.082	0.195	0.283
Kaliber	Ireland	-14.146	0.082	0.194
Labatt	Canada	-8.820	0.219	0.095
Lowenbrau	USA	-10.389	0.231	0.146
Michelob	USA	-10.563	0.524	0.160
Michelob Light	USA	-7.872	0.542	0.081
Miller	USA	-7.584	0.399	0.105
Miller Light	USA	-5.310	0.452	0.029
Milwaukees Best	USA	-15.125	0.222	0.209
Molson	Canada	-14.059	0.449	0.184
Molson Golden	Canada	-14.188	0.409	0.193
Moosehead	Canada	-6.036	0.425	0.037
Old Milwaukee	USA	-12.122	0.257	0.198
Rolling Rock	USA	-18.121	0.600	0.332
Schaefer	USA	-5.198	0.531	0.024
Schlitz	USA	-7.991	0.196	0.079
St. Pauli Girl	Germany	-7.242	0.384	0.063
Average: Home		-9.929	0.322	0.134
Average: Foreign		-15.007	0.347	0.218

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Quality Assurance and other Marketing Management Elements as Key Success Factors for Entering a New Market: a Case of Functional Food Market in Indonesia

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Summary

Based on its distinctive profiles functional-food (FF) can be considered as a mixture of food and pharmaceutical items. Apparently, these different characteristics that exist beyond conventional food products contribute success of the commercialization of new innovative FFs. Therefore, assumption can be made by arguing that for the marketing a FF a distinctive marketing-strategic beyond the one usually used for the conventional food products must be employed. This study was pursued with the main aims to understand the consumer's psychological factors and to find out elements important to setting up the marketing strategy. These two findings will be then used as basis for designing a distinctive marketing strategy for a FF. We found that consumer's psychological set varied across different sample groups. Therefore, segmentation plays a significant role. Due to the fact that most of the consumers had a medium to high involvement level, communication strategy becomes a salient means for the marketing of FFs. According to the respondents some important extrinsic/intrinsic quality based elements of FF can be generally incorporated into the communication platforms for FF. From the industry's point of view this study showed that internal organizational and management, market attractiveness and trade capability are the most important elements supporting a firm in developing a new innovative FF in Indonesia.

KEYWORDS: product quality, communication, segmentation, key success factors for market entry, functional food in Indonesia.

1. Introduction

In the last two decades international product innovation projects have been directed to redesign conventional food and beverage products in such a way that they can provide additional health benefits beyond their basic nutritive function. As an example, researchers have tried to influence the systemic immune reaction by specific nutrients and food ingredients directly (e.g. by triggering immune cell activation or altering immune cell interactions) or indirectly (e.g. by changing substrate for DNA synthesis, altering energy metabolism, changing physiologic integrity of the cells or altering signals or hormones) (Deibert and Berg, 2002).

This innovative development is triggered by improvement of people' interest in the nutrition and health prevention. Researchers and industry have continuously pursued discussions that try to find out about clear definition of "functional food". In short, functional food describes products similar in appearance to conventional food (and beverage) products, consumed as a part of the usual diet. They come from natural sources or have been enriched with natural substances or other components with a specific physiological preventive and/ or health promoting effect (Backgrounder, 1998; ILSI, 1999; Health Canada, 2004). However, there has been a long-standing debate about the definition and limitations of health promoting effects of functional foods and about how to prove

those effects. Apparently, these issues relate to legal aspects, especially, concerned with the commercial uses of health claims for marketing of functional food products. In many Western countries there is a strict dividing line between food and medicine. Health effects such as prevention-, treatment- and reduced risk of chronic diseases are, more or less, considered as the domain of medical and not of nutritional intervention. Principally, through establishing a legal regulation the government or food authority intends to protect the consumers from the abuse of a health claim. But from the view of industry, this legal regulation is often being seen as a rigid construct limiting their marketing creativity. It is not surprisingly, that industry pays much attention to this issue, because, it is a fact that the presence of a health claim for functional foods endows an important distinctive trademark, which differentiates a functional food from conventional food items. For marketing purposes a health claim is a valuable unique selling proposition, which is beneficial for establishing product positioning and segmentation.

The other distinctive characteristics of functional food over conventional foods beyond the above mentioned features are (1) the presence of disparity in terms of consumers' psychological set (perception, knowledge, attitude, motivation and involvement level) in the society; (2) the present of moderate to high cost of investment, (3) the presence of an asymmetrical market structure. The concept of functional food especially for finished and packed food and beverage products is relatively newly introduced and communicated to the public. Apparently, consumers' reactions towards this concept depend on their perception and motivation towards general health- and prevention of diseases concept. Possibly, we can argue that consumers, who have a relatively high awareness level or interest on a healthy life style and who have a high motivation level towards disease prevention measures will tend to have a positive attitude and acceptance towards functional foods. And contrarily, consumers with low awareness and low motivation level towards a healthy life style and diseases prevention measures will ignore or pay no (or less) attention to functional food products. Beyond that, we can find that quite a lot of people, who show their negative or skeptical perceptions about functional food, will possibly have a low acceptance level towards the consumption of functional food. Due to these facts we can argue that people have different psychological settings towards functional food and that this issue can be considered as one specific characteristics of the functional food field. According to Henderson and Clark's (1990) classification of innovation, functional food can be classified as a "strategic innovation" group, because functional food is perceived as having a new design but being otherwise based on established technologies. To develop such innovation a firm may require higher financial and management capability, especially when this is compared to the financial means required for developing a conventional food product. The main cost-created-activity in developing a functional food is related to R&D activities, especially to the investigation of the ingredient supposedly delivering the health effect and to prove its efficacy in that respect. Developing a functional food product carries a much higher risk than developing a conventional one especially when and if the product faces a flop. As has been mentioned above, an improvement of awareness of general health problems can be observed, although, people's inherent knowledge concerning medical perspectives of health and nutritional sciences varies. Considering its distinctive design and function, we can argue that the functional food represents a mixture of food and pharmaceutical product. In order to understand the concept of functional food and its offered health effects, a certain level of medical knowledge is absolutely required. Considering the variety of people's inherent knowledge level and the sophistication of the functional background of functional food, we further observed the presence of asymmetrical information in the field of functional food. There seems to be a large discrepancy between medical experts and industry as information holders and consumers on the likely effects and benefits of the consumption of functional food.

Understanding the clear distinctive features of functional food, therefore for the view of marketing, we argue that a firm needs a different marketing approach than the one used for marketing of conventional food products, because, obviously a distinct strategy will ensure the success of the commercialization of the newly developed functional food products. For that purpose this study has the main aim to understand and study elements important for the marketing of functional food products. In this study two main anchors, i.e. consumers' and company's perspectives will be deliberately investigated.

2. Background

Since year 2000 plenty of food and beverage products were marketed with different health claims in Indonesia. Most of them are produced and marketed by locally or even regionally based companies. The significant trend of the functional-food market in Indonesia follows the fast market development of supplement products and it is strongly influenced by international functional food market developments. Increasing people's awareness of following a healthy life style through nutrition consumption upholds the positive movement of the functional food market. Actually, for the Indonesian people the concept of functional food is not really new because of the fact that consuming food which provides health benefits is a part of their ancient traditional eating habit. An example of a traditional functional food worthy to be mentioned is a fermented product of soybean called Tempeh. There are many published scientific studies that confirmed the health benefits of Tempeh and those studies supported Tempeh to be classified into the functional food category (Karyadi & Lukito, 2000, Wilcox, et al., 1990 and Sudarmadji et al. 1997). However, due to the absence of a consistent regulation, which is supposed to be issued by the Indonesian food authority, we find that many so-called functional food products have been improperly marketed. The usage of a health claim as marketing instrument was wrong and many advertising campaigns were misleading and elusive. Without any single supportive scientific argument or relevant scientific finding some companies used health claims as product selling propositions. Therefore, it is not surprising that one can find a product, which is claimed to be beneficial for treating a broad range of diseases such as from skin infection to cancer. This development is aggravated by a strong trajectory competition in this market.

Consumer behavior studies have emphasized the importance of consumers' psychological factors such as attitude, perception; knowledge, involvement level and attitude are fundamentals for developing the marketing strategy for a product (Solomon, 1996; Chisnall, 1994; Foxall and Goldsmith, 1994). Attitude is defined as a learned predisposition to respond in a consistently favorable and unfavorable manner with respect to a given object (Sarnoff, 1960 and Thurstone, 1931 in Fishbein & Ajzen, 1975). It is typically viewed as a latent or underlying variable that is assumed to guide or influence behavior. The individual attitude is predisposed toward performing a type of behavior, all of which are either favorable or unfavorable with respect to the object. Unfortunately, till now a consumer study concerned with attitude towards functional food in Indonesia is absent. Our assumption regarding people's attitude towards functional food suggests that due to massive deceptive marketing programs launched by companies the consumer's acceptance and attitude towards functional food products may be negatively influenced. We assumed that consumers will have a negative perception towards functional foods. This tendency can hamper the development of new functional food market.

While, involvement level is perceived as level of perceived personal importance, feeling of interest, enthusiasm, familiarity, normative, commitment, excitement about product specific that is evoked by a stimulus within a specific situation (Solomon, 1996; Bloch and Richins, 1986; Freedman, 1964; Howard and Sheth, 1969, Lastovicka and Gardner, 1979).

Depending on the importance of the product, significant risk, emotional appeal and norm identification, the consumer involvement can be classified i.e. low, medium or high involved consumers). In this study, attitude and involvement level of prospected consumers towards functional food were investigated. The results will be then used as prominent platforms for developing the other marketing concepts.

Communication is a core in the marketing program and it can play different roles determining the product success. The important purpose of the communication is to contribute to brand equity (Keller, 1998). Communication is a media that helps to position the product image in the consumers' mind. Communication can put something in consumers' mind or change consumer's attitude or get consumer into a buying action. It is a bridge that connects between product and consumer and it is a means by which it can establish dialog and build relationship with consumers. Through communication marketer can be seeking a cognitive, affective or behavioral response from the target consumers. Researcher have been argued that understanding target consumers' perception, attitude and inherent knowledge level is required as basis for set up appropriate, efficient and interesting communication messages. Communication message can be established through emphasizing what the targeted consumer want to reach and what response they want (Kotler, 1994). Consumers will hear the messages that fit into their belief system. Communication effects are greatest where the message is in line with the existing opinions, beliefs, and dispositions of the consumers (receivers) (Fiske and Hartley, 1980 in Kotler 1995). In the food and beverage market, basically, we can observe that, communication platform for food and beverage products follows the one usually used for the commodities. In this case consumers are assumed to have low involvement towards all products. Most of consumers buy a product without comparing actively all available brands or product alternatives and without making a long process of decision making (inertia). They just pick a familiar brand or make a decision based on trial and error principal. Therefore communication of these products is usually simpler and more animated, which suitable for passive learning consumers. It has little opportunity for reflection or making connection, and it often deals with unimportant matter (Assael, 1995). Further, apparently, for currently marketed foods and beverage products the main communication messages often relate to emotional or affective issues such as taste, freshness, great pleasure or enjoyment, and newness. Due to the fact that functional foods have clear distinctive comparisons over the conventional foods, therefore, consequently, we can further argue that communication strategy is a prevalent marketing tool. Through communicating the unique features and benefits a firm can position a functional food differently from conventional food products. In this study we aimed to find out idea concerned with communication messages suitable in general for functional food from the view of consumers.

Consumers' psychological set is not only important as a basis argument for establishing product communication, but it is also useful to be used as a platform for segmenting the products. Our above mentioned assumptive preposition stated that consumers of functional food have a wide variation in term of their behavior, personal characteristic and value with regards to the healthy life style and prevention measures. Therefore, we further assumed that market segmentation is relevant for a functional food, because it will give an opportunity for a firm to base its strategy on a more relevant and prospective segment and to allocate more efficiently their resources and capability on focused target segment. In the case of functional food, when a firm want cover a mass market as they usually do to market conventional foods it seems that a substantial financial resources is required especially for improving or upgrading people's awareness and acceptance. According to its capacity and capability a firm may cover segment which is large enough to bring an optimal turn over. Marketing theory has emphasized that the traditional segmentation model, which bases on consumers' social-, economical and demographical-characteristics such as age, income,

gender, location, often fails to perform an optional return on investment because, apparently, consumers can not be easily segmented based on those profiles. Non-demographic segmentation, which is based on people's need-want, perception, and value, may serve as a good basis for marketing strategy (Yankelovich and Meer, 2006). Reynolds (2006) argued that essentially focusing on the potential "need-and-want hot buttons" is most likely to be successful for product extension development and new product development. Understanding consumers' need, value, and behavior associated with the product can help the marketer to develop segments around brand loyalty, price-sensitive, or feature-sensitive respondents (Feldman, 2006). Understanding the different market structure and different characteristics of functional food, therefore in this study we assumed that segmentation plays important role for the success of marketing of a functional food. This study is aimed also to find out and propose a segmentation model required for marketing of a functional food especially in the Indonesian market.

Although communication and segmentation are considered as the most central issues for marketing strategy, intrinsic and extrinsic product profiles also contribute significantly to the success of marketing of a product. Intrinsic (such as taste, color, texture, appearance, quality) and extrinsic profiles (such as packaging, brand name, name of producer, price, labeling) are relevant for differentiating a product from their competitors and for defining the unique selling proposition of the product. Apparently, these factors are attributed as indicators for general product quality. Consequently, intrinsic and extrinsic quality cues can be used as one possible communication themes, depending on the consumers' attention, interest, awareness and desire towards the product. Since continuous and consistence communication messages or called product-positioning will occupied the consumers' top of mind, therefore, it will help the consumer to easily recognize the product and finally it will influent consumer's buying decision. Considering the importance of intrinsic and extrinsic quality cues, in this study we intended to identify the consumers' perception regarding the importance of intrinsic and extrinsic elements related to buying decision of functional food products.

3. Objectives

Understanding the past and current development of functional foods and beverages in Indonesia this study was designed to investigate the following research objectives:

- finding out the consumers' attitude towards functional food concept,
- investigating marketing elements (intrinsic and extrinsic quality cues, possible communication message and segmentation) importance for influencing consumers' buying decision of functional food and,
- understanding marketing management elements important for developing innovative functional food from the view of the industry (firms).

4. Data and methodology

In order to accomplish the research objectives, this study's framework was designed, which consists of a combination of an exploratory and a descriptive research. We conducted a consumers' study using an in-depth personal interview method. This field study was being conducted in Indonesia (Jakarta and its surroundings) starting in October 2002 and was finished in September 2003. Jakarta was selected, because it represents a rapidly developing city where the market for such functional products is widely open up.

Respondents were recruited based on a judgmental sampling method, which selects certain respondents according to the presumable representation of the population of interest (target segment) (Dillon et al., 1994). In general, the inclusive criteria for selecting respondents were as follows:

- Persons with ages of 16 years and older.
- Persons, who are living in the selected region.
- Persons, who have selected diseases such as CHD, hypertriglyceridemia, obesity, medical care providers and a healthy group.

In recruiting respondents we used a priory segmentation method, which targets respondents prior to the study by establishing the following groups (A) patients with coronary heart disease (confirmed by angiography, PTCA, bypass operation or myocardial infarction. (B) patients with high serum triglyceride level (all hypertriglyceridemic patients with plasma triglyceride levels of > 200 mg/dl- or according to the NCEP (National Cholesterol Education Program ATP II guideline), with or without the metabolic syndrome. (C) patients with obesity (according to the ITFO (International Task Force on Obesity) guideline, overweight and obese patients is defined when the patients have BMI (Body Mass Index) more than 30 kg/m²) with or without other metabolic diseases. (D) medical experts, including Physicians (Internists, Cardiologists and General Practitioners), Nutritionists, and Pharmacists, and (E) healthy persons as controls. Groups of patients were selected as respondents in order to represent a direct target group for functional foods and to represent motivated consumers, who are dealing directly with the diseases and are aware of food-diseases relation and who have direct access to the scientific information. A Healthy person group as control represents unmotivated consumer, it was our initial assumption, who are less aware of disease prevention and healthy diet patterns. In this study we intended to compare these two groups of consumer especially in term of their attitude toward functional foods and to compare their response toward product innovation. Medical experts were also included in this study, because of their important role in passing through the scientific and product information and in influencing the patients' diet pattern. Respondents were interviewed by using a prepared questionnaire. A total number of recruited respondents were 237.

Attributes and beliefs evaluation necessary for attitude evaluation was measured according to the Fishbein model. It was further confirmed by the five scale model of Likert's attitude measurement technique. Functional food attributes necessary for the attitude measurement were evaluated and determined prior to the study by using the full rank method of attributes selection, thus providing a basis for finding out and presenting fairly all of the important attributes (which included positive and negative characteristics) of functional foods to the respondents. In order to evaluate the correlation between attitude and intention to buy we used a non-parametric correlation analysis of Kendall-Tau-b and Spearman-Rho. Involvement level was determined by measuring certain indicators such as (1) people's intention to search for information (2) type and number of sources of information usually used and (3) quality of information usually collected. Involvement level towards functional foods was measured using a theoretical construct model presented by some authors (Assael, 1995). People's motivation level towards healthy life style and disease prevention was measured by using some life style parameters such as (1) sport activity, (2) healthy food and supplement consumption, (3) vegetarian behavior.

Factor analysis was used in order to find out some important new factors, which could be extracted from collected multi-attributes of functional foods. The new factors found by factor analysis would then be useful to determine further the communication concept of a functional food. Further, using a multivariate regression model all new factors were analyzed in order to obtain information regarding the importance of each factors for influencing the buying behavior. Cluster analysis using K-means clustering was used in order to segment the market of functional food.

In order to understand the internal and external elements important for a firm or company in developing functional food products, opinions of the selected managers responsible for product launching in some food companies (such as Business Development Manager, Marketing Manager, Research and Development Manager, Product Manager) were collected. The company study was focused on the evaluation of success and risk factors when launching a new food product. We have done in-depth interviews with some managers and staff using a guided questionnaire. The main theme declared in the questionnaire was concerned with the evaluation of success and risk factors in developing and launching a new product. It was designed in accordance with Standard Performance Measures from Cooper and Cooper (1984), Kleinschmidt and Cooper (1991), Weiss et al., (1994), and the Risk Evaluation List from Keizer et al., (2002) and self modification. A total of 11 managers from two companies were interviewed. The selected companies had different or opposite profiles in terms of size, organizational and managerial capability and culture.

5. Results

5.1 Consumers' psychological set

Although both attitude models are using different and separate questioning techniques and different measurement scoring the final calculation of both methods showed a quite identical result of measuring consumer's attitude. The mean value of the Likert model indicated that people's overall attitude toward functional food was close to the quite positive value (mean value of 3.6) and the Fishbein analysis agreed (see FIGURE 01 and 02). In spite of aggressive and negative marketing campaign concerned with the health claims for food and beverage products done in the past, consumers apparently still displayed a positive feeling, desire and perceptual tendencies towards functional food products. They learned to evaluate functional foods in a consistently favorable way. The Fishbein attitude evaluation basically measures a person's perception regarding the importance of all possible attributes of an object and a person's belief in that object. This model showed that people have a positive perception towards the attributes of functional foods, but that their belief was inadequate. The respondents are in favor of the health features of functional foods, but they, apparently, did not have an adequate belief that such food and beverage products can perform those health benefits. The low belief in benefits of the product was as result of an aggressive misleading and elusive health campaign done in the past. As the belief in a product is a key success factor determining future consumption behavior, therefore in the future industry needs to improve the image of the functional food concept through empowering people's belief. Improving people's belief will give a positive impact on attitude and finally on intentional buying behavior. The healthy control group showed the lowest attitude score as compared to the other groups. The attitude of healthy people in this group was varying. Most of the healthy respondents had a lower level of awareness of the necessity of prevention than participants of the patient groups. The correlation analysis showed that there is a pertinent relationship between attitude and people's intention to buy in a medium scale (Table 01). People with a positive attitude tend to consume functional food better than people with a negative attitude.

The other findings concerned with consumers' psychological factors such as involvement level showed that quite a number of respondents had a medium to high involvement toward functional foods. Only 3% of the Indonesian respondents showed to have a low involvement (FIGURE 03). This finding indicates that most of the respondents paid attention toward product information and that they spent some time to search for, process, evaluate, and learn the product profiles. The above-mentioned discussion allows us to accept our previously stated hypothesis of this study, which mentions that the involvement

level towards functional foods was medium to high and that it is different from the involvement level towards conventional foods, which is usually perceived as low. The consequence of this finding for a firm is that product information and communication will be beneficial for the consumers' buying decision process.

Moreover, this study argued that respondents, who have a higher motivation, tend to have a better knowledge level concerning health aspects as compared to respondents with a lower motivation level. This study showed that the actual and perceived knowledge level was relatively good, but that product class familiarity was low. In general, the before mentioned group had a more positive attitude towards different attributes that can possibly be offered by functional foods. For marketing purposes this finding suggests that people vary in term of their psychological set towards functional food. Patients groups have a higher motivation level, a more positive attitude and a higher knowledge level than healthy young respondents. Consequently, this group is supposed to have a higher readiness to consume functional food. For a firm, this segment is an adequately potent target group of consumers for such functional foods, because they already have positive behavior foundation such as knowledge, motivation, attitude and perception important for determining product acceptance.

5.2 Marketing elements important for the buying decision of functional foods (from the viewpoint of consumers)

Product profile is one of the important elements in a marketing mix. Especially for functional food and beverage products both intrinsic and extrinsic elements contribute significantly to the influence on consumers' acceptance. In general, product quality can be represented by both intrinsic and extrinsic features. Examples of extrinsic profiles of functional food importance to be mentioned are labeling, brand name, packaging size and outlook, and price. In this study we intended to evaluate whether some of these elements provide equal or different roles for influencing consumers' buying decision. We did not intend to compare the role of each element. According to the respondents quality and safety guarantees provided by the manufacturer and the presence of a logo or a label as proof of quality from external institutions were the most important profile items determining the buying decision (positive correlation coefficients of 0.300 and 0.107 respectively). The Indonesian respondents perceived that brand name and company name as the second most important extrinsic profile item of functional food. This study confirmed that product quality and safety are the most important issue determining consumers' trust. Consumers can easily recognize the product quality through brand name and company name. The consumers' demand for product quality guarantee is mainly due to the negative perception and low confidence in food quality control measures currently implemented by the government. People do not see that there is any significant and serious improvement in the government's or food authority's engagement with regard to food quality assurance and control. Therefore, it is not surprising that many food scandals are now emerging there in the public such as the use of formalin and borax (sodium borate) as a preservative components and the use of prohibited coloring materials such as Rhodamin for some traditional food products. A low level of sanitary and quality control of traditional foods contributes to decreasing people's confidence and trust in food and beverage products. Thus, this development is a challenge for local, regional wide-, and home-made- food companies, because they are asked to improve and establish a high quality image in order to maintain their position and to win the consumers' trust. While international food companies, which are perceived to have high sanitary standard and adequate quality assurance measurement will have a better opportunity to market new functional food products through the company's name umbrella-branding. Taste is another one of the important elements for functional food. We did a trade off analysis by asking the respondents about the importance

of the health claim versus the taste. They argued that although, a product may have important health effects but it will no longer be attractive (32.9% of total respondents) or may be not attractive (52.7%) when its taste is marginal. Therefore, we further assumed that taste, quality, safety and efficacy are the most importance intrinsic elements of functional foods, while, labeling, company name, brand name are importance extrinsic features. For the marketing process this finding can offer some ideas how to position a functional food product in the Indonesian market. Possibly, these are also some issues which consumers want to hear about from the industry.

In the previous section this study has identified a medium to high involvement level of respondents towards functional foods. Consumers pay much attention to product information. It is different with the involvement level toward conventional food products, which is suggested to be low. In order to make a buying decision in favor of such functional foods products, the consumers went through a medium intensity high buying decision process. They needed more products' information in order to perform an intensive attribute evaluation and for establishing a positive motivation, belief and attitude toward the object. Finally this will direct the buying decision. These findings confirm the importance of the communication strategy within the whole marketing process of functional foods. Factor analysis of several attributes of functional foods has identified 9 new factors of the communication messages appropriate for a functional food according to the respondents' opinion. In general we have classified two major communication themes in relation to the functional foods attributes: (1) affective components, which cover all communicative messages emphasizing the emotional aspects of consumers, such as feeling, passion, fear, happiness etc. (2) cognitive components, which cover all logical reasons for buying or consuming a product. The affective components cover two major issues (a) internal usage consequences, which cover all emotional factors, resulting from the functional consequence of having used or consumed a functional food product. Examples of this are the feeling of satiety (feeling full), feeling good, and looking good (cosmetic feeling) and (b) immediate intrinsic association, which includes other emotional factors resulting from the intrinsic features of functional food, such as confidence of outlook (resulting from good product appearances), confidence of efficacy (resulting from product effectiveness in performing the health claim), confidence of safety (resulting from product assurance of minimal or no side effects), confidence of usage (resulting from the presence of guarantee of quality and appropriate applications). The cognitive components are covering two main other issues (a) health benefits sought (relating to all health benefits offered by the functional food product). The health benefit sought can be divided into two parts based on the length of the product reaction time to achieve the health claim, i.e. (a1) short term effects, such as achieving expected nutritive the expected nutritive value, improving health and fitness, improving the body's defense mechanisms etc., and (a2) long term effects, such as lowering the risk of disease, prevention of disease, treatment of disease and reduction of the cost of drugs, and (b) non-health benefits sought. This relates to all other aspects beyond the offered health aspects, which are perceived as product features important for influencing consumers' belief. The non-health benefits include many other cognitive components such as (b1) providing a natural base of foods, (b2) convenience of usage including features, which offer ease of handling of the product (easy pouring or opening, easy packaging design for keeping purposes, easy disposing of, (b3) freedom of choice, presenting functional food in a variety of end products, (b4) potency and efficacy, the product offering a strong effectiveness regarding the health claim (as potent as a drug), (b5) fast onset of action, performing health benefits in a short period of time.

For a new product launching, the cognitive components seem to be more important to be emphasized in the communication message rather than the affective components. According to our multiple regression analysis the affective components did not successfully

influence the intentional buying behavior. In the first launching period of a functional food product it appears that the affective components would fail to build the consumers' belief toward the product. They could not clearly explain and convince the consumers to what extent, the product can solve what the consumer tries to get done. The cognitive components seem to be more appropriate for convincing the consumer to intentionally make a choice decision. This finding confirms the existing theories, i.e. consumer-response stage models or response-hierarchy-models such as ``Hierarchy-of-Effects``, ``Innovation-Adoption``, ``Communication`` and ``AIDA model``. All of these models assume that consumers pass through a cognitive, affective and then behavioral stage, in that order (Kotler, 1994). In these models a cognitive stage leads to the establishment of attention, awareness, reception and knowledge level towards an object.

The result of the cluster analysis indicated that segmenting the market of functional foods is still beneficial. Cluster analysis has confirmed that there were some specific differences in the consumers' characteristics among different clusters. The consumers with a high intentional buying behavior can be separately defined from groups of consumers with medium or low buying intention. Each cluster has a certain consistent bundle of characteristics, which is totally different from alternative clusters. Segmentation can still be considered as an efficient method in selecting a target consumer group and focusing the promotion for a product. However, our findings suggest that the marketers can not base their segmentation solely on the basis of the traditional segmentation methods, such as geographic location and demographic factors, socioeconomic, psychological and organizational, because those factors did not form the cluster in a consistent manner. As a consequence of this result we would like to suggest another way of segmentation, i.e. based on consumers' perspectives and not based on consumers' characteristics.

We called this segmentation method ``Instrument-Value (I-V) Segmentation``. ``Instrument`` means that a product is being seen as a tool or a stuff that helps the consumer's job to be done. While ``Value`` refers to the relative importance of a product perceived by the consumers. Therefore, the ``Instrument-Value Segmentation Model`` is based on the product as an instrument and on how the consumers value the product. This I-V segmentation emphasizes the necessity to regard the consumers' perceived value of a product or service. It concentrates more on what consumers really do with their product. This covers all cognitive and affective demands. A certain segment can consist of some consumer characteristics such as differences in age (young or old), different education levels and family status etc., but all groups of consumers may have ``the same job to be done`` (Christensen and Raynor, 2003). The advantage of using the I-V Segmentation Method is that the firm can cover prospective consumers with broad characteristics, who have the same way of thinking about the value of the product. The I-V Segmentation Method will avoid being misled by determining sets of consumers' characteristics, especially, when those characteristics are complex. However, if the usage of this I-V segmentation covers too large a market segment, which the firm cannot afford to reach, then hybrid segmentation can be selected. A hybrid segmentation model combines I-V segmentation with other segmentation model using one or two factors related to demographic, geographic, socio-economic profiles with the purpose to limit market coverage. Depending on its capability and goals the firm can decide how broad they want to cover the market. This study suggests the following relationship between a firm's capability and resources and the range of market coverage (see FIGURE 06).

To enter a small and limited market segment can be considered as an appropriate strategy, especially when the firm has only limited financial and non-financial resources, because -in our opinion- entering a large market requires big resources. Without enough support it would be inefficient. For functional food products, segmenting a product to patients, who

can value the product' health benefit, is an example of a narrow but reasonable segmentation strategy. In other cases, e.g. when a firm has higher (moderate) financial resource, covering a larger target market will make much more sense. Based on our I-V segmentation model, a firm can target its functional food to consumers, who have high level of risk factors of certain related diseases. This segmentation can be further developed based on the firm's capability. The final stage will be reached, when plenty of financial capabilities and resources are available. In that situation covering a very huge segment like all healthy people- including those who are unaware of a healthy life style- may be possible. In this last segmentation model the firm is assumed to be willing and ready to invest into changing people's awareness, perception, attitude and acceptance towards a healthy life style, disease prevention measures as a prerequisite for their acceptance of functional food products (see FIGURE 06).

5.3. Marketing management elements important for developing innovative functional foods (from the view of industry or firms)

The result of an in-depth interview with managers and staff working at the selected companies showed that, although the two recruited companies had quite different profiles especially in terms of size, organizational and managerial capabilities, they were in agreement with regards to analyzing important factors for developing and launching new functional food products. Company A represents a small to medium sized company, which has the main business in the food market. Company B represents a big enterprise, which has a wide business interest, such as in the food market, pharmaceutical market, packaging materials, distribution, etc. They perceived that organizational and management problems are the most important internal factors, while market attractiveness and trade capability were the important external elements. In our study organizational and managerial issues consisted of for examples of the following themes: cooperation, team work spirit, leadership and communication and motivation within team members in the development process of new product, collaboration and cooperation with other departments, support from top management, effective sales force to support newly launched product. Market attractiveness covers issues such as degree of competition, number of competitors, size and growth of the market, impact of launching of innovation towards market and company, the consumers' loyalty towards competitor products, timing of product launching, reaction of competitors towards new coming innovative products. Trade capability means trade (wholesaler, retailer) readiness to absorb, sell or distribute new product, company power vs. trade power issue, coverage profile of distributor, financial capability of trade, managerial and man power of trade, procurement management of distributors or retailers.

6. Final remarks

The result of attitude analysis showed that most of the respondents are actually still in favor with the health features possibly can be offered by a functional food, but, apparently they did not have an adequate belief in the efficacy of related health effect supposed to be performed by a functional food. People with a medium and high motivation (patients groups) tend to have a more positive attitude and higher motivation level than the young and healthy control group. However, an adequate number of respondents tend to have a medium to high involvement towards functional foods. These two findings indicate that the prospected consumers of functional food vary in term of their psychological factors especially attitude and motivation. The finding regarding respondent's involvement level enable us to further suggest that basically, a comprehensive product communication program is important for the marketing of a functional food in order to satisfy the needs on information requested by the medium to high consumer group. Based on the collected

consumer' opinions the two major communication themes suitable in general for a functional food can be classified, i.e. (1) affective components, which cover all communicative messages emphasizing the emotional aspects of consumers, such as feeling, passion, fear, happiness etc. (2) cognitive components, which cover all logic reasons for buying or consuming a product. The finding regarding variations in term of people's psychological set suggest that new product introducing can be efficiently achieved through an appropriate market segmentation strategy. Cluster analysis has confirmed the presence of some specific differences in the consumers' characteristics performed by different clusters. This study suggests segmenting the market based on the consumers' perspectives and not based on consumers' characteristics. This study proposed using the "Instrument-Value" (I-V) Segmentation model for the marketing a functional food. This model offers possibility that a firm targets its prospected consumers based on the similarity of the consumer's ways of thinking towards a product. With this model a firm can segment the market based on how the consumers value the product and how the product as instrument can fulfill the consumer's demand and need (and how the product can finish the consumer's job to be done). Moreover, it emphasizes the necessity to regard the consumers' perceived value of a product or service and concentrates more on what consumers really do with their product. Concerning the quality profiles of functional food important for a buying decision process, this study found that taste, quality, safety and efficacy are the most important intrinsic elements of functional foods. While, labeling, company name, brand name are the important extrinsic features. This finding suggests that intrinsic and extrinsic quality based profiles offer some benefits that are relevant for setting up a communication and position strategy for a functional food product. From the point of view of industry to develop a functional food a firm may require adequate organizational and management capabilities. Moreover, the success of marketing of an innovative functional food will also depend on the market attractiveness and the trade capability.

7. References

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Tables

TABLE 01. Correlation of attitude and intention to buy

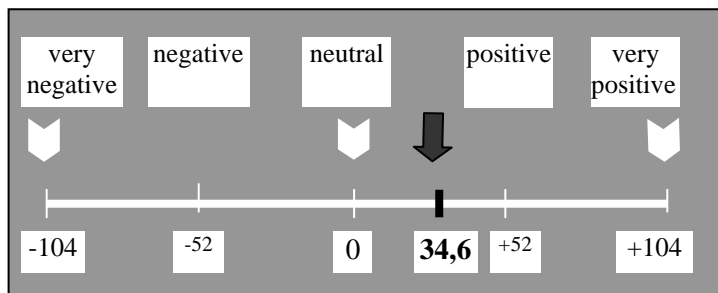
Correlation method	Attitude measurement	Correlation coefficients	Intention to buy
Kendall's tau_b	Fishbein's scale	Correlation Coefficient	.248(**)
		Sig. (2-tailed)	.000
	Likert's scale	Correlation Coefficient	.219(**)
		Sig. (2-tailed)	.000
Spearman's rho	Fishbein's scale	Correlation Coefficient	.309(**)
		Sig. (2-tailed)	.000
	Likert's scale	Correlation Coefficient	.239(**)
		Sig. (2-tailed)	.000
		N	237

** Correlation is significant at the 0.01 level (2-tailed).

Source: Model re

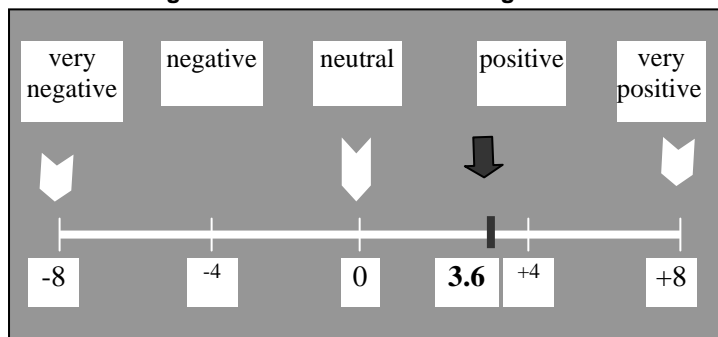
Graphs and Diagrams

Figure 01. The mean value using the Fishbein model



Source: Model result

Figure 02. The mean value using the Likert model



Source: Model result

FIGURE 03. Respondent involvement level towards functional food

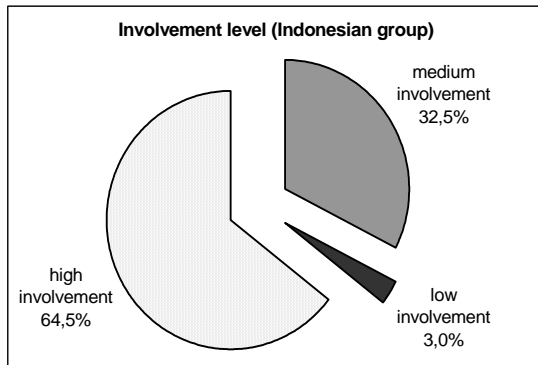
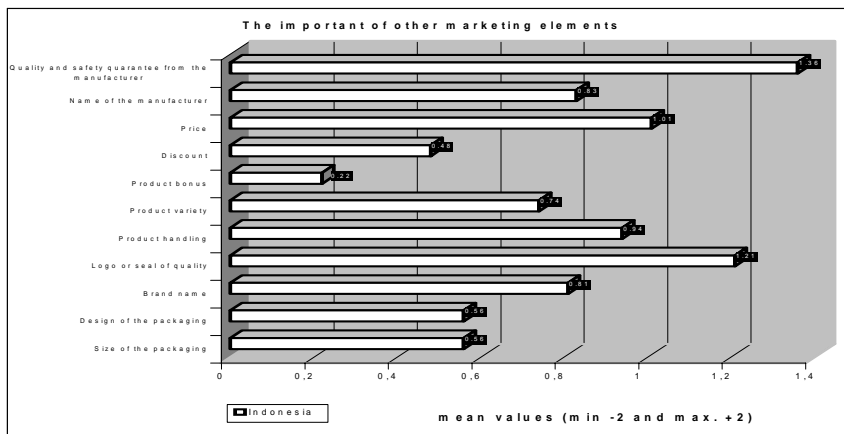
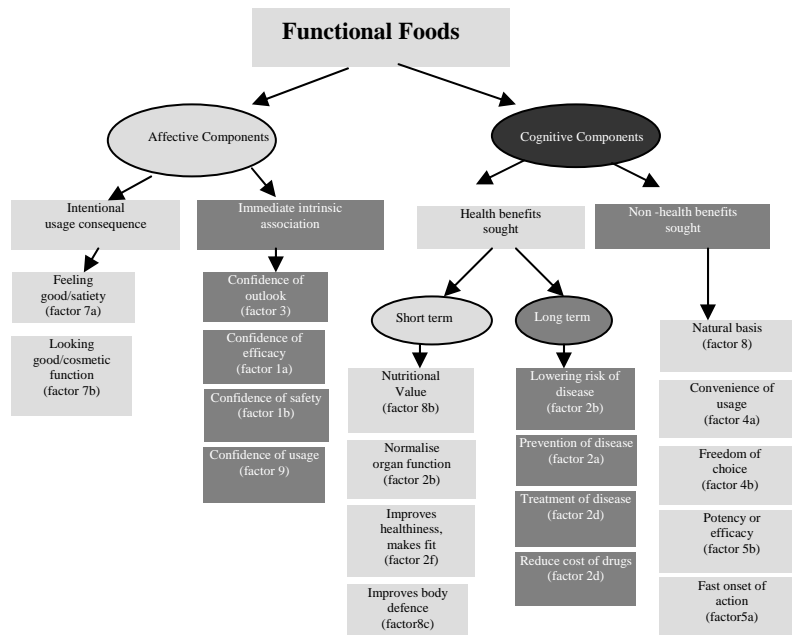


FIGURE 04. The importance of other marketing elements



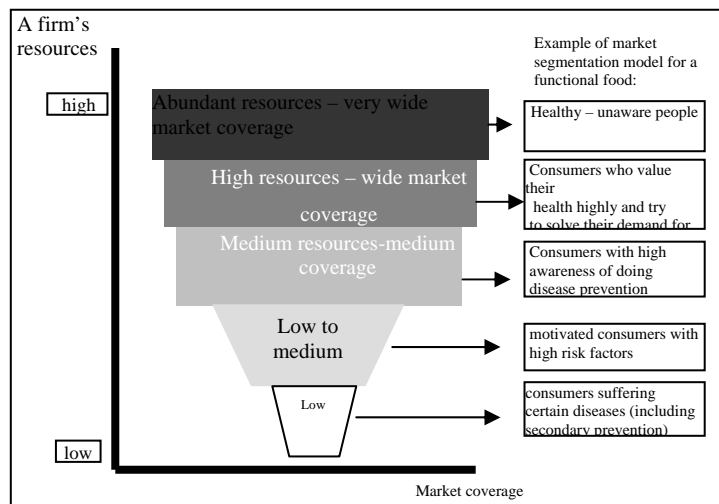
Source: Author's field study

Figure 05. Communication Messages for functional foods



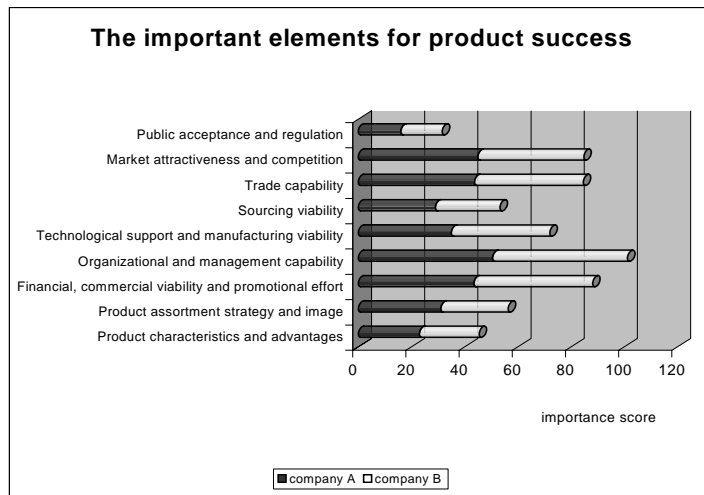
Source: Author's presentation

Figure 06. Segmentation model for functional foods



Source: Model result

FIGURE 07. Important elements for defining the success of new product development



Source: Author's field study

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Determinants of Consumer Preferences for Regional Food

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Summary

In recent years an increasing consumer preference for regional food can be observed, both in Germany and in other European countries. Regression models investigating this region-of-origin effect are rare and in most cases the region or sample size under consideration is quite small. Different from that, the present study is based on a representative data set for Germany. Our objective is to identify and quantify the determining factors of consumers' preferences for regional food. Therefore, a theoretical construct is proposed and tested empirically by using a binary logit model. The results indicate that cognitive and normative factors are the main determinants on consumer preference for regional food, whereas affective and socio-demographic variables only are taking marginal influence. Especially consumers' perceptions, that regional food has better product attributes and offers a higher food safety, are significant and important determining factors. The same is true for the idea to support the domestic agriculture by purchasing locally grown food. Contrarily, no significant influence could be examined for most of the socio-demographic variables, e.g. level of education, location size, and level of income.

KEYWORDS: Consumer preferences, willingness to pay, region-of-origin effect, regional food, binary logistic regression model

1. Introduction

Regional food is defined as food which is grown in the surrounding region and which is usually unprocessed (Dorandt 2005). In Germany most of the consumers define their home federal state as their home region (ZMP 2003: 9ff.).

In recent years an increasing interest in regional food can be observed both in Germany and in other European countries. Several studies have been carried out on this phenomenon already. However, in most surveys, either the study region is relatively small or the sample size is rather limited, so that results seldom are statistically representative. In addition, only a few researchers have applied explorative methods like regression analyses to investigate the so-called region-of-origin effect (ROOE). Thus, the level of knowledge about the main reasons and the magnitude of preferences for regional food is still quite low.

In Germany as well as in many other European countries regional cooperations have been established to promote the sale of regional food. For those cooperations it is important to understand the determinants of preferences for regional food, because knowing the impact factors can help to promote locally grown products more successfully.

Our study is based on a representative survey for Germany. We used the survey data to examine and quantify the impact factors for the preference for regional food by applying a binary logit model.

The article is structured as follows. Chapter two contains a literature review of studies that have investigated the demand for regional food by means of regression analyses. In chapter three we explain the theoretical construct of our research and in chapter four we characterise the data we used. A summary of our empirical results is given in chapter five and the last chapter contains our conclusions and recommendations for further research.

2. State of research

Many surveys in Germany as well as in other European countries and in the United States have already attempted to identify a consumer segment with preferences for food of their home area (among others Becker 2000; Dorandt 2005; Schröder et al. 2005). However, there are only few studies which applied advanced econometric methods to survey the determinants for preferences for regional food, especially in German speaking countries. Most of them have been conducted in the United States. In nearly all of the studies the focus was either on psychographic or socio-demographic factors.¹

- a) Psychographic factors for preferences towards regional food

Consumers' perceptions of product quality and food safety belong to this group of factors. It seems to be empirically proven that in consumers' perception of regional food is linked with higher food safety as well as with higher quality and, thus, regional food is preferred to other products. Furthermore, the awareness of health and nutrition as well as environmental concerns and the willingness to support the economy of the home region are supposed to take influence on the preference for regional food. In connection with that it is expected that emotions like sympathy for the home region are promoting the demand for regional products. To our knowledge no survey has been conducted so far including all mentioned psychographic factors.

- b) Socio-demographic factors for preferences towards regional food

Age, sex, class of income, education and the number of children in the household are the most surveyed factors in this field. The impact of the time period someone has already lived in a region as well as the size of the home region (urban versus rural areas) are included scarcely. While correlation analyses and non-parametric methods often show significant relations between socio-demographic variables and preferences for the origin of food products, causal analyses seldom show statistically significant impacts. Furthermore, many causal analyses in this context provide contradictory results. While some studies proved a positive influence of the number of children per household on the preference for regional food, other survey results showed a negative influence. Only in terms of sex there is consistency across different studies: women usually have got a higher preference for regional food than men. All in all the results regarding the influence of socio-demographic factors on the preference for regional food are not stable across different studies. Moreover, results indicate that socio-demographic have got only a marginal effect on the preference for regional food.

3. Theoretical Construct

The main point of criticism on all of the published studies we surveyed is, that none of them has considered the full range of possible impact factors in the causal analysis. To give an overview about the plurality of possible factors influencing the preference for regional food the theoretical framework proposed by Obermiller and Spangenberg to explain the effects of country-of-origin labels is presented (Obermiller and Spangenberg 1989, 456ff.). Von Alvensleben applied this concept to the region-of-origin-effect and groups the determinants into cognitive, normative and affective processes (Von Alvensleben 2000a: 6ff.).

a) Cognitive factors

The geographical origin might be used as a quality cue by consumers who are unsure about the quality of a product. This effect may result from two processes. First, the region of origin is a "signal" for the general product quality. Based on this there might be a positive

¹ A review of causal analytical studies considering psychographic and socio-demographic factors is presented in Annex 1 and 2.

bias in the consumer's perception of other attributes that are not necessarily linked to the region-of-origin. Second, regional food is perceived to be fresher, healthier and more environment-friendly (Darby et al. 2006:2ff.).

b) Normative factors

A preference for regional food as a consequence of environmental-friendly consumption aspects (e.g. short ways of transportation, sustainability) can also result from normative processes. Thus, social norms instead of consumers' own beliefs may lead to environmental-friendly behavior. Social norms influence the purchase intention independent of cognitive and affective processes directly. Van Ittersum specifies this theory. He assumes that the preference for regional food is influenced by consumer ethnocentrism (Van Ittersum 1999: 46ff.). Consumer ethnocentrism is defined as the beliefs consumers hold about the moral appropriateness to favor domestic products (Shim and Sharma 1987: 280ff.). Therefore, consumers feel constrained to support the local economy by their selective purchase decision.

c) Affective factors

The impact of ethnocentric and patriotic norms might also be influenced by emotional aspects. Thus, emotions like pride of and sympathy to the own region may be transferred directly to the product. Moreover, Von Alvensleben suggests that sympathy to the region leads to a positive bias in the perception of the product and its attributes (Von Alvensleben 2000a). The contact-affect-phenomenon is discussed as the cause of this positive image transfer from the region to the product (Von Alvensleben 2000b: 401): The pure contact to an object leads to familiarity and finally to sympathy to the object (Kroeber-Riel and Weinberg 2003: 624ff.) <Figure 1>.

The described processes above are not independent from each other; in fact they overlap and interact. In addition, they are affected by individual (availability of other quality indicators, confidence in referent information) and situational (product category heterogeneity, availability of other information) factors (Obermiller and Spangenberg 1989: 455ff.). Furthermore, there is a strong interdependence with demographic factors.

There is no empirical consensus on the effects of socio-demographic factors (see chapter 2b). Thus, in the following paragraph the influences of different socio-demographic factors on the preference towards regional food will be derived theoretically.

The age may have a positive impact on the preference. Older consumers tend to be more closely connected to their home region (Balling 2000:29), they have more time for purchasing and preparing food and they are more concerned about health issues. Furthermore, age is often closely connected with the life time in the home region, which in turn encourages the emotional ties to the region (Wirthgen 2003). On the other hand, older consumers tend to be less flexible in the food items they accept (Schupp and Gillespie 2001:38) and they are often less concerned about the impacts of pesticides on the environment or on food (Loureiro and Hine 2002: 484). These considerations may lead to a negative impact of age on the preference for regional food.

Males are considered to be less interested in nutrition and health issues than females (Patterson et al 1999; Schupp and Gillespie 2001). Thus, it is hypothesized that women tend to prefer food from the own region more strongly.

Consumers with higher incomes tend to desire a larger variety of food in the marketplace. Regional food can be part of such a larger variety (Schupp and Gillespie 2001: 38ff). By contrast, Umberger et al. found a significant negative sign for the income coefficient. They assume that wealthier consumers already believe that their food is safe and therefore they are less concerned about the origin of food (Umberger et al 2003: 111ff.). Another explanation could be that wealthier consumers tend to use the price as an indicator of

quality. More expensive food products are expected to be products of higher quality and therefore the origin is not used as a quality indicator at all.

Consumers with higher levels of education are expected to evaluate products by the price and specific quality attributes rather than by brand names or labels of origin. Thus, a negative coefficient is expected. Opposite to this, the higher level of education could lead to a larger awareness of the external effects of the consumption. In this way a positive sign is also plausible.

The presence of children in a household could have several effects on the preference towards regional food. Parents are concerned about the safety and quality of food for their children and thus they are more interested in nutrition issues (Patterson et al. 1999: 187). At the same time families have to deal with time and budgetary constraints. This could reduce the interest in locally produced food (Schupp and Gillespie 2001: 38).

Further on, the geographical location and the size of residence are expected to explain the preference for regional food to some extent. Consumers living in urban residences may spend less attention to food from the own region, because they are less connected to the local agriculture. Consumers in rural areas appreciate more strongly locally produced food (Jekanowski et al. 2000: 47ff.). It is hypothesized that the size of residence has a negative impact on the preference for regional food. Additionally, we assume that consumers in the southern and eastern states of Germany have got a higher preference for regional food than consumers in other parts of Germany. This assumption bases on two different reasons. First, the agricultural sector in southern Germany is mainly small scaled and thus a closer connection between farmers and non-farmers is expected. Second, in eastern parts of Germany a return to products which were popular in the former German Democratic Republic (GDR) can be observed (Abbe 2005).

4. Data and Methodology

The main objective of our study is to elaborate and to quantify the determining factors of consumers' preferences for regional food. Hence, we tested the theoretical construct described in the previous chapter empirically by applying a binary logit model, which is the appropriate econometric tool to explain the outcome if there are only two response levels (Diaz-Bohne and Kühnemund 2003:1f.).

The data came from a representative German wide telephone survey, which was conducted in 2002². Altogether, 3000 consumers answered the questionnaire. All variables, except the demographic factors, were measured on a Likert Scale where 1 stands for "I totally agree with the statement" and 7 refers to "I do not agree at all".

a) Definition of the dependent variables

Two alternative items were used to define the dependent variable: "If it's possible, I try to buy products from my home region" and "I like to spend more money for products which verifiably come from my home region". The first one expresses the preference (PREF) towards regional food, whereas the second item is an indicator for the willingness to pay a premium (WTPP) for regional food. In the analysis the items were transformed into binary variables. The Top-Two-values of the Likert Scale were coded as 1, meaning that a preference resp. WTPP exists. The others were coded as 0, meaning that no distinct preference resp. WTPP exists.

² The survey was ordered by the CMA, the Central Marketing Organization of German Agricultural Industries (ZMP 2003).

b) Definition of the *independent variables*³

Psychographic factors

Based on cognitive processes consumers may use the products' origin as a quality indicator. Thus, items expressing the perception of product attributes and food safety were included as explanatory variables representing psychographic factors. Further on, affective processes are effecting consumers' product evaluation. Sympathy to the own region is directly transferred to the food product. Items which express the sympathy to the own region and to the regional food supply are defined as affective factors. Finally, normative aspects can influence the preference for regional food. Items which express the environmental friendliness and the support of the local economy by purchasing regional food were used to define normative factors.

Consumption and shopping habits

It is hypothesized that the preference for organic food is correlated positively with the preference for regional food. Consumers who prefer convenience products may not buy regional food, because most regional food is non-processed food and therefore needs more time for preparation. Thus, items which express the shopping habits related to organic and convenience food were taken into account in the analysis. Furthermore, items which express the preference of supermarkets vs. other kinds of shopping places were included. It is hypothesized that consumers who buy in grocery stores because of convenience aspects do not show a strong preference for regional food. Finally, it is expected that consumers who classify taste as a more important product attribute than origin spend less attention to regional food.

Demographic factors

Gender, age, education, income, occupation, geographical location and size of residence are included as demographic factors.

5. Empirical Results

In our case the logit model defines the functional relationship between the elected level of agreement to the statements and the preference resp. willingness to pay a premium for regional food. The logit analysis calculates the probability to belong to a certain category of the dependent variable by using the cumulative logistic distribution for each individual with personal characteristics. The degree of impact of the independent variables is reported by so-called effect-coefficients $\exp(b)$ which indicate the change of the odds⁴ ratio when the independent value increases for one unit. It is defined as the ratio of the odds of an event occurring in one group to the odds of it occurring in another group, or to a sample-based estimate of that ratio (Backhaus 2003: 443f.).

We used the Nagelkerke R^2 to assess the goodness of fit of the model and the Wald test to estimate the significance of the influence of the independents. The data set was subjected to stepwise forward logistic regression analysis using the maximum likelihood function. The model was performed by using SPSS[®] 12.0 for Windows. To allow the model to calculate with discrete independent variables (occupation, home region, shopping habits) these data were also dichotomized.

The following table presents the results. < Table 1 >

The probability to classify people correctly depending on their answer patterns into the two answering groups is upgraded to 74.4% by the model compared to 59.9% by random classification for the WTPP-question. For the preference-statement (PREF) the right classification is about 79.8% by the logit model compared to 74% by random allocation.

³ Detailed definitions of the included statements and variables are given in annex 3.

⁴ $Odds(Y = 1) = \frac{P(Y = 1)}{1 - P(Y = 1)}$

The R-squared values indicate that a remarkable part of the variance in the stated preference and WTPP for regional food can be predicted from the independent variables. Most of the sociodemographic variables like sex, income and number of children per household had no significant impact on the dependent variables and were taken out of the models.

All included explanatory variables show the expected signs and have at least in one of the models a significant impact on the dependents. Hence, the results confirm the theoretical construct of impact factors. There are more independent variables with a significant impact on the preference than on the WTPP. This is not surprising since the grade of agreement was relatively higher for the PREF-statement, which can be probably due to the less binding character of this statement compared to the WTPP.

People from the eastern part of Germany stated significantly higher preferences for regional food, but there is no remarkable regional difference in the stated willingness to pay more for regional food. In our survey elderly people tend to show a higher preference and willingness to pay for regional food than younger people. This can be explained on the one hand by the fact that elderly people are usually more closely-connected to their home region and on the other hand that younger people prefer more often processed food because of convenience aspects. This is consistent with the finding that respondents who agreed to the statement that they prefer shopping in supermarkets, because there they find everything they need, and to the agreement that taste is more important than origin, showed a significant lower preference for regional food. Not surprisingly, there is a positive relationship between the frequency of buying bio-products and the grade of agreement to the WTPP-statement. As expected, an agreement to the statements about the perceived attributes of regional food has in almost every case a positive influence on both of the dependent variables. Only the assessment of higher safety standards for regional grown food has got a statistically significant impact just on the stated WTPP. This is consistent with the observation that a high agreement to all statements with regard to caring about food safety has got a highly significant influence on the WTPP and a significant impact on the preference. Especially the remarkable $\exp(b)$ on the item "*Quality is much more important to me than the price when I buy food*" indicates that quality and safety are important factors for the willingness to pay more for regional food.

Both logit models indicate an obvious impact of the probability to agree strongly to the two statements by normative aspects. The two most important normative aspects are the support of farmers of the home region and environmental considerations. However, a positive influence of the sympathy towards the home region could only be detected for the preference for regional products but not for the willingness to pay more for them.

All in all, the explanatory variables of the model confirm the expected coherence and indicate consistency in the answer patterns of the questioned people.

6. Final remarks

On the basis of the obtained results it can be concluded that cognitive and normative processes are the most important factors determining the preference towards regional food. Socio-demographic factors and affective processes hardly can explain the variance in the preference towards regional food. From consumers' perspective the food origin is an important indicator of quality and safety. Social norms, especially the wish to support the local economy by the purchase decision, also have important influence on the preferences. But with regard to the last point it is important to take the *warm glow* of personal surveys into account. *Warm Glow* specifies the moral satisfaction of a certain action or behaviour. It occurs whenever people get involved with public affairs because of the feeling to be a good citizen rather than due to the matter itself (Henseleit 2006, S.41).

There are still some points in this subject which need to be investigated empirically in more detail. The first is the product specific nature of the effect of products' origin on

consumers' food evaluation (Van Ittersum et al. 2003). Representative studies need to clarify impact differences according to different food products. Second, the appliance of a structural equation model on this subject is recommendable because of the indirect impacts of determinants on consumers' preferences and the latent nature of variables.

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Tables

Table 1: Effect Coefficients of the Binary Logit Models

Variable	PREF	WTPP
	N = 3000 R ² = 0.355 Exp(B)	N = 3000 R ² = 0.391 Exp(B)
Constant	0.237*** (30.184)	0.055*** (113.794)
Germany (ref. East):		
Sociodemographic Variables	North	0.488*** (18.792)
	South	0.436*** (34.476)
	Middle	0.601** (10.834)
	Age (ref. <mean)	1.672*** (23.731)
	Occupied	0.879 (1.487)
Habits	Hab.Shop	0.582*** (28.813)
	Hab.Taste	0.671*** (15.263)
	Hab.Bio (ref. rarely/never)	1.184 (2.748)
Cognitive Perception	Prod.Qualit	1.732*** (22.566)
	Prod.Taste	1.496*** (12.639)
	Prod.Health	1.614*** (17.316)
	Prod.Law	0.993 (0.005)
Cognitive Safety	Safe.Scandal	1.421** (9.331)
	Safe.Qualit	1.460*** (14.086)
	Safe.Farmer	1.354* (6.607)
	Safe.Time	1.570*** (16.548)
Affective	Est.Region	1.509*** (12.483)
	Est.Supp	1.567*** (20.173)
Normative	Norm.Transp	1.537* (6.076)
	Norm.Prod	1.367** (7.848)
	Norm.Farmer	2.582*** (49.936)

Brackets: Wald statistic

*, **, *** denotes statistical significance at the 0.10, 0.05 and 0.01 level, respectively.

Source: Own presentation

Annex 1: Influence of Psychographic Determinants on the Preference towards Regional Food - Review of Empirical Studies

Author (Year)	Cognitive			Normative		Affective	
	Quality In General	Freshness	Food Safety	Health, Nutrition	Environment- Friendliness	Support of Economy	Sympathy, Image
Van Ittersum (1999)							+/+
Wirthgen et al. (1999)						+	+
Jekanowski et al. (2000)	+						
Schupp und Gillespie (2001)	n.s.		+				
Loureiro und Hine (2002)		n.s.		+			
Loureiro und Umberger (2003)			+/n.s.				
Wirthgen (2003)			n.s.	+	+	+	+
Van Ittersum et al. (2003)	+/+						n.s./+
Roosen et al. (2003)			+				
Umberger et al. (2003)		+	+				
Schröder et al. (2005)	n.s.	n.s.	+		n.s.		n.s.
Mabiso et al. (2005) ^{a)}	+		n.s.				
Mabiso et al. (2005) ^{b)}	+		+				
Loureiro und Umberger (2003)			n.s./n.s./+				

Notes: (+; -) positive and negative estimates refer to significance level of at least 0.10; (**n.s.**) if found to be not significant; If nothing is specified this variable was not included in the study. If several results are listed for one study this is due to different products under consideration.

^{a)} probit model; ^{b)} logit model.

Source: Own presentation.

Annex 2: Influence of Socio-Demographic Factors on the Preference towards Regional Food – Review of Empirical Studies

Author (Year)	Age	Lifetime	Women	Inc	Edu	HH	Kid`s	Resid
Patterson et al. (1999)	n.s.	n.s.	n.s.	n.s.	n.s.		+	
Jekanowski et al. (2000)		+	+	+	-	n.s.		n.s.
Schupp/ Gillespie. (2001)	-		+	n.s.	n.s.	- ^{a)}	-	-
Loureiro/ Hine (2002)	n.s.		n.s.				n.s.	
Wirthgen ^{b)} (2003)	+	n.s.		n.s.		n.s.		
Loureiro/ Umberger (2003)			+/+	-	+/n.s.		+/n.s.	
Umberger et al. (2003)	n.s.		n.s.	-	n.s.		n.s.	
Mabiso et al. (2005) ^{c)}	n.s.		n.s.	n.s.	n.s.		n.s.	
Mabiso et al. (2005) ^{d)}	-		n.s.	-	n.s.		n.s.	
Loureiro/ Umberger (2005)	-/n.s./n.s.		+/+/+	+/+/n.s.	-/-/n.s.		n.s./n.s./-	

Notes: Inc=Income, Edu=Education, HH=Household Size; Resid=Residence (+; -) positive and negative estimates refer to significance level of at least 0.10; (n.s.) if found to be not significant.

^{a)} 1 = Single Household Head; 0 = Otherwise. ^{b)} Wirthgen (2003) also estimates product specific models beside the general regression. In some regressions the variable life time instead of age was significant. Both factors are strongly correlated. ^{c)} probit model. ^{d)} tobit model.

Source: Own presentation.

Annex 3: Sample Characteristics

	Variable	Definition	Respondents and Top-values in %, resp.	Code
Dependent Variable		If it's possible, I try to buy products from my home region.	73.0	<i>PREF</i>
		I like to spend more money for products which verifiably come from my home region.	59.3	<i>WTPP</i>
Socio-demographic Variables	Residence in Germany	North	16.2	<i>north</i>
		Middle	35.4	<i>middle</i>
		South	27.0	<i>south</i>
		East	21.3	<i>(reference)</i>
Age	Older than mean	Mean: 46.47 years		<i>age</i>
	Younger than mean			<i>(reference)</i>
Occupation	Yes	57.6		<i>occupied</i>
	No	42.4		<i>(reference)</i>
Habits		The taste is more important than the origin of food products.	35.6	<i>Hab.Taste</i>
		I prefer food which is quickly to prepare.	35.8	<i>Hab.quick</i>
		I prefer shopping in supermarkets. because I can buy everything there at once.	46.3	<i>Hab.Shop</i>
	Shopping frequency of organic food	Regular or occasional Seldom or never	54.4 45.6	<i>Hab.Bio</i> <i>(reference)</i>
Cognitive Processes	Product Perception	The food is fresher.	84	<i>Prod.Fresh</i>
		The food is of higher quality.	60	<i>Prod.Qualit</i>
		The food is tastier.	65	<i>Prod.Taste</i>
		The food is healthier.	49.3	<i>Prod.Health</i>
		There are strong legal requirements for food.	57.3	<i>Prod.Law</i>
	Food Safety	Caused by the food scandals in the last years I lost confidence in products from supermarkets.	31.3	<i>Safe.Scandal</i>
		Quality is much more important to me than the price when I buy food.	59.0	<i>Safe.Qualit</i>
		I can be sure: Food which I buy directly from the farmer is free of any pollutants.	35.9	<i>Safe.Farmer</i>
		I spend a lot of time to eat healthy.	43.0	<i>Safe.Time</i>
Affective	Sympathy to the home region	80.8	<i>Est.Region</i>	
	Assessment of food supply of the home region.	63.2	<i>Est.Supply</i>	
Normative	Products from my home region have short transportation ways.	92,9	<i>Norm.Transp</i>	
	Regional products are naturally and eco-friendly produced.	50,4	<i>Norm.Prod</i>	
	I support the domestic agriculture when I buy food from my home region.	87,0	<i>Norm.Farmer</i>	

Source: Own Presentation.

Graphics

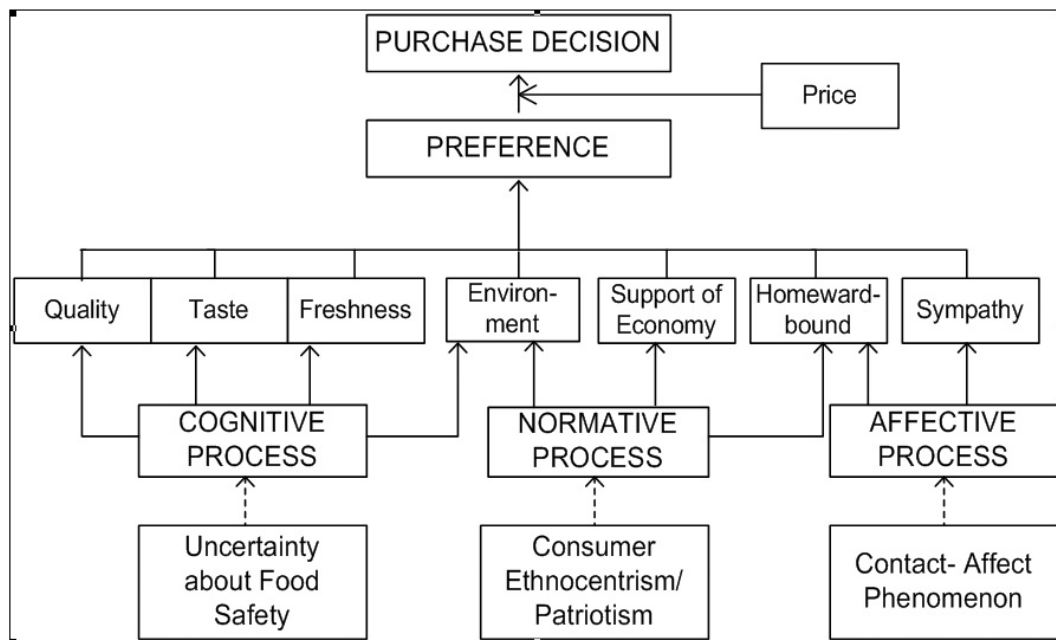


Figure 1: Theoretical Framework of the Psychographic Determinants for the Preference for Regional Food

Source: Own presentation.

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The influence of label on wine consumption: its effects on young consumers' perception of authenticity and purchasing behavior

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Summary

The last forty years have seen a dramatic decrease in wine consumption in France. In 1965, the wine consumption per people per year was 160 liters ; in 2005, people didn't drink more than 70 liters of wine in a year. Moreover, from 1980 to 1990, people over 14 years who drunk wine have decreased from 80 to 67 % of the population. In 2005, only 62 % of them pretended drinking wine. That is one million French people less than in 2000.

This decline in wine market can be explained by the fact that young people consume less wine than older people. This article identifies authenticity as a factor explaining purchasing behavior of young consumers. Findings suggests that the label of bottled wine influences young consumers' choice of wine. Originality and projection are two dimensions of the authenticity explaining how young consumers perceive performance risk, perceived price and purchase intentions.

KEYWORDS: authenticity, bottled wine, label, performance risk, perceived price, purchase intention.

1. Introduction

Wine has become a significant beverage in many nations around the world. For example, in 2003, over 233 million cases of wine were sold in the United States and sales totaled 21,800 million dollars (Adams Wine Handbook, 2004). However, the last forty years have seen a dramatic drop in wine consumption in France. In 1965, the wine consumption per people per year was 160 liters. In 2005, according to the INRA, people didn't drink more than 70 liters of wine in a year. Moreover, from 1980 to 1990, people over 14 years who drunk wine have decreased from 80 to 67 % of the population. In 2005, only 62 % of them pretend drinking wine. That is one million French people less than in 2000.

Why the decline in wine market ? Wine experts suggest that this decrease in wine consumption is not surprising when one realizes how the status of wine has evolved. The status of wine seems to have transited from "wine as an aliment" to "wine as pleasure" (Corbeau, 1997). Wine was former considered as a whole part of the meal, while today it is associated with pleasure. That transition also explains that regular wine consumers are not as numerous as before. Regular consumers represented 60 % of consumers over 14 years in 1980, 40 % in 1995 and only 33 % in 2005 (Onivins, 2001). These figures highlight that people drink less, and it also seems they want to drink better. The desire for quality and the degree of expertise of consumers has increased. As a questionnaire carried out in 2005 emphasized, consumers pay more attention to signs of quality, as AOC French label. When French people were asked "Do you know what the AOC is ?", they were 58 % to answer yes, while they were only 41 % ten years ago (Onivins, 2005).

Along with the issue represented by the drop of the wine market, there is also an other issue represented by young people. A dynamic analysis provides information about future wine consumption. The weak wine consumption by young people suggests that wine consumption in the future is likely to keep low. Because regular wine consumers, especially represented by old people, won't be replaced after their disappearance, a decrease of wine

consumption in France is therefore unavoidable. The APC econometric model forecasts a decline in wine consumption between 13,3 % and 18,1 %.

Despite this decline of per capita consumption volumes in France, French producers don't seem to be interested in marketing as a useful tool to sell wine. However, marketing practices seem to be efficient in selling wine. For instance, researchers about the influence of store atmospherics have concluded that classic music made people buy more wine (Areni and Kim, 1993). North et al. (1999) have lately evidenced a relationship between the geographic origin of a music in a point of purchase (French versus German) and the choice of products. Consumers buy more wines coming from a geographic place congruent with the music : if the music is French, consumers buy French wine ; if it is from Germany, they buy wine from there.

At the same time, consumers often make their choices among a large numbers of alternatives in a very short time (Britton, 1992). In this context packaging becomes a fundamental marketing tool for the winery. As Rocchi and Stefani (2005) suggest, the shape of the bottle, the colour of glass, types and drawing in the label should attract the attention of the potential purchaser, distinguishing a specific wine bottle from several competitors.

One marketing concept of interest to relate to wine packaging in order to understand how to make wine sell good could be authenticity. In general terms, authenticity can be defined as the fact of being original (McLeod, 1999). Researchers go as far as to state that the search for authenticity is one of the cornerstones of contemporary marketing (Brown et al., 2003). They have identified that authenticity is often more contrived than real, but in the case of wine, authenticity is real. So, focal questions are : Can the label improve the perception of authenticity for the consumer ? Do wine consumers prefer authentic wine ? On the contrary, do they prefer modern wine, one that does not seem to be authentic ? Does authenticity improve perceived quality, decrease perceived risk, and enhance the probability of buying, especially in young people ?

The purpose of this article is twofold. Firstly, this article aims to contribute to a better understanding of authenticity as a marketing tool. Secondly, it is to highlight the relationship (1) between the label of bottles of wine and perceived authenticity and (2) between perceived authenticity and wine consumption.

The research described in this article addresses this issue by first developing a conceptual framework for examining the concept of authenticity. Then we highlight the relationship between authenticity in food products and consumer behavior. This review of literature will allow us to draw hypothesis about authenticity in wine and its relationship with consumer behavior. We will explain the methodology we used to test our hypothesis. The results are reported with managerial implications considered at the end of the article.

2. Background

The following section first explains the concept of authenticity by defining its dimensions and attributes. The latter sections then integrate the issue of how authenticity will interact with the consumers' buying behavior of bottled wine to influence.

The authenticity concept : definition, dimensions and attributes

The issue of authenticity has been identified as a central principle in research. As a result, there are as many definitions of authenticity as there are those who write about it.

Authentic products can be defined as those that refer to "an imaginary located in ancient times or in exotism". This definition provided by Warnier (1994) highlight what any author dealing with authenticity suggest : any definition of authenticity must be done with reference to any place, time or product. Indeed, behind any definition of authenticity lie

assumptions about the significance of content, fixity, consistency of reference, provenance and context. Authenticity can be defined as being original, or being faithful to an original. It can mean uncorrupted but also of clear and known provenance. It demands that sources, forms, style, language and symbol all derive from a supposedly homogeneous and unbroken tradition (Rushdie, 1991: 67). Given those considerations, we retain as a marketing definition of authenticity the one given by Camus (2004: 41). The perceived marketable authenticity can be seen as “a characteristic of the product which brings it to an origin, which distinguishes it because it fills up a lack, an insatisfaction, and which is reinforced since the products represents a part of the identity of the consumer”.

In her research, Marianna (1997) sees authenticity as a declaration of identity with, belonging to, knowledge about, respect for and responsibility towards the product. Identity refers to upbringing, beliefs, stories, cultural ways of living and thinking what the product is to be. Belonging means to be either connected with stories about country or connected with the history of the product. Knowledge is about both familiarity gained from experiences and also having a clear and certain individual perception of expression. Respect and responsibility is about having regard for and looking after culture. It's about acting in a way which is sensitive to others and which does not exploit other people's identity, knowledge and belonging.

In the field of marketing, according to Cova and Cova (2001), when authenticity is linked to a product, it refers to a four-dimension concept. Those dimensions are history, space, socialisation and naturalization. Two dimensions have been added to form “six worlds of authenticity” in the consumption world. Those are the archaeological world, the spaciological world, the ritualized world, the natural world, the inspired world and the technical world (Cova and Cova, 2002).

Those dimensions of authenticity can be compared to the ones found by Camus (2003) who made the French major research on authenticity in food markets. She identified three dimensions and nine attributes of authenticity. These dimensions of authenticity are originality, uniqueness and projection. Originality could be seen as naturality. This dimension deals with the question of the origins of the product. To be authentic, the consumer must see the product as original, he must have information about the place the product has been produced. To be authentic, a product must be perceived as different from manufactured products which are sold by millions all around the world : it must be perceived as unique. And it must be seen as a projection of the consumer : the consumer must see the product as a reflect of his personality.

These three dimensions can be defined by nine attributes, which are : customization, origin (including the author, the period, country, human or technical factors), price and signs of certification. These findings are close to the ones found by Beverland (2006) who studied the attributes of authenticity for luxury brands of wine. The author identified six attributes of authenticity : heritage and pedigree, stylistic consistency, quality commitments, relationship to place, method of production, and downplaying commercial motives. Heritage and pedigree refer to the history of the brand ; this attribute is close to the origin suggested by Camus. The drawings of castles and vines, and the name of the castle, refer to history as well. Stylistic consistency can be compared to the typography, that is the way the name of castle is written on the label. Quality commitments for brands can also be compared to exhibition awards on labels of wine. It also can be compared to the signs of certification suggested by Camus. This attribute of authenticity is a major one. In Camus and Beverland's typologies, origin and history are attributes of authenticity.

So far, we have explained how authenticity is defined and characterized. We have emphasized that authenticity refers to something original, unique, far from merchandises, usually seen by consumers as standardized goods. The next issue is how consumers integrate authenticity as a criterion while buying food products.

Authenticity and food consumption

The quest for authenticity is a characteristic of postmodern consumption (Firat and Venkatesh, 1995). People are nostalgic about old ways of life, and they want to relive them by the way of living authentic experience. According to Fine and Speer (1997), an authentic experience involves participation in a collective ritual, where strangers get together in a cultural production to share a feeling of closeness or solidarity.

Researchers use the term 'authenti-seeking' for consumers searching for authenticity in a range of products, services and experiences or looking for it within themselves. In tourism area, authenticity as a concept is nothing new ; destinations such as Australia, Canada or China are promoting authentic experiences in order to attract tourists. In looking for authenticity, some tourists focus on the product in terms of its uniqueness and originality, its workmanship, its cultural and historical integrity, its aesthetics, and/or its functions and use (Hugues, 1995).

Also in other areas, such as food market, one of the key areas identified by research into the future of food market focuses on this concept of authenticity. This focus on authenticity is largely a consequence of the risk consumers perceive while buying food products. Indeed as Fischler (2001) noticed, there's a real paradox in postmodern consumption: while consumers have today a maximal security when they buy food products, their fear about what they eat has never been so important. Consumers have a great consciousness of what they eat and what risk can be associated to their food. This behavior is ruled by two universal principles.

The first one is the "principle of incorporation", which can be defined as "I get what I eat". By controlling the food you eat, you control what you get, in order to maintain your self-esteem. Authenticity allows people to be sure about what they eat : you eat something natural, something original, something unique.

The second principle is the "principle of classification". As anthropologists notice, people are used to classifying things in order to make rules or norms. The most fundamental classification is the one related to what can be eaten and what can not be. An other classification can be about authenticity : some things are authentic, others are not.

Those two principles of incorporation and classification can be considered as risk reducers. By being conscious of the quality of food products and by classifying, people reduce risks related to food behavior. Many risk reduction models have been suggested in marketing literature, including word-of-mouth, warranties, brand image, a price-quality association and salesperson assurance (Hawes and Lumpkin, 1986). But authenticity has never been to our knowledge integrated into consumer behavior research dealing with consumers' choice of wine.

Wine label, choice and authenticity

One approach to studying food choice derives from social psychological research into attitude-behaviour relationships. Referring to the Theory of Planned Behavior (Ajzen, 1991), it is assumed that most part of the influences on food choice are mediated by the beliefs and attitudes held by an individual. Beliefs about the nutritional quality and health effects of a food may be factors more important than the actual nutritional quality and health consequences in determining an individual's choice. Concerning wine, the beliefs about its health consequences play a major role. Indeed, wine can be both a good friend (in moderation, providing physical and social benefits) but a cruel enemy too (in excess, causing moral and physical declines). That is, one of the most prominent factors influencing consumer's wine choice has been found to be perceived quality (Hauck, 1991). Quality can be perceived by human senses, as sight : for food products, and especially for wine, that means packaging and labels are some of the sources consumers refer to in order to judge the quality of the product and to make a choice.

With respect to Olson and Jacoby's typology (1973), the label is considered as an extrinsic cue, an attribute which is not part of the physical product. Rocchi and Stefani (2005) found out consumers seem to be affected by extrinsic cues, such as shape, size and colour of the bottle. On the other hand they consider the dress of the bottle, represented by the set of the other packaging elements (labels, capsules). The label on the bottle signals the producers' names, the types of wines, the origin, the vintage, the level of alcohol, and the government warnings. But it is also placed on goods to make them seem more authentic, to add a quality assurance tag, and even explain their wider context. Such marking helps to make explicit the exchange value of the product (Halewood and Hannam, 2001).

An other factor influencing consumer's wine choice is information. As Marianna (1997) suggests, consumers have become clearly discerning and are demanding more information about the products they buy. People want to know what they are buying and what the product's origins are. In case of wine, the 'where' question is complex and elicits notions of classifications, appellations and the terroir. Indeed, when a winery wants to indicate the geographic pedigree of its wine, it uses a tag on its label called an appellation of origin. This appellation of origin must meet federal and state legal requirements. It is seen as a sign of quality for reputable production areas, and an assurance to consumers of quality standards. The origins carry significant weight for both producers and consumers, and so much effort goes into protecting and promoting it. For instance, the National Institute of Controlled Appellations created in 1935 made the label "Controlled Appellation" as a sign of authenticity and singularity.

Quality is not the only factor consumers refer to in their choice. Choice is not determined only by physiological or nutritional need (Shepherd, 1999) ; it is influenced by many interrelating factors. There are many factors in the context within which the choice is made that are likely to be very important, such as motivations for instance. In addition to the utilitarian (physical) and symbolic (social) motivation, a third motivation labelled 'experience' must be emphasized, in line with the evolution of consumer behaviour studies of wine consumption. People choose a bottle of wine not only for the taste or for social reasons, but also to live a unique experience (Holbrook and Hirschman, 1982).

Other factors include marketing and economic variables as well as social, cultural, religious or demographic factors (Murcott, 1989). In their summarizing framework, Orth and Krska (2002) identified five factors influencing consumer's choice of bottled wine (Figure 1). They include push factors, pull factors, exogenous factors and economic restraints (time and money) [Include here Figure 1].

Besides these situational factors, consumer's choice can be moderated by individual ones. Wine consumption has been seen as moderated by sex : men drink more alcohol than women. It is also moderated by age. It is only between 20 and 25 years old that people begin to appreciate drinking wine (Aigrain et alii., 1996).

3. Objectives

The main objective of the paper is to identify the effects of authenticity on purchase behavior. These effects can now be linked with the previous discussion about the buying processing of bottled wine to develop the hypotheses to be tested. So, from the review of the literature, we propose three sets of hypothesis. They are dealing respectively with the relationship of the three dimensions of authenticity identified by Camus (2003) and perceived risk, perceived price and purchase intention.

Authenticity and perceived risk

The study of perceived risk has a long history in the marketing literature. Risk perceptions are considered to form the basis of a heuristic framework that guides decisions about behaviour (Frewer et alii., 1994). Researchers generally agree that perceived risk is a combination of the perception of the likelihood that something will go wrong and the

perception of the seriousness of the consequences if it does (Garbarino and Strahilevitz, 2004). That's why, following Stone and Gronhaug's conceptualization (1993), we define perceived risk as the subjective expectation of a loss. While a number of risk dimensions have been suggested, only one is included, performance risk. This risk dimension can be viewed as the loss incurred when a product does not perform as expected. In the case of food products, performance risk can be viewed as the loss incurred when the product is not as good as expected.

With a large range for consumers to choose from, consumers have to cope with the complex nature of the varieties of wine. Along with the varying tastes of different people, consumers are interested in approaches that will lower the risk of purchase and help them make a good decision (Johnson and Bruwer, 2004). The packaging of wine can be considered as a quality cue contributing to lower the risk and define the expected quality of the product. According to Hall and Winchester (2000), the consumer uses these cues to assess alternative products with respect to his system of values following a set of subjective rules. Authenticity may be perceived from these cues.

However, the relationship between authenticity and perceived risk has not yet been deeply established in marketing literature. Only Cova and Cova (2002) suggested, without bringing any evidence, that when the product appears as not very sure, when you can see the product as physically risky, it appears as not authentic. The literature has mainly focused on the relationship between authenticity and quality.

So, we hypothesized that :

H1 : The greater the authenticity, the less is the perceived risk about quality of the wine.

- H1a : The greater the natural dimension of authenticity, the less the performance risk.
- H1b : The greater the projection dimension of authenticity, the less the performance risk.
- H1c : The greater the uniqueness dimension of authenticity, the less the performance risk.

Authenticity and perceived price

Literature about price has widely provided evidence about the influence of price on other variables, such as quality or risk (Roselius, 1971). Literature about risk reduction models suggests a link between quality and price, the price-quality association being viewed as a risk reducer. Concerning wine, Landon and Smith (1997) measured the absolute impact of current wine quality and reputation on price and purchasing decisions for Bordeaux wines. Their results showed that reputation has a large impact on the implicit price. The label has also an influence on price. Combris et al. (1997) showed that the price of Bordeaux wine is essentially determined by its objective characteristics appearing on the label of the bottle (year of harvest, geographical origin of grapes and concentration of alcohol).

But the direct relationship between price and authenticity has been far less studied. To Warnier and Rosselin (1996), the value of the authentic product can not be estimated. Every masterchief which is not a copy can be sold at the highest price because of its originality and uniqueness. And the lack of expertise of the consumer can be caught up by a reference to price : a low price raises the risk of a copy whereas an higher price is a sign of authenticity (Bessy et Chateauraynaud, 1995). Therefore, for any product, a decrease in price will be prejudicial to the perceived authenticity of the product. Thus, it is hypothesized that :

H2 : The greater the authenticity, the more is the perceived price of the bottled wine.

- H2 a : The greater the natural dimension of authenticity, the greater the perceived price.
- H2 b : The greater the projection dimension of authenticity, the greater the perceived price.

- H2 c : The greater the uniqueness dimension of authenticity, the greater the perceived price.

Authenticity and purchase intention

The focus on the relationship between visual perceptions of the labels and purchasing process has several psychological implications that need to be taken into account. One of these psychological implications may be the perception of authenticity.

The relationship between authenticity and purchase intention has not been widely studied. On one hand, intention has often been related to confidence; Bennett and Harrell (1975) suggested that confidence plays a major role in predicting intentions to buy. On the other hand, there is evidence demonstrating that intention to buy is positively influenced by attitude (Laroche and Brisoux, 1989) and consumer's knowledge confidence (Laroche and al., 1996). If authenticity could improve confidence (Camus, 2003), we can hypothesize that :

H3: The greater the authenticity, the more is the intention to buy the bottled wine.

- H3 a : The greater the natural dimension of authenticity, the more is the intention to buy the bottled wine.
- H3 b : The greater the projection dimension of authenticity, the greater the purchase intention.
- H3 c : The greater the uniqueness dimension of authenticity, the greater the purchase intention.

We do not hypothesize that perceived relative price directly reduces risk about quality. We could have, considering that Monroe (1990) regarded product quality as influenced by perceived price. Hypotheses 1-3 can be represented by the model presented in Figure 2 [Include here Figure 2].

4. Data and methodology

As Rocchi and Stefani (2005) concluded, further developments are possible both using quantitative and qualitative approaches. Considering this conclusion, this section describes a qualitative and a quantitative study that were designed to test the propositions described in the previous section.

Qualitative study :

An exploratory survey on consumers' perception of wine packaging has already been done by Rocchi and Stefani (2005). They used a repertory grid (RG) approach as a methodological framework in order to know which pattern of features is better at inducing purchase.

The purpose of our qualitative study was different. Its main objective was to have a better knowledge about what means authenticity for consumers and how they can perceive authenticity in bottled wine from labels. Ten interviews of young people between 18 and 25 years were conducted. Considering the exploratory nature of the research, we needed a composition of the sample compatible with the elicitation of the broadest range of constructs. We decided to interview regular consumers and non regular consumers so that we could receipt opinions from expert and non experts consumers. Interviews were carried out with participants in French at their university, and on average lasted for twenty minutes. Questions evolved around their perception of authenticity provided by front labels on bottles of wine. All interviews were taped. Details of the sampled respondents and their responses are shown in table 1.

[Include here Table 1]

As a result, we identified 7 attributes of authenticity provided by the label on the bottle : the drawing of a castle, the drawing of vine, the color of the label, the shape of the label, the presence of a wine exhibition award, the name of the castle, the typography. This result can be compared to the six attributes of authenticity for luxury brands found out by Beverland (2006). It can also be compared to the pull factors identified by Orth and Kraska (2002). It also can be compared to the traditional cues identified by Rocchi and Staefani (2005) : colours, shape and size of the bottles, and labels. An other result is that authenticity seems to be linked to the structure of the wine industry. Authentic and most quality wine is seen as coming from small, family growers and not from larger producers controlling global distribution.

Quantitative study and measures

The findings of the qualitative study have been used to design the questionnaire. Through the interviews, the most relevant attributes of authenticity to include in the questionnaire were determined. So, the categorization of the bottles for the questionnaire emerged from the initial interviews. The second major source was the in-depth literature review. On the basis of the qualitative study and the literature, two bottles were selected as the target pieces for the main experiment, each of which was rated as authentic or non-authentic. With respect to the attributes of authenticity found out with the qualitative study, we decided to choose bottles of wine with equal reputation. The pictures of these two bottles of wine were placed in the questionnaire. The bottle perceived as authentic provided on its label all the legal mentions plus a drawing of a castle and vines, a classic-colored paper looking like a parchment. We decided to choose for this authentic bottle a label with a French name, a Chateau Prieuré Lalande, Côtes de Bourg 2004. On the contrary, the bottle perceived as non authentic provided on its label grey and orange colors, a non-handwritten typography, an orange circle out of the label located on the bottle. For this non-authentic bottle, in order to increase the gap of perception, we chose a bottle with a French name (Art de Vivre) but with an english explanation (The art of bottling sunshine) (Figure 3). The questionnaire with these two labels inside has been administered to 94 students. In the first part of the questionnaire, people had to answer questions about the authentic bottle ; in second part, they had to answer questions about the non authentic bottle. By doing so, we collected 188 data relative to the two bottles. This technique to collect data is recommended by Bowman and Gatignon (1995). The data were collected in the form of self-report questionnaires.

The risk performance measure was designed to assess participants' evaluation of the risk they perceive while consuming the two kinds of bottled wine. Performance risk was assessed with a single-item and seven-point Likert scale, taken from the scale developed by Dandouau (1999).

The perceived price measure was composed of a unique question. The participant had to write the price he thought the bottles were.

The authenticity measure was composed of a 12-item and seven-point Likert scale derived from the scale developed by Camus (2004). Participants were asked to rate the items according to how they thought the bottles of wine were original, unique, and the reflect of their personality. We examined the dimensionality of the scale by using an exploratory factor analysis. The Bartlett' sphericity test provides good results ($KMO=0,784$), as does Chi-Square test (1024,982, $df=66$). Communalities were good ($>0,500$). These results allowed us to factorize the data and along with Camus' results we found out by using a Varimax rotation the tridimensionality of the scale. Authenticity can be measured by the three dimensions identified by Camus (2004) : originality, uniqueness, and projection dimensions. These three dimensions provide 70,376% of the overall variance. The reliability has been examined and validated by measuring Cronbach's alpha (Table 2).

[Include here Table 2]

5. Results

To examine whether authenticity has any effect on the consumers' behavior, all the relationships between authenticity provided by the label of bottles and consumer behavior attributes (performance risk, perceived price and purchase intentions) have all been tested by using linear regressions.

About the relationship between authenticity and performance risk, which can be seen as the perceived quality of wine, we found a significant main effect of the natural dimension of authenticity on performance risk ($\text{sig} = 0,000$, $\hat{\alpha} = -0,788$, $t = -5,732$), strongly supporting prediction 1a. Further, the R^2 was 17,0 %. This means that when the label is authentic, young consumers don't see any risk buying the wine because the presence of the label is a definitive indication of the product's authenticity. When the label is modern, they perceive a risk.

However, the linear regression made to test the influence of the projection dimension of authenticity on performance risk did not bring significant results ($\text{sig} = 0,175$). Prediction 1b is not supported. This results means that, when the label of a bottle of wine reflects his personality, a young consumer does not perceive it as a sign of quality, as a guarantee that the quality of the bottle is good enough to buy it.

The linear regression made to test the influence of uniqueness on performance risk shows that the influence is significant at 10 %. At this level of significance, we found a significant main effect of the uniqueness dimension of authenticity on performance risk ($\text{sig} = -0,248$, $\hat{\alpha} = -0,248$, $t = -1,669$), supporting prediction 1c at 10% only. The R^2 for the analysis was low (1,7 %). As far as the level of significance allows us to bring any conclusion from the analysis, this result may means that young people who perceive a wine as unique from its label may perceive it as less risky to buy.

About the relationship between authenticity and perceived price, the main result should interest producers : the only dimension of authenticity that affects perceived price of bottles is the natural dimension. This results supports prediction 2a, while prediction 2b is not supported ($\text{sig} = 0,274$). Wines with a label improving the perceived natural dimension are perceived as more expensive ($\text{sig} = 0,029$, $\hat{\alpha} = 0,128$, $t = 2,197$).

However, the linear regression made to test the influence of uniqueness on perceived price shows that the influence is significant at 10 %. At this level of significance, we found a significant main effect of the uniqueness dimension of authenticity on perceived price ($\text{sig} = 0,071$, $\hat{\alpha} = 0,930$, $t = 1,820$), supporting prediction 2c, meaning that young consumers perceive bottled wine as more expensive when the label provides a sign of uniqueness. The R^2 for the analysis was low, at 2,0 %.

About the relationship between authenticity and purchase intention, we found a significant main effect of the natural dimension of authenticity on purchase intention ($\text{sig} = 0,000$, $\hat{\alpha} = 0,839$, $t = 6,572$), strongly supporting prediction 3a. Further, the R^2 for the analysis was 20,7 %.

An interesting result shows that people are more intended to buy a bottle of wine when the label reflects their personality, supporting the prediction 3b claiming that the second dimension of authenticity has an influence on purchase intention ($\text{sig} = 0,000$, $\hat{\alpha} = 0,683$, $t = 5,122$). The R^2 for this linear regression was 13,5 %. Maybe this result could mean that young people may be more attracted by bottled wine with modern labels, while elderly people may prefer authentic labels.

Inversely, the last dimension of authenticity, uniqueness, does not improve purchase intention ($\text{sig}=0,829$). Consumers may perceive physical risk by buying a wine that seem too different from other wines. Prediction 3c is not supported.

6. Final remarks

Wine marketers spend billions of dollars annually seeking to enhance consumers' perceptions of value associated with their bottles. Because of the size and the negative evolution of the market, it is critical for them to have a clear understanding of the way the labels on the bottles can influence buying behavior, especially for young consumers. Indeed, although young consumers still account for only a small portion of total consumers, they represent the future consumers for wine producers.

This study was intended to provide a more complete understanding of the influence of the authenticity perceived from the label of bottled wine. As an attempt to extend the research on the influence label of bottled wine can have on consumers' decisions of buying, the current article shows some interesting results. Based on the regression results, the answer the study gives to the research questions can be summarized as follows. Our central finding is that authenticity consumers perceive from the label on bottled wine influences the performance risk they perceive while buying the product. Bottles of wine with labels perceived as authentic by young consumers are seen as less risky to buy. New kinds of labels, without any drawing of castle or vineyard for example, or with bright colours, are seen as risky.

This is not, however, the only one interesting result. Rather, our second major finding is that all the dimensions of authenticity do not affect the consumers' behavior. As original dimension of authenticity influences performance risk, perceived price and purchase intention, reflect of personality and uniqueness dimensions do not influence all the dependant variables. For instance, the fact that the label reflects the consumers' personality does not influence perceived price, while natural dimension does.

In this context, we also show that young consumers only develop purchase intentions from two dimensions of authenticity. Natural dimension and the fact that the label reflects the consumers' personality influence purchase intentions. The fact that young people want to buy wine that reflects their personality is interesting for marketers. Wine has become a situational product, a product you consume for special times, as parties or important dinners. A young person would like to offer his guests a wine they would enjoy drinking, a wine he can be proud of, a wine he can "you like it, you like me". Wine can be seen here as an extended self product (Belk, 1988). Implications for producers are numerous. Producers could adopt a marketing strategy based on labels. For young people, they could make typologies in order to have a good knowledge of their customers and adapt the labels to their personality.

Limitations and future research

What is clear from these findings is the major role played by labels. However, our research holds some limitations.

First of all, from an academic point of view, because our results are directly relevant only to young people, researchers should be interested in understanding the effects of labels of bottled wine on other kinds of targets. The middle-aged people can be considered as an important target for wine producers and the research may be replicated to know if this target is influenced by authenticity as young consumers are. Further research should clarify the extent to which the relationships we have found will broadly hold. Additionally, we only studied the influence of authenticity for red wines. Further research should clarify the extent to which the relationships we have found will be similar for white wines.

Moreover, more attributes may have to be determined and tested for further research to better understand the role of authenticity. Indeed, there may be other factors than the ones determined in this study that could have a potential influence on authenticity. Our qualitative study brought some interesting results, but these results should be measured in order to confirm if attributes of authenticity found out in this study really increase perception of authenticity. And authenticity could be linked to other variables, such as

attitude, attitude being seen as a powerful predictor of behavior (Fischbein and Ajzen, 1975).

Of particular interest could be the influence of point of sale on authenticity. Future research might focus on the way the point of sale, if it is perceived as authentic or not, could influence the perceived authenticity of the wine sold in it.

From a methodological point of view, we only presented front labels in the questionnaire. While front label is usually considered for evocation, back label is expected to provide to an informative function, containing the relevant technical information about the wine. This back label could have been presented. Further research should measure its influence during the purchasing process.

An other methodological limit is due to linear regressions. Structural equation modeling (SEM) could be chosen in future research because it can support simultaneously latent variables with multiple indicators, interrelated dependent variables, mediating effects, and causality hypotheses. Structural equations can measure independent variable errors while regression analysis cannot (Bollen, 1989).

Implications for market

A number of implications for research and practice flow from this line of research. An obvious implication of these findings is that, in order to increase a consumer's intention to buy a bottle of wine, a marketer needs to enhance his/her perceived authenticity. Authenticity decreases the level of performance risk, enhances perceived price and purchase intention. Enhancing authenticity can be done by making a label that makes the wine be perceived as natural and unique (the projection dimension does not significantly influence consumer behavior). Making the wine be perceived as natural can be easy, by putting a picture of vineyard or castle on the label. Making it being perceived as unique can be done by enhancing the quality of the label for instance.

According to Seth Godwin (2005) : "Authenticity: If you can fake that, the rest will take care of itself". As a conclusion, we emphasize the jeopardy of faking authenticity. Labelling bottled wine in a way that enhances the consumers' perception of authenticity could be doomed to failure. Consumers could perceive the wine as "false authentic" and develop negative affect toward the producers and negative purchase intentions.

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Table 1 - Summary of case studies

	Attributes of authenticity on labels of bottled wine	Attributes of non authenticity on labels of bottled wine
Person 1 « expert male »	Drawing of a castle or vineyard, handwritten writing, information about the place of production, the year of production	Bright colours, non handwritten writing
Person 2 « expert male »	Parchment-looked paper, year of production, country of production, put into the bottle at the castle	Bright colours
Person 3 « non expert male »	Medals from contests, French name of the castle	Non handwritten writing
Person 4 « non expert male »	Year of production, name of the castle, drawing of vineyard	Bright colours, non handwritten writing
Person 4 « non expert female »	Pale colours, name of the castle, reputation	Non squared label
Person 6 « non expert female »	Year of production, Pale colours, name of the castle, French name	Bright colors, emptiness of the label
Person 7 «expert female »	Country of production, the year of production, the name of the castle, put into bottle at the castle	
Person 8 «expert male »	Country of production, put into the bottle at the castle, year of production, name of the castle	
Person 9 « non expert female »	Wine exhibition awards, name of the castle, year of production	Emptiness of the label, bright colours, non handwritten writing
Person 10 « non expert male »	Wine exhibition awards, name of the castle, country of production, appellation of origin	Non handwritten writing

Table 2 - Measures used in the study and reliabilities

Constructs	Scale items	Reliability
Natural dimension of authenticity	When you're looking at the label on the bottle number X, you can say about the wine : - it is natural - it is made from natural stuffs only. - it is not made from natural stuffs (inversed) - you know how it has been produced. - you know where he comes from	0,8484
Projection dimension of authenticity	When you're looking at the label on the bottle number X, you can say about the wine : - it can reflect your personality - it can define yourself - it can help you being yourself - it is at your style	0,8853
Uniqueness dimension of authenticity	When you're looking at the label on the bottle number X, you can say about the wine : - it is unique - it is one-of-a kind - there's not other like it	0,8221
Performance risk	When you're looking at the label on the bottle number X, you can say about the wine that its quality may not come up to my expectations	No alpha
Perceived price	When you're looking at the label on the bottle number X, how would you rate the price of the bottle ?	No alpha
Purchase intentions	When you're looking at the label on the bottle number X, you can say about the wine, you would seriously consider buying the bottle.	No alpha

Figure 1 – Factors influencing consumer's choice of bottled wine (Orth and Krska, 2002)

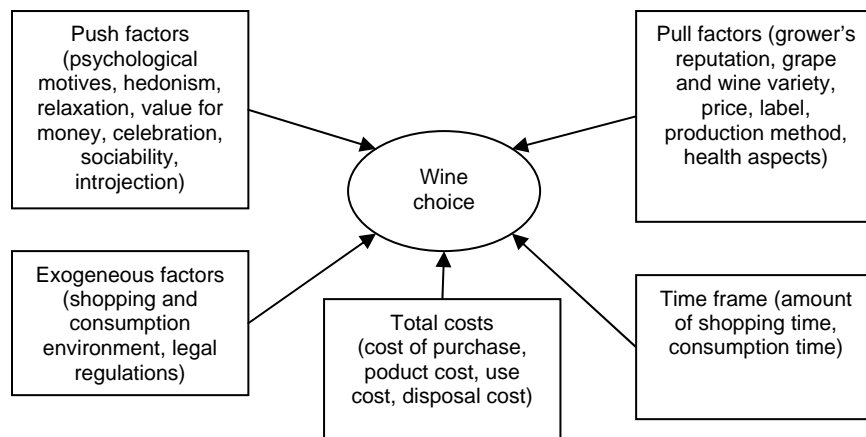


Figure 2 – The conceptual model

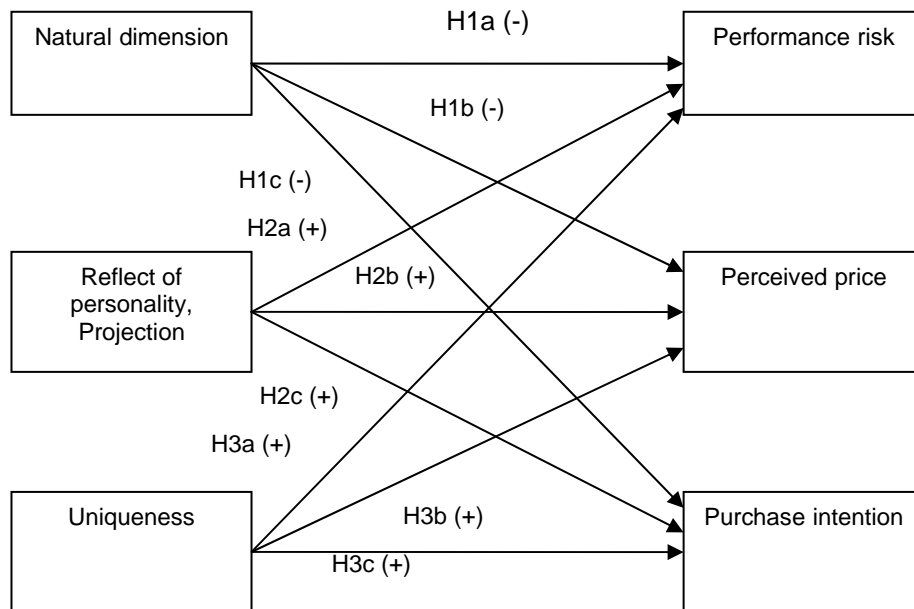
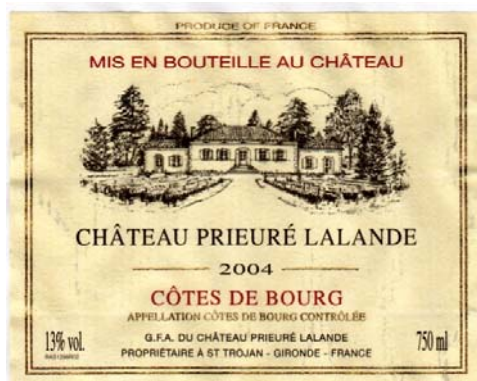


Figure 3 – The two labels for the questionnaire



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What Impact Are EU Supermarket Standards Having on Developing Countries Export of High-Value Horticultural Products? Evidence from Kenya

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Summary

European Union (EU) retailers are setting global benchmarks for the production of fresh food, and are asking their suppliers for produce to be certified according to food safety and quality standards. Compliance to these standards for developing countries small-scale producers entail costly investment in variable inputs and long term structures. Limited empirical evidence exists either to refute or confirm the concern that the proliferation and enhanced stringency of these standards marginalize smallholders from global market. This article therefore explores the costs of compliance, factors explaining the smallholder decision to adopt EU private quality standard and the impacts of the standard on farm financial performance. We develop a two-stage standard treatment effect model to account for self-selection as a source of endogeneity. Analysis is based on a random cross section sample of 439 small-scale export vegetable producers in Kenya whose production was monitored in 2005/2006. We demonstrate that adopters and non-adopters are distinguishable by their asset holding and household wealth, access to services, labor endowment and level of education. Once we control for endogeneity problem, we found that small-scale producers can benefit substantially from adopting the standard at the farm level.

KEY WORDS: Kenya, export vegetables, adoption, EurepGAP standard, impact assessment

1. Introduction

One way that Kenya and other sub-Saharan African countries have attempted to reduce poverty and achieve higher rates of growth is by diversifying their export portfolio away from primary commodities into non-traditional exports with more auspicious market trends (Harris et al., 2001). Participation in international trade is generally recognized to favor economic growth and especially agricultural exports would promote development in low-income countries due to the link with the rural economy (Aksoy, 2005). Extensive household surveys have shown that smallholders participating in export vegetables, whether as producers or the workforce employed in the sector, are better off than non-export smallholders, with average annual household incomes being almost five times higher (McCulloch and Ota, 2002; and Humphrey et al., 2004). However, there is a concern that the proliferation and enhanced stringency of food-safety standards that are imposed by high-income countries can negatively affect the competitiveness of producers in developing countries in particular smallholders and impede actors from these countries from entering high-value food markets (Augier et al., 2005). An alternative and less pessimistic view emphasize that compliance with food-safety standards can be a catalyst for upgrading and modernization of developing country's food supply systems (Jaffee and Henson, 2004; Maertens and Swinnen, 2006).

The challenge especially for small-scale producers is the fact that horticultural export is becoming increasingly competitive and sophisticated. Consumers require high quality produce and this has to be traced back to the producer to ensure strict adherence to total quality management (Jenson, 2004). The smallholders' ability to maintain and strengthen their role in horticultural exports will depend on their capacity to adapt to these changes and comply fully with the emerging standards. Compliance to these standards entails costly investments in such as variable inputs (in particular, the switch to approved pesticides) and long-term structures (e.g., grading shed, charcoal cooler, disposal pit, toilet, and pesticide store). These investments are "lumpy" in nature and mostly specific to the fresh export vegetable business. The general view in the literature is that smallholders, especially the poorest ones, are increasingly being squeezed out from high-standards export production (Barrett et al., 1999; Dolan and Humphrey, 2000; Farina and Reardon, 2000; Reardon et al., 2003; Weatherpoon and Reardon, 2003; Joffe, 2003; Jensen, 2004; Okello, 2005).

Participation of small-scale producers in high-standards export production is a necessary but not a sufficient condition for an enhanced welfare effect of high-standards agricultural trade (Maertens, 2006). Faced with high cost of compliance and complexity of the standard, farmers examine the perceived benefit vis-à-vis the expected cost before making a decision to adopt the standard. Theoretically, complying with food-safety standards provides a broad spectrum of potential direct and indirect benefits to the farmers. Small-scale producers complying with the standard are expected to have high productivity and good quality produce which reduce the level of rejection by the buyers and increase the return. The health and environmental impacts stemming from changes in pesticide use and hygiene practices associated with adoption are another important benefit. Adopters are expected to have better market access and stable income over time compared to the non-adopters and in addition spill-over effects to domestic production could benefit the domestic consumers (Henson and Jaffee, 2004).

Much research addressed impacts of standards on developing countries at a policy level (Henson and Loader, 2001; Beghin and Burea, 2001; Jaffee et al., 2005; Henson and Jaffee, 2005; Aloui and Kenny, 2005; Manarungsan et al., 2005), however less attention has focused at the level of small-scale producers. The few exceptions, to the best of our knowledge, are the study by Okello (2005), who investigated on compliance with international food-safety standards for Kenyan green beans producers on case study basis. He found that resource poor farmers are likely to be marginalized by international food-safety standards. However, they can overcome the capital barrier by banding together into cooperative groups and then jointly investing in costly facilities. The study by Maertens (2006) and Minten et al. (2006) focused on Senegal and Madagascar export vegetable industry respectively and found a positive impact of high standard export contract on smallholder welfare, income stability and shorter lean periods.

In this paper we undertake an empirical study of the impact of complying with a most widely known EU private food-safety standard on small-scale producers in Kenya. We addresses three main objectives: (1) to investigate the nature, magnitude and significance of cost of compliance with EU private standards, (2) to examine factors explaining the smallholder decision to adopt EU private standard and (3) to estimate the impacts of standard on farm financial performance.

The organization of the rest of the paper is as follows. Section 2 is devoted to a review of trend in Kenyan horticultural industry and the evolving EU food-safety standards. The methodology and empirical model is presented in section 3. Section 4 presents and discusses the empirical findings and section 5 reports the conclusions and policy implications of the study.

2. Kenyan Fresh Export Production

2.1. Overview of the Horticultural Sector

Compared to many African countries, the horticultural export industry of Kenya is now by far the largest exporter of vegetables to the EU and has been for about a decade the country's second most important foreign exchange earner in the agricultural sector, after tea (Jaffe et al., 2005). The major export vegetable crops are green beans, peas and Asian vegetables (such as karella, chillies, aubergines and okra) with beans and peas mostly being exported to the EU. The main flowers exported include roses, carnations, statice and a variety of summer flowers (voor den Dog, 2003). The vast majority of this produce (89.4%) is destined for Europe, with the UK market absorbing the major share 71% in 1999. Kenya also exports Asian vegetables to the Middle East market (Harris et al., 2001).

There are various players active in the export market channels of fresh fruits and vegetables in Kenya. Small-scale producers often operate as individuals or as a member of out-grower schemes. Figure 1 shows the high-value vegetable supply chain to illustrate the different choices the actors have in selling their produce.

Figure 1 Here

The strength of the horticulture export sector can be attributed to several factors. First, Nairobi's location as a centre of air transport between Europe and the East and Southern African region, and Kenya's role as a major tourist destination, ensure that there is sufficient northbound air cargo to transport exports. Second, preferential treatment under the Lomé Convention between African Caribbean Pacific (APC) countries and the EU provides concessionary access for Kenyan flowers and vegetables to the European market. Third, the sustained demand for horticultural products as a result of high and growing incomes in Europe provides a stable and growing market for Kenyan producers. Fourth, close co-operation with the supermarket chains in Europe and a smooth adaptation to the new criteria defined in the various labels by supermarkets and other market sources. Finally, the presence of ample local and international investors, particularly in the cut-flower business, provides Kenya with an added advantage (Markandya et al., 1999; voor den Dog, 2003).

2.2. Role of Small-scale Producers

The figures on the number of small-scale farmers involved in export fresh fruit and vegetable production in Kenya vary depending on the source and year of estimation. Estimates from the early 1990s suggest that smallholders supplied over half of the export fruit and vegetable production (Kimenye, 1993; Jaffee, 1995). More recently, the Horticultural Crops Development Authority (HCDA) estimated that 40% of exported fruit and 70% of exported vegetables are produced by smallholders (Harris et al., 2001). According to interviews with four leading exporters, Dolan and Humphrey (2000) conclude that just 18% of vegetables for export come from smallholders. They further make the case that smallholders are being squeezed out of export production because of the difficulty of ensuring compliance with food safety and quality requirements imposed by supermarkets and other buyers. They argue that these requirements are leading exporters to grow their own produce or purchase from large-scale commercial farms. On the other hand, exporters may wish to under-report the share of their production that comes from smallholders to satisfy European buyers who are suspicious of smallholder quality control (Harris et al., 2001). Jaffee (2003) interviewed several exporters and estimates that smallholders account for 27% of exported fresh vegetables and 85% of exported fresh fruit, for an average of 47% of fresh fruit and vegetable exports. A recent review and update estimated the current number at about 12,000 smallholders producing for the vegetable export market in nine districts of Kenya (Mithöfer et al., 2006). Previous estimates range from 13-16,000 (Jaffee,

1995) to 80,000 smallholders producing vegetables and fruits for the export market (Karuga and Masbayi, 2004)

One of the difficulties in estimating the number of participating smallholders is the definition of the same. With an exception of Mithöfer et al. (2006), in most of these estimate small-scale producers are defined as farmers with less than 10 acres of land while medium-scale and large-scale producers are farmers with between 10 to 20 and larger than 20 acres respectively (Harris et al., 2001). This definition was re-discussed with experts from Kenya, and majority of the experts concluded that this definition does not reflect the reality on the ground. The experts instead defined small-scale horticultural producers as farmers with less than 5 acres of land under horticulture, whereas farmers with 5 to 10 acres of land and greater than 10 acres under horticultural production as medium- and large-scale producers, respectively. This is the definition applied throughout the paper.

2.3. European Private Food-safety Standards

European consumers are increasingly concerned about possible health consequences of pesticide residues. Even consumers who are not part of the growing “organic food” movement are increasingly wary of agricultural chemicals (Dolan et al., 1999). In 1990, the U.K passed the Food Safety Act which obliged food retailers to demonstrate “due diligence” to ensure that the food they sell is safe and the resultant supermarkets developed codes of practice. In practice, this means that supermarkets have become much more involved in imposing requirements on how food is produced throughout the commodity supply chain, even to the degree of monitoring and controlling horticultural production in developing countries (Dolan et al., 1999). These changes were initially aimed at addressing the problem of microbial contaminants in food. They later evolved to cover three broad areas: i) pesticide residue standards, including pesticide usage, handling, and storage as well as disposal of pesticide containers and leftover pesticides, ii) hygiene standards, including sanitation of grading and storage facilities and general personal hygiene, and iii) traceability requirements, including documentation of production activities, especially pesticide usage, planting and spraying dates, and labeling of graded produce (Jaffee et al., 2005).

Many of the individual quality and food-safety standards of retailers in EU have been harmonized, with two prominent common standards being the British Retail Consortium (BRC) standard and European Retailer Produce Working Group for Good Agricultural Practices (EurepGAP). Companies supplying branded fresh and processed food products use BRC, which has been in operation since 1996 and it covers basic safety and quality requirements, including HACCP (Hazard Analysis Critical Control Point). EurepGAP is the most widely known example of a common EU private standard. It is a model of on-farm assurance that is being promoted to growers of fresh food as a mandatory standard and it is regarded as a condition of entry to EU markets and is unlikely to provide price premium.

The EurepGAP guidelines reflect a harmonization of the existing safety, quality, and environmental guidelines of the major European retailers, and are a response to increasing consumer interest in food-safety and environmental issues (EurepGAP 2003). The detailed production protocols were first developed for fruit and vegetables and now also cover flowers and grains. EurepGAP has a growing membership of retailers, including leading food retailers such as Sainsbury’s, Tesco, Safeway, Coop Italia, Belgian Wholesale Markets, Waitrose and Kesko. It hopes to become the global player in agricultural production standards and verification frameworks. The main focus is food-safety, but the protocols also addresses a number of issues concerning the environment (soil, water, and wildlife conservation), occupational health and safety, complaint procedures and internal audits (EurepGAP 2003).

EurepGAP offers four options to producers who seek to obtain certification under the standard. Under Option 1, an individual farmer applies for certification. The farmer must

carry out an internal self-inspection and undergo an external inspection by a certification body, which is a certification enterprise accredited by EurepGAP. Under Option 2, a group of farmers applies for a group certificate. Farmers must establish an internal management and control system, perform individual self inspections and group internal inspections before receiving an external verification by a certification body. Under Options 3 and 4, individual farmers or farmer groups that have already implemented another standard can apply for a “EurepGAP benchmarked scheme certificate”, i.e. EurepGAP recognizes the existing standards scheme as being equivalent to the EurepGAP standard (EurepGAP 2003).

3. The Theoretical Framework

Adoption and diffusion of innovations theory (David, 1969; Rogers, 1995; Sunding and Zilberman, 2001) has been widely used to identify factor that influence an individual’s decision to adopt or reject an innovation. An innovation is defined as an idea, practice or object that is perceived as new by individual or other unit of adoption. The perceived newness of the idea for the individual determines his or her reaction to it (Rogers, 1995). Rogers identifies five characteristics of an innovation that affect an individual’s adoption decision. These are (1) relative advantage, which is the degree to which an innovation is perceived as being better than the idea it supersedes; (2) compatibility, or to the degree to which an innovation is perceived as consistent with the existing values and beliefs, past experiences and the needs of potential adopters; (3) complexity, which is the degree to which an innovation is perceived as relatively difficult to understand and use; (4) trialability, or the degree to which an innovation may be used experimentally on a limited basis; and (5) observability, which is the degree to which the results of an innovation are visible to others. The relative advantage and observability of an innovation describe the immediate and long-term economic benefits from using it whereas compatibility, complexity, and trialability indicate the ease with which a potential adopter can learn about and use an innovation (Rogers, 1995).

For the purpose of this study, EurepGAP food safety standard is considered as an innovation. The adoption and certification of this standard cannot be seen as a single event that takes places on a farm. It rather must be described as a process over time with different stages from the first knowledge of the standard until its implementation. The process of compliance can be described as a process, which consists of at least three stages: 1) information, 2) decision and 3) implementation. At the first stage, the information stage, the producer obtains information and knowledge on the standard. He or she becomes aware of the existence of the standard and gains knowledge on how the standard works. The information stage is essential to pass to the subsequent steps of the compliance process, as certain knowledge on the standard is necessary to form an attitude toward the standard and to make a decision. It is vital to emphasize the critical importance of this stage in developing countries like Kenya. In such countries the largest number of producers faces great difficulties in accessing information, due to limitations including the lack of formal education and poor infrastructure. These limitations create obstacles to information access. At the second stage, the decision stage, the producer makes a decision on the implementation of the standard. Once the decision to implement the standard is made, the producer enters the implementation stage. The implementation stage consists of the actual adoption of the standard and the introduction of the standard’s requirements on the farm.

The manner in which agricultural households respond to interventions is a critical factor in determining the relative merits or demerits of alternative option. In economic theory, the problem of production, consumption and labour supply decisions are usually analysed separately through the behaviour of the three classes of agents (Sadoulet and de Janvry, 1995). The first one is producers who maximize net revenue with respect to levels of products and factors, subject to constraints determined by market forces and technology,

secondly consumers who try to maximize utility with respect to the quantities of goods consumed, subject to constraints determined by market forces, income, household characteristics and tastes and thirdly the workers who try to maximize utility with respect to income and leisure subject to constraints determined by the market wages and total time available and worker characteristics. The agricultural household model recognizes that the household decision maker is often engaged simultaneously in production, consumption and work decisions. The household has a dual role of producer and consumer, and makes production, labour allocation, and consumption decisions that may be interdependent of one another depending on market forces. By consuming all or part of its own output, which could alternatively be sold at a given market price, the household implicitly purchases goods from itself. By demanding leisure or allocating its time to household production activities, it implicitly buys time, valued at the market wage, from itself (Singh et al., 1986). This household behaviour has necessitated the integration of the three decision problems into a single household problem.

The basic structure of the agricultural household model (Singh et al., 1986) also known as the household farm model is based on the assumption that for any production cycle, the household maximizes a utility function:

$$U = u(c_m, r_m, l_i; T_u) \quad (1)$$

We assume that households derive utility from consumption of on-farm goods (c_m), market goods (r_m), leisure (home time) (l_i) and vector of other factors that shift the utility function (T_u). The household maximizes utility subject to a set of constraints, namely cash income constraints, (equation 2), time constraints (equation 3) and technology constraint (equation 4).

$$\sum_{i=1}^N [p_i(Q_i - c_m) - w \sum x_i + E] \geq \sum_{m=1}^N [p_m r_m] \quad (2)$$

$$D \geq l_i + l_a(G) \quad (3)$$

$$Q_i \leq Q_i(l_a(G), x_i(G), G; Z_u) \quad (4)$$

Where Q_i and $p_{i,m}$ denote the quantity and price of farm output respectively; w and x_i represent the price and a vector of inputs used for farm production activities respectively, D and l_a are total household labor endowment and labor devoted to own farm activities, respectively; Z_u denotes a vector of exogenous farm and community level characteristics that shift the production function whereas E and G represent unearned income and adoption of EurepGAP code of practices, respectively. As its mentioned in the previous chapters, its considered that the adoption EurepGAP code of practices will increase complexity and reduce flexibility that translate into increased labor allocated for farm production activities. In this case, the amount of labor devoted to own farm activities l_a and possibly the use of other farm inputs x_i are a function of G , the adoption of EurepGAP standard.

A technology-constrained measure of household income is obtained by substituting Equation (4) into Equation (2) (Huffman, 1991; Fernandez-Cornejo et al., 2005).

$$\sum_{i=1}^N [p_i(Q_i(l_a(G), x_i(G), G; Z_u) - c_m) - w \sum x_i + E] \geq \sum_{m=1}^N [p_m r_m] \quad (5)$$

The Lagrangian technique is used to solve the household utility maximization problem. The Lagrangian solution to the household constrained maximization problems yields a system of first order conditions, which constitute the structural form of the model. The structural form of the model can then be solved for the reduced form of the model that gives the endogenous variables as a function of exogenous variables. The first-order conditions for optimality can be obtained by maximizing the Lagrangian expression L over a set of choice variables.

$$L = U(c_m, r_m, l_i; T_u) + \lambda \left\langle \sum_{i=1}^N [p_i \{Q_i(l_a(G), x_i(G), G; Z_u)\} - c_m] - w \sum_{i=1}^N x_i(G) + E - \sum_{m=1}^N p_m r_m \right\rangle + \mu ((D - l_i - l_a(G))) \quad (6)$$

The EurepGAP adoption decision may be obtained from the following Kuhn-Tucker conditions:

$$\frac{\partial L}{\partial l_a} = \lambda [P_i(\partial Q / \partial l_a)] - \mu = 0 \quad (7)$$

$$\frac{\partial L}{\partial G} = \lambda [p_i((\partial Q / \partial l_a)(\partial l_a / \partial Q)' + (\partial Q / \partial x_i)(\partial x_i / \partial Q)' + \partial Q / \partial G) - w(\partial x_i / \partial G)'] - \mu(\partial l_a / \partial G)' = 0 \quad (8)$$

$$\frac{\partial L}{\partial x_i} = \lambda [p_i(\partial Q / \partial x_i) - w] = 0 \quad (9)$$

$$\frac{\partial L}{\partial c_m} = U_c - \lambda p_i = 0 \quad (10)$$

$$\frac{\partial L}{\partial r_m} = U_r - \lambda p_m = 0 \quad (11)$$

$$\frac{\partial L}{\partial l_i} = U_l - \mu = 0 \quad (12)$$

where U_c , U_r and U_l are the partial derivatives of the function U . We assume the production function is concave and that G and $l_a \geq 0$. The EurepGAP adoption decision condition is obtained from the optimality conditions, Equation (8) and Equation (7) and Equation (11), noting that the expression in brackets in Equation (8) is the total derivative dQ/dG . Thus we obtain

$$p_i(dQ/dG) - w(dx_i/dG)' - (\mu/\lambda)(dl_a/dG)' = 0 \quad (13)$$

But from Equation (11) and Equation (12), $\mu/\lambda = p_m(U_l/U_r)$, then

$$p_i(dQ/dG) - w(dx_i/dG)' - (p_m(U_l/U_r))(dl_a/dG)' = 0 \quad (14)$$

The left-hand side of this expression may be interpreted as the marginal benefit of adoption of EurepGAP, $p_i(dQ/dG)$ minus the marginal cost of adoption, which includes the

marginal cost of the production inputs, $w(dx_i/dG)^'$, and the marginal cost of labor $(p_m(U_l/U_r)(dl_a/dG)'$, brought about by adoption of EurepGAP. It will not be optimal to adopt if the marginal benefit of adoption falls short of the marginal cost of adoption.

4. Empirical Model And Data

Following Greene (1997) and Fernandez-Cornejo et al. (2005), a two-stage standard empirical model is developed to account for self-selection as a source of endogeneity. The first stage consists of the adoption decision model for identifying determinants of EurepGAP adoption and the second stage is the impact model that provides estimates of the impact of adopting EurepGAP protocol on household income.

4.1 The Adoption Decision Model

Equation (14), implied by the Kuhn-Tucker conditions, is the central for the EurepGAP adoption decision. Considering a first-order approximation and adding a disturbance terms, the adoption decision can be empirically represented by:

$$G_i = \beta_i X_i + u_i \quad (15)$$

where, X_i are non-stochastic vectors of observed farm and non-farm characteristics and u_i is random disturbances associated with the adoption of the new technology. Assuming that the disturbances are independently and identically normally distributed, the probit transformation can be used to model the adoption decision. The probit model assumes that the error term of the model follows a normal distribution between $-\infty$ and the value βX_i such that the area under the curve represents the probability that EurepGAP protocol is adopted. Hence, the larger the area under the curve, the higher is the probability of adoption. The functional form of for a probit model F (cumulative distribution function) may be defined as follows:

$$F(\beta X_i) = \int_{-\infty}^{\beta X_i} \frac{1}{\sqrt{2\pi}} \exp\left(-\frac{t^2}{2}\right) dt \quad (16)$$

The parameters of the probit model were estimated by maximizing the likelihood function K in equation (17). The likelihood function is specified as the product of the probabilities of adopting D_i and not adopting $(1 - D_i)$ and its log is maximized with the respect to the unknown parameter.

$$K = \prod_{G_i=1} G_i \prod_{G_i=0} (1 - G_i) \quad (17)$$

4.2 The Impact Model

An econometric impact model is specified, which statistically controls for factors considered relevant, and for which there are data, by holding them constant, so that the effect of adoption can be estimated. The model developed takes into consideration that unobservable factors may cause farmers complying with food-safety standards to earn higher incomes than non-compliant farmers, resulting in an overestimation of the adoption effect and use instrumental variable techniques to purge the dependence of adoption. The predicted probability of adoption, obtained from the adoption decision model, is used as an instrument for estimating the effect of adopting EurepGAP in the impact model.

Unlike the traditional selectivity model in which the effects are calculated using the subsamples of adopters and non-adopters separately, the impact model uses all the observations and is known as a “standard treatment effects model,” used by Fernandez-Cornejo et al. (2005). In this model the observed indicator variable, G_i , indicates the presence or absence of some treatment, which in this case adoption of EurepGAP standard (Greene, 1997). Formally, given the unobserved or latent variable and its observed counterpart, the treatment-effect equation, which is the basis for our impact model can be expressed as:

$$G_i^* = \beta X_i + u_i \quad (18)$$

$$Y_i = \alpha V_i + \gamma G_i + e_i \quad (19)$$

$$G_i = 1 \text{ if } G_i^* > 0, \text{ otherwise } ; G_i = 0 \quad (20)$$

G_i^* is the unobservable or latent variable for EurepGAP adoption, G_i is its observable counterpart (dummy for adoption of EurepGAP), Y_i is a vector denoting the farm net-income¹, V_i is a matrix of exogenous variables thought to affect farm financial performance and X_i are non-stochastic vectors of observed farm and non-farm characteristics determining adoption. e_i and u_i is random disturbances associated with the impact model and the adoption of EurepGAP.

Note that we cannot simply estimate (2) because the decision to adopt may be determined by unobservable variables that may also affect income. If this is the case, the error terms in (1) and (2) will be correlated, leading to biased estimates of γ , the impact of adopting EurepGAP. We can correct for the selection bias by assuming a joint normal error distribution, and using a two-step procedure. In the first step we use a probit model to estimate adoption. Using the probit results, we compute the inverse Mill's ratio for each observation. In the second step, we linearly regress income on the explanatory variables and the inverse Mill's ratio (Greene, 1997). The reduced form of the first stage adoption model is

$$ADOPTION = f [\text{household characteristics (AGEH, GEND, EDU1, EDU2, FEMA, CHIL), asset holding and household wealth (LIVE, LAND, FERT, FACI, MACH), communication behavior (RADI, TVUS, TRAI, MOBI, EXTE) and access to services (CRED, CONT, GROU, DIST, IRRI, EXPO, OFFF)}]$$

Where the dependent variable adoption of EurepGAP standard (ADOPTION) equals one, if the household has commenced to comply with EurepGAP code of practices during 2005 cropping season, and zero otherwise. It is generally assumed that the household's aim to maximize its expected utility subject to various constraints determines the decision to adopt an innovation. Based on this assumption, the following observable factors are hypothesized to affect the adoption decision.

First, the household's endowment with family labor is expected to positively affect the probability of adoption, given the labor-intensive nature of export vegetable production. Labor variable in the model include the number of adult females (FEMA) and children

¹ Net-income is computed as total revenue from all export vegetables minus all variable cost including family labor per cropping season. The value of family labor was approximated by the existing wage rate in the nearest village.

under 15 years of age (CHIL). The age of household head (AGEH) and his or her educational attainment (EDU1) as well as that of other household members (EDU2) capture differences in the quality of management. We expect education of household head and members to positively influence EurepGAP adoption although the direction of the age effect might be ambiguous. Age is usually taken as a proxy for experience and is expected to have a positive impact on adoption of an innovation. However, it is argued that there is a certain threshold of age beyond which the ability of farmers to take risk and adopt innovations decreases. This means that young farmers are more likely to face the risks associated with innovations, e.g. uncertainty in return and unfamiliarity of the technology and to adopt them than their old counterparts. Also, the direction of the gender (GEND) effect is not clear a priori.

Farm resource endowment variables such as the value of livestock (LIVE), value of farm machinery (MACH) and facility index (FACT)² are expected to have a positive impact on adoption of EurepGAP since these variables are a good proxy for measuring the capacity of households to invest in new infrastructure necessary for the compliance and take risks. The coefficient of land size (LAND) can take either sign depending on alternative form of land use, thus representing opportunity cost of land. Communication and information related variables include level of agricultural training (TRAI), total hours spent on listening to radio per week (RADI), total hours spent on watching television per week (TVUS), access to mobile phone (MOBI) and distance to extension service (EXTE). We expect these variables to enhance the ability of farmers to quickly acquire, synthesize and respond to changes, thereby increasing the probability of adoption of EurepGAP adoption.

Access related variables cover access to credit (CRED), access to formal contract (CONT), duration of group membership (GROU), use of irrigation (IRRI), participation in off-farm activities (OFFF), distance to input seller (DIST) and number of years the household has been producing export vegetables (EXPO). Smallholders in Kenya can hardly afford to make the necessary investment to comply with EurepGAP code of practices individually and hence seek to get a certificate under Option 2, which requires farmers to organize themselves in a group. Thus, the stronger and more cohesive the group is, the higher the probability to acquire and analyze information and to implement the protocol.

For the second stage, the impact model, household net-income from export vegetables is taken as a dependent variable. The primary interest is to analyze whether EurepGAP has an effect on the income of the households. Description and descriptive summary of the explanatory variables used in the model are presented in Table 1 below.

Table 1 Here

4.3. Data Source and Sample

To generate the empirical basis for answering the research questions, data collection was conducted at vegetable grower level. A multi-stage sampling procedure was used to select districts, sub-locations and small-scale vegetable producers, respectively. The first stage was to select five districts purposively from two major vegetable producing provinces (namely Nyeri, Kirinyaga, and Murang'a Districts in Central Province and Meru Central

² Facility index: $D_{ht} = \sum D_{ih} (1-P_i)$ $P_i = n_i/n$

where $G_{ih} = 1$ if household h has access to facility i ; the facilities are having cemented floor, number of rooms, access to pipe water, and being less than 100 meter from water source; P_i is the probability of having facility i ; n_i = number of households which have a facility i ; and n = total number of households. (McCulloch and Ota, 2002)

Durable goods index: $G_h = \sum G_{ih} (1-P_i)$ $P_i = n_i/n$

where $G_{ih} = 1$ if household h possesses durable i ; P_i is the probability of having durable good i ; n_i = number of households which have durable i ; and n = total number of households. The items used to compute the index are refrigerator, sofa set, swing machine, radio, television, bicycle, motorcycle and car. (McCulloch and Ota, 2002)

and Makueni Districts in Eastern Province) based on the intensity of export vegetable production, agro-ecology, types of crop produced and accessibility. These districts represent the major export vegetable producing areas, which according to the current update on the number of smallholders producing for the vegetable export market (Mithöfer et al., 2006), cover approximately half of the share of all smallholder vegetable export producers. Overall, 21 sub-locations³ were randomly selected from the five districts based on proportional to export vegetable producers size. Lists of all smallholders in export production, which were compiled for that update at the sub-location level (Mithöfer et al., 2006), served as a sampling frame for this study. A total of 439 export vegetables producer households were selected randomly for the interview.

Data collection took place during the 2005/2006 cropping season. The survey was conducted through single visits (re-call survey) and season-long monitoring of household production practices. The data were collected by trained enumerators supervised by the researcher using structured questionnaires, which covered a broad range of socio-economic aspects of the rural life from household composition and asset position to agricultural production and input use. The re-call survey questionnaire covered specific information on the characteristics of household members, household income (both farm and off-farm), household assets such as land size, livestock ownership, farm machinery and household equipments and access to different services like credit, irrigation, formal contract and group membership. The respondents were also asked a host of questions related to costs and benefits associated with compliance with EurepGAP standard. The season-long monitoring survey questionnaire primarily focused on inputs and outputs related to export vegetable production. Besides personal interviews, a series of formal and informal farmer group discussions have been conducted to understand the export supply chain and to get more information on the intangible benefits of compliance with the standard.

5. Results

The data analysis is performed in two steps. First a description of the socioeconomic characteristics of the sample of export vegetable producers comparing adopters and non-adopters is presented. Secondly, the results of the regression are discussed.

5.1. Descriptive Statistics

As presented in Table 1 the average age of the farm households in the research area is 45.7 years. The majority of the sampled households are male headed (85%) and on average the household size measured in adult equivalents is 4.36. The average number of female household members of the sample is 2.8 whereas adult members between 14-60 years and children less than 14 years make 3.6 and 1.7, respectively. The highest grade attained by household head is 8.6 and other adult household members except the head 9.6. The average farm size and number of plots owned by households are 3.01 acres and 2.04, respectively and 95% of the total land area owned by the respondents is perceived as fertile land. The average number of tropical livestock units owned is 2.06 and its equivalent monetary value is estimated at 20,884 KSh. The average durable goods index and facility index is 0.86 and 1.21, respectively. Fourteen percent of the respondents participate in off-farm activities, 73% have access to reading printed materials, 87% have access to mobile phone, 95% have access to irrigation water, 34% have adopted EurepGAP protocol and only 17% are EurepGAP certified. The average gross annual income from export vegetables amounts to

³ Sub-location is the lowest administrative unit in Kenya

33,864 KSh. On average the sample households spent 8.2 hours per week watching their own or neighbors' television and 27.3 hours per week listening to a radio. Majority of the sampled households are grower group members with the average years of group membership 2.04 and participation in export production business 4.33 years.

Chi-square and t-test procedures are used for some selected variables as a starting point to compare EurepGAP adopter categories and results are presented in Table 2 and 3. From Table 2 the access and communication related variables such as participation in off-farm activities, access to credit service, participation in agricultural training, use of television, reading printed materials, access to mobile phone, group member and opinion leadership are statistically significant below the 0.1 level of probability. However, there is no significant difference between the two-adopter categories in terms of use of irrigation water. The result depicts that adopters of EurepGAP have higher levels of access to credit, training, reading printed materials and use of television than the non-adopters. The adopters also consider themselves as opinion leaders, have higher levels of access to mobile phones and are to a higher share a member of grower groups than their counterparts. Those who are a member of a group are 96% EurepGAP adopters and 67% non-adopters while 32% of the adopters and 17% of the non-adopters have access to credit services. Those who had participated in agricultural training are 58% adopters and 43% non-adopters whereas 63% adopters and 47% non-adopters consider themselves as opinion leaders. Those who use television are 64% adopters and 44% non-adopters while 94% of adopters and 84% of the non-adopters have access to mobile phone.

Table 2 Here

From Table 3 the wealth related variables such as land size, tropical livestock units owned, durable goods index, facility index, number of farm machinery owned, and the household characteristics' variables such as education level of the head and other adult household members, dependency ratio, children below 14 years of age and adults between 15-60 years of age are statistically significant different below 0.1 level of probability between the two groups. Moreover, access and communication related variables such as access to mobile phone use, television use, duration of group membership, number of major training subjects and amount of credit used differ significantly below 0.1 level of probability. However, there is no significant difference between the two groups in terms of some household characteristics variables such as age, number of female household members and household size.

Table 3 Here

The results suggest that EurepGAP adopters have higher level of household members' education, larger land size, more livestock, higher number of farm machinery, higher level of durable good and facility indexes than the non-adopters. The level of participation in grower groups member, amount of credit received, level of training, intensity of television use and duration of mobile use are also significantly higher for EurepGAP adopters compared to their counterpart. As shown in the Table 3, actual mean household net-income from export vegetables is also significantly higher for EurepGAP adopters than for non-adopters.

5.2. Costs and Benefits of EurepGAP Compliance

Implementation of EurepGAP necessitates changes of production practices and/ or investment in infrastructure. This imposes substantial costs on smallholder export farmers. These costs are a major hurdle that has to be overcome especially for small-scale producers in order to achieve the certificate. Our survey estimates approximately 37,000KSh per group member to implement EurepGAP and achieve the certificate, which is approximately 30% of the total annual crop income of the adopters. The main costs (30300 KSh) are for the buildings and facilities that farmers must establish as a pre-condition of implementing the standard. These two cost elements comprise represent the nonrecurring costs: a one-

time investment to set up the implementation. The other 18% (6,700) are the recurring costs of compliance (protective clothing, record keeping, salary for the grader etc). The costs for external auditing, certification, training and soil analysis are not included in the cost calculations since they have so far been met by others, e.g. NGO's and exporter companies. Unlike large-scale farms who can purchase all of the required equipment and facilities within six or seven months (a maximum of one year), small-scale farms cannot afford these costs all at once and hence they tend to prepare for the requirement in two or three years. Indeed many of the smaller producers who decide to adopt the protocol are forced to rely on loans and external support even though some rely on their own financial resources. This result is also supported by Mausch (2007) findings where he found that contracted large-scale farm reaches its break-even point after a year while the contracted smallholder farm needs more than two years to break even.

Beyond the costs, Figure 2 highlights a number of wider benefits from compliance with EurepGAP perceived by the farmers. Smallholder growers who adopted the protocol appreciated highly to be part of a group going through the EurepGAP compliance process. They were assured of markets with buyers who offered the best price as well as timely payment. Many also perceived that implementation of EurepGAP at the farm level increased quality of production and reduced the amount of reject by the buyer. Under EurepGAP, agrochemicals are stored and handled by trained individuals and many growers felt that their health is better protected. Likewise the installation of disposal pits for the waste generated on the farm, clean toilets, baths and hand-washing facilities had clearly brought better hygienic conditions at the farm. Growers complying with EurepGAP are proud of the neatness of their farms compared to before compliance. Another perceived benefit is improved bargaining power with their major buyers. Prior to EurepGAP, growers were often price takers and hardly negotiated with their buyers on different marketing arrangements but many farmers confirmed that by complying with EurepGAP they will be in a better position to bargain with their buyers especially on price.

Figure 2 Here

5.3. The Adoption Decision Model Results

To further investigate if the above observed disparity between the adopters' categories affects a farmer's decision to adopt EurepGAP protocol at the farm level, we estimate a probit regression (Table 4) that estimates the predicted probabilities of adoption of EurepGAP protocol by smallholder export vegetable farmers. The null-hypothesis that all variables can be dropped is rejected at less than the 1% level of significance and the Wald Chi-square is 99.53.

Table 4 Here

Among the statistically significant variables in the adoption model, the coefficient of female household members takes positive sign corroborating our hypothesis. However the number of children below the age of fourteen is negatively associated with the probability of adoption. The status of women in the study area is intimately linked to their labor but also responsibility for the cultivation and preparation of food. Predominantly women are responsible for labor intensive task of planting, weeding and harvesting of the crop, e.g. picking of French beans, thus provide most labor for export vegetable production. Therefore households with more female household members tend more likely to adopt the standard than their counterparts. Even though the coefficient is not significant, young farmers seem more likely to adopt the protocol and take the risk associated with the technology than the older farmers.

Education is a very important determinant of the adoption of new technologies. We hypothesized that the decision whether to adopt EurepGAP or not is not necessarily made by the head of the household alone but also by other educated adult members of the household. Our findings also support this notion. As shown in Table 4, the coefficient value

of education level of the head and other adult household member except the head takes a positive sign and significant indicating the positive effect of intra-household literacy on the adoption decision of EurepGAP. This result shows that, even if the household head is illiterate, the presence of an adult literate person in the family plays a crucial role in increasing the probability of the household to adopt the protocol. This is in line with the thought that an educated member of the household “confers a positive externality on the illiterate agents in the household by sharing the benefits of his or her literacy” (Basu et al., 2000; Asfaw and Admassie, 2002). The household decision to adopt EurepGAP is also positively and strongly related to the level of agricultural training received prior to EurepGAP adoption, which once again indicates the importance of knowledge in the adoption decision.

Land size is negatively associated with EurepGAP adoption, which implies that having less land size has not been a serious constraint to the adoption of practices in the sampled areas. However households with more fertile land seem more likely to adopt the practices compared to their counterparts. Households with relatively big land size in the study area tend to focus more on production of cash crops such as coffee and tea, which requires bigger areas unlike export vegetable crops. As expected, the number of farm machinery and value of livestock variables takes positive sign corroborating our hypothesis. This implies that the higher the capacity of the household to absorb risk and make an investment on additional activities, the greater the likelihood of adopting the protocol. Facility index is another crucial variable that substantially explains the household decision to adopt the protocol. It shows a strong and positive association with the adoption decision.

Contrary to the findings of Okello (2005), we find no evidence that access to extension service increase the likelihood of adoption of the standard. This result sounds counter-intuitive at first sight. Nevertheless, they make more sense if we closely consider the information channels in the export supply chain. Unlike other agricultural innovation, the private sector such as exporter companies and NGOs play a crucial role in disseminating the information concerning EurepGAP. Majority of the exporters in Kenya have got trained technical personnel at the grass root level who provides technical services for the smallholders producing export crops for them. The technical personnel visit the farmers on frequent basis and provide the necessary information and services and hence the role of government extension personnel is very limited related to export crops. However other communication related variables such as radio use and television use increase the likelihood of a farmer adoption decision. Radio is extensively used in the research area and the primary purposes of listening are the news and entertainment features. However there are agricultural programs on television and radio, which could increase awareness about new emerging standards and influence the adoption decision and the more a farmer listens to the radio or watches TV, the more likely h/she is to learn of EurepGAP contribution.

As expected, the coefficients of many access related variables have their hypothesized signs. The variable group membership takes positive sign in line with our hypothesis. This implies that farmers who have been a group member for long years are more likely to adopt EurepGAP standard vis-à-vis farmers with few years of group membership. As discussed in the background, smallholders participating in export vegetable business often organize themselves in a group to deliver their produce to their buyer and apply for EurepGAP certificate. Often, grower groups provide some of the services farmers require to meet the standard and most export farmers affiliated with farmer groups depended on a technical assistant either hired by the group or the buyer (exporter) to meet technical requirement of the standard (e.g. pest scouting, record keeping, pesticide application etc) and hence the dynamics and cohesiveness of the group plays a very crucial role for the implementation of the protocol. In his study Okello (2005) also presented similar results.

Surprisingly, the experience in export production measured by the time period a farmer has produced for export market, has negatively associated with the adoption decision in contrary to our expectation. However, the length of time the farmer has produced with a

formal contract increases the probability of adoption of EurepGAP. The likelihood of adopting the protocol does also seem to increase significantly with use of irrigation. Most export crops are susceptible to water stress especially during pod filling, which results in wrinkles and spots on the pods. Such quality is rejected by most buyers that enforce EurepGAP. The amount of credit does seem to have a positive impact on adoption decision behavior though not significant. Given the required investment to establish the necessary infrastructure to comply with the standard, access to credit service plays a very crucial role in mitigating the financial constraints faced by many smallholders. Participation in off-farm activities is strong and negatively correlated with the adoption decision. This underlines the important role of the opportunity costs of labor for a technology that is labor demanding.

5.4. The Impact Model Results

Net-income from export vegetables significantly differs for adopters and non-adopters of EurepGAP standard. However, while illustrative, a comparison of means can only lead to a definite conclusion in an ideal experimental setting. Unlike controlled experiments, conditions other than the treatment are not equal in farm surveys. Thus, these differences in mean household income cannot necessarily be attributed to adoption of EurepGAP. To measure the financial benefit of adopting the standard, it is necessary to take into account the fact that individuals that adopt EurepGAP might have earned a higher income even if they had not adopted. Hence, to control for this sample selection bias we estimated a separate impact model. Thus, the model examines whether the differences in income between the adopter categories disappear when one takes into account other differences between the households. The results presented in table 5 show that this is not the case.

Table 5 Here

Explanatory variables in the impact model include a dummy for EurepGAP adoption, several indicators of household characteristics (such as age and household size), household assets (such as land size, number of farm machinery, value of livestock, and durable goods index), and participation in off-farm activities. A series of dummy variables for different districts is also included to represent heterogeneity in agro-ecological conditions. Results show that the coefficient associated with the inverse Mill's ratio is not significant, indicating that the correction for selectivity bias is insignificant in this model.

Adoption of EurepGAP standard is strongly and positively associated with household net-income. All other things kept equal adopting EurepGAP protocol results in an increase in net export vegetable income of 5,271 KSh. However, the fact that some small-scale producers benefit significantly from adopting the standard does not necessarily imply the whole sector is better off. The standard's positive impact on poverty and pro-poor development depends on the scale of adoption. According to data from FoodPlus secretariat, the legal body of EurepGAP, by June 2006 about 33 large-scale producers and 10 smallholder farmer groups with 267 members were certified for EurepGAP standard for fruit and vegetables under Option 1 and 2, respectively. The survey on the number of export smallholders conducted in preparation for this survey arrived at about 3,400 smallholders who in September 2005, were in the process of EurepGAP certification in the nine districts surveyed from Central and Eastern Province of Kenya (Mithöfer, 2006). This implies that from September 2005 to June 2006 not much progress was made in terms of increasing smallholder certification and further, taken the approximately 12,000 smallholders in export production, the scale of adoption seems to be rather low for achieving a direct significant impact on whole sector. If we compare this figure with the total number of stallholders involved in export production, the scale of adoption seems to be much lower to bring significant impact on pro-poor rural development.

The age of household head is negatively and strongly associated with the net-income, which suggests that the age of the head poses considerable constraints upon a household's ability to obtain higher income from export vegetables. Age is usually taken as a proxy for

experience and is expected to have a positive impact on income however it is argued that there is a certain threshold of age beyond which the ability of the farmers to take risk and implement new ideas decrease, which might have a negative impact on income. The size of household is positively associated even though the coefficient is not statistically significant. The coefficient of number of crops grown by the household shows that net-income significantly is an increasing function of the diversity of the export crop portfolio. All other things kept equal, an increase of crop number grown by one results in an increase in net export vegetable income of 7,658 KSh. This shows the first highest positive impact on the net-income followed by EurepGAP adoption. The more assets a household owns the higher its net-income could be expected to be, but with an exception of the number of farm machinery, other asset related variables such as land size under export vegetables, livestock value and durable goods index are neither strongly nor statistically significantly associated with higher net income. Conversely, participation in off-farm activities is negatively and strongly associated with the net-income. This may be due to the high labor demand required for export vegetable production, which is shared by other off-farm activities and affect the net-income from export vegetables negatively. We also found evidence that agro-ecological and location variation does affect the household net-income from export vegetables. Households from Meru District do earn significant higher net-income than households from other districts with an exception of Makueni. Meru District is situated at higher altitude, which has a favorable environment for beans and peas, i.e. higher productivity, better quality and higher price for their produce compared to the other districts. Makueni District is at a lower altitude and therefore primarily involved in producing Asian vegetables.

6. Conclusions and Policy Implications

The study detailed in this paper indicates that EurepGAP adopters are statistically distinguishable from non-adopters in the principle measures of asset holding and household wealth (quality of land, farm machinery, value of livestock and facility index), access to services (group membership, use of irrigation, access to contract and credit) and household characteristics (labor endowment, educational level and training). This implies that access to information, capital, services and availability of labor are major factors influencing the ability of small-scale producers to adopt the standard and exploit export opportunities for agricultural and food products in developed country markets. These results empirically demonstrate the general argument in the literature that resource poor farmers with limited access to information and services hardly comply with the emerging food-safety standards (Dolan and Humphrey; 2000; Weatherpoon and Reardon, 2003; Okello, 2005).

The results of the impact model indicate that small-scale producers complying with the EurepGAP protocol obtain a significant higher net-income from export vegetable production than non-adopters. Besides the significant improvement in the financial performance, farmers implementing EurepGAP regulation are aware of the non-financial benefits such as more secure and long-term relation with their buyer, continued participation in potentially lucrative export markets, increased awareness of agrochemical handling practices and improvements in general conditions of hygiene and cleanliness at the farm. With respect to benefits from potential spillover effects on domestic production, domestic food safety, farmers' health and the environment no conclusions can so far be drawn and this area requires further research.

Despite the standard's positive impact on the financial performance of the adopters, the impact on the development of the sector depends on its successful adoption by a broad number of producers, which is so far not yet the case in Kenya. The primary message is that poor small-scale producers on themselves are unable to comply with the emerging food-safety standards under the current existing condition. This implies that a significant proportion of the smallholder is likely to be excluded from the lucrative export market.

If it is the policy goal of the Kenyan government to keep smallholders in the export market, the question is at what costs can this be achieved? So far the donors have picked up much of the bill of initial investment for supporting the smallholder in attaining the standards. It is not clear, however, whether they would continue to do so in the future? There is thus a need to assess the costs of helping a larger part of the smallholder population to achieve food safety standards and compare these with alternative options for attaining poverty alleviation and rural development.

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Table 1. Definition of selected variables used in the model (N = 439)

Variable name	Variable definition
<i>Dependent variables</i>	
ADOPTION	EurepGAP adoption dummy
NETINCOME	Net-income from export vegetables ('000 KSh)
<i>Household characteristics</i>	
AGEH	Age of the household head (yrs)
GEND	Male household head dummy
HHSI	Size of the household (Adult Equivalent)
FEMA	Female household member (numbers)
CHIL	Household members less than 15 years of age
ADUL	Household members between 15-60 years of age
EDU1	Highest grade attained by household head only (yrs)
EDU2	Highest grade attained by other adult household members (yrs)
<i>Asset holding and household wealth</i>	
LAND	Total land size (acres)
LAEX	Land size under export vegetables (acres)
CRNU	Number of export vegetable crops grown
FERT	Proportion of land that is fertile in percentage
LITU	Number of Tropical Livestock Unit owned
LIVES	Value of livestock ('000 KSh)
MACH	Number of farm machinery owned
FACI	Facility index
DURA	Durable goods index
<i>Communication behavior variables</i>	
TVUS	Television use per week (hrs)
RADI	Radio use per week (hrs)
PRIN	Reading printed materials dummy
TRAI	Number of major training subjects (excluding EurepGAP training) attended in the past three years prior 2005
MOBI	Access to mobile phone use dummy
EXTE	Distance to extension service (km)
<i>Access related variables</i>	
OFFF	Participation in off-farm activities dummy
CERT	Proportion of households who have EurepGAP certificate
CRED	Amount of credit used for the past three years prior 2005 ('000 KSh)
DIST	Distance to input seller (km)
CONT	Number of years the household has been involved in formal contract
GROU	Number of years the head has been a group member
EXPO	Number of years the head has been participating in export production
IRRI	Irrigation use dummy

Table 2. Chi-square analysis of EurepGAP adopters by some selected variables

Variable	Adopters (N = 149)		Non-adopters (N = 290)		Chi-square ^a	P-value
	N	%	N	%		
Gender of household head						
Male	132	88.59	239	82.41	2.868*	0.090
Female	17	11.41	51	17.59		
Participation in off-farm activities						
Yes	14	9.40	47	16.21	3.069*	0.080
No	135	90.60	243	82.79		
Use of television						
Yes	90	64.29	127	44.56	14.616***	0.000
No	50	35.71	158	55.44		
Reading printed materials						
Yes	112	80.00	199	69.82	4.952**	0.026
No	28	20.00	86	30.18		
Access to credit service						
Yes	48	32.21	51	17.59	12.059***	0.001
No	101	67.79	239	82.41		
Participated in agricultural training						
Yes	87	58.39	125	43.10	9.210***	0.000
No	62	41.61	165	56.90		
Access to mobile phone use						
Yes	141	94.63	244	84.14	10.045***	0.002
No	8	5.37	46	15.86		
Group member						
Yes	144	96.64	196	67.59	47.584***	0.000
No	5	3.36	94	32.41		
Opinion leadership						
Yes	89	63.57	134	47.02	10.315***	0.001
No	51	36.43	151	52.98		

^a Statistical significance at the 0.01 (***), 0.05 (**), and 0.1 (*) level of probability.

Table 3. Analysis of t-test for selected variables

Variable	Adopters (N = 149)	Non-adopters (N = 290)	t-stat ^a	P-value
Age of household head (yrs)	45.145	45.883	-0.525	0.599
Dependency ratio	0.591	0.763	-2.371**	0.018
Highest grade attained by household head only (yrs)	9.418	8.231	3.117***	0.002
Highest grade attained by other adult household members (yrs)	9.715	8.136	1.700*	0.094
Size of the household (Adult Equivalent)	4.526	4.291	1.064	0.287
Female household members (number)	2.778	2.612	0.887	0.375
Household members less than 15 years of age	1.316	1.827	-3.017***	0.002
Household members between 15-60 years of age	3.854	3.304	2.286**	0.022
Total land size (acres)	2.702	2.716	-0.964**	0.045
Proportion of land that is fertile (%)	96.929	94.042	1.409	0.159
Number of tropical livestock unit owned	2.262	1.936	1.706*	0.088
Number of farm machinery owned	14.336	8.403	4.805***	0.000
Durable goods index	1.015	0.825	2.476**	0.014
Facility index	1.549	1.044	5.556***	0.000
Net-income from export vegetables ('000 KSh)	12.275	3.155	5.619***	0.000
Total annual crop income ('000 KSh)	101.981	70.707	3.700***	0.000
Duration of mobile phone use (yrs)	1.252	0.940	1.779*	0.076
TV use per week (hrs)	11.078	7.220	3.055***	0.002
Radio use per week (hrs)	27.861	26.648	0.672	0.501
Amount of credit used ('000 KSh)	5.268	3.419	1.134	0.257
Group membership (yrs)	3.258	1.345	7.229***	0.000
Major training subjects (number)	6.871	4.882	4.830***	0.000
Distance to extension service (km)	3.146	2.750	1.209	0.227
Formal contract (yrs)	2.679	2.187	1.677*	0.094

Notes: Dependency ratio = the number of individuals aged below 15 or above 60 divided by the number of individuals aged 15 to 64

The exchange rate at the time of the survey was approximately 72 KSh/\$US.

^a Statistical significance at the 0.01 (***), 0.05 (**) and 0.1 (*) level of probability.

Table 4. Probit estimation of the adoption decision model

Dependent Variable: Dummy for EurepGAP Adoption (ADOPTION)

Variable	Estimated ^a Coefficient	Robust Standard Error	t-value
<i>Household characteristics</i>			
AGEH	-0.0086685	0.007776	-1.11
GEND	0.3807204	0.281860	1.35
EDU1	0.0590389*	0.0310199	1.90
EDU2	0.0418688**	0.0204017	2.05
FEMA	0.1845052***	0.064532	2.86
CHIL	-0.3165243***	0.0730512	-4.11
<i>Asset holding and household wealth</i>			
LIVE	0.0000179***	0.00000662	2.71
LAND	-0.0834754*	0.0505795	-1.65
FERT	0.0106348**	0.0044329	2.40
FACI	0.2778661**	0.1293365	2.15
MACH	0.0261786***	0.0099379	2.63
<i>Communication behavior variables</i>			
TVUS	0.0156500*	0.0085651	1.83
RADI	0.0141094***	0.005164	2.73
TRAI	0.0715265***	0.0247873	2.89
MOBI	0.2741820	0.2080225	1.32
EXTE	0.0565071	0.0352104	1.60
<i>Access related variables</i>			
CRED	7.3100001	0.00000580	1.26
CONT	0.0688753*	0.0355304	1.94
GROU	0.2402460***	0.0508226	4.73
DIST	-0.0874578**	0.0375335	-2.33
IRRI	0.8999331*	0.4811122	1.87
EXPO	-0.0784233***	0.028974	-2.71
OFFF	-0.6982502**	0.2994148	-2.33
CONSTANT	-4.393365***	0.9985857	-4.40
Number of observations	439		
Log pseudo-likelihood	-3947.7521		
Prob > Chi-square	0.0000		
Wald Chi-square	99.53		

^a Statistical significance at the 0.01 (***), 0.05 (**) and 0.1 (*) level of probability.

Table 5. Parameter estimates of the financial impact model**Dependent variable: Net- income from export vegetable production (NETINCOME)**

Variable	Estimated ^a	Robust	t-value
	Coefficient	Standard Error	
AGEH	-134.4842***	50.38352	-2.67
HHSI	317.8607	347.1996	0.92
LAEX	2257.678	5660.1992	0.48
LIVE	0.0356174	0.0411154	0.87
MACH	89.62331*	54.07188	1.66
CRNU	7658.305***	2918.619	2.62
DURA	-135.58	1220.621	-0.11
OFFF	-2869.691*	1473.968	-1.82
DISTRICT			
MERU (Base)			
KIRINYAGA	-5521.866***	1732.185	-3.19
MURANGA	-4264.873***	1522.137	-2.80
NYERI	2879.357	2083.477	1.38
MAKUENI	4332.62*	2492.018	1.74
ADOPTION	5271.258**	2615.297	2.02
INVERSE MILLS RATIO (IMR)	1409.859	1443.771	1.91
CONSTANT	508.4128	4519.101	0.11

^a Statistical significance at the 0.01 (***), 0.05 (**) and 0.1 (*) level of probability.

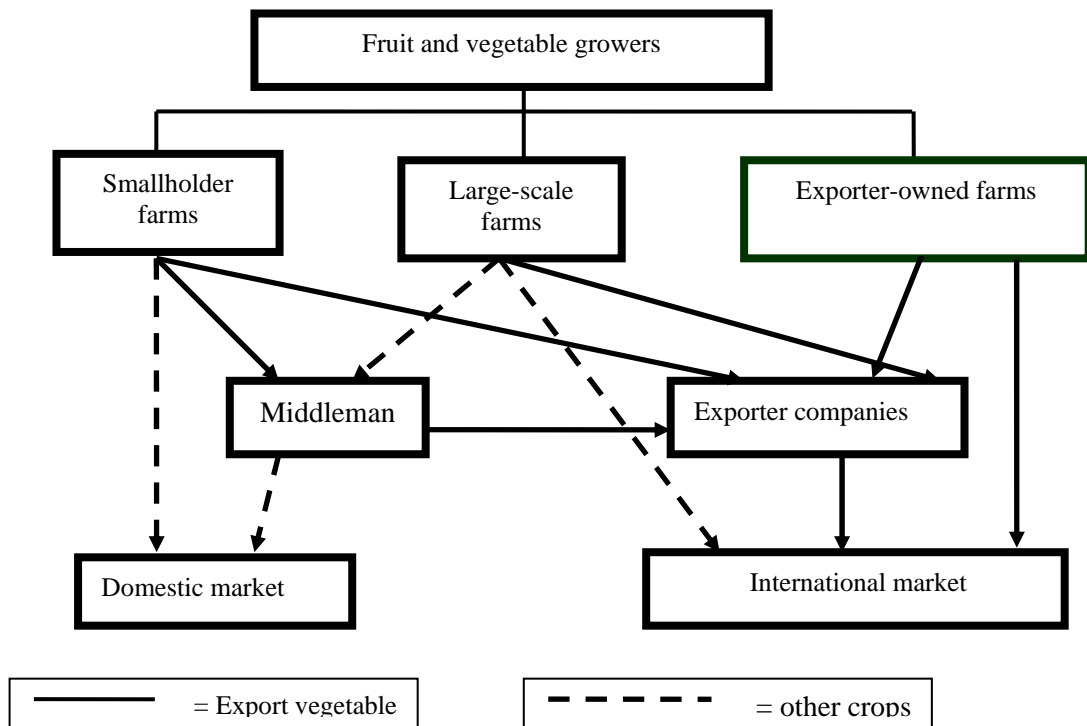


Figure 1: Supply chain of fruits and vegetables in Kenya

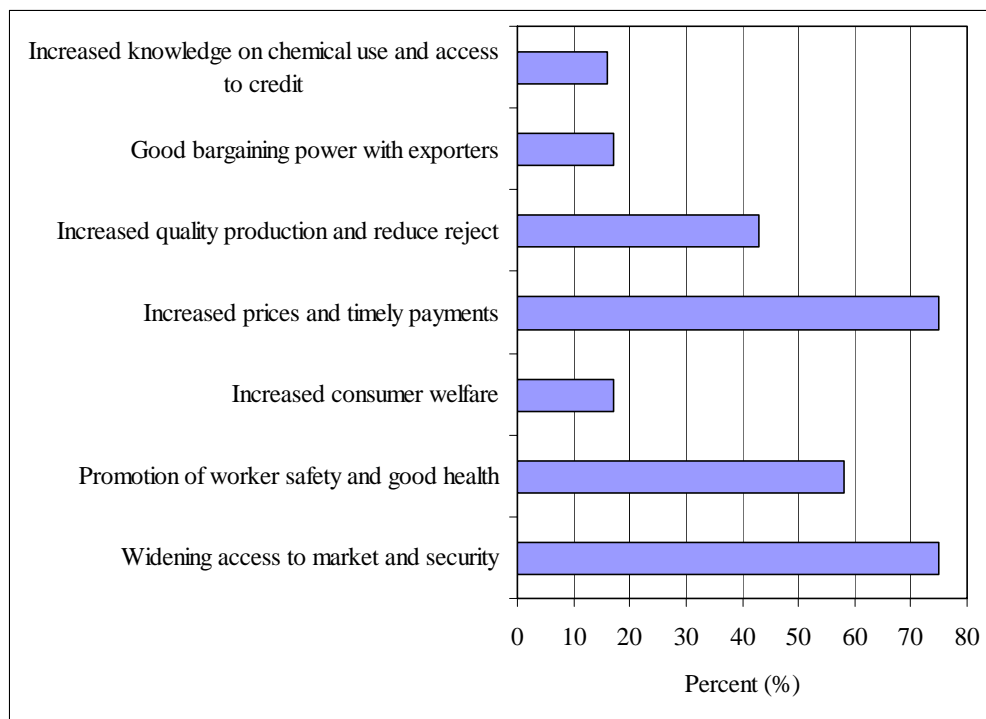


Figure 2: Adopters' perception of benefits of EurepGAP protocol (N=149)

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Potential income gains for rural households in North Eastern Thailand through trade with organic products

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Summary

The study groups households in North Eastern Thailand according to their income and grade of specialisation in crop production to derive representative household types. For these household types a linear optimization model is run to calculate net incomes under four scenarios. These are certified organic farming, organic farming in the initial and transitional phase and a self-sufficient farming. Simulations for the different management scenarios show that per ha cash profits are about double under certification while they can only be increased by 30 percent under self-sufficient farming, even under favourable assumptions. But transition costs to organic farming are high due to reduced yields at the beginning. According to the figures and model used, only under certified organic production it pays to hire non household workers. Labour hence is a major limiting factor.

KEYWORDS: organic agriculture, Thailand, household income

1. Introduction

Worldwide there is a growing demand for organic products. In the United States the sales of organic foods are estimated to have grown by 15.7 percent in 2005 (NFM 2006) and high growth rates are observed in many other industrialized countries as well. The major consumers of certified organic products are North America, Europe and Japan (Buley, Jährmann et al. 2004).

The growing demand is recognized as opportunity for farmers to increase the value of their products as the consumer's willingness to pay is higher for organic than for conventional products. In many industrialized countries this opportunity to increase the value of agricultural products is supported by subsidies since there is public interest in less environmentally harmful farming. The growing demand and public support has led to an enormous increase in organic production (Willer and Yossefi 2006).

Due to the demand for organic products in industrialized countries, organic farming in developing countries has increased as well. Non Governmental Organisations (NGO) have been engaged for decades to build up producer co-operations and build international trade links. The co-operations often favour organic production since it reduces input costs, is less environmentally harmful, poses less danger to the health of the farmers and can realize higher at the gate prices. These initiatives typically consist of small scale farmers (Oxfam GB 1994; Udomkit and Winnett 2002; UN ESCAP 2002). But with the increasing demand for organic products the production of organic food became interesting for agricultural enterprises as well. A practiced model that allows a maximum of control for the enterprise is contract farming. Farmers become workers on their own land and agree to comply to the agreement with the enterprise (Setboonsarng, Lueng et al. 2006). As the trade volume increased, traders, certification institutions and governmental bodies that provide support have been established. Additionally, research and education about organic farming is now standard in many agricultural universities around the globe. In the last decade also

international organizations and national development agencies increasingly foster organic production in their programs (UN ESCAP 2002; Buley, Jährmann et al. 2004; Willer and Yossefi 2005; BMF and ADA 2006). They see organic farming as an opportunity to reduce poverty while pushing environmentally less harmful farming.

In Thailand, current organic production is overwhelmingly rice and some organic vegetables and baby corn. It is estimated that about 0.12 percent of arable land is used for organic production. A functioning system of governmental and private, IFOAM accredited, certification institutions have been installed in the last decade. For 2006 it is estimated that the total market value of organic products is 20 million US\$ which is about 0.12% of total agricultural exports. The majority of organic rice exports goes to the European Union as the organic standards of the United States are not met by many Thai producers (Eischen, Prasertsri et al. 2006).

The remainder of the paper is organized as follows. The next chapter provides background about organic agricultural policy in Thailand and about the region this paper focuses on. In chapter 3 the objectives of the research are defined. Chapter 4 gives details about the data and method used to form household types, the mathematical model and its calibration. Finally, the results and concluding remarks are given in the last two chapters.

2. Background

In September 2006 a military coup in Thailand over-threw the government of Taksin Shinawatra and the interim-government of Surayud Chulanont was installed by the military. In its economic policy Taksin's government was export oriented and, as critics claim, overspending (The Nation 2006). As reaction to this and with the experience of the East Asian Crisis in the late 1990s in mind, the interim government of Surayud Chulanont now champions "sufficiency economy" (originally it was translated as "self-sufficiency" economy but this was quickly changed after first reactions from the business community (Kanoksilp 2006)). How serious the interim government is about sufficiency economy is manifested through mentioning it in the interim constitution.

The theoretical bases of sufficiency economy was promoted by His Majesty King Bhumipol Adulyadej of Thailand since the 1970's. Since the coup, sufficiency economy has been widely discussed as the understanding of its practical meaning is unclear to many people. In particular it was emphasized that sufficiency economy is not to be confused with a backward self-sufficiency economy (Noi 2006). The concept of sufficiency economy is best developed for small scale farms and is known as "New Theory Farming". In a three phase plan the farm first seeks self-sufficiency, in the second phase it forms co-operations with other farms and in the third phase it is involved in trade (Chaipattana Foundation 2006). Farms following the New Theory Farming model can manage their farms according to organic farming rules. It is therefore no contradiction to run a certified organic farm that follows the ideas of New Theory Farming. New Theory Farming favours, at least in the initial stage, agricultural inputs produced on the farm over inputs bought from the outside. The major difference between New Theory Farming and organic management is that the former is focused on self-sufficiency while the latter produces for the market.

Self-Sufficiency in Thai politics is not a new concept and it has been competing with organic farming for governmental resources already before the coup. In January 2005 the Taksin government approved a national agenda for self-sufficiency. This originally didn't include organic farming and it was only included after lobbying from NGOs. But, the proportion of funds devoted to organic farming remained a small share of the total initiative (Eischen, Prasertsri et al. 2006). The already weak governmental support for certified organic farming is likely to be even less with the new government's economic focus. It thus

remains to business, research and international institutions to promote certified organic farming.

An example for an internationally financed support for organic farming is the research and promotion project for organic agriculture currently done by Thammasat University, Bangkok (Thammasat University 2005). It is financed by the EU and the aim of the project is to develop organic management methods for rice and cassava in North Eastern Thailand with a minimum usage of external input. It intends to reduce cash costs for fertilizer and increase at the gate prices through certification. The project and this paper focuses on North Eastern Thailand where two thirds of Thailand's poor live (Ahmad and Isvilanonda 2003). Rural poverty in the North East is due to the poor soils, low and unstable precipitation and unstable yields (Entwisle, Walsh et al. 2005). The main product is rice which is, nowadays, predominantly grown rain-fed with only one harvest per year. In lower elevations (lowland) paddy rice is grown, while on higher elevations (upland) field crops such as cassava, maize or sugar cane are grown (Fukui, Chumphon et al. 2000). The region was sparsely populated until the end of WWII when mortality fell and the population density increased. Under the population pressure rice cultivation expanded from alluvial plains to surrounding terraces. Much of the forest was displaced for upland cash crops, such as cassava. The population pressure was reduced with the increasing use of contraceptives and the construction of roads which allowed migration to the urban centres in the late 1960s (Entwisle, Walsh et al. 2005). The expansion of agriculture to marginal land made it more vulnerable to weather conditions. But the better connection to the markets that allows off-farm employment and to buy cheap foods helps to buffer these risks (Fukui, Chumphon et al. 2000).

Today income from non farm sources plays a major role in North Eastern Thailand. A study on household income of three villages in Khon Kaen in North Eastern Thailand used data from 140 households from the years 1995, 1998 and 2002 to analyse the income diversity of households (Ahmad and Isvilanonda 2003). The figures show that income from rice is, on village average, as low as 15 to 40 percent of total income. Average income from non-farm and off-farm activities vary between 32 and 63 percent. The agricultural census of 2003 also suggests an important role of non-agricultural incomes, stating that in North Eastern Thailand 60 percent of the households live only or mainly from agriculture while 21 percent live mainly from other sources and another 15 percent live from agriculture and other sources in equal parts (NSO Thailand 2003).

3. Objectives

This paper seeks to describe income portfolios of households in North Eastern Thailand and how they can change due to higher at the gate prices through international trade with organic products and through reduction of input costs.

4. Data and methodology

Income increases through intensification of rice cultivation in the Central Province of Thailand is no viable option in the North East with its water scarcity and poor soils. Therefore, organic agriculture is seen as a way to increase the value of the production in this area and the calculations in this study all refer to this region.

Household types

For household level data a large scale survey from University of Chicago (Townsend 1997) is re-used. The so called "Townsend Project" collected data from North Eastern Province in 1997 just a couple of months before the Asian Economic crisis began with the devaluation of the Thai Bath. In the North Eastern Province two regions (Buriram and Srisaket) were chosen for data collection as for those two, benchmark data were available. Within each of these two provinces 12 tambons (administrative units) were selected by using stratifications

by land cover classes from satellite imagery (Binford, Lee et al. 2004). Within each tambon, four villages were selected at random. From the Community Development Department's enumeration list 15 households in each village were randomly selected. In total about 1400 households were interviewed in North Eastern Thailand in May 1997.

To derive representative households we followed the example of Ellis (2000) and grouped them according to their income and sources of income: the households sampled are divided into three groups, depending on their income. The lowest net income third is below 17,000 Baht per year, the middle group lower than 43,896 Baht and the highest above this value (1997 Thai Baht). Figure 1 shows the distribution of the income where the fat vertical lines indicate the thresholds between the lower, middle and upper third of the income. There is a long tail with high income households while the vast majority earns a far lower. The income is per household and the study is therefore limited to income flows and does not deal with the much more complex issue of poverty.

For each of these three groups net income portfolios are calculated to quantify the sources of income. From Figure 2 the shares of average net income from different sources for households grouped by income can be seen. Income from "Crop" is primarily from rice, "Off-Farm" work consists of all income through paid work (also agricultural work on other farms), "Remittances" contain transfers from (migrated) relatives, government transfers etc. while the category "Other" contains incomes from renting out tools and those incomes specified as "Other" in the survey. Incomes through changes in the stock (e.g. selling of land) were excluded. The figure shows that the main sources of income is from crop cultivation, off-farm work and remittances. "Livestock" and "Other" have only a minor contribution to income. The differences between household groups are not very big, though, for the high income group off-farm work plays a more important role.

The grade of specialization on crop cultivation is used as criteria to form household types within each of the three income groups. The four types have 1) no, 2) more than zero but less than one third, 3) more than a third but less than two thirds and 4) more than two thirds of their net income from crops. In total this results in 12 types. Table 1, describes some characteristics of these household types. In order to mitigate the impact of outliers, the medians are used to describe the groups. Of the third with the lowest income per year, almost half (14.7 % of the total population) has no income from crops. This type is also worst off in terms of most other assets: the median of the maximum of years a family member spent at school is far lower than that of other households. They own less land (but it is positive as this can also be the plot where their house is built) and they have less agricultural and household assets than every other household. Also their social network in terms of relatives and the persons older than 18 years in the household are slightly lower than other households'. Only in terms of debts per income they are in a better situation than the farming households'. What is true for the lowest income third, is not true, for the middle and high income third: there the households without income from crops are not worse off than their farming counterparts. This suggests that there is a better educated group of household specializing on non-farm jobs. Worth to mention is that no household type has savings, some of them even substantial amounts of debts.

Comparing the households with the same share of income from crops, it can be seen that those with higher incomes have more or equal education, more land they own, more relatives, more household and agricultural assets and more family members over 18 years of age. It thus can be assumed that factors as education, agricultural assets, land ownership and the social network contribute to the income.

Mathematical model

A linear one period farm level optimization model is used to describe the household's behaviour under different scenarios (a mathematical summary is given below). Households maximizes cash income by choosing the management method and how much to work off-

farm. Income consist of three sources: Crop cultivation, off-farm work and the remaining income sources (consisting of remittances, livestock and other and noted with an $R^{observed}$). The latter is not modelled but just assumed to be fixed in the short run. The income from off farm work is subject to an upper limit which is set to be the observed value $NF^{observed}$. The idea behind it is that labour markets allow only a certain level of employment in off-farm activities in rural areas. It is assumed that households already work off-farm as much as the labour market allows.

The income from crops is generated through cultivation (x_c gives the ha planted with crop c) and sales (s_c gives the sales in kg) minus labour (V_t^T gives the hired workers days and r_t^T the wage) and input costs (m_c are the input costs for crop c per ha). The model also allows production of cassava on upland fields. But, as shown below, the median values revealed no upland fields for the median households (This is surprising as upland crops are considered as important cash source for households). Farmers can opt between organic and conventional management of their crops (modelled as different crops c). They can employ workers and choose how much off farm work they do (h_t^{off} are the days in month t and w_t^T is the wage for off farm work). Since here only cash flows are modelled, family farm work is supplied at a wage of zero.

As a property of linear models, the optimization algorithms don't choose mixed strategies. The model therefore opts for the choice with the highest marginal income. The wage for off-farm work is set marginally lower than the costs for hired workers. Thus family members prefer to do the farm work themselves.

Mathematically, the model can be summarized as

$$\max \sum_c p_c s_c - r^T \sum_t V^T - \sum_c m_c x_c + \sum_t w_t d_t + R^{observed}$$

s.t.

$$\sum_c l_{t,c} x_c \leq L \quad \forall t$$

$$\sum_c v_{tc} x_c \leq h_t^{farm} V^F + V_t^T \quad \forall t$$

$$y_c x_c = s_c$$

$$h_t^{farm} + h_t^{off} \leq V^F d$$

$$\sum_t w_t d_t \leq NF^{observed}$$

$$x_c \geq 0 \quad \forall c$$

$$V_t^T \geq 0 \quad \forall t$$

$$s_c \geq 0$$

where y_c is the yield per ha, p_c is the price of crop c , L is the total land available in ha, l_{tc} is the fraction of a month that crop c occupies the land, v_{tc} is the labour required for crop c during month t , and d are the working days per month per person.

Calibration

The data for the endowment of the different household types and the input costs are derived directly from the Townsend Project dataset. Other necessary data had to be taken from other research or had to be assumed. Monetary values are calculated in 2003 Thai Baht.

The data of median endowment and median input costs derived from the Townsend Project data are provided in Table 2 and Table 3. Monetary values are multiplied by a factor of 1.24 to adjust for inflation in the years between 1997 and 2003 (BTEI Thailand 2004). It can be seen that households with higher income also cultivate more lowland if compared with households with the same grade of specialisation. The median of the persons older than 18 years is two for the households with low income while it is three for the households with middle or high income. The medians for the input costs in Table 3 are not as easily structured. Dummy variable regressions also didn't show a significant influence of the "type of household dummy" on the costs. But, in another regression, the size of lowland cultivated could be shown to have a significant influence on the costs per ha (regression not shown here). In absence of better data, the medians presented in Table 3 were used as cash input costs per ha.

The Townsend Project data provide no data on yield. Therefore results from a working paper of the Asian Development Bank which builds on a data collection from Ubon Ratchathani, Surin and Yasothon in North Eastern Thailand in 2003 are used (Setboonsarng, Lueng et al. 2006). According to this study, rice yields per ha are 2181 kg/ha on average, and the price per kg of conventional rice is 5.87 Baht/kg. For farm workers the study suggests a wage of 195 baht/person/day for contract farms.

Working hours per ha per month are taken from Fukui (1993), page 223 ff. In his studies he observed families during their peak working times. This is used as guidance for the work effort during different months. The last 12 columns of Table 4 give the work effort for different months for rice cultivation. Finally, for family members a working month is assumed to have 25 working days.

For calibration of the crop activities, first a base scenario is run. The calculated income from crop cultivation is compared with the observed income and the factor by which they differ is used to scale the calculations in the following scenarios. This factor is called alpha and corrects the model for errors due to misspecification. An alpha smaller than 1 means that the observed income from crops is lower than the results of the model and an alpha greater than 1 means that the observed income from crops is higher than the model outputs. An implicit assumption is that alpha does not change if another management is applied. The values for alpha are given in the last column of Tabel 2. The correlation between the ha cultivated and alpha is 0.93. This indicates that without alpha the income from crops for small scale farms is overestimated and for larger farms underestimated.

Management scenarios

Different management scenarios are applied to the model described above. The scenario "base" describes the income under conventional management. It is used to derive alpha. The scenario "certified" describes a household that cultivates organic rice along the guidelines of an organic certification organization and receives a substantially higher at the gate price. Also input costs are reduced. Yields are as high as under conventional management as farmers are experienced in organic cultivation. The scenario "transition" describes a farm that has been under organic management for two to four years but has not yet been certified. The at the gate price is not as high as for "certified" farms but input costs are reduced. Yields are lower since the soil has not yet fully recovered from chemical fertilisation and the farmer is not as experienced. The scenario "initial" is for farms that have their first or second year of organic management. The at the gate price is only slightly higher than for conventional products but yields are reduced even more than for farms in transition. The last scenario is not about organic management but is a stylized version of "sufficiency" economy. It is only the first step of the three steps suggested by New Theory Farming in which the farm seeks to reduce dependency by reducing input costs. The way it is model here, the work effort is as high as for organic farming but at the gate prices are not as high as for organic products. Yields are as high as under conventional management.

The data for the different scenarios are collected from various sources. The prices for organic farming are taken from the above mentioned Setboonsarng, Lueng et al. (2006) paper. Table 4 shows that even in the initial phase and during transition farmers have slightly higher prices compared to conventional farming. This is possible by selling them on local markets as “pesticide save”. Several studies showed that yields under organic management can be as high as under conventional farming (Khunthasuvon, Rajastasereekul et al. 1998; Setboonsarng, Lueng et al. 2006). The Setboonsang, Lueng et al. study even suggests that during the initial and the transitional phase yields are not significantly different. But since samples size is very low and other evidence suggests that yields are temporarily reduced, we assume that yields are reduced by 50 percent during the initial phase and by 25 percent during the transition phase (A less arbitrary determination of yields would require assumptions about many agricultural parameters which are not available in this model). Cash costs for conventional farming depend on the household type. For organic farming scenarios it is assumed that cash const can be reduced due to abandonment of pesticides (100 percent reduction), reduced fertilizer cash costs (47 percent reduction) and lower cost for machinery (24 percent reduction). These reductions are derived from the reductions in cash costs given in the Setboonsang, Lueng et al. paper. Depending on the use of pesticides in the base scenario this is a total reduction of input cost between 40 to 42 percent in comparison to the base scenario. The working hours for organic management are higher as is shown in Table 4. Here, once again, it is difficult to find appropriate values in scientific publications. The values given are pure assumptions. Note, that work effort is identical during peak working seasons in all scenarios. If it was assumed that work effort during peak seasons was higher under organic or sufficient management, this would reduce profits as labour had to be hired.

The figures for the sufficiency scenario are a combination of the price for conventional rice and work effort for organic management. But it is assumed that input costs are reduced by 90 percent. It is unclear if such a high reduction is possible while keeping the yield on the level of conventional farming, but for the sake of argument exaggeration is preferred in this context.

5. Results

Column 1 of Table 5 shows cash profits from one ha of rice cultivation. It is between 9,5 Baht per ha for the households with low income (with crops < 33) to 10,5 Baht per ha for households with high income (with 34 < crops < 66). Roughly, household that plant more corps, have higher cash profits per ha (correlation of 0.64). The following 4 columns of Table 5 give the percentage change in cash profit per ha for the four scenarios. With an increase of the price by 70 percent and input costs reduced by about 40 percent, cash profits per ha for certified organic management are increased by about 100 percent for all household types. In the transition phase, when cash input costs are reduced by about 40 percent, but yield is reduced by 25 percent, cash profits per ha remain approximately the same as in the base scenario for all household types. In the initial phase a reduction of cash profits per ha of 48 percent is calculated for all households. This is due to the yield reduction by 50 percent. For the sufficiency scenario, income per ha is increased between 19 and 31 percent. In particular households with high input costs, which are predominantly those not specialized on crop cultivation, gain.

A transition to organic agriculture is, according to these calculations, costly in the initial phase and valuable after certification. Even though a reduction of input cost by 90 percent was assumed, in the sufficiency scenario per ha profit increases only up to 31 percent.

Table 6 gives the total household profits in the base scenario and the changes in percent under different management strategies. In the different scenarios households are forced to apply the respective management, even if it doesn't maximize profit. The results are similar

to those from Table 5. Trivially, household without income from crops are not effected from the management decision. But, as mentioned already above, this is the type with the lowest income. The main winners from certified organic crop production are households whose main income is from crop production. But, if they want to change to organic management all at once, they also face the highest absolute losses during the period of transition.

Under the conventional, initial, transitional and sufficient management scenarios, only family labour is used for cultivation since marginal profits are not high enough to employ workers. This limits the cultivated area to the working capacities of the household during the peak working season. With organic farming, having a higher marginal profit, it becomes feasible to hire workers. The increased cultivated area increases households profits under organic farming more than proportional. Never the less, even under organic management labour is a limiting factor as cost per ha keep on raising with the area cultivated. Figure 3 shows the cash profits per ha for high and low income households with more than 66 percent of their income from agriculture under organic and conventional management. The differences in profits between organic and conventional farmers are substantially and are mainly due to the higher price of organic rice. But the striking fact about cash income is the quick reduction as soon as workers have to be employed. Richer households have more household members and they can therefore cultivate more at lower cash costs.

6. Final remarks

The results presented are derived from a calculation of cash incomes of different household types. The results allow several conclusions which can contribute to the discussion about agricultural policy in Thailand.

The data used show that households with the lowest income have no income from crops. Households with higher income gain in absolute terms more from organic agriculture as they cultivate more land. Organic farming is therefore no policy that favours households with low incomes (directly). Never the less, in relative terms, households with low income but a high specialisation in agriculture can gain substantially.

Differences in per ha cash input costs of different household types do not have a magnitude that plays a decisive role in which management system to choose.

According to the data, a reduction of cash input costs by 90 percent can increase cash profits by up to 31 percent while under organic farming, cash profits per ha increases of 100 percent are possible. International trade with its high price premiums therefore allows increases of income by much more than what can be achieved through reduction of input costs.

Available labour is a limiting factor as wages are relatively high. According to the figures used in this model, cultivation does not pay if labour has to be hired. Under organic management, per ha profits are high enough to hire workers to increase the cultivated area. Labour scarcity is limiting the cultivated area in particular during planting and harvesting time. Organic farming techniques are therefore more suitable if they don't increase the work effort during the peak working season. This raises the question to which degree labour can be substituted by capital in organic agriculture and if a more intensive organic agriculture could be a way out.

Yield reductions during the initial phase of organic farming make it expensive to change to organic management. In particular households that have the majority of their income from crop cultivations can suffer high losses which might not be affordable as many households have debts already. It is therefore critical to keep yields high during the years before certification which is possibly achievable through training and research.

7. References

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Tables

Table 1. Population share, median income (1997 Baht per year) and median characteristics of household types.

income	crop %	pop %	income baht	sav./ inc.	max. school	ha owned	househ. asset	agric. assets	rela- tives
low	0	14.7	8,200	-0.05	4	0.12	65,000	0	12
low	<33	5.4	12,480	-0.15	6	1.44	86,600	10,000	15
low	<66	4.9	11,010	-0.22	6	1.56	105,550	10,500	14
low	>66	7.4	9,849	-0.14	6	2	91,400	20,000	13
middle	0	7.3	28,530	-0.01	6	0.16	102,050	0	12
middle	<33	7.4	27,170	-0.11	8	1.68	125,000	21,500	15
middle	<66	10.1	27,400	-0.14	7	2.56	142,900	27,000	15
middle	>66	8.9	27,390	-0.17	7	2.9	147,900	48,500	14
high	0	8.5	72,000	-0.03	8	0.16	164,800	0	13
high	<33	12.5	82,160	-0.03	9	3.46	216,850	31,500	15
high	<66	7.1	66,710	-0.13	8	4.64	204,500	52,000	16
high	>66	5.8	60,700	0.00	9	4.8	206,400	57,000	15

Table 2. Persons and land endowments used in the model and sources of income in%.

income	crops %	persons >18	upland ha	lowland ha	off-farm income	crop income	other income	alpha
low	<33	2	0	1.12	0.74	0.26	0.00	0.22
low	<66	2	0	1.02	0.28	0.72	0.00	0.64
low	>66	2	0	1.92	0.00	1.00	0.00	1.07
middle	<33	3	0	1.28	0.67	0.28	0.05	0.52
middle	<66	3	0	1.92	0.34	0.61	0.05	1.06
middle	>66	3	0	2.3	0.00	1.00	0.00	2.01
high	<33	3	0	2.08	0.81	0.19	0.00	0.99
high	<66	3	0	3.2	0.28	0.63	0.09	2.67
high	>66	3	0	3.36	0.02	0.98	0.00	4.1

Table 3. Cash input costs per ha in Baht (2003)

income	crops %	fertilizer	pesticides	seeds	machins	total
low	<33	1,875	0	0	750	2,625
low	<66	1,817	0	0	516	2,332
low	>66	1,250	0	0	573	1,823
middle	<33	1,479	0	0	670	2,150
middle	<66	1,432	0	0	625	2,057
middle	>66	1,606	70	0	747	2,422
high	<33	1,559	10	0	694	2,264
high	<66	1,330	0	0	497	1,827
high	>66	1,382	20	0	500	1,902

Table 4. Key data of different management scenarios

	yield	price	cash	work days per month											
	kg/ha	%	cost%	1	2	3	4	5	6	7	8	9	10	11	12
base	2,181	100	100	0	0	0	0	0	10	35	35	5	3	50	50
organic	2,181	170	60	10	10	10	11	20	20	35	35	18	5	50	50
transit.	1,636	122	60	10	10	10	11	20	20	35	35	18	5	50	50
initial	1,091	107	60	10	10	10	11	20	20	35	35	18	5	50	50
suffic.	2,181	100	10	10	10	10	11	20	20	35	35	18	5	50	50

Table 5. Base profit in Baht (2003) per ha and changes in percent under different management.

income	crops %	base	organic	transistion	initial	sufficient
low	<33	9,549	108	2	-48	31
low	<66	9,912	103	1	-48	26
low	>66	10,544	94	-2	-48	19
middle	<33	10,138	99	-1	-48	24
middle	<66	10,253	98	-1	-48	22
middle	>66	9,800	105	1	-48	28
high	<33	9,996	101	0	-48	25
high	<66	10,538	94	-2	-48	19
high	>66	10,446	96	-1	-48	20

Table 6. Household income in Baht (2003) and changes in percent under different management

income	crops %	base	organic	transition	initial	sufficient
low	0	4,400	0	0	0	0
low	<33	8,327	0.28	0.01	-0.12	0.08
low	<66	8,866	0.74	0.01	-0.34	0.19
low	>66	11,284	0.98	-0.02	-0.48	0.19
middle	0	22,000	0	0	0	0
middle	<33	23,808	0.28	0.00	-0.14	0.07
middle	<66	26,784	0.61	-0.01	-0.29	0.14
middle	>66	29,601	1.07	0.01	-0.48	0.28
high	0	62,400	0	0	0	0
high	<33	79,174	0.20	0.00	-0.09	0.05
high	<66	67,101	0.62	-0.01	-0.30	0.12
high	>66	65,993	0.97	-0.01	-0.46	0.20

Figures

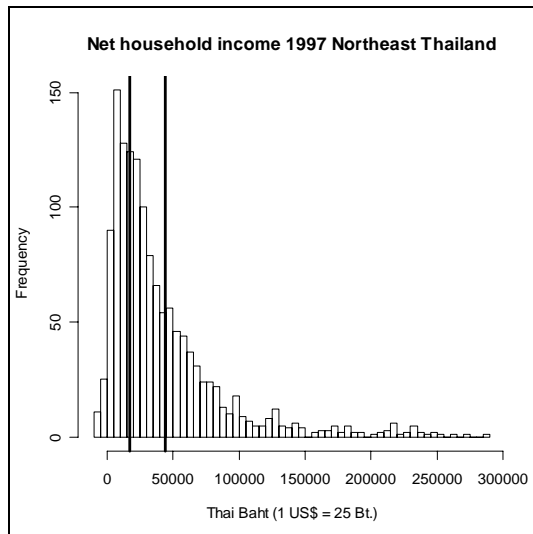


Figure 1. Income distribution of the sample in Baht (1997).

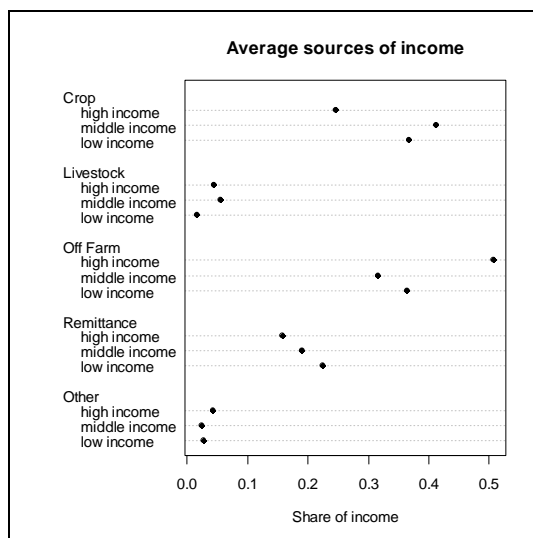


Figure 2. Average shares of sources of income for household groups.

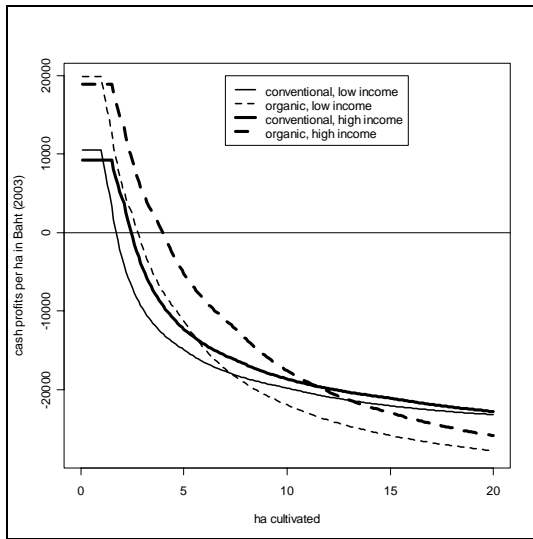


Figure 3. Profits per ha with labour cash costs.

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A Principal-Agent Model for Investigating Traceability Systems Incentives on Food Safety

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Summary

This article investigates the effects of contingent payments and a traceability system's expected traceback rate of success on the food safety effort exerted by raw material suppliers. This sheds light on when contingent payments and the reliability of a traceability system are substitutes and complements to each other in terms of inducing raw material suppliers to exert higher food safety effort. In addition, the effect of higher penalties and costs of food safety crisis on the effort to be induced by buyers (principal) on suppliers (agents) is investigated under a symmetric information setting. Finally, the asymmetric information setting is formalized as a principal-agent model and left to be explored in a future work. Some numerical exercises are carried out to illustrate main findings. It has been found that more reliable traceability systems might induce higher food safety efforts by suppliers. However, this same effect could be accomplished either with higher payments whenever no food safety crisis occurs or with lower payments whenever a food safety crisis occur both assuming the traceability system works. Finally, it is shown that without a traceability system in place no incentive scheme could be implemented.

KEYWORDS: Information Asymmetry, Identity Preservation, Food Traceability, Supply Chain Management.

JEL: D82, D86, C61.

1. Introduction

Following high profile food safety problems, worldwide public and private initiatives aiming at traceability system implementation have come to the forefront. The European Union and Japan made cattle traceability a public good by imposing mandatory systems after a series of mad cow disease outbreaks. Important exporters like Australia have started national mandatory traceability systems as a means of maintaining or enhancing export market shares.

In the US, private voluntary traceability systems have been the most common practice. Three primary objectives have motivated firms in the US food sector to develop, implement, and maintain traceability systems (i) to differentiate market foods with credence attributes, (ii) to improve supply chain management, and (iii) to facilitate tracing back for food safety and quality (Golan et al., 2004). Thus, to improve food safety is only one of the reasons motivating firms to voluntarily adopt a traceability system. Regarding this, Hobbs (2004) identifies that a traceability system may be used to strengthen liability incentives (liability function). This article will focus specifically on the liability function of a traceability system in the context of food safety.

In order to understand the liability function of a traceability system, it makes necessary to stress the differences between traceability systems and procedures such as Pathogen Reduction¹ (PR) and Hazard Analysis and Critical Control Point² (HACCP). Unlike PR and HACCP approaches, a traceability system does not aim at direct interventions in

¹Examples of innovative and effective technologies for limiting carcass contamination and pathogen reduction are carcass steam pasteurization, spray-washing, irradiation and chemical interventions (Vitiello and Thaler, 2001: p. 600).

²Notermans et al. (1994: p. 204) defines HACCP as a systematic approach to the control of potential hazards in a food by identifying problems before they occur, and establishing measures for their control at the stages in production that are found to be critical.

procedures and processes to improve quality and safety controls. Even if changes in a production line are necessary, for example to limit raw material mixing (Antle 2001, p: 1103), the ultimate goal of a traceability system is to accumulate information about product attributes, including safety and origin, as the product moves through the supply chain (Starbird and Amanor-Boadu, 2006). Thus, the information stored in a food traceability system is not expected, by itself, to lead to an improvement in food safety. To influence food safety, this information must be used either to remove unsafe food that is already in the supply chain, or to prevent unsafe food from ever entering the supply chain. For instance, in the event of a food product recall³, the information stored in a traceability system may be used to backward trace to uncover the source of the problem, and to forward trace to find all other products and instances that have the same undesired properties (Jansen-Vuller et al. 2003). Thus, a more rapid and precise withdrawal of dangerous food products from the supply chain can be performed, ultimately reducing the probability by which consumers are exposed to contaminated food product.

Since traceability creates the opportunity of determining responsibilities whenever a food crisis event occurs, the effectiveness of tort liability law as an incentive for firms may be improved (Hobbs 2004). Indeed, most opponents of mandatory introduction of traceability (e.g. a national animal identification system) mention increased liability as a primary concern (Souza-Monteiro and Caswell 2004; Golan et al. 2004).

A traceability system might be used in a food supply chain as one of the pieces of incentive mechanisms, connecting the reward and punishment of raw material suppliers with observed safety of the food. It would be expected that by making incentive mechanisms feasible to be implemented, a traceability system can indirectly change the probability by which a food product is safe for consumption by enticing agents to exert more food safety efforts. In other words, it is hypothesized that a traceability system might be voluntarily employed by food processors to prevent unsafe food from entering the supply chain by motivating raw material suppliers to produce and deliver safer food. In this context, one of the issues addressed in the present article is whether a more reliable traceability system could be taken by the final consumer as a signal that a safer food has been produced.

This article objective is to shed light on the following issues: What is the relationship between traceability reliability and food safety? Are contingent payments and the reliability of a traceability system substitutes or complements? How do penalties and costs of food safety crisis affect the level of efforts on food safety?

2. Background

Research related to the effect of information asymmetry on food safety and quality has developed in two directions: (1) to study the effect of using a noisy grading or testing technology to infer producers' behaviors regarding their investment in product quality (adverse selection issue), (2) to investigate the use of a noisy grading or testing technology as a tool to create incentive mechanisms driving the level of effort on product quality and safety by producers.

As an example of the first group of works, Hennessy (1996) constructs a conceptual model wherein food processors test raw material supplied by producers as a method to protect their reputation in the consumer marketplace. Using this model Hennessy shows that as a result of measurement errors in testing and grading a price-grade incentive is incapable of producing market equilibrium where the first-best level of investment in quality by producers is attained. As a solution to the underinvestment in quality by producers, he advocates that processors and producers vertically integrate or source via product contracts.

³A food recall is a voluntary action by a manufacturer or distributor to protect the public from products that may cause health problems or possible death. Teratanavat and Hooker (2004) present a broad review of the characteristics and trends of US meat and poultry recalls between 1994 and 2002.

Along this same line of reasoning, Chalfant et al. (1999) argue that imperfect verification of quality may be mitigated by grading. However, incentives based on an imperfect grade will not be strong enough to induce producers to incur first-best investments in higher value product. The reason for this is that incentives to produce high quality raw material are lowered because grading a lower quality product as being of higher quality (type II error in grading) is a feasible event.

Bogetoft and Olesen (2003) also study the effect of using a noisy grading technology to infer producers' behaviors regarding investing in product quality. They show that the results obtained by Hennessy (1996) and Chalfant et al. (1999) hold only for a perfectly competitive market structure where trade occurs after grading (a posteriori competition) but does not necessarily hold for a competitive setting where all trade occurs before grading (a priori competition).

As examples of the second group of works, Dubois and Vukina (2004) adapt the closed form solution for a principal-agent (PA) model with linear contracts, normally distributed measurement errors and agents' exponential utility to econometrically estimate farmers' degree of risk aversion in contracting production of hogs. Their results give empirical evidence that agents' degree of risk aversion constrain the set of possible incentive mechanisms to be offered by the principal to agents as predicted by the PA model. Starbird (2005) examines the effect of inspection policies set by the principal on the efforts exerted by producers (agents) concerning product safety. His findings support the idea that inspection policies are effective tools for improving food safety. King, Backus and Gaag (2007) develop and apply a dynamic principal-agent model for salmonella control in pork production in the Netherlands. In their model the principal offers a contract to the agent specifying the frequency at which the agent's hogs will be tested on delivery, the share of the expected testing cost paid by producer, and the level of penalty per hog for a salmonella prevalence test that exceeds a tolerance level pre-defined by the principal. The main contribution of this article is to show that reputation-based contracts affect agents' behavior. A common characteristic of all previous studies is that at the time a signal correlated with an agent's action is observed, the principal knows the agent's identity. This is certainly the case when raw material is tested on delivery. However, once the processing of the raw material starts, unobservable characteristics of the raw material on delivery might become observable, but by this time the identity of the raw material supplier is likely to have been separated from the processed product.

3. Conceptual Framework

In general terms, a traceability system is composed of a series of procedures by which the identification, preparation, collection, storage, and verification of data are performed. A system like this accumulates information about product attributes, including safety and origin, as the product moves through the supply chain (Starbird and Amonor-Boadu 2006). Like any other information system, a traceability system is expected to fail with some frequency. Therefore, a traceability system investigated in the present article is fully characterized by its expected traceback rate of success in preserving information about the supplier's identity attached to the final food product. Hence, the unique information maintained by this traceability system is the identity of the supplier of the raw material, which gives the traceability system's breadth⁴. This information should be kept attached to the food product along its processing and packing. In other words, the identity of raw material suppliers should remain attached to the food product from the delivery of the raw materials up until the final product is sold to final consumers. Therefore, every traceability

⁴ Breadth is the amount of information recorded by the system (Golan et al. 2004).

system's depth⁵ in the present article is assumed to be from delivery of raw materials to the consumption of the final food product. Moreover, in the context of the present article a traceability system's precision⁶ will be 100% whenever it properly works in keeping the identity of a raw material supplier attached to the final food product, and zero otherwise.

It is hypothesized that a food processor, retailer, or wholesaler (the principal or buyer) purchases raw materials from a group of homogeneous growers or supplier (the agents or suppliers) to run a one-time project. Notice that, if the buyer were sourcing from only one supplier, a traceability system as conceptualized in the present article would be useless. But, because the buyer sources from many homogeneous suppliers, he/she is not able to keep track of suppliers' identity along food processing without using a traceability system. Thus, this traceability system in place will make it possible for the principal to associate, with a certain probability of success, the safety of the final food product to the safety of the raw material delivered by a supplier. This makes it feasible, with some probability of success, either to punish or to reward a raw material supplier based on the observed safety of the final food product, even after a transaction has occurred.

Given the above context, the principal and each agent play a two-stage sequential game that will run as shown in Figure 1. The buyer is the first mover, choosing and committing to the payment scheme and the traceability system's traceback rate of success. These two pieces together fully characterizes an incentive mechanism or contract. In sequence, each agent will be the second mover, choosing and then exerting the level of food safety effort as the best response to the contract offered by the principal. Finally the feasible contingencies are observed and income transfers will be made based on them.

[Figure 1, Here]

It is recognized that food safety problems occur due to many different causes. Despite this, I assume that a traceability system will never pinpoint a raw material supplier as the cause of a food safety crisis if this is not the case. Further, I take into account only food safety problems that might be originated at farm level. In other words, I assume that the principal's level of effort has no effect on the safety of the final product (e.g. the chances of observing excessive concentration of growth hormone in meat and broken syringe needles from health treatments depend only on the effort exerted by growers).

4. Probabilities in the Model

The traceability system is assumed to fail with certain frequency. Thus, if the identity of the raw material supplier will remain attached to the final food product is a random event. In addition, the safety of a food product will be also a random event. This is because there are other factors, out of agents' control, influencing the safety of the raw material supplied by them (e.g. human mistakes and failures in machinery can occur even in a context in which high effort has been exerted on food safety). Given all this, for the setting in which a traceability system is in place and the effort exerted by suppliers are not observable (asymmetric information), the sample space is composed of a collection of 2-tuples formalized as: $E = \{(z_1, z_2): z_1 = 0 \text{ or } 1, z_2 = 0 \text{ or } 1\}$, where z_1 equals 1 if the traceability system works in tracing back the identity of a raw material supplier, otherwise 0; and z_2 equals 1 if the raw material supplied by an agent does not cause a food product lot to be unsafe for consumption, otherwise 0.

I denote the expected frequency by which the traceability system will properly trace back the identity of an input supplier by s . Finally, the probability, $F(z_2=1|a)$, that the raw

⁵ Depth defines how far backward and forward traceability is maintained (Golan et al. 2004).

⁶ Precision represents the system's ability to pinpoint the original source of a problem (Golan et al. 2004).

material supplied by an agent will not cause a food product lot to be unsafe for consumption, given the supplier has exerted the level of effort a , is represented as $F(a)$. Given those definitions, the probabilities of every feasible contingency in the asymmetric information setting with traceability are summarized in table 1.

[Table 1 - Here]

5. The Supplier's Objective Function

As one of the steps in setting an incentive mechanism, the buyer should determine contingent income transfers to be offered to each agent. In doing so, the buyer knows that there is no means of making transfers contingent on the safety of the food product whenever the agent's identity is lost during food processing. Hence, let I_0 be the income to be transferred to a supplier whenever the traceability system does not work, regardless of the safety of the food product lot (contingency 0). However, whenever the traceability system works it will be possible for the principal to make income transfers, as dollar per delivered lot, contingent on the safety of the final product. Thus, let I_1 stand for the income transfer to an agent whenever the traceability system works and no food safety problem is observed (contingency 1). In addition, let I_2 be the income transfer to the Agent whenever the traceability system works and at least one food safety problem associated with the raw material is observed (contingency 2). To sum up, there will be an income transfer (I_m) to a supplier in dollars per lot delivered in each contingency $m \in M$ with $M = \{0, 1, 2\}$ as shown in Table 1.

I assume that a supplier's preferences can be represented by a utility function whose arguments are the contingent transfer (I_m) and the level of effort (a) exerted by supplier. Following Holmstrom (1979), Tirole (1988), Goodhue (2000), and Starbird (2005), it is assumed additive separability between the utility of income and the disutility of effort by letting the agent's utility function $U: \mathfrak{R}^2 \rightarrow \mathfrak{R}$ be of the functional form given as:

$$(1) U(I_m, a) = u(I_m) - d(a)$$

where $U(\cdot)$ is a *von Neuman Morgenstern* utility function and $u(\cdot)$ is a Bernoulli utility function as defined by Mas-Collel, Whinston and Green (1996: p. 184), $d(\cdot)$ is a utility function for effort⁷. This type of *von Neuman Morgenstern* utility functional form imposes independence of agent's preferences over income lotteries and perfectly certain actions (Haubrich, 1994).

Given equation (1), a supplier's expected utility for a given incentive mechanism (s, I_0, I_1, I_2) and level of effort (a) is given as:

$$(2) U(s, I_0, I_1, I_2, a) = (1-s)u(I_0) + sF(a)u(I_1) + s(1-F(a))u(I_2) - d(a)$$

where s denotes the traceability system's expected rate of success in tracing back the source of the raw material; $F(a)$ is a continuously differentiable cumulative density function (CDF) in an agent's effort with its first and second derivatives following $F'_a > 0$ and $F''_{aa} < 0$. These assumptions assure that the probability of a safe food product is increasing and that the marginal probability of a safe food product is decreasing both on agent's effort (see Tirole 1988: p.54).

6. The Supplier's Problem

To deal with the question on the relationship between traceability system reliability and the degree of food safety, it suffices to look at the problem faced by the supplier of raw material. In the sequence, the problem of the principal will be formalized and investigated

⁷ See Grossman and Hart (1983) for technical details.

in order to deal with the effect of increased costs with food safety crisis on the level of food safety to be induced by the principal on agents.

The supplier of raw material or agent wants to maximize his/her expected utility, choosing the level of effort to be exerted, taking as given the incentive mechanism (s, I_0, I_1, I_2) set by the principal. Therefore, the agent's problem is formalized as (4):

$$(4) \max_a (1-s)u(I_0)+sF(a)u(I_1)+s(1-F(a))u(I_2)-d(a)$$

The necessary condition for an interior solution to (4) is:

$$(5) sF_a(u(I_1)-u(I_2))-d_a=0$$

Notice that if the reliability of the traceability system is zero, then the best response for a supplier is to exert the level of effort that makes $d_a=0$. In other words, if a traceability system is not in place, a supplier's best response is to exert the level of effort that implies the lowest disutility for him/her.

The sufficient condition for an interior solution to (4) is:

$$(6) sF_{aa}(u(I_1)-u(I_2))-d_{aa}<0$$

Let's say that the principal will pay more for preferable contingences, which implies that $u(I_1)-u(I_2)>0$. Moreover, if $s \in (0,1]$, $F_{aa}<0$, and $d_{aa}>0$ the sufficient condition is automatically fulfilled.

Rearranging (5), an interior maximum is found to exist if:

$$(7) sF_a(u(I_1)-u(I_2))= d_a$$

The left-hand side of (7) gives the marginal utility of food safety effort for a supplier. This supplier's marginal benefit stems from the reduction in the probability of a food safety crisis as long as more food safety effort is exerted. The right-hand side of (7) gives the marginal disutility coming with more effort being exerted by a supplier. In other words, at an optimum level of effort (a^*) the marginal benefit of effort should equal its marginal cost.

7. Traceability, Incentive Scheme and the Supply of Safe Food

I assume that the maximizer for the problem (4) is a continuously differentiable function of traceability system's reliability, and the income transfers in contingencies 0, 1 and 2, such that $a^*=f(s, I_0, I_1, I_2)$. Given this, how will the optimal level of effort chosen by the supplier of raw material change with respect to the arguments of $f(\cdot)$?

First, what is the effect on a^* of a more reliable traceability system?

Taking the derivative of (5) at the point $a^*=f(s, I_0, I_1, I_2)$ with respect to s results that $F_a(u(I_1)-u(I_2))+sF_{aa}(\partial a^*/\partial s)(u(I_1)-u(I_2))-d_{aa}(\partial a^*/\partial s)=0$, which implies that:

$$(8) \partial a^*/\partial s = -F_a(u(I_1)-u(I_2))/(sF_{aa}(u(I_1)-u(I_2))-d_{aa})$$

It is known from (6) that the denominator in the right-hand side of (8) is negative. This fact implies that $\partial a^*/\partial s > 0$. In other words, a more reliable traceability system induces more effort by the raw material suppliers, everything else remaining constant.

Second, what is the effect on a^* if an incentive scheme offers higher income transfers for the contingency wherein the traceability system works and no food safety crisis is observed?

To answer this question, I take the derivative of (5) with respect to I_1 at the point $a^*=f(s, I_0, I_1, I_2)$, which gives $sF_a(\partial u(I_1)/\partial I_1)+sF_{aa}(\partial a^*/\partial I_1)(u(I_1)-u(I_2))-d_{aa}(\partial a^*/\partial I_1)=0$. Rearranging terms, the following result is obtained:

$$(9) \partial a^*/\partial I_1 = -sF_a(\partial u(I_1)/\partial I_1)/(sF_{aa}(u(I_1)-u(I_2))-d_{aa})$$

A supplier's Bernoulli utility function is strictly increasing in income so that $\partial u(I_1)/\partial I_1 > 0$. Also, from (6) it is known that the denominator of (9) is negative. Therefore, it must be true that $\partial a^*/\partial I_1 > 0$. In other words, if everything else remains constant, an increase in the income to be transferred to suppliers under the contingency wherein the traceability system works and no food safety crisis is observed will induce more food safety effort by a supplier.

Third, what is the effect on a^* of higher income transfers under the contingency in which the traceability system works and a food safety crisis caused by the raw material supplied is observed?

Taking the derivative of (5) at the point $a^*=f(s, I_0, I_1, I_2)$ with respect to I_2 results that $-sF_a(\partial u(I_1)/\partial I_2)+sF_{aa}(\partial a^*/\partial I_2)(u(I_1)-u(I_2))-d_{aa}(\partial a^*/\partial I_2)=0$. After rearranging terms, the following result shows up:

$$(10) \partial a^*/\partial I_2 = sF_a(\partial u(I_2)/\partial I_2)/(sF_{aa}(u(I_1)-u(I_2))-d_{aa})$$

Again, since $\partial u(I_2)/\partial I_2 > 0$ and the denominator of (10) is negative, it will be true that $\partial a^*/\partial I_2 < 0$. In other words, if everything else remains constant, a reduction in the income to be transferred to suppliers under the contingency wherein the traceability system works and a food safety crisis is observed will induce more food safety effort by a supplier.

Summing up, $\partial a^*/\partial s > 0$, $\partial a^*/\partial I_1 > 0$, $\partial a^*/\partial I_2 < 0$. Based on these results, higher income transfers under the contingency in which the traceability system works and no food safety crisis caused by the raw material supplied is observed (I_1) and lower income transfers under the contingency in which the traceability system works and a food safety crisis caused by the raw material supplied is observed (I_2) are substitutes one to each other and also to higher traceability system reliability (s). Despite this, it is important to mention that there would not be any incentive for exerting food safety effort to raw material suppliers if either s were set equal to zero or if I_1 were made equal to I_2 . In this sense, s , I_1 and I_2 are in some degree complements too.

The role played by I_0 is to make $(1-s)u(I_0)+sF(a^*)u(I_1)+s(1-F(a^*))u(I_2)-d(a^*) > \underline{U}$. Where \underline{U} denotes the reservation utility or the minimum expected utility a contract must offer to a supplier to assure that this same agent will accept the contract offered by the buyer. In other words, I_0 must be higher enough to assure that an interior solution ($a^* > 0$) is feasible, otherwise the supplier will exert the lowest level of food safety effort available to him/her.

Despite the fact that $\partial a^*/\partial s > 0$, which indicates that the more reliable a traceability system is the higher the food safety effort exerted by suppliers will be, it is wrong to infer the safety of a food product based on the reliability of a buyer's traceability system. This is because an incentive mechanism based on a traceability system with high reliability but that offers I_1 and I_2 such that $(u(I_1)-u(I_2))$ is low might be inducing low efforts by suppliers. In other words, a buyer could be inducing the same level of food safety efforts on suppliers by using a very reliable traceability system combined with low difference between I_1 and I_2 . Putting another way, higher values for (I_1-I_2) might do the same job as making s closer to one.

7.1. A Numerical Illustration

To illustrate a supplier's best response as given by formula (7), let the Bernoulli utility function for a supplier be CRRA (Constant Relative Risk Aversion) with the coefficient of relative risk aversion very close to zero so that $u(I_m)=\ln(I_m)$. Assume that the probability of no food safety crisis caused by the raw material supplied by a supplier is given as $F(a)=0.5a^{1/2}$ with $a \in [0,4]$, and the disutility of effort is given as $d(a)=0.5a^2$. Parameterizing (4) with these functions and values results that the optimal food safety effort to be exerted by a supplier is given as $a^*=(s \ln(I_1/I_2)/2)^{2/3}$ which complies with $\partial a^*/\partial s > 0$, $\partial a^*/\partial I_1 > 0$,

$\partial a^*/\partial I_2 < 0$. For instance, the case in which $I_1=15$, $I_2=0.1$, $s=0.8$ which implies $a^*\approx 1$ is illustrated with Figure 2.

[Figure 2 - Here]

8. Investigating the Effect of Penalties and Costs of Food Safety Crisis on Food Safety Efforts

I will start with the first-best or symmetric information setting characterized by agents' actions being freely verifiable by the principal. As discussed before, the principal should set a payment scheme such that each agent will want to exert the effort level chosen by the principal. Hence, the First-Best program is formalized as program (11).

$$(11a) \min_{a, I} I + (1-F(a))r_e$$

Subject to:

$$(11b) u(I) - d(a) \geq \underline{U}$$

where r_e is the external cost of a food safety crisis which includes the direct cost of liability, product recalls, allowances, court or market-imposed penalties and fines levied due to safety failures; $(1-F(a))r_e$ is the measure of the negative externality an agent can cause on the principal; Finally, \underline{U} denotes the reservation utility or the minimum utility a contract must offer to an agent to assure that an agent will accept the contract (participation constraint).

Given a level of effort, for instance the first-best level of food safety effort (a_{FB}), the principal's cost will increase with higher income transfers. Thus, it must be true that any income transfer greater than I_{FB} will result in higher costs to the principal. As a consequence of this, the participation constraint (11b) has to bind in an optimal solution for (11), which implies that:

$$(12) I_{FB} = v(\underline{U} + d(a_{FB}))$$

where $v(\cdot)$ denotes the inverse of the Bernoulli utility function $u(\cdot)$.

By plugging (12) into (11a) and solving the unconstrained minimization problem for a_{FB} , results that the first order condition will be given as:

$$(13) \partial v(\underline{U} + d(a_{FB})) / \partial \underline{U} + d(a_{FB}) \partial d(a_{FB}) / \partial a_{FB} - r_e \partial F(a_{FB}) / \partial a_{FB} = 0$$

Notice that the first-best level of effort is a function of r_e , $a_{FB} = a_{FB}(r_e)$. Taking the derivative of equation (13) with respect to r_e gives that:

$$(14) \partial a_{FB} / \partial r_e = F_a' / (v'(\cdot) / \partial \underline{U} + d(a_{FB})^2 + \partial v(\cdot) / \partial \underline{U} + d(a_{FB})) \partial^2 d(a_{FB}) / \partial a_{FB}^2 - F_{aa} r_e > 0$$

Since $v'(\cdot) > 0$, $v''(\cdot) > 0$, $d''(\cdot) > 0$, $F_a > 0$, and $F_{aa} < 0$, then it is possible to see from (14) that increased external cost of a food safety crisis will induce a buyer to contract higher level of effort under the first-best setting. Of course, this result holds assuming that an interior solution will still hold. In fact, if the cost of a food safety crisis becomes too high, a buyer could be better off producing nothing or even leaving the industry.

8.1. The Model for the Asymmetric Information Setting with Traceability

Having previously defined all the elements necessary to set the up the asymmetric information setting with traceability I will now set the principal-agent model with traceability as a mathematical programming problem.

The principal wants to minimize his/her expected cost incurred with the payment of raw material suppliers, with the costs of a traceability system and with the costs of a food safety crisis. In doing so, the principal chooses and offers to agents a contract (s, I_0, I_1, I_2) such that it will be in an agent's best interest to accept the contract and to exert an action a . Ultimately, the principal-agent problem can be formalized as the program (15).

$$(15a) \quad \min_{a, s \in [0,1], I_0, I_1, I_2} (1-s)I_0 + sF(a)I_1 + s(1-F(a))I_2 + (1-F(a))r_c + g(s)$$

Subject to:

$$(15b) \quad (1-s)u(I_0) + sF(a)u(I_1) + s(1-F(a))u(I_2) - d(a) \geq \underline{U}$$

$$(15c) \quad sF_a(u(I_1) - u(I_2)) - d_a = 0 \quad (\text{see Equation (7)})$$

where $g(\cdot)$ denotes the cost of tracing a lot of raw material as a strictly increasing, continuously differentiable and convex function in s . All other terms have previously been defined.

The first term in (15a) gives the expected cost of income transfers to a supplier (agent) per lot of food product or raw material whenever the food product is safe and the traceability system does not work. Without loss of generality I am assuming the one lot of raw material is necessary and sufficient to produce one lot of food product. The second term in (15a) stands for the expected cost of income transfers whenever a food safety crisis happens and the traceability system does not work. The third term in (15a) gives the expected cost of income transfers whenever the food product lot is safe and the traceability system works. The fourth term in (15a) gives the expected cost of a food safety crisis to the principal. Finally, the participation constraint is set as (15b) and the incentive compatibility constraint is given by (15c).

Analytically solving program (15) is very complex. Therefore, I leave the principal-agent model set to indicate what future works could be dealing with this in order to answer, in more general terms, how "penalties and costs of food safety crisis" will affect the level of food safety to be chosen by the principal to induce agents to exert.

9. Results

This article formalizes the problem of inducing food safety efforts on suppliers of raw material in a context of information asymmetry. It is hypothesized that by making it possible to pass the cost of unsafe food to the source with some chance of success, a traceability system will motivate raw material suppliers to deliver safer inputs to a food processor.

A principal-agent model is conceptually developed under the assumption that a buyer sources from many homogeneous suppliers in an information asymmetric world. Therefore, I first explore the supplier's problem by deriving his/her best response function. Using the best response function, it is investigated the relationship between traceability reliability and food safety and the complementarity and substitutability between contingent payments and the reliability of a traceability system. I found substitutability among higher income transfers under the contingency in which the traceability system works and no food safety crisis caused by the raw material supplied is observed, lower income transfers under the contingency in which the traceability system works and a food safety crisis caused by the raw material supplied is observed, and higher traceability system reliability. Despite this, it is important to mention that there would not be any feasible incentive scheme if a traceability system either is not in place or never works. This feature gives the complementarity between contingent payments and traceability system's reliability. It is defended that it is not reasonable to infer the safety of a food product on the basis of the reliability of a buyer's traceability system. This is because contingent payments properly set can do the same job as a very reliable traceability system.

Finally, I investigate how penalties and costs of food safety crisis are important to make buyer to demand from suppliers high levels of food safety efforts. At least under the symmetric information setting, it has been found that increased external cost of a food safety crisis will induce a buyer to contract higher food safety level of effort. This same investigation under the asymmetric information setting was properly formalized but left for a future work.

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Figures

Figure 1. Timing of the principal-agent game with traceability

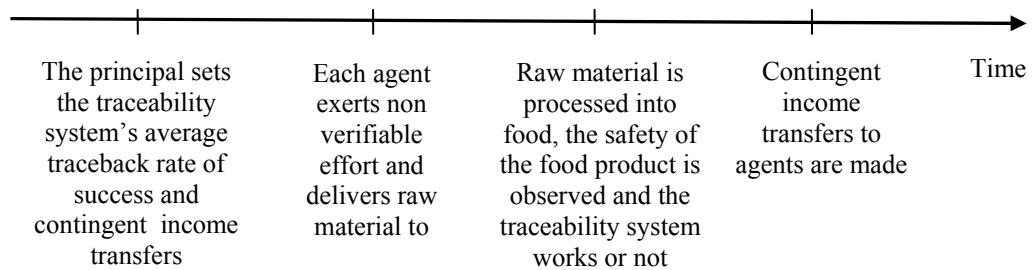


Figure 2. An illustration of the marginal utility function ($sF_a(u(l_1)-u(l_2))$) and marginal disutility function of food safety efforts (d_a) for the case wherein $l_1=15$, $l_2=0.1$, $s=0.8$, $u(l_m)=\ln(l_m)$, $F(a)=0.5a^{1/2}$ with $a \in [0,4]$ and $d(a)=0.5a^2$.

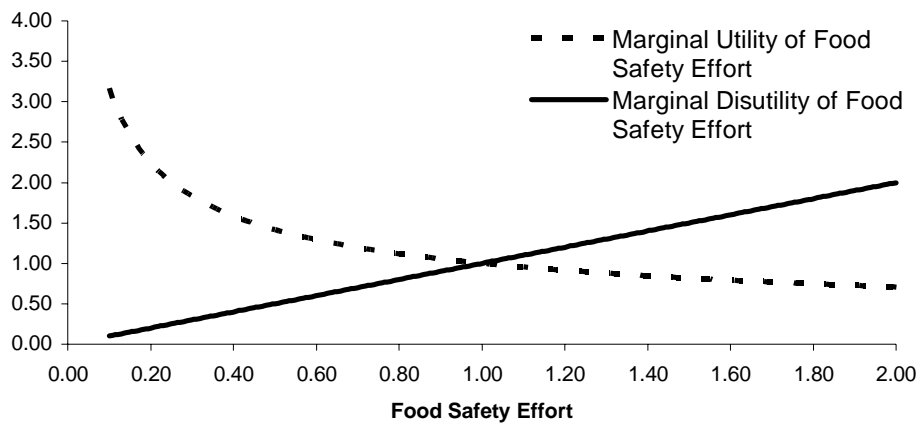


Table 1. Summary of Probabilities and Income Transfers in the Models

Event	Symmetric Information Setting	Asymmetric Information Setting with a Traceability System in Place			
		Traceability Works		Traceability does not Work	
		Probability	Income Transfer	Probability	Income Transfer
The raw material supplied by the agent does not cause any food product lot to be unsafe for consumption	$F(a)$	$F(a)s$	I_1	$(1-s)F(a)$	I_0
At least one lot of food product is found as unsafe for consumption due to problems originated from the raw material supplied by an agent	$(1-F(a))$	$(1-F(a))s$	I_2	$(1-s)(1-F(a))$	I_0

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Effectiveness of Appellations of Origin on international wine market

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Summary

The objective of this paper is to evaluate the role of the Appellation of Origin system on the international wine market, given *i*) the Geographic Indications international legal protection system, *ii*) the main aspects of world wine demand evolution and *iii*) the strategic choices of firms on the international market.

On the demand side, we show through descriptive statistics and economic literature review, the increasing wine consumers' appreciation of reputation and origin attributes. On the supply side, we identify the main quality strategies implemented on the international wine market and show an increasing role of origin in firms' strategic choices worldwide.

Finally, a direct survey on Italian Appellations of Origin concerning the AO registration on the international market shows an increasing risk of an imperfect use of geographical place names. The main consequences are identified for both producers and consumers. Firstly, a misperception of products' quality attributes can arise and menace the effectiveness of AO as informative tool. Secondly, the free riding phenomenon may arise and affect the AO collective reputation with a consequently long term demand drop. A public authority intervention is envisaged in order to reduce market distortions related to an imperfect use of geographical place names.

KEYWORDS: Appellations of Origin, Consumer Information, Intellectual Property Right protection, International Trade Agreements, Wine market.

Introduction

International wine markets are subjected to increasing competition. As traditional wine producing Countries in the EU-25 address the domestic challenges of increasing stocks and stagnating per-capita consumption, the emergence of the so-called "New World" producers has animated extensive international discussions on the issues of labelling, brand protection and Geographic Indications of Origin (GIs) (Camanzi et al., 2007).

In this environment, differentiated products can offer the hope of maintaining profitability. As a sensory experience good, wine differentiation hinges primarily on the transmission and perception of information on product quality.

Consumers face the problem of asymmetric information, with the potential that the average quality in the market will be less than optimal. Conversely, producers need to find ways to efficiently transmit information on their product quality, so as to maximize the potential price premium.

In the traditional European approach, producers tend to organize through consortia, which centre around the Appellation of Origin (AO) designation. This mechanism is much more than a simple geographic delineation. The consortium can be governed by history, tradition, culture, *terroir*, and even by tight controls over production decisions, irrigation, plant varieties etc... Product quality is embodied in everything the Appellation stands for. The AOs play also an important role in EU exports. In fact they provide a tool for product differentiation in order to better fit demand segmentation as to create higher added value for producers.

With growth in international trade, subtle national differences in regulatory and legal frameworks can become major irritants between exporting and importing Countries. Pragmatically, there is a need to find common ground so that trade can continue to flow. Discussions aimed to find that common ground have been taking place for a number of years in different fora. From the 1891 Madrid Agreement to the more recent talks taking place within the TRIPS framework.

At present an important debate is taking place about the meaning of the notification and protection system. According to the US and other "New World" producing Countries the GIs should be based on a voluntary registration system as an identification tool. Therefore GIs should be considered as a form of territorial right and their utilization should be discussed in national legislation. On the other hand according to EU the GIs should enter in a multilateral register that should be enforced in all Countries.

The aim of this paper is to discuss the efficiency of AO system on the international wine market as an instrument that can satisfy both producers and consumers needs, and then to give some suggestions to improve the market performance in the future.

Background

The protection of the Appellations of Origin on the international market

An important debate is taking place in the WTO concerning the legal protection of GIs on the international market. Article 22 of the Trade Related Intellectual Property (TRIPS) agreement provides the general protection for food products, but additional protection is accorded for wines and spirits in article 23 and 24 of the agreement¹.

Article 23.1 permits each Member to "provide the legal means to interested parties to prevent the use of a geographical indication" identifying wines or spirits which do not originate in the place indicated by the geographical indication in question. However, a first issue arises because the TRIPS Agreement does not set out the registration requirements for a geographical indication (Blakeney, 2001). It addresses the issue negatively by permitting, in Article 23.2, Members to legislate to provide "an interested party" to request the refusal or invalidation of the registration of a trademark which contains a geographical indication identifying wines or spirits, which contains or consists of a geographical indication which does not have the indicated origin².

More in detail, Article 23.3 establishes a protection for each geographical indication for wines in the case of homonymous indications. Conflicts typically arise where products on which homonymous geographical indications are used and are sold into the same market. Concurrent use of homonymous geographical indications in the same territory may be problematic where the products on which a geographical indication is used have specific qualities and characteristics which are absent from the products on which the homonym of that geographical indication is used. In this case, the use of the homonymous geographical indication would be misleading, since expectations concerning the quality of the products on which the homonymous geographical indication is used are not met (Blakeney, 2001).

Article 23 stipulates that each Member shall provide legal protection for GIs 'even where the true origin of the goods is indicated or the geographical indication is used in translation

¹ In the current debate, some Countries consider this additional protection as an unacceptable discrimination against all other products and they have agitated for an extension of that protection to all kinds of geographical indications (Blakeney, 2001).

² An important issue currently at stake consists in the provision (Article 23.4) of a multilateral system of notification and registration of geographical indications for wines eligible for protection in those Members participating in the system.

or accompanied by expressions such as “kind”, “type”, “style”, “imitation” or the like’. No mention is made of misleading the public or unfairly competing within Article 23: as the Article is headed ‘additional’ protection, the presumption is that no such conditions are required for GI protection for wines and spirits (Josling, 2006).

However, article 24 establishes important exceptions, which are likely to limit the effectiveness of the international protection of GIs for wines and spirits.

Members are exempted (Article 24.4) from having to “prevent continued and similar use of a particular geographical indication of another Member identifying wines or spirits in connection with goods or services” where GI has been used “in a continuous manner with regard to the same or related goods or services” in the territory of that Member either for at least ten years preceding 15 April 1994 (the date of entry into force of the TRIPS Agreement) or where the continuous use has been in good faith. For example, US. Bureau of Alcohol, Tobacco and Firearms (BATF) permit the use of “semi-generic names” such as “Champagne”, “Burgundy” and “Chablis” if “the correct place of origin is directly conjoined to the name” (Brody, 1994).

Article 24.5 states that when a trademark has been acquired or registered in good faith before the date of application of the Agreement in that Member, or before the geographical indication was protected in its country of origin, measures adopted to implement TRIPS Section 3 shall not prejudice eligibility for or the validity of the registration of a trademark or the right to use a trademark, on the basis that such trademark is identical with or similar to, a geographical indication.

Parallel to, but distinct from the TRIPS Agreement, there are a number of bilateral and multilateral (including regional) agreements, which contain provisions modifying the TRIPS provisions dealing with geographical indications.

For example, in 1994, the EU negotiated an agreement with Australia which included the phasing-out of European wine names used by Australian wine-makers that had entered into generic use. The Agreement also provided for mutual recognition of oenological practices of each party and improved European market-access conditions for Australian products, by removing a number of technical barriers to trade between both parties.

On March 10, 2006, the US-EU wine trade Agreement has been signed. The Agreement covers wines with an actual alcohol content of not less than 7% and not more than 22%. It addresses several key issues, sets a framework to facilitate future wine trade between the United States and Europe and provides for mutual acceptance of existing oenological (wine making) practices (with the mutual acceptance of wine making practices the US will exempt EU wine from new US certification requirements for imported wine), certification (the EU will simplify its import certification requirements for US wine) and labelling (the Protocol on Wine Labelling, sets specific conditions for the use of names of vines, vintage characteristics, production methods, product types and variety names).

Moreover, the US and the EU agree to recognize certain of each other's names of origin in specific ways (article 7) and the US agrees to seek legislative changes to limit the use of 16 semi-generic names. The “traditional expressions” that the U.S. will be allowed to use under specified conditions are: Chateau, classic, clos, cream, crusted/crusting, fine, late bottled vintage, noble, ruby, superior, sur lie, tawny, vintage and vintage character. These terms may only be used if they have been approved for use on wine labels in the U.S. on a Certificate of Label Approval (COLA). Current US laws permit these names to be used on non-European wine. The new rules will prohibit new brands from using these names on non-European wine, but will grandfather existing uses of these semi-generic names.

The effectiveness of Appellations of Origin for producers and consumers

According to the economic theory, the creation of a brand has important effects on social welfare.

First of all we know that when the quality of the product is not adequately signalled to consumers, a decrease in the average quality provided on the market is expected to arise. In this sense, the brand acts as informative tool and can increase consumers' utility.

Secondly, the brand creation increases quality differentiation and thus let producers gain positive profits in the short-term, according to the degree of products substitutability (Dixit and Stiglitz, 1977).

Finally, as far as the brand corresponds to an actual quality differentiation, the Intellectual Property Right acts as a tool to protect both consumers and producers interests.

In the specific case of Appellations of Origin, we can consider that an AO has an important role for both producers and consumers. On the demand side, the Appellation of Origin represents a quality signal, which provides information about the region of origin and the wine's average quality. On the supply side, the Appellation of Origin represents a long-term commitment constraining firms' strategic choices in terms of quantity and quality; in exchange, producers have access to a collective reputation.

On the one hand, Appellations of Origin represent a way to solve of the asymmetric information problem (Laporte, 2001). In a context where the wine's quality is not directly observable to consumers, AO represents an important quality sign concerning the wine characteristics by providing information about the wine geographical origin and its average quality. In fact, wine market is characterized by a very heterogeneous supply and the impossibility to observe the product quality before purchase. This leads to relevant asymmetric information between producers and consumers and consequently implies strong promotional and information research costs (Nelson, 1970, Darby e Karny, 1973). The major consequence of quality signals' inefficiency as regard to consumer's expectations on quality and typicality is the risk of a decrease in the average quality level supplied on the market, which can imply a long-term demand drop (Akerlof, 1970). In this context, the AO aims at reducing consumers' information costs.

On the other hand, Appellations of Origin have important consequences on the "characteristics space" (Lancaster, 1966). The *delimited production area* and the existence of *specific production requirements* (the maximum yield of wine from grapes, the minimum density of rootstocks per hectare, the minimum natural alcohol level by volume, the minimum total acidity, etc) confer to wine *specific quality characteristics and substantially differentiate each Appellation of Origin from the other ones*. As a result, the construction of an AO provides an increase in the *inter-appellation* quality differentiation and a decrease in the *intra-appellation* quality differentiation, by conferring specific quality characteristics to the wines belonging to the same AO. The quality differentiation is thus based on the *specific production requirements* to which producers commit. In exchange of quantity restrictions (delimited production area and maximum yield per hectare), which limit producers' strategic flexibility in the long term, producers have access to a collective reputation, which may increase consumers' willingness to pay for the AO (Chambolle, Giraud-Héraud, 2003).

Objectives and methodology

The objective of this paper is to discuss the performance of the Appellation of Origin system on the international wine market, with respect to some relevant context factors, such as: *i*) the GIs international legal protection system; *ii*) the world wine demand trend and size; *iii*) the strategic choices of the competitors on the international market.

In particular, the analysis aims at identifying the key factors that determine the effectiveness of Appellations of Origin to provide both profitability for producers and satisfaction for consumers.

We will show AO importance for producers by describing how it helps to build and give access to a collective reputation, making it profitable for them to undertake relevant investments for quality.

As regards consumers we intend to point out that AO are an effective tool for them to recognize the quality attributes they look for, especially when they are seeking an actual link with *terroir*: this means that the AO represent a valid solution to the asymmetric information problem.

The study is conducted in three steps.

First, we carry out a demand analysis in order to evaluate consumers appreciation of origin attributes. The demand analysis is conducted through descriptive statistics and a critical review of the related economic literature.

The second step of our methodology consists in a supply analysis carried out in order to describe and evaluate alternative market strategies adopted by the main wine producing Countries and in order to identify the role of origin in firm's strategic choices.

Thirdly, through two empirical analyses we intend to show the risks that arise for both consumers and producers as a consequence of the coexistence of the brand names and AOs on the international markets.

The first investigation is conducted the United States Patent and Trademark Office (USPTO) trademark register database in order to illustrate some cases of imperfect use of quality signals on the international market. This analysis is aimed at quantifying the actual risks of altering of consumers' quality perceptions and of weakening of Appellations' reputation on the international markets.

Further, we conducted a direct survey on the Italian AO Consortiums Association (Federdoc) in order to give some insights into producers' efforts to register the collective brand on the international markets.

Results

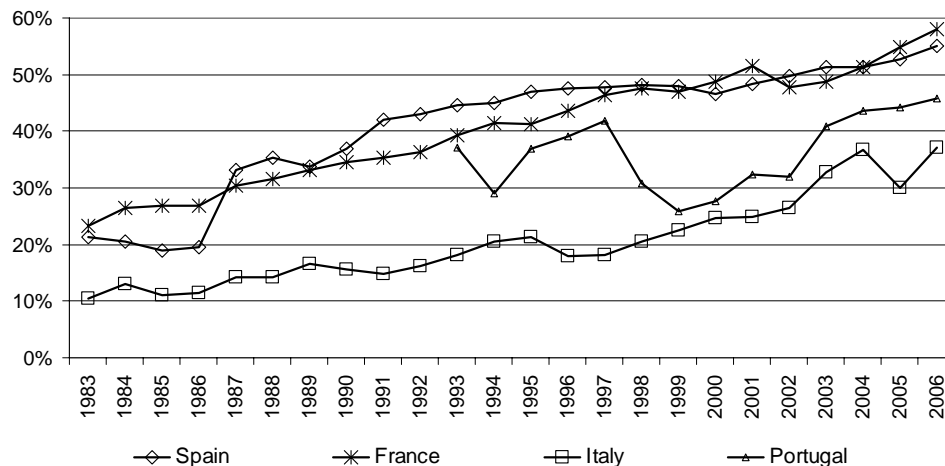
Consumers' appreciation of quality and origin attributes

This section of the paper aims at evaluating the role of quality in consumers' behavior through descriptive statistics and literature review.

The demand analysis shows that wine's quality seems to be a fundamental factor behind consumption trends. In fact, if we consider the demand for wine from 1984 to 2003, we observe that the two categories "quality wine" and "table wine" have been moving in different directions. In particular, there has been a substantial fall in consumption of "table wines". Over the same period there has been a growth in consumption of "quality wines", but not sufficiently large to compensate for the reduction in the first category.

If we consider the traditionally producing and consuming Countries (France, Italy and Spain), the gross human consumption per-capita (GHC) of total wine has decreased about 40% from 1984 to 2004, whereas the opposite trend is registered in the case of quality wines PSR. Figure 1 shows the role of quality wines PSR on the total GHC per capita in France, Italy, Spain and Portugal.

Figure 1 - Role of quality wines PSR on per-capita gross human consumption in the traditionally wine producing and consuming Countries (1983-2006)



Source: Eurostat data, Wine Balance Sheet (2006)

European consumers appear to be more quality-oriented than quantity-oriented. The raising importance of occasionally wine consumption is confirmed by several socio-economic surveys. In 2003, about 67% of Italian wine consumers consume wine each day, while about 33% consumes wine occasionally. The 75% of occasional consumers is identified as «wine-passionate» consumers, which also have a «wine-culture». As for France, the INRA-ONIVINS survey 2005 confirms the increasing role of occasionally consumption.

As for the Italian market, a recent ISMEA's survey (ISMEA, 2005) examines the role of the designation of origin in consumers' purchase choices. According to this survey, Italian consumers recognize the Appellations of Origin as high quality products from the point of view of *i*) taste and *ii*) food safety (due to the existence of production system's control mechanisms). Moreover, an increasing knowledge concerning AO is registered, which highlights an increasing interest in these categories of products.

Further, the demand analysis through the review of economic literature shows, an increasing relevance of objective characteristics (as region of origin, the reputation and other objective characteristics) on consumers' willingness to pay for wine.

When a product has a high proportion of attributes that can only be assessed during consumption (experience attributes) as with wine (Chaney, 2000), then the consumers will fall back on extrinsic cues in the assessment of quality (Speed, 1998).

Several papers show the impact of objective characteristics on price differentials. This category includes the vintage's year, the Appellation, the region, the grape variety, which usually appear on the label and are therefore easy to identify by consumers.

Combris et al. (1997, 2000) use data for Bordeaux and Burgundy wine to estimate a hedonic price function. In both studies, price is strongly explained by objective attributes appearing on the label of the bottle. The authors conclude that consumers may decide to vary their willingness to pay for wine primarily according to observable attributes. See also Nerlove (1995) and Gergaud (1998) for an analysis carried out using the data for Champagne. The relevance of objective traits is also underlined in Oczkowski (1994).

Landon and Smith (1997), use an unbalanced panel of 196 red wines from the five Bordeaux vintages from 1987 to 1991 and estimate two hedonic price equations. The authors confirm the relevance of the objective traits and show that long term reputation explains much more variation in the consumers' willingness to pay than does short term quality changes. This finding has been confirmed by focusing only on a balanced panel of

151 wines for the 1989 and 1990 vintages (Landon and Smith, 1998). Subsequent applications to premium wines from North America, Australia, South Africa and Chile by Schamel (2000) and to Australian premium wines by Oczkowski (2001) support the presence of significant reputation effects.

Schamel (2003) estimates a hedonic pricing model of premium wines sold in the U.S in order to analyze the factors behind price differentials based on regional origin and points out that the domestic regions command higher prices than wines imported from other New World sources.

As for the Italian market, Benfratello, Piacenza, Sacchetto (2004) estimate an hedonic model using a dataset on two premium quality wines (Barolo and Barbaresco) covering the 1995-1998 vintages and show that the reputation acquired by wines and producers during the years is more important than taste in driving market prices.

Other papers, dealing with experimental studies, point out that the AO can improve consumer's WTP (Bazoche, Combris, Giraud-Héraud, 2005).

Mtimet and Albisu (2006) examine Spanish AO wine consumer behavior by the use of a choice experiment technique. Empirical results indicate the importance of the designation of origin and the wine aging attributes on wine selection. The grape variety variable, although it has a lower utility values, is also found to be significant (especially a foreign variety), thus confirming the emergence in the Spanish wine market of the "New World" marketing strategies based on well-known varietal wines.

Quality strategies on the international wine market: the role of origin

Two main production–marketing systems coexist on the international wine market. Behind these systems two main strategies can be identified: the private brand strategy and the Appellation of Origin system. These two strategies can be distinguished through the degree of commitment-flexibility, which characterizes producers' strategic choices.

The *private brand strategy* is advantageous for the firms, because it allows speedier adjustments to market conditions, particularly changing in this field of the agrifood consumption. Let us consider as an example the large firms of "New World" producing Countries (Jacob's Creek, Gallo, Southcorp, etc.). These firms develop a whole series of brands, easily identified by consumers, thanks to a great market volumes and notoriety. Considerable investments in promotion are associated with these brands. The firm efficiency is based on its capacity for scale economies, which allows it to meet market volume requirements and to develop strategies of price promotion. For example, around 66% of Australian wine is sold on price or multi-buy promotion on the UK market.

On the other hand, the *Appellation of Origin system* requires the producer's commitment to specific production requirements, which constraint the producers in terms of quantity. In exchange, the producer benefits from a collective reputation related to the Appellation. The quantity constraints may result in a loss of strategic flexibility (Giraud-Héraud, Grazia, 2006). The loss of strategic flexibility can constitute a limitation of firm's expansion in the markets which are characterized by an increasing wine consumption trend (mainly the Anglo-Saxons Countries) and thus by a great level of competition between Appellations of Origin and "New World" wines. Indeed, whereas the wine consumption is nowadays stagnating in the Countries with the highest wine production (and consumption) as France, Italy or Spain, on the other hand, it is not the same in the U.S.A, in the United Kingdom and in the Asian Countries, as China or Japan, where the competition between the AO and the private brands is very strong and leads to several strategic difficulties for the producers.

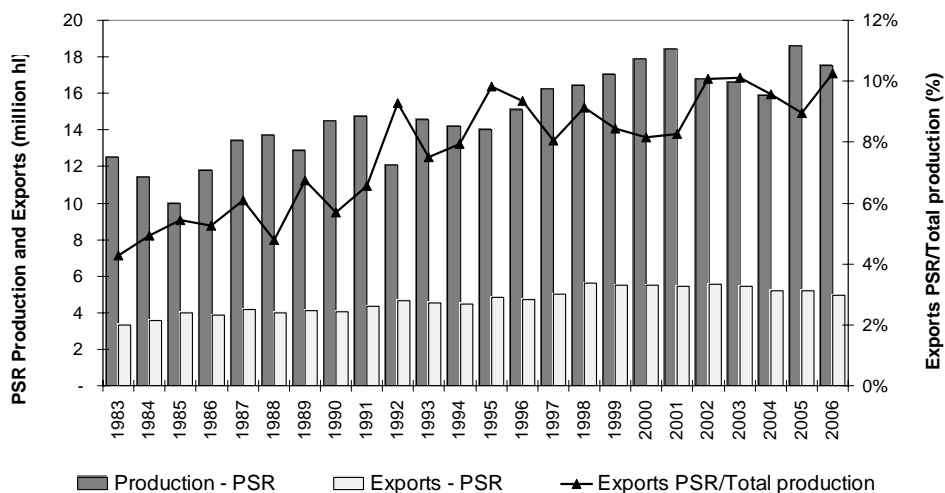
The importance of wine origin for traditionally producing Countries', can be appreciated from the following graph showing the trend of wine *production* and *exports* in the leading trio of producing and exporting Countries (France, Italy and Spain)³.

Table wines still make up more than half of Community wine production (98 million hl in the 2004/05 wine year) but their share is declining in favor of quality wines. The increase in the share of quality wines on the total wine production is mainly resulting from conversion of lands and reclassification on some table wines in response to changing demand.

The analysis of the trend of volume of *exports* by category of wine (for France, Italy and Spain), points out that the growth in exports of quality wines has been slower but more constant than for table wines. This points out a relatively stability of quality wines' image on the exports markets.

The conjoint analysis of the trend in production and exports points out that the relative importance of exported volumes of quality wines with respect to the total production has increased in the period 1983-2006 from 4% to 10%. This points out an increasing importance of quality wines strategy for the traditionally producing Countries with respect to exports markets.

Figure 2 - The relative importance of quality wines PSR exports on total wine production in the trio of leading world producing and exporting Countries



Source: elaborations on Eurostat wine balance sheet (1983-2006)

The competition between the two systems mentioned above (*private brand* vs *Appellation of Origin*) is particularly tight in those markets characterized by increasing consumption. Nevertheless, we observe that many producers around the world started to use Geographical Indications to differentiate their product (Hobbs, Kerr, Phillips, 2001): the increasing competition by foreign wines and the evolution of consumers' behavior towards an increasing appreciation of quality, implies the implementation of origin-oriented strategies.

³ France, Italy and Spain together account for 50% of world production and 60% of world exports.

In this perspective is worth noticing the development of the American Viticultural Areas (AVAs) in California and in particular in Oregon and Washington (Rousset, Traversac, 2006): over 160 American Viticultural Areas are nowadays approved.

An American Viticultural Area (AVA) is a delimited grape-growing region distinguishable by geographic features, with boundaries defined by the United States government's Alcohol and Tobacco Tax and Trade Bureau (TTB). The TTB defines these areas at the request of wineries and other petitioners. An AVA specifies a location. Once an AVA is established, at least 85% of the grapes used to make a wine must be grown in the specified area if an AVA is referenced on its label. Current regulations impose the following additional requirements on an AVA: *i*) evidence that the name of the proposed new AVA is locally or nationally known as referring to the area, *ii*) historical or current evidence that the boundaries are legitimate and *iii*) evidence that growing conditions such as climate, soil, elevation, and physical features are distinctive. It can be noticed that the AVA implies a lower level of commitment as compared to the European AO. In fact, it does not limit the type of grapes grown, the method of vinification, or the yield, for example. Some of those factors may, however, be used by the petitioner when defining an AVA's boundaries.

The use of Geographical Indications in Australia started in 1993 when the Australian Wine and Brandy Corporation Act (1980) was updated to enable Australia to fulfill its Agreements with the European Community on Trade in Wine and the Agreement on Trade-Related Aspects of Intellectual Property Rights (TRIPS). The use of GIs is aimed at “providing the legal means for interested parties to prevent use of a geographical indication identifying wines for wines not originating in the place indicated by the geographical indication in question”. With respect to the European AO system, it is much less restrictive in terms of viticultural and winemaking practices. In fact the only restriction is that wine which carries the regional name must consist of a minimum of 85% of fruit from that region. This protects the integrity of the label and safeguards the consumer.

The assessment of the effectiveness of Geographical Indications on the international market: empirical results

In order to assess the risk of consumers' misperception of the link between the geographical place name and the actual region of origin, we carried out an analysis on the USPTO database with respect to the 17 "semi generic" names concerned by the EU-US Wine Agreement. This analysis points out some examples of trademarks, which explicitly refer to European Appellations of Origin, but have been registered by firms located outside the delimited production area.

The main results of the analysis are the following:

- Several semi-generic names appear in non-wine related products. In this case the level of consumers' misperception is relatively low. See for example, “The Champagne of Tea”, “Pink Champagne” (Beauty products), “The Champagne of Water (Drinking Water), “Champagne Honey mustard splash” (salad dressing) or “Marsala” (Fresh olives and grapes), Porto's (Bakery goods);
- Some of the semi-generic names are explicitly mentioned in trademarks referring to wine (relatively high risk of misperception), which have been registered by producers located outside the delimited production area. See examples in the Table below;
- A few semi-generic names are not registered as trademarks, neither from producers located in the delimited production area, nor from US firms (Haut Sauterne, Hock, Moselle, Retsina, Sauterne). “Porto” and “Malaga” do not appear in trademarks registered from producers located outside the delimited production area;
- The most “used” geographical place names (both in non-wine and wine related sectors) are likely to be those with the highest notoriety on the international

market; thus, in addition to the risk of consumers misperception, an opportunistic behavior may take place, when producers located outside the original production area may take advantage of the Appellations of Origin collective reputation;

- In particular some multinational firms seem to develop a sort of strategy based on an explicit mention to European Appellations of Origin (Arbor Valley).

Table 1 - Registration on the US market of semi-generic names

Burgundy	Arbor Valley American Burgundy, Inglenook classic Burgundy Taylor California Cellars Burgundy
Chablis	Arbor Valley American Chablis Inglenook Chablis
Champagne	Chamblue (Sparkling wine)
Claret	Bearitage California Claret, Vanderbilt Claret, Crown Claret
Madeira	Arbor Valley American Madeira
Marsala	Arbor Valley American Marsala
Rhine	Taylor New York Rhine Wine
Sherry	Arbor Valley american Sherry, Arbor Valley american cream sherry
Tokay	Y-Tokay

Source: elaboration on United States Patent and Trademark Office (USPTO)

As a second step of the investigation, we searched the USTPO database for names similar to the Italian Controlled and Guaranteed Denominations of Origin (DOCG). The results are shown in the following table.

Eleven out of the thirty-four DOCG names are not registered at all (neither from the Consortium nor from other firms not related with the actual product's origin or with the wine sector). These are the following: Albana di Romagna, Bardolino, Carmignano, Ghemme, Soave Superiore, Taurasi, Torgiano Rosso Riserva, Valtellina Superiore, Vermentino di Gallura, Vernaccia di San Gimignano, Gattinara.

More interestingly, we found that some DOCG are not registered by the Consortium, but their geographical place name has been registered as trademark or service mark by non-wine related firms (Barbaresco, Barolo, Chianti, Gavi o Cortese di Gavi). IN this case the risk of misperception is relatively high, in particular for the DOCG Chianti, which has not been registered by the Consortium. In fact, its geographical place name appears in wine-related trademarks (Arbor Valley American Chianti, Inglenook Chianti, Good Chianti, Chianti Station).

The risk of misperception can arise in spite of the registration from the Consorzio di Tutela. For example, the DOCG Asti has been registered by the Consortium, but the geographical place name "Asti" appears in trademarks registered by non-wine related firms.

An effective intervention of the Consortium is registered for Brachetto d'Acqui, Brunello di Montalcino, Chianti Classico, Franciacorta Spumante, Gattinara, Ramandolo, Recioto di Soave and Vino Nobile di Montepulciano.

A relatively important action is that of individual firms, which register their individual brand (containing the geographical place name of the AO). Let us consider for example the trademarks, Marchesi di Barolo, Primore Casa Vinicola in Gattinara, Gavi La Scolca,

Martini & Rossi Asti Spumanti Martini, The Bosca Millennium Collection Asti, Poggio Rosso Chianti Classico, Barone Pizzini Franciacorta DOCG brut.

In some cases the individual registration strategy allow the firm to protect its brand (and indirectly the geographical place name of the concerned AO), in spite of a lacking intervention of Consorzio di Tutela (Ruffino Chianti 2004 dal 1877 DOCG, Chianti DOCG 2001 Piccini, Chianti Vino Pasolini).

Table 2 - Registration on the US market of Italian DOCG

	Registered by the ConSORZIO di Tutela	Risk of mis perception	
		Registered in wine sector (high risk)	Registered in non-wine sectors (low risk)
Asti spumante – Moscato d'Asti	ConSORZIO dell'Asti (Trademark), Asti (Certification Mark)		Astipure, Asti, Asti aircraft safety technology, Asti magnetics corp.,
Barbaresco			Barbaresco (Service Mark)
Barolo			Villa Barolo Ristorante and Wine Bar (Service Mark), Barolo, Barolo Tuscan Grill (Service Mark), Barolo (watches), Barolo (shoes)
Brachetto d'Acqui	Brachetto d'Acqui (Certification Mark)		
Brunello di Montalcino	Brunello di Montalcino (Certification Mark)		
Chianti		Arbor Valley American Chianti, Inglenook Chianti (Constellation Brands), Good Chianti, Chianti	Chianti
Chianti Classico	Chianti Classico (Trademark), Chianti Classico dal 1716 (Trademark), ConSORZIO Vino Chianti Classico (Collective Trademark)		
Franciacorta Spumante	Franciacorta DOCG (Trademark)		
Gavi o Cortese di Gavi			Gavi, Gavi Fund, Piazza Gavi
Montefalco Sagrantino	Montefalco Sagrantino (Certification Mark)		Sagrantino di Montefalco (Service Mark), registered by an Italian firm
Ramandolo	Ramandolo (Trademark)		
Recioto di Soave	Recioto di Soave (Certification Mark)		
Vino Nobile di Montepulciano	Vino Nobile di Montepulciano (Certification Mark)		

Source: elaboration on United States Patent and Trademark Office (USPTO)

In order to give an insight into traditional wine producing Countries attitude towards brand registration in international markets we conducted a direct survey among the most representative Consortia in Italy.

Consortia were chosen from the National Confederation for Voluntary Consortia for the Oversight of the Denominations of Origin (Federdoc).

Results refer to 21 Consortia that account for 40,3% of Italian production with Appellation of Origin.

The survey shows that almost one out of two Consortia interviewed (48%) have not taken any action yet to register their Appellation of Origin as a brand, neither on the national or EU market, neither on the international market. At least two of them are presently evaluating the cost of registration in few Countries which are their main importers.

Among those Consortia that already have registered a mark we notice that quite a few (19%) have taken this action only to protect their Appellation on the National or European market.

Therefore only one third of the Consortia considered makes use of international marks, in the form of individual trademarks, collective marks and international marks (according to the Madrid Agreement).

The most used tool for Appellation protection on the international markets is the Individual trademark, chosen by 24% of Consortia of our sample, followed by the collective mark which is used by a smaller percentage of Producers Associations – 19%. Only in one case (5%) we recorded the use of the Madrid Agreement through which the Appellation is protected in 31 Countries.

Table 3 – Attitude of Italian Consortia towards marks

Strategy	Consortia	
	(n.)	(%)
No action	10	48%
<i>Presently evaluating costs of registration</i>	2	10%
Registered international marks	7	33%
<i>Trademark</i>	5	24%
<i>Collective mark</i>	3	14%
<i>Madrid Agreement</i>	1	5%
National or European collective mark	4	19%
Total	21	100%

Source: Direct survey on Appellations of Origin associated to Federdoc

As regards the Countries in which Appellations seek for protection, Canada and the US are leading the list (71% of cases), followed by Japan (57%), Argentina, Australia, Chile and South Africa (43%).

Another relevant group of Countries includes Brazil, Philippines, Mexico, New Zealand, Venezuela, in which 29% of our sample Consortia registered their marks.

Finally there are several Countries such as India, Indonesia, North Korea, Paraguay, Peru, South Korea, Switzerland, Taiwan, Thailand and Uruguay, where only one Appellation is registered as mark.

Table 4 – Countries in which marks are registered by Italian Consortia

Countries	Registered marks	
	(n.)	(%)
Canada, USA	5	71%
Japan	4	57%
Argentina, Australia, Cile, South Africa	3	43%
Brazil, Phillippines, Mexico, New Zealand, Venezuela	2	29%
India, Indonesia, North Korea, Paraguay, Perù, South Korea, Switzerland, Taiwan, Thailand, Uruguay	1	14%
Total	7	100%

Source: Direct survey on Appellations of Origin associated to Federdoc

In the last three years the overall registration process cost was about 126.000 euro and it has been more expensive for trademarks (almost 89.000 euro) than for collective marks (37.300 euro), but this is due to the greater use of the former as compared to the latter.

At present two important Consortia are pursuing registration of both trademarks and international marks in many other Countries such as Albania, Algeria, Bulgaria, Croatia, Cuba, Malta, Morocco, Romania, Singapore, Tunisia, Turkey, Vietnam.

The main difficulties come up in the registration process relate to refusals, in particular in Australia, Canada Russia and Switzerland. Other issues arose because of the bureaucratic burden, the excessive time length and costs (consultants and personnel) required by the procedure.

As for the legal actions in protection of the Appellation or the mark the survey shows that Consortia had to spend even more than for the registration process (164.000 versus 126.100 euro). However we notice that in most cases they are oriented at protecting the Appellation of Origin, with a cost up to 114.000 euro, while the protection of the trademark / collective mark occurred more rarely with a lower overall cost.

Final remarks

The higher competitiveness on the international wine market, in the last years, has increased the implementation of strategies to differentiate production and at the same time, it has increased the demand for a protection system apt to guarantee high investments and commitments by producers.

The study conducted aimed at assessing the effectiveness of the AOs on the international wine market. The results of the analysis conducted are both positive and negative. As for the negative factors, we observe a weak performance of AO on international markets. In fact, given the present IPR system, in some case we observe a double registration of brand, and double costs for producers: one for the AO registration, and one for the industrial brand registration. Further, we observe a weak recognition of specific investment and quantity and quality commitment for AO producers and some risk of altering of consumer quality perceptions.

The debate at national and international level, concerning industrial brand and AO brand, is linked to distribution of monopole rent derived from monopolistic competition by the brand. In the case of industrial brands, since these are property of a firm, the firm will directly benefit from them. In the case of AOs, the beneficiaries are all the producers of the area, who may be considered as a club. In fact the management of AO is always a collective concern, with many difficulties because of the different interests and behaviors of the beneficiaries.

This is why, in order to develop its potential benefits, the AOs need a strong economic regulation and specific controls to adapt, by one hand, supply to demand to avoid short term opportunist behaviors and stabilize product's quality in the long term, and, by the other hand, to increase its notoriety and information guarantee and trust to consumers. Individual and collective brand should coexist, with differentiated and specific dynamic to fit in wider segmented wine markets.

Moreover the AO implies specific techniques, a traditional competence linked to territory, a collective patrimony, with an economic value and also a strong social and cultural dimension that constitute determinant factors of quality policy for European producers.

This is another reason why we believe that the present IPR system should be improved in order to avoid an improper use of geographical place names. In addition to this a more intense promotional effort should be provided by both economic agents and institutions in order to take full advantage from the opportunities offered by the AO system.

All this considered, and given the importance of the AO to protect and incentive intangible investments such as *terroir*, tradition and social history, we suggest that AOs should be accorded a more extensive recognition on the international market.

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How to make money by feeding the tourists: the case of Fiji

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Summary

This paper reports a study of the horticultural chain in Fiji. The objectives of the research was to understand how the domestic horticultural supply could meet the demand currently generated by the tourism sector, i.e. how new income opportunities for the rural people could be generated by feeding the tourists.

If policy interventions are to be directed at strengthening backward economic linkages between tourism and local food supplier, a better understanding of factors driving farmers marketing choice is required. This paper aims to contribute in this regard by analyzing the decisions of farmers to engage in direct selling to hotels. Hotels pay premium prices for quality fresh produce and direct marketing can allow farmers to retain the highest possible portion of this premium without sharing it with intermediaries. The results of the application of a discrete choice model to data collected in the chain study, suggest that quality is the most important factor among those affecting the choice of direct marketing to hotels. Other variables influencing the decision were found to be ethnicity, distance from the market and the availability of transportation means of property.

KEYWORDS: horticultural markets, direct marketing, discrete choice models, Fiji.

1 Introduction

Fiji, as many other Small Island Developing (SID) countries, faces several disadvantages related both to its reduced size and to being made up by many small islands. These disadvantages include, among other, limited resources, which lead to undue specialization; excessive dependence on international trade and hence vulnerability to global developments; costly public administration; insufficient infrastructures -including transportation and communication; limited institutional capacities; domestic markets too small to provide significant scale economies and reduced volumes available for exports, sometimes from remote locations, which lead to high freight costs and reduced competitiveness.

The performance of Fiji 's economy since 1999 has been irregular (Tab 1), also due the political and constitutional instability experienced between 1999 and 2001. The military coup in December 2006 is likely to cause long-term harm to the economy. According to recent estimates (NZIER, 2007) the 2000 coup caused a 39.4% fall in visitor arrivals; a 33.1% fall in investment; and a 3.5% increase in the real interest rate. A moderate countervailing factor was a 9.9% increase in government expenditure. In percentage terms, the biggest estimated long-run effects were a 36% decrease in informal sector wages, a 24% decrease in exports, an 8% decrease in real GDP and a 7% decrease in real national welfare. Although it is too early to be certain, the effects of the 2006 coup are likely to be qualitatively similar, because the external and internal shocks are likely to be the same. However, it is very unclear at the moment to predict what the quantitative impacts will be.

In addition, the Fijian economy continues to face uncertainties due to unsolved political issues¹ and the impact of restructuring its agriculture and manufacturing sectors in response to changes in international trade arrangements².

The crisis of the sugar sector, started even before the EU price reductions³, has already caused a sharp drop in the contribution of this sector to GDP -from 11.3% in 1995 to 6% in 2005. This, in turn, has made the overall contribution of the agricultural sector to total GDP decline⁴ and the tourism and textile become the largest GDP contributors.

Among sectors performing well, tourism is the lead sector: it presently is the country's largest source of economic growth, investment and foreign exchange earnings. The multiplier effects of tourism growth, though, are limited by the high dependence of tourism industry on imported supplies.

By *increasing backward economic linkages between tourism and local food suppliers* Fiji can

- *maximize* benefits from tourism development;
- *improve* benefits *distribution*; and
- *reduce the pressure on the national balance of payments*.

First of all, the increase in the demand for local fresh food supplies by hotels and resorts can generate *positive direct, indirect and induced impacts* on domestic agricultural production, hence on farm incomes. At present, food, as well as most other supplies and services, used in the tourism sector are brought in from overseas. This means that part of the tourism sector food demand growth does not create new income domestically. The substitution of domestic food supplies to the imported ones, can makes the *tourism multiplier increase*, in this way *maximizing benefits from tourism development*.

In addition, stronger backward economic linkages between tourism and the domestic agricultural sector can *increase* not only the level but even *the distribution of benefits* from tourism growth. At present, only the population living in the coastal areas where the tourism industry is located is gaining from tourism, If the hotels and restaurants demand for domestic fresh food increases, then even the livelihoods of rural, often poor, agricultural population can improve.

Finally, the substitution of the current import flow of fresh food with a domestic supply can help reducing the widening deficit in the balance of payments⁵, thus contributing to increasing the country's macroeconomic stability. The Strategic Development Plan 2007-2011 has addressed this import substitution stance and has indicated in a) the enhancement of tourism industry and agriculture sector linkages to match demand and supply, and b) the promotion of food safety and quality the two leading strategies to meet the objective of reducing the value of food imports from \$370m in 2006 to \$260m in 2011.

Previous research (Bennett et al.) has however pointed out that these linkages cannot be assumed to emerge alone – they must be actively facilitated. This points to the need of establishing how these linkages could be best put in place.

If policy interventions are to be directed at strengthening backward economic linkages between tourism and local food supplier, a better understanding of farmers production and marketing choices is required. This paper aims to contribute in this regard first by reporting the major findings of a horticultural chain study recently implemented in Fiji. In addition the paper focuses the attention on the case of direct marketing to hotels.

¹ Such as constitutional reform and leasehold land issues.

² Mainly related to the loss, in 2005, of its garment quota with the USA and the progressive erosion of its preferential access to the EU market, where up to 60% of Fiji's sugar production (173,000 tons/year) has been sold in the past years.

³ EU has planned a price reductions from 5% in 2006/2007 to up to 39% by 2009/2010.

⁴ From 19% in 1989 to 13% in 2005.

⁵ The annual food import bill continues to rise. It exceeded \$350m in 2005.

The rest of the paper is structured as follows. In the next section, the methodology used to carry out the horticultural chain study is presented. We then present the major findings of the study in regard to the demand for horticultural products of the tourism sector and the supply of the Fijian horticultural. In the last paragraph we report the estimation results from applying a discrete choice model to identify the factors affecting the farmers decision to engage in direct sales to hotels.

2 The horticultural chain study

The study implemented by FAO-UN⁶/INEA⁷/SPC⁸ was meant to understand the nature and relevance of the existing constraints of the local production and distribution of high quality horticultural productions so as to meet the tourism demand in Fiji. The research was implemented in the context of three chain studies carried out throughout the South Pacific region by the FAO regional project: “Support to the Regional Programme for Food Security in the Pacific Islands Countries” (GTFS/RAS/198/ITA).

The intent of the study was to solicit information from agricultural, trading and tourism firms in Fiji on the existing constraints to link the tourism industry demand to the domestic horticultural production.

More specifically, the objectives of the study were:

- to investigate the present domestic demand for the targeted products and the existing constraints to the development of their national supply so as to replace (at least partly) their current import flows;
- to prepare a strategy to overcome identified bottlenecks and to assure the full exploitation of the detected potentials.

The study followed a “participatory” approach by which INEA proposed first drafts of both the overall methodology and the specific tools (questionnaires) to be used to collect information, which were then validated by regional (SPC and FAO-SAPA) and national counterparts (country coordinator for Fiji).

The four horticultural products (mango, papaya, tomato and carrot) targeted with the study were selected by the local Ministry of Agriculture in the light of their relevance within the fresh-agricultural products basket currently demanded by the Fiji tourism industry.

Four surveys were then implemented to study the state of facts of the four targeted crops. To this end, four types of questionnaires were elaborated, one for each of the relevant operator within the chain (horticultural producers, domestic traders, importers and tourism operators). The questionnaires were worked out based on secondary information collected through an “ex-ante” assessment and were validated, prior to their use, through field testing.

Although changing according to the operator investigated, the questionnaires targeted primary information related to: the enterprise; production or procurement of the investigated product; harvest and post-harvest issues; domestic marketing or trading (import) issues and, only in the case of the producer’s questionnaires, matters dealing with certification schemes, financing and extension services.

The surveys were carried out in May-July 2006 by a private consultant (working as national coordinator) assisted by 24 interviewers/data collectors. The total sample consisted of: 238 farmers; 100 tourism operators and 55 traders –out of which, 5 were importers.

<Table 1. Sample sizes >

⁶ Food and Agriculture Organization of the United Nations.

⁷ Italian Institute of Agricultural Economics.

⁸ South Pacific Commission.

3 Demand for horticultural products of tourism sector

The tourism sector is the country's largest source of economic growth, investment and foreign exchange earnings. Visitor arrivals (Graph 1) have been growing over the last decades, although with some fluctuation due to political turmoil. Medium term prospects were very encouraging, although they might need to be reconsidered in the light of the 2006 coup.

< Graph 1>

Tourism earnings are by far the largest foreign exchange earner and reflect the number of visitor arrivals as well as their length of stay. Food and beverage consumption are a significant part of tourist expenditure. According to recent investigations (Berno, 2006), around 15% of tourist expenditure in Fiji is currently spent on food.

In addition, it has been estimated that, although nearly half of hotel purchases are from local providers, two thirds of overall food import expenditures destined to the tourism sector is for food products that could be grown in Fiji (Berno 2006).

The growth of tourism sector is constantly increasing the food import bill, thus placing significant pressures on Fiji's balance of payments.

The survey carried out among tourism sector operators has shown that almost all the hotels and restaurant requirements of papaya and mango are met by domestic supplies. However, in the case of tomato, hotels and restaurants have a clear preference for imported products while nearly all hotels surveyed sourced practically all their requirements of carrots from importers (Graph 2).

The survey also confirmed that the two major reasons for preferring imported fresh produces are unavailability and inconsistency of local high quality fresh horticultural supplies.

< Graph 2>

4 The horticultural sector in Fiji

The agriculture sector, excluding sugar, contributes around 6% to GDP; accounts for around 14% of agriculture exports and for 15% of total food imports and sustains 54% of the total country's population.

The total value of horticulture production (around \$50 million) is growing quite rapidly either in terms of contribution to the total agricultural value added and to exports.

Most of the commercial horticultural supply is originated in the Ba region and the Sigatoka Valley. Even though this latter area is smaller than the Ba region, it is however a larger supplier of vegetables to the nearby tourism sector.

A random sample of 252 farmers were interviewed and data on 238 of them were used for the analysis (table 2).

<Table 2. Farmers interviewed by province and crop>

Farms in which papaya and tomato are grown have on average bigger farm size (respectively 17.3 and 13.2 ha) than those in which mango and carrots are grown (9.6 and 2.8 ha).

Most of farmers investigated make use of traditional production technologies (Table 3) with the exception of all tomato producers in the Nadroga / Navosa province who make use of Integrated Pest Management. In addition, a tomato grower is presently converting its production into organic.

<Table 3. Technology used by crop and region>

With regards to certification schemes, none of the farmers interviewed indicated that they make use of organic, fair trade, EUREP-GAP or other certification schemes.

The most commonly cited production constraints (Table 4) for the four crops were issues related to availability of improved varieties, seed and credit and to pests and diseases. At the same time, it is worth noting that the land issue was cited amongst the least relevant production constraints. For Indian farmers, in fact, land tenure may not have been a problem because the lease agreements have been worked out to their satisfaction. For Fijian farmers, however, the question related to this issue in the questionnaire did not delve into the issue of communal land and thus did not allow to explore this matter satisfactorily despite the fact that land tenure, especially in terms of security, may be an issue among these growers.

<Table 4. Producers' ranking of production problems, by crop>

Pawpaw and tomato growers prefer to market directly (table 5), whilst carrot and mango producers make greater use of intermediaries.

<Table 5. Marketing channels by crop>

Market price fluctuations (Table 6) is ranked by producers as the most important constraint for three (pawpaw, mango, tomato) of the four targeted commodities. In the same way, the lack of market information is ranked within the top four identified constraints for all commodities. With the exception of carrot, unreliable demand from the tourist sector is ranked as one of the top three problems identified by producers, and the problem of long distances to final buyers was identified as a significant constraint for mango and tomato.

<Table 6: Producers' ranking of marketing problems by commodity>

5 Determinants of direct sales to hotels

The data collected in the survey were used to better understand what are the determinants in the establishment of direct linkages between horticultural growers and hotels and restaurants, that is what are the variables that are affecting the probability of farmers to directly sell their products to the tourism sector agents. Hotels and resorts pay premium prices for quality fresh produce and direct selling can allow farmers to retain the highest possible portion of this premium without sharing it with intermediaries. .

Modeling the choice of direct selling to hotel

Discrete choice models can be used to analyze farmers' decision of direct selling to hotels within a utility maximization framework. In these models the observed choice is considered an expression of a continuous latent variable reflecting the propensity to choose a specific option amongst diverse alternatives.

The basic assumption here is that farmer's choices are driven by a random utility model (RUM). Random utility models are founded on the assumption that agents undertake an action based on a marginal cost/marginal benefits calculation derived from the utilities achieved with their choice. The utilities are not observable, but the observed choice reveals which one provides the greater utility. In this context, binary choice logit/probit models are usually employed.

Thus, when for a particular farm the values of the independent variables are known, it is possible to estimate the probability for a farmer to sell directly to hotels and restaurants.

In the specification of the logit/probit model "y_i" denotes the category –not selling to hotels and restaurants (y_i = 0), directly selling to hotels and restaurants (y_i = 1).

The binary model estimates the probability for each farmer to be engaged in a direct selling to hotels and restaurants, given the farm and demographic characteristics of the family and of the operator. The estimated coefficients measure the influence of variables on the probability of farmers to get directly engaged in direct sales to hotels and restaurants.

Definition and description of data

Table 7 provides definitions and descriptive statistics of the variables used in the model.

The sample used for estimating the model contains information on 197 farms. The exogenous variables used to explain the farm behavior refer first of all to the characteristics of: the family (ethnicity and dimension); the farmer (age, instruction and level of involvement in farming activity); the farm (dimension, level of production of target crop, distance from the market, use of own/buyer's transport means, distance from market, participation in marketing activities).

<Table 1: Description of variables used in the model>

Farmers of the Fijian ethnic group tend to engage more in direct deliveries to hotels as compared to those with an Indian origin. Family size has a normal distribution, with an average of 4 components. Operators engaged in direct selling to hotels do farm more on a full-time basis than those not engaged, while there are no relevant differences in age and education

Farms who sell their products to hotels are on average smaller than the rest of the sample in terms of land, both total and used land, and, in the case of mango, of level of productions. In addition, they tend to use more their own and less buyer's transportation means. Another difference is that in the choice of the purchaser for their products, they rely more on extension staff recommendations and less on their own choice. Additionally, they tend to present a higher participation of their sons into the marketing activities. Finally, they more frequently make use of IPM techniques.

Results

The results of the discrete choice logit model are presented in Table 8 which shows the estimated coefficients, the odds ratio (i.e. the effect of a unit change in each independent variable on the probability of direct marketing).

The model correctly predicted the choice to directly selling to hotels in 90.82 percent of the cases.

<Table 8. Results of logit model>

Ethnicity is the only significant variable among those relating to the family. This confirms the hypothesis made in the past (Macedru, 2003) about the importance of ethnicity in determining farmers' attitude for commercial agriculture. The negative sign means that Indians farmers have a lower probability than Fijian farmers to participate in direct marketing to hotels. This can be explained with the fact that Indians, usually more trade oriented than Fijians, have already good consolidated relationships with intermediaries and wholesalers.

Variables referred to quality, that is the use of IPM and of post harvest technologies -such as cooling facilities during or immediately after the harvesting operations, selecting and grading, present the highest impact on probability of selling to hotels.

Other variable that significantly affect the decision are the distance from the market, negative, and the availability of transportation means of property. The influence of these latter variables on the probability of direct selling., though, is fairly limited.

It is interesting to note that the variable referring to extension staff recommendations in the purchaser choice, although not statistically significant, presents a positive sign; the use of personal criteria, on the contrary, shows a significant and negative impact on the choice.

Finally, it is of interest to point out that the participation of sons in the marketing activity, though not significant, appears to have a positive sign.

6 Final remarks

The information collected in the horticultural chain study confirmed that the Fijian tourism sector demand for fresh food is constantly increasing and that, due to the inconsistency of a local high quality horticultural supply, this demand is largely met by imports .

The high propensity to import limits the multiplier effect of tourism growth and, in addition, prevents the spreading of economic benefits stemming from tourism activities to the rural population.

In order to amplify the multiplier effect of tourism growth, emphasis must be placed on increasing the size and quality of the domestic agricultural supplies meant to meet the demand of Fiji's hotels and resorts.

The analysis produced has so far confirmed that the main issues to be tackled for the targeted products are still relating to an increase in the consistency of their supplies and to traditional aspects of quality -mostly referring to grading, etc.- while no interest was detected as far as more sophisticated aspects of quality are concerned –such as: geographic indications, organic or fair trade kind of certifications. While for pawpaw and mango there is still a need to develop production and to improve distribution networks so as to gather supplies from different local producers into the volumes required by the tourism sector, in the case of tomatoes efforts should also be made in improving the overall quality of this product. As for carrots, given the very low current production and the quality of current imports, it is quite unlikely that domestic growers could compete with the latter in any close future.

In addition, the application of a logit model has helped us to identify the factors that affect the farmers decision to be engaged in direct selling to hotels and restaurants. Direct selling is a particularly interesting strategy for farmers either because hotels and resorts pay premium prices for quality fresh produce, and because it allows farmers to retain the highest possible portion of this premium without sharing it with intermediaries.

Variables referred to quality, namely the use of IPM and of quality increasing post harvest technologies, have been found to have the highest impact on probability of selling to hotels. Results also suggest that ethnicity is important, with Fijian less oriented to this choice as compared to Indians. In addition, distance and the availability of transportation means of property appears to significantly increase the chances of direct selling.

Future research could be directed to better understand which are the drivers of different commercial strategies by making use of a multinomial logit model .

7 References

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Tables

Table 1. Sample dimension by survey

Survey	Interviews
Producers	238
Tourism operators	100
o Hotels	(46)
o Restaurants	(33)
o Supermarkets	(21)
Traders	50
Importers	5
Total	393

Table 2. Farmers interviewed by province and crop

Province	Fruit and vegetable					Total
	Pawpaw	Mango	Tomato	Carrot	Papaya + tomato	
Ba	22	40	21	10	0	93
Nadroga / Navosa	38	0	55	0	23	116
Ra	1	10	18	0	0	29
Total Producers	61	50	94	10	23	238

Table 3. Technology used by crop

Production technology	Pawpaw	Mango	Tomato	Carrot	Total
Traditional	83	50	91	10	234
IPM	1	0	26	0	27
Organic	0	0	0	0	0
Under transition	0	0	1	0	1
Total	84	50	118	10	262

Note: Since a producer may be growing 2 or more of the targeted commodities, the numbers in the table exceeds the number of producers (238) interviewed.

Table 4. Ranking of production problems by crop

Production problem	Papaya	Mango	Tomato	Carrot
Lack of improved varieties	1	4	6	4
Fertilizers / chemicals not available or of bad quality	2	11	3	4
Certified seed too expensive	3	5	7	2
Certified seed not available from local dealers	4	7	4	3
Too many pests and diseases	5	1	2	6
Lack of specific credit lines	6	3	8	1
Lack of technical advice	7	9	5	8
Lack of suitable land	8	2	9	9
Land tenure	9	10	10	10
Lack of water for irrigation	10	6	1	7
Inadequate harvesting technology	.	12	.	.
Trees too scattered and grow wild	.	8	.	.

Notes: Relevance of the matter decreases from 1 to 12.

Table 5. Marketing channels by crop

Selling practice	Pawpaw %	Mango %	Tomato %	Carrot %
<i>Through intermediaries</i>				
Through intermediaries when the production is still in the field/on the tree	17	28	7	0
Through wholesalers in village/town markets	9	36	20	90
Through retailers in village/town markets	9	1	11	10
<i>Direct sales</i>				
Sell directly in my farm/in front of my house/on the road side	18	8	13	0
Sell directly in village/town markets (personally or family members)	24	21	25	0
Sell directly to supermarkets	1	0	12	0
Sell directly to hotels and/or restaurants	10	1	11	0
Other	12	5	1	0
Total	100	100	100	100

Table 6. Ranking of marketing problems by crop

Marketing problems	Papaya	Mango	Tomato	Carrot	Total
Inadequate or too expensive post-harvest technology	6	7	6	7	26
Inconsistency of supply flows	5	6	8	6	25
Lack of transport	8	8	7	2	25
Final buyers too far away from the production areas	7	5	5	3	20
Unreliable demand from the tourism sector	2	3	3	7	15
Low quality of supplies	4	1	2	5	12
Lack of market information	3	3	4	1	11
Market price fluctuations	1	1	1	4	7
Other	9	9	9	9	36

Table 7: Description of variables used in the model

Variable	Description	Farms selling to hotels		Farms not selling to hotels	
		Mean	Std.Dev.	Mean	Std.Dev.
Ethnicity	Ethnicity of the operator (0 Fijian; 1 Indian)	0.35	0.49	0.61	0.49
Family_size	Number of components	2.92	1.55	3.28	1.61
Age1	Operator age (years)	47.31	11.44	47.07	10.52
Educ1	Operator education (primary=1; secondary=2; university=3)	1.92	1.32	1.68	0.94
Employ1	Operator employed exclusively or part time in the farm (exclusively=0; partially=1)	0.08	0.27	0.18	0.38
Lfarm	Total land (ha) logarithms	2.58	1.81	3.77	4.19
Lprod	Used land (ha) logarithms	8.04	18.88	12.38	35.08
P_pln	Quantity of papaya produced (ln)	3.01	4.26	2.16	3.66
M_pln	Quantity of mango produced (ln)	0.30	1.54	1.91	3.20
T_pln	Quantity of tomatoes produced (ln)	4.74	3.88	2.87	3.61
P_harv_tecn	Pre-cool, selecting and grading (0=no; 1=yes)	0.73	0.45	0.66	0.47
IPM	Use of IPM (0=no; 1=yes)	0.27	0.45	0.08	0.27
Transp_own	Own transport used (0=no; 1=yes)	38.08	40.50	30.50	44.97
Transp_buyer	Buyer's transport used (0=no; 1=yes)	25.00	31.78	29.62	43.68
Distance	Distance from selling place (Km)	7.85	9.11	24.30	37.28
Sell_extens	Purchasers choice recommended by extension staff (0=no; 1=yes)	0.31	0.47	0.13	0.34
Sell_personal	Purchasers choice: personal (0=no; 1=yes)	2.08	1.41	2.58	1.05
Sell_son	Son participates in the production, marketing activities (0=no; 1=yes)	0.15	0.37	0.13	0.34
Sell_husband	Husband participates in marketing activities (0=no; 1=yes)	0.58	0.50	0.67	0.47
Sell_wife	Wife participates in marketing activities (0=no; 1=yes)	0.15	0.37	0.23	0.42
Sell_nonfam	Non family person participates in marketing activities (0=no; 1=yes)	0.12	0.33	0.21	0.41
N		26		171	

Table 8. Results of logit model (dependent: probability of direct selling to hotels)

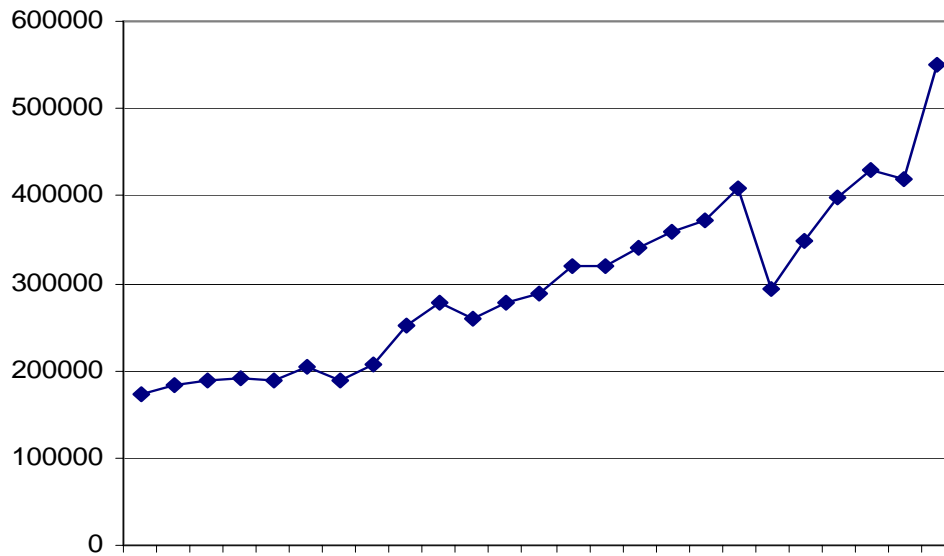
	Coefficients	Std. Err.		Marginal
Ethnicity	-3.173	1.078	***	-0.072
Family_size	-0.192	0.231		-0.002
Age1	0.048	0.030		0.001
Educ1	0.075	0.308		0.001
Employ1	-1.519	1.119		-0.013
Lfarm	0.056	0.119		0.001
Lprod	-0.011	0.013		0.000
P_pln	0.399	0.267		0.005
M_pln	-0.080	0.344		-0.001
T_pln	0.320	0.288		0.004
P_harv_tecn	2.074	1.068	*	0.022
IPM	3.337	1.282	***	0.195
Transport_own	0.031	0.013	**	0.001
Transport_buyer	-0.018	0.011		-0.001
Distance	-0.055	0.029	*	-0.001
Sell_extension	1.314	0.930		0.028
Sell_personal	-0.636	0.336	*	-0.008
Sell_son	0.874	0.959		0.015
Sell_husband	-1.884	0.792	**	0.024
Sell_wife	-0.918	0.892		-0.009
Sell_nonfam	-1.082	0.999		-0.010

Notes: *, **, and *** denote statistical significance at the 10%, 5%, and 1% levels,

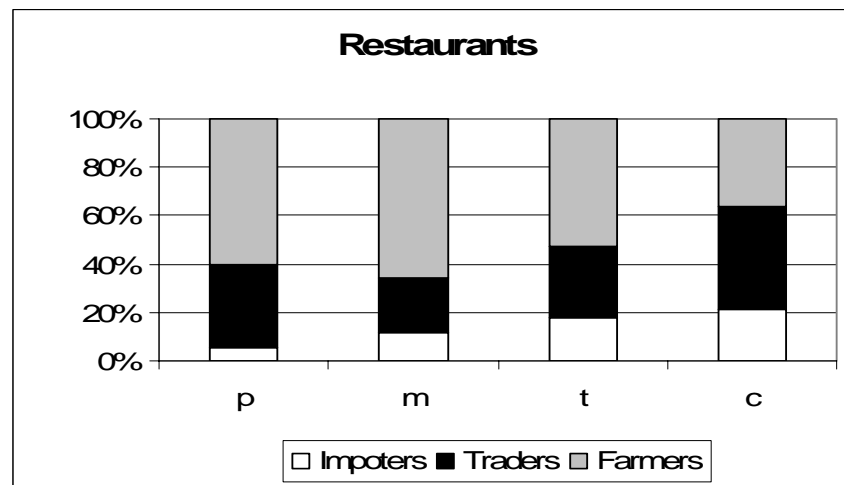
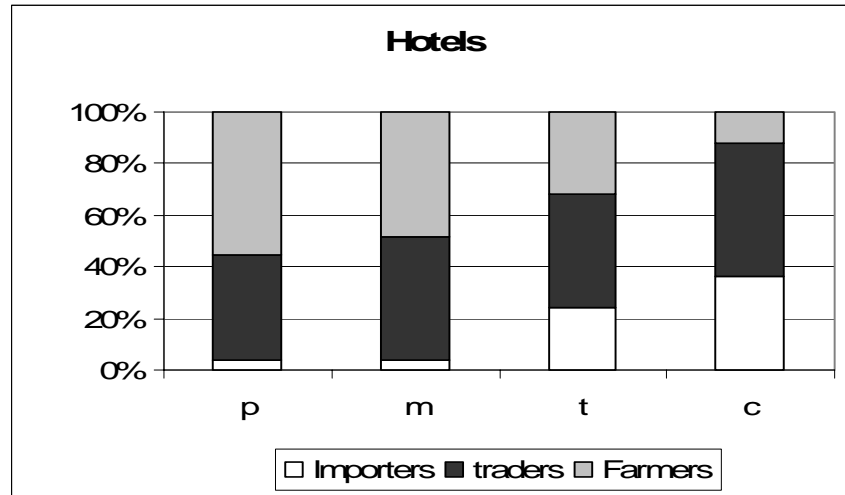
Graphs and Diagrams

Graph 1. Tourists annual arrivals

TOURISTS. Annual arrivals, 1977 - 2005



Graph 2. Hotels and restaurant - origin of purchases (percentage)



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Consumer Perception of Organic Food in Urumqi

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Summary

The market for organic products in Urumqi is at the beginning of its development. The objective of this paper is to gain knowledge about consumer's attitudes toward organic food in Urumqi which is the capital of Xinjiang Uygur Autonomous Region. The consumer's attitudes were collected by means of a face-to-face survey. Attitudes, purchasing frequency, supply satisfaction and beliefs about organic food were studied with a sample of 720 consumers. The data obtained from the survey were analyzed with univariate analysis, chi-square test, ANOVA and correlation analysis. About 44.9% of Urumqi consumers had never heard of organic food. Urumqi consumers who know organic food consider organically-grown products as very healthy, of good quality and tasty. Consumers are not very familiar with the supply of organic food in the market. One reason might be that there was very little advertisement about organic products. Some groups of consumers have more positive attitudes towards organic food, and they express an increased willingness to pay higher prices for these food. Therefore, marketing strategies for organic food should be targeted towards such groups. According to the research results, an important task for the producers will be to increase consumers' knowledge of what organic food is and how to differentiate it in the marketplace.

KEYWORDS: Urumqi, Consumer behavior, Organic food

1. Introduction

Xinjiang Uygur Autonomous Region is a big agriculture province in China, its unique oasis ecology environment and natural resources are suitable to organic agriculture. Organic agriculture is also good for Xinjiang's ecological environment and will keep it sustainable.¹ Organic food include grain, vegetable, fruit, dairy product, livestock or poultry product, honey, aquatic product and condiment.²

In China, organic food is a new concept to most consumer, green food is used to name the healthy and environment protecting products. The most conspicuous difference between organic food and green food is that artificial composite such as pesticide, fertilizer and hormone are absolutely forbidden in the production and process of organic food, but they can be used limitedly in the production and process of green food.

If the consumer could increase their knowledge and acceptance of organic food, the consumption might become the impetus of organic food production.

2. Background

In China, consumers have become more concerned about the nutrition, health, and quality of food they eat as their income increase. The demand for organic food is bigger and bigger. However, food market is becoming a saturated market. In this saturated market environment, distribution channels, marketing activities, diversification strategies, and food quality are increasingly important.

However, there are little research on the consumer attitudes and preferences of organic food in China yet. There is little knowledge about whether the consumer in China know the organic food or not and what image consumer have on organic food.

The market for organic products in Urumqi which is the capital of Xinjiang is at the beginning of its development. To the best of our knowledge, there has been no research pertaining to consumer attitudes toward organic products in Xinjiang. Therefore, Marija Radman's research³ was referred to do a survey in Urumqi.

This paper presents the results of a survey conducted with customers in six big supermarkets and two big agriculture products country fairs in Urumqi. The survey was done in November, 2005.

3. Objectives

There is no sufficient knowledge about organic consumers in Urumqi, Xinjiang, China. The objective of the paper is to gain knowledge about Urumqi consumers' perceptions of organic food. To that end, attitudes, purchasing frequency, supply place and beliefs about organic food were studied with a sample of 720 consumers. The results of this research could be used for the marketing planning of organic products, the identifying of the target segments, the proper information and sale channels and the promotion of organic food.

4. Data and methodology

The consumers' attitudes were collected by means of a face-to-face survey. Attitudes, purchasing frequency, supply satisfaction and beliefs about organic food were studied with a sample of 720 consumers. The data obtained from the survey were analyzed with univariate analysis, chi-square test, ANOVA and correlation analysis.

4.1 Survey

The survey was carried out in two kinds of places. The first is in six big super markets in Urumqi, the second is two big agriculture products country fairs where the agriculture products are sold mainly as a whole. They are Haojiaxiang supermarket on Qingnian road, Jiajiale supermarket, Qiyijiangyuan supermarket on Changjiang road, Carrefour supermarket, Wuika supermarket, Youhao department supermarket, Tianbaimingpin supermarket, Beiyuanchun and Qingnian road agriculture products country fairs in Urumqi. Face-to-face survey was made in November 2005 with shoppers in the supermarkets and agriculture products country fairs in Urumqi. Goods in the fairs include various agriculture products and prepared food, such as: vegetables, fruit, fish, meat, eggs, nuts, wine, honey, etc.

The survey was performed with a random sampling of 720 fair customers of differing demographics, including age, sex, educational and social background. Only those customers that were willing to participate in the survey were interviewed. Thus, it is not possible to calculate a response rate based on how many people declined to respond. Interviews were conducted by the senior students of Economic and Management College of Xinjiang Agricultural University and they lasted about 5-8 minutes with each respondent.

No claims can be made that the sample group represents the general populations of Xinjiang or even Urumqi. However, the fact that the supermarket and fair customers are interested in green products, and possibly in organic food, suggests that the survey respondents provide an interesting study group for this issue.

4.2 Questionnaire

The questionnaire consisted of 15 questions organized into several groups of questions, including: knowing the concept organic products, channel to get organic food information,

knowledge about the difference between green food and organic food, knowledge about supply of organic products in the market, the kinds of ecologically-grown food respondents bought, willingness to pay extra price for these products.

Several attributes of organic food were asked. Attributes examined were subjective and included: healthiness, quality, taste, shelf-life, appearance, and price. These attributes were chosen according to the results of previous research studies.³

The final section of the questionnaire dealt with socioeconomic characteristics of the respondents. Among them were demographic characteristics such as sex, age, profession, education and income.

Eleven of the questions are single choice questions, the other four questions were multiple answer questions.

4.3 Data analyses

The data obtained from the survey were analyzed with univariate analysis in order to check distributions of frequencies and to detect possible errors occurred during the research and data entering.

Chi-square, ANOVA and correlation analysis were performed to examine the differences in buying behavior and attitudes among consumer groups. Statistical analyses were made using SPSS package, and EXCEL were used for drawing some graphs.

5. Results

5.1 Sample description

The sample consisted of 431 female and 289 male. The percentage of female is 59.86, and the percentage of male is 40.14.

The average age of the respondents was 34.15 years. 37 percent of them were between 25 and 35, 31 percent were between 35 and 45, 18 percent were under 25 years old, and 14 percent were older than 45. (see Graph1)

When asked the occupation, 26.9 percent of respondents were self-employed, 22.6 percent were in enterprise, 15.7 of them work in institution, and 11.3 percent were retired, 10.3 percent of them were students, 6 percent work in government, and the others is 7.3 percent. (see Graph2)

41 percent of the respondents had higher education, 29 percent finished senior middle school, 20 percent had polytechnic school education, 8 percent completed junior middle school, the rest 2 percent belong to the other education level. (see Graph3)

The average monthly family income per capita of the vast majority of the respondents was between 800 and 1,100 RMB. There are 22.6 percent of the respondents whose monthly family income per capita is lower than 800 RMB, 21.9 percent is between 1100 and 1500 RMB. 29 percent is higher than 1500 RMB. (see Graph 4)

5.2 Questionnaire information

5.2.1 Level of the understanding of organic food

The first question asked respondents about organic products was whether the respondents have heard about organic food. About 55.1 percent (397 respondents) answered “yes” (YES group); the respondents who answered “no” (NO group) will skip to the latter questions, No group’s percentage is 44.9.

Then the respondents who answered “yes” were asked about the channel through which they heard about the organic food. 56 percent of the YES group had heard about organic food from TV, 47 percent learned about organic food from magazines, 23 percent through

internet, 16 percent get the information from supermarket, 10 percent had the knowledge from friends, and 5 percent get the organic food information from other channels. (see Graph 5)

When the respondents were asked if they have heard about green food, 94 percent of the respondents answered “yes”, but when asked in YES group if the organic food and green food are the same, the output is not satisfied as expected.(see Table 1)

Even though 64 percent of respondents know that organic food and green food are different, when asked further what are the differences, the answer is they do not know or they can't tell the difference clearly. So it might be concluded that the consumer has an obscure recognition of organic food.

5.2.2 Buying frequency

Then the frequencies to buy organic food were asked in the group who claimed to know organic food. From the Table 2, we know that 12.6 percent of YES group “never” buy organic food, 67.8 percent “rarely” buy, only 18.1 percent of the respondent claimed to buy organic food “often”. (see Table 2)

5.2.3 Buying place

70 percent of the YES group think they can buy organic food in big supermarket, 23 percent of the YES group think they can purchase organic food in agricultural products country fair, 5 percent think organic food might be bought in morning market (buy from the farmers who produce the organic products directly), and 3 percent think organic food can be found in food market. (see Graph 6)

5.2.4 Kinds of buying food

It shows that 87.2 percent of yes group claimed they had bought organic food from text above. 71 percent of this group bought fruits and vegetables, 44 percent bought milk and dairy products, 33 percent bought meat, 32 percent bought grain and oil, 23 percent bought tea, 19 percent bought eggs and poultry, and the other 19 percent bought honey. (see Graph 7)

5.2.5 Willingness to pay more money

When the YES group was asked the willingness to pay more money for organic food, 18 percent do not want to pay more, 40.3 percent are willing to pay more, 39 percent answered that it depends on the price. They might be willing to pay more money if the price of organic food is not very expensive. (see Table 3)

For the respondents who did not know organic food, the concept “organic food” was introduced by the interviewers, then they were asked the willingness to pay more money for organic food.

31.3 percent don't want to pay more money for organic food in NO group, 36.5 percent choose depend on the price, 32.2 percent are willing to pay more money for organic food. (see Table 4)

5.2.6 Acceptance extent of paying an extra price

When the YES group were asked the acceptance extent of paying an extra price for organic food, 4.3 percent chose not to answer the question, which might mean the respondents who really do not want to pay more money is only 4.3 percent, 43.3 percent choose below 10%, 35.8 percent choose between 10% and 20%, 14.1 percent choose between 20% and 30%, the respondents who are willing to pay more than 50% extra price are 0.8 percent. (see Table 5)

When the NO group were asked the acceptance extent of paying an extra price for organic food, 1.9 percent chose not to answer the question, which might mean the respondents who really do not want to pay more money in NO group is only 1.9 percent, 52 percent choose below 10%, 34.1 percent choose between 10% and 20%, 9.6 percent choose between 20% and 30%, 1.9 percent choose between 30% and 50%, the respondents who are willing to pay more than 50% extra price are 0.6 percent. (see Table 6)

5.2.7 Image of organic food

Finally the question of what are the attributes of organic food are asked in YES group. 86.9 percent think that organic food is healthy, 50.9 percent think it has good quality, 30 percent believe it is tasty, 18.6 percent consider it has long shelf life, and 19 percent hold that it is expensive, 13.1 percent consider it has nice appearance.(see Graph 8)

The image of organic food is asked in NO group. 76.5 percent think that organic food is healthy, 44.6 percent think it has good quality, 25.7 percent believe it is tasty, 18.9 percent think the organic food has nice appearance,17.6 percent consider it has long shelf life, and 17.6 percent hold that it is expensive.(see Graph 9)

5.3 Comparison between YES group and NO group

There is little difference between YES group and NO group on the aspects of distribution of sex, age, occupation, education and income. The Pearson correlation coefficient is 0.886 (N 25) ,correlation is significant at the 0.01 level(2-tailed).

There is little difference between YES group and NO group on the aspect of willingness to pay more money for organic food. (F 15.548; df 1; N 706; sig 0.000) .

There is little difference between YES group and NO group on the aspect of willingness to pay an extra price for organic products (F 4.491; df 1; N 696; sig 0.034).

5.4 Correlation in the group

There is high correlation between buying frequency and family income. The Pearson correlation coefficient is 0.391 (N 391) ,correlation is significant at the 0.01 level(2-tailed).

There is high correlation between income and acceptance extent of paying an extra price for organic food. The Pearson correlation coefficient is 0.450 (N 380) in YES group and is 0.326(N 317) in NO group, correlation is significant at the 0.01 level(2-tailed).

5.5 Details of each question

5.5.1 Channel

Chi-square analysis showed that there were differences in consumer's getting information channels with respect to their sex(χ^2 12.325; df 1; p 0.05). We found that men tend to use TV more often than women. More than 70 percent of male and 48 percent of female claimed to know organic products by TV. Further, our results suggested that old people(age over 45) get information from magazine and friends more than young people(age under 35), young people get information from net more than old people, retired people more often get information from friends, and seldom get information from net. Enterprise employees pay more attention to the supermarket's advertisements and promotions than the other groups.

5.5.2 Knowledge of the difference between organic food and green food

Our research deduce that older people get more knowledge about organic food and green food than younger people, the percentage to think green food and organic food are different is 93 in the "age over 45" group, 77 in the "age between 35 and 45" group, 62 in the "age between 25 and 35" group, 58 in the "age under 25" group.

5.5.3 The frequency to buy organic food

We find that organic food buying frequency is related to occupation, education and income. The rate claimed “often buy” is 75% in “government employee” group, 27% in “enterprise employee” group which is the second high, and 0% in retired group. The group who had higher education “often buy” rate is 21%, other groups are 13% to 16%. Family monthly income per capita over 2000RMB □ group “often buy” rate is 41%, between 1500 and 2000 RMB □ group is 30%, between 1100 and 1500 RMB □ group is 21%, between 800 and 1100 RMB □ group is 10%, under 800 RMB □ groups is 0%. Higher education, higher income, higher buying frequency.

5.5.4 Buying place

Young people more often buy organic food in big supermarket; old people more often buy organic food in food market and agricultural products country fair. The rates which “buy organic food in big supermarket” is 81% in “age under 25” group, 71% in “age between 25 and 35” group, 75% in “age between 35 and 45” group, 27% in “age over 45” group. Government employees and those self-employed more often buy organic food in big supermarket; retired people often buy organic food in agricultural products country fair. High income groups more often buy organic food in big supermarket than low income groups

Some respondents in YES group claimed to buy organic fruit and vegetables in morning markets. However, there are almost no products in morning markets in Urumqi with organic labels. It could be assumed that consumers made their own assessment that purchased products were organically grown. It might deduce that those consumers think that agriculture products purchased directly from farmers are organic products. Therefore, we could conclude that Urumqi’s consumers are not well informed about organic production.

5.5.5 Kinds of organic food to buy

The rate to buy fruits and vegetables is higher in “age over 45” group than in other groups, the rate to buy other kinds of organic food is higher in “age between 35 and 45” group than in other groups. If the income is higher, the rate to buy all kinds of organic food is higher, the difference is larger especially in fruits and vegetables and milk.

5.5.6 Willingness to pay more money

The rate for willing to pay more money is lower in “age over 45” group than in “age under 45” group, is higher in “high education” group than in other groups, is highest in government employees and is lowest in retired people group. The rate for willing to pay more money is increasing when changed from lower income group to higher income group.

5.5.7 The acceptance to pay extra price

If the extra price is under 20%, male’s acceptance rate is higher than female’s. If the extra price is over 20%, female’s acceptance rate is higher than male’s. If the extra price is under 30%, “age under 45” group’s acceptance rate is higher than “age over 45” group’s. If the extra price is over 30%, “age over 45” group’s acceptance rate is higher than “age under 45” group’s. Government employees and student more likely to accept 10-20% extra price. Retired people and self-employed people likely to accept below 10% extra price. “High education” group’s acceptance to pay more extra price is higher than the other groups. If the income is higher, the acceptance rate to pay more extra price is higher.

5.5.8 Image

There is little difference among all groups on the image of organic food.

5.6 On-the-spot observation

The interviewers observed the survey places very carefully. They found there are organic food for selling in big supermarkets. The organic food lay along with ordinary food without special shelf, and the kinds of organic food is very few. The main organic products are organic honey and organic tea, and there is no highlight to indicate its identification except the organic mark on itself. There is little advertising in supermarket for organic food. In the fruits and vegetables selling area, there is no labeled organic food.

6. Final remarks

6.1 Conclusions

Urumqi's consumers are not well informed about organic food, almost half of them even have never heard of "organic food", those who had heard of organic food could not tell clearly what organic food is. They confused organic food with green food. Consumers are not very familiar with the supply of ecologically-grown products in the market. Some consumers are "not satisfied" with the supply of organic products. They are willing to buy organic food, but they don't know where to buy.

Urumqi's consumers consider organically grown products as very healthy, of good quality and tasty. However, these products are perceived as rather expensive and of questionable appearance.

About 18 percent of respondents claimed to buy organic food "often", and another 69 percent viewed their purchase of such products as "rare". Most consumers will pay more money for organic food, 82% consumer can accept less than 20% extra price.

Organic Fruits and vegetables are bought by 71 percent of consumer, but most of them have no label. Consumers were very willing to buy organic food. However, the purchasing place showed that many respondents were not informed about organic food and organic production.

Therefore, the education of consumers must become one of the first objectives for organic producers. An important task will be to increase consumers' knowledge of what an organic product is and how to differentiate it in the marketplace. Educational activities such as organized presentations on organic production and food should be held at agriculture products fairs and open markets where the majority of the customers lack such knowledge.

Consumers are not very familiar with the supply of organic products in the market. Hence, promotional activities on organic products are of great importance to Urumqi's consumers. Visible displays in the selling place as well as promotion through media should be used more often.

The research results showed that some groups of consumers have more positive attitudes toward organic food, and they exhibit an increased willingness to pay higher prices for these products. For that reason, marketing strategies for organic products should be targeted towards those segments of consumers.

6.2 Limitation

One limitation of this study is that the sample choose place were restricted to big supermarkets and big agriculture products country fairs. The consumers who often do their shopping in morning markets and food markets or small supermarkets are neglected. Therefore, additional studies will be necessary to get information about these consumer groups for planning further marketing activities.

7. References

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Tables

Table 1 Do you think that organic food and green food are the same? (5.2.1)

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	same	65	16.4	16.5	16.5
	different	252	63.5	64.1	80.7
	not know	76	19.1	19.3	100
	Total	393	99	100	
Missing	0	4	1		
Total		397	100		

Table 2 How often do you buy organic food? (5.2.2)

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	never	50	13	13	13
	rarely	269	68	69	82
	often	72	18	18	100
	Total	391	99	100	
Missing	0	6	2		
Total		397	100		

Table 3 Are you willing to pay more money for organic food(YES group) (5.2.5)

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	no	69	17.4	18	18
	depend on the price	155	39	40.4	58.3
	yes	160	40.3	41.7	100
	Total	384	96.7	100	
Missing	0	13	3.3		
Total		397	100		

Table 4 Are you willing to pay more money for organic food?(NO group) (5.2.5)

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	no	101	31.3	31.3	31.3
	depend on the price	118	36.5	36.5	67.8
	yes	104	32.2	32.2	100
	Total	323	100	100	

Table 5 Willingness to pay an extra price for organic products(YES group) (5.2.6)

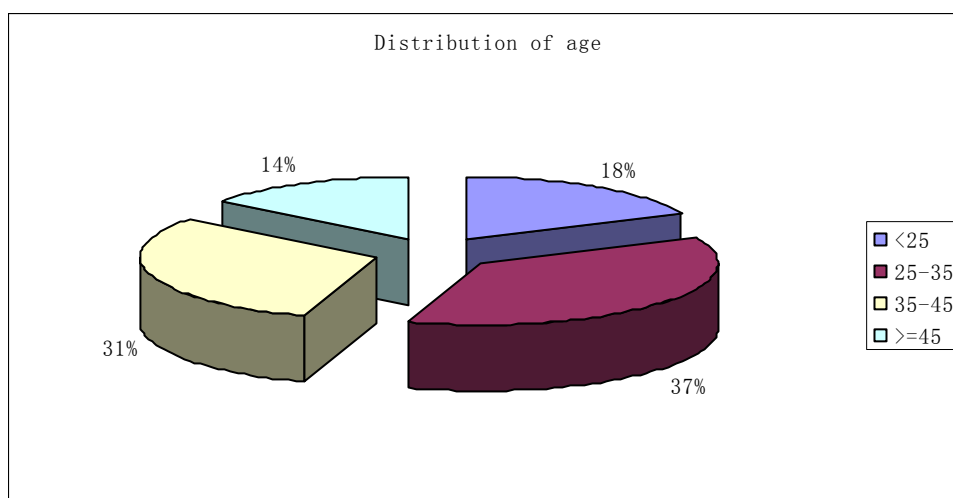
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	<10%	172	43.3	45.3	45.3
	10%-20%	142	35.8	37.4	82.6
	20%-30%	56	14.1	14.7	97.4
	30%-50%	7	1.8	1.8	99.2
	>50%	3	0.8	0.8	100
	Total	380	95.7	100	
Missing	0	17	4.3		
Total		397	100		

Table 6 Willingness to pay an extra price for organic products(NO group) (5.2.6)

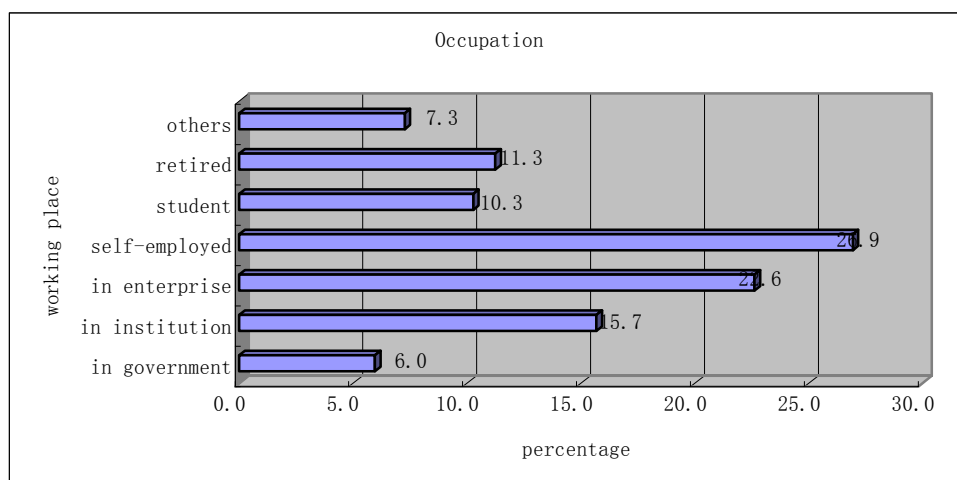
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	<10%	168	52	53	53
	10%-20%	110	34.1	34.7	87.7
	20%-30%	31	9.6	9.8	97.5
	30%-50%	6	1.9	1.9	99.4
	>50%	2	0.6	0.6	100
	Total	317	98.1	100	
Missing	0	6	1.9		
Total		323	100		

Graphs and Diagrams

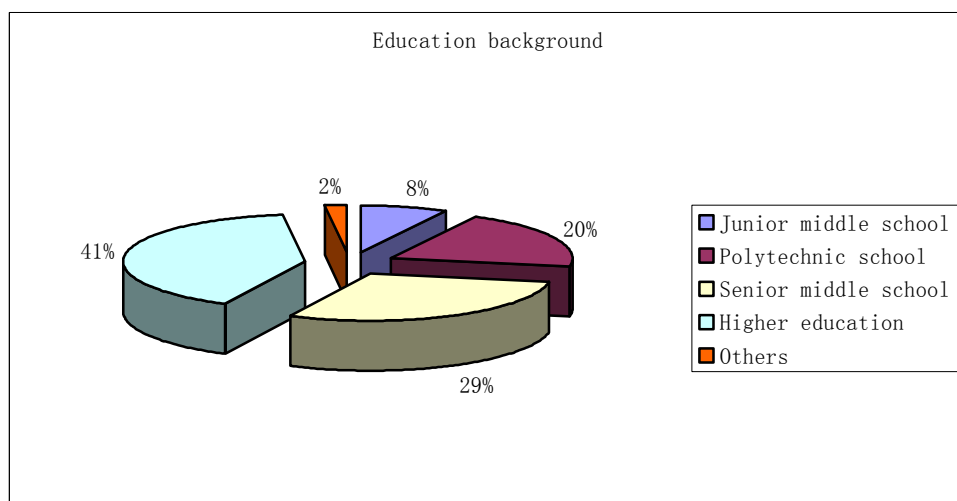
Graph 1 (5.1)



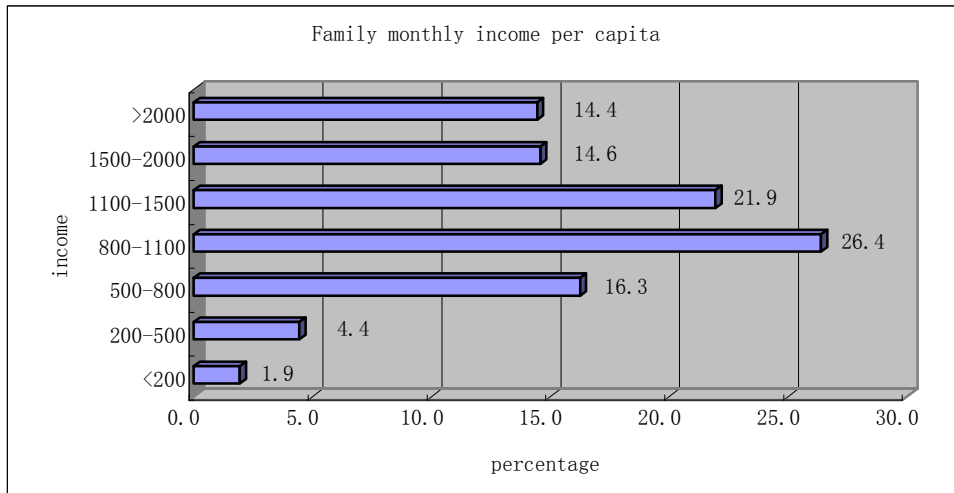
Graph 2 (5.1)



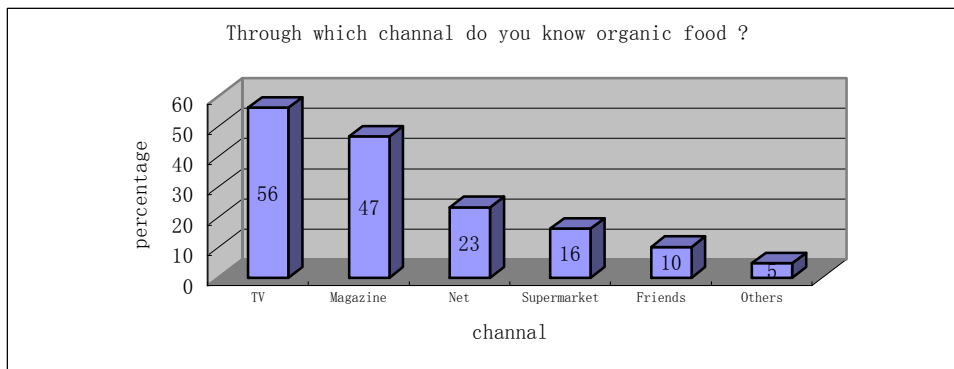
Graph 3 (5.1)



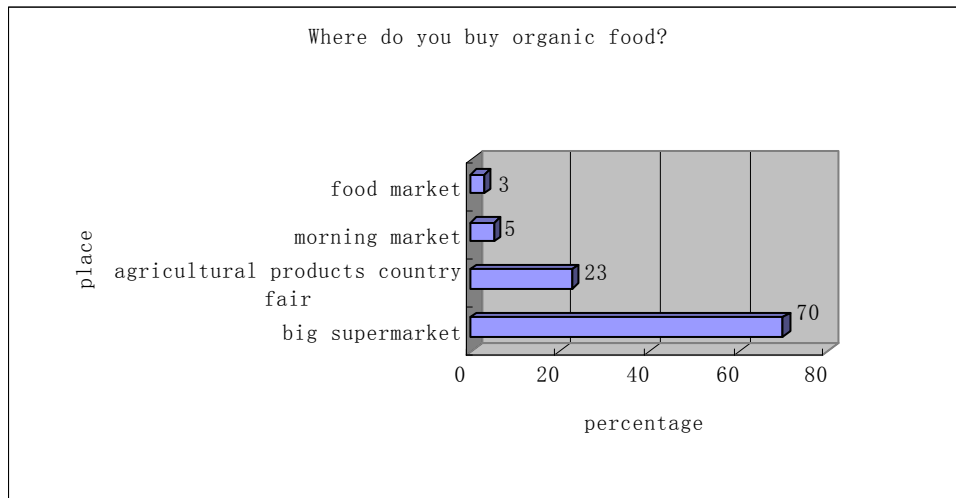
Graph 4 (5.1)



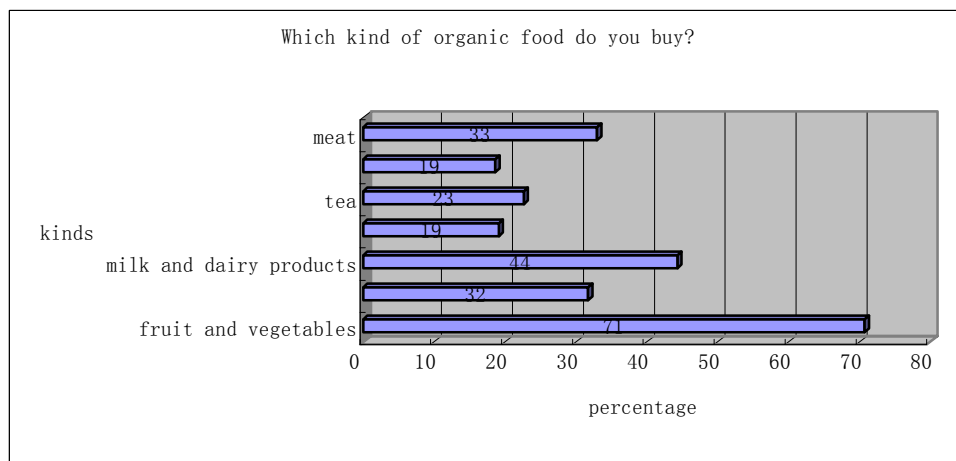
Graph 5 (5.2.1)



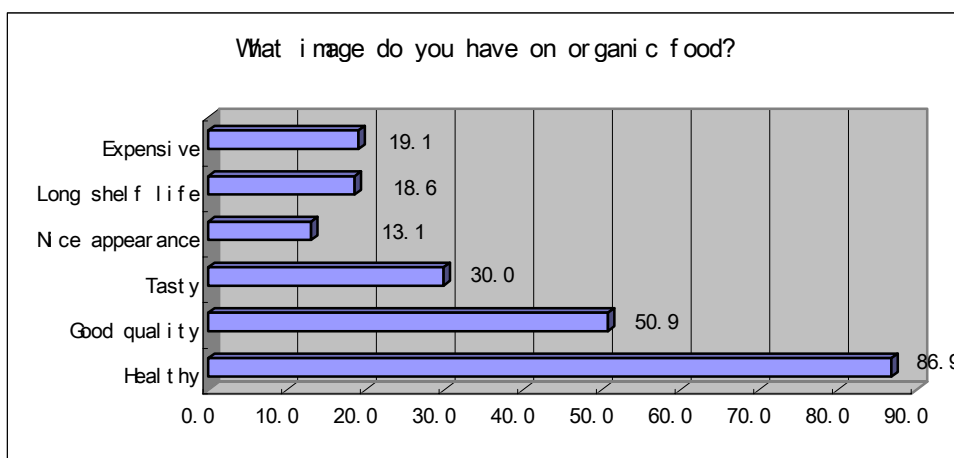
Graph 6 (5.2.3)



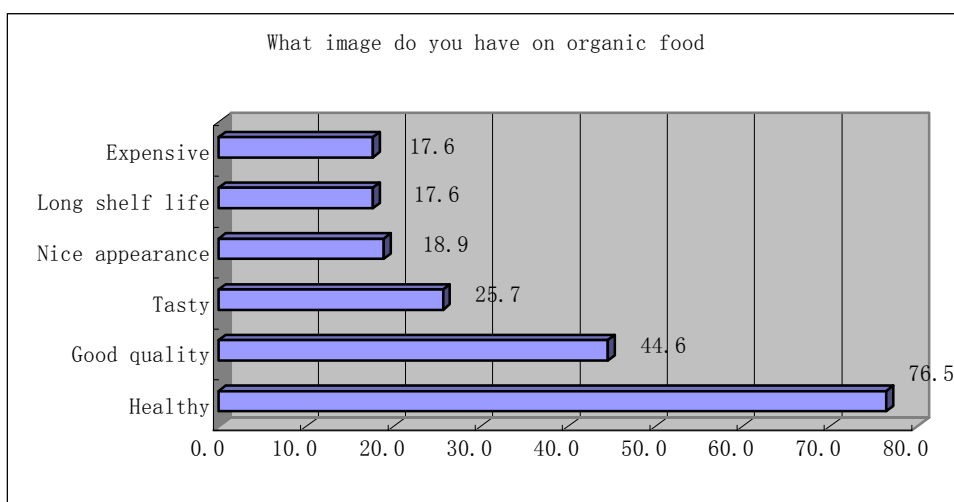
Graph 7 (5.2.4)



Graph 8 (YES group) (5.2.7)



Graph 9 (NO group) (5.2.7)



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Willingness to pay for organic food in Argentina: Evidence from a consumer survey

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Summary

Most food markets do not count on complete information about food quality for consumers. Quality has become a key concept in the new approaches of the Demand Theory (Lancaster, 1966; Antle, 1999), and, therefore, food quality information has turned into a crucial factor when explaining the existing differences between demand profiles.

Throughout these last years, organic agriculture has undergone a notorious expansion due, among other things, to the greater interest shown by consumers aware of food safety concerns involving real or potential quality risks perceptions. (Henson, 1996)

This paper aims to estimate consumers' willingness to pay (WTP) for organic food products available in the Argentinean domestic market, with a view to providing useful evidence to the government, and thus gain support in the promotion of organic production, regulation processes and labelling programs.

The Contingent Valuation Method (Hanemann, 1984) was selected to estimate WTP. Data derives from a food consumption survey conducted in Buenos Aires city in April 2005. The parameters estimates for the selected products were obtained by applying a Binomial Multiple Logistic Regression.

The results indicate that Argentinean consumers are willing to pay a price premium to acquire better quality products. Indeed, this is conditioned by the effective prices in the domestic market, in which price premiums range from 6% to 200%, thereby restricting their acquisition. Besides, the scarce availability of these healthy products has also become another meaningful obstacle for domestic consumption expansion in Argentina.

KEYWORDS: Willingness to pay, Food quality attributes, Organic price premium, Argentina.

1. Introduction

Most food markets do not count on complete information about food quality for consumers. As a consequence, quality has become a crucial concept in the new approaches of the Demand Theory (Lancaster, 1966); and so, Antle (1999) started to incorporate it in food demand functions as an additional variable.

Quality is a wide and subjective notion that refers to different kinds of attributes that could either be verified by consumers or not, before or after purchasing food, e.g. colour, temperature, taste, nutritional facts, applied processes -such as irradiation or genetic manipulation- and added substances during the productive processes.

Quality uncertainty has played a key role in the literature about safety and products liability. Several articles have dealt with quality and uncertainty, the most relevant of which is that by Akerlof (1970), which demonstrates that, even though suppliers can determine quality by incurring greater costs, consumers cannot test quality before purchasing, and then bad goods tend to drive good ones out. Consumers acquire products based on their perceived quality expectations. The attributes of the quality-nutritional content, i.e.; food safety attributes; convenience; place and manner of production, including environmental production processes, are all valued in accordance with consumers' subjective perception.

When purchasing food, consumers make their choices by comparing prices and qualities. Such choices are definitely conditioned by the uncertainty they perceive in relation to the different qualities offered; in other words, by the information available to them. Before purchasing, consumers could get better informed, though to a certain extent, since that would imply additional search costs. (Andersen & Philipsen, 1998) Hence, food quality information is an attribute in itself and becomes a crucial factor when explaining the differences existing between demand profiles.

Throughout these last years, organic agriculture has undergone a remarkable expansion due, among other things, to the greater interest awoken in producers and consumers. Such interest arises from an awareness process that involves food safety concerns. These concerns are related with real or potential quality risks perceptions linked with technologies applied to food production and processing. (Henson, 1996)

In Argentina, key factors such as very good agro-ecological conditions; intensive labour requirements and increasing export perspectives for these differentiated foods, could transform organic production into an attractive activity for farmers, distributors and retailers, thereby improving the development of our regional economies. Even though Argentina relies on national organic dispositions which have turned it into the First Third Country with a national regulation adapted to the European Union requirements (1993)¹ as well as on a private certification system accredited by SENASA (National Service of Agrifood Quality and Safety) and on significant public research actions carried out by technological institutions such as the INTA (National Institute of Agricultural Technology) and universities, information scarcity remains a gap to be bridged as it confines supply and demand quantification and the potential market growth. (Rodríguez, 2005)

The total organic production in Argentina reached 71,748 Mt. in 2005 (SENASA, 2006); 94 percent was destined to the foreign market in the same period. The domestic market, on the hand, demanded as little as the remaining 6%. The biggest marketing export volumes are cereals -corn and wheat-, oils and soybean. Fruits -apples and pears- and industrialized products such as sugar and wines are placed behind; and aromatic herbs rank third. Cereals and oils are also central products in the domestic market due to their high volume, and vegetables and pulses are noteworthy because of their diversity.²

The organic sector in Argentina has grown thanks to its own efforts. No governmental direct subsidies or economic aids are provided to this sector. Some public funding for research and teaching activities are available, and other official export agencies help producers attend international fairs.

Along these lines, the INTA fosters key public research actions to develop new technologies and train farmers and the SAGPYA (National Agricultural Office) has implemented the National Program for the Development of Organic Production (PRONAO). This program aims at promoting organic product on a domestic basis, increasing the number of producers committed to this activity, developing new markets, and creating well-informed consumers.

In the Argentinean domestic market, many consumers are willing to pay higher prices for healthy products, i.e. organics, because they increase their utility level reducing health

¹ Since 1993, Argentina has been recognized as an organic certified country included in the list of Third Countries. This has enabled it to export organic product processed and certified in accordance with standards equivalent to those of the EU (International Federation of Organic Agriculture Movements - IFOAM).

² Other processed organic products such as olive oil, sugar, concentrated juices, honey and wine, regardless of their low production volumes, are also attractive export alternatives. The European Union imports more than 80% of the Argentine organic products, the rest is exported to the United States.

risks. Even if the part these “safe products” play in the food consumption budget is still small, they are considered a market niche of great potential growth.

The main restrictions to expanding the domestic demand is the lack of information available to consumers; prices over those of conventional foods; and the limited and erratic domestic supply. Besides, many consumers do not trust the certification proceedings carried out by private certification agencies. (Rodríguez, 2005)

2. Background

2.1 Estimation of Willingness to Pay (WTP)

Many consumers seek food safety and are willing to pay higher prices for “healthy or nutritive products” since they increase their utility level, reducing, at the same time, health risks. However, they are unable to ascertain food safety before purchase, being this the most important constraint to economic efficiency in the production and marketing of food safety. Since some of these health risks benefits are hard to assess, a method commonly applied to determine food safety benefits is estimating consumers’ willingness to pay for safer and better quality food. (Goldberg & Rosen, 2005)

Along these lines, the notion of *willingness to pay* could be defined as the sum of money representing the difference between consumers’ surplus before and after adding or improving a food product attribute. Van Ravenswaay & Wohl (1995) and Halbrendt *et al.* (1995) introduced models that estimate consumers’ willingness to pay when adding or enhancing a given quality attribute. Such models lie on Lancaster approach (1966), which sustains that consumers directly derive utility from goods’ attributes.

When measuring willingness to pay (WTP), some methodologies apply primary data directly derived from consumers. These methods are Contingent Valuation, Conjoint Analysis and Experimental Auctions. Hedonic Prices is the most well-known method used indirect sources to infer consumers’ willingness to pay. While the methodologies in the first group lie on consumers’ elicited preferences, Hedonic Prices is based on consumers’ revealed preferences. (Lee & Hatcher, 2001)

2.2 Measuring WTP by applying the Contingent Valuation Method (CVM)

In this study, the selection of the Contingent Valuation (Hanemann, 1984) as the method applied to estimate consumers’ willingness to pay resulted from a theoretical and empirical analysis concerning those methods most commonly applied.

CVM creates a hypothetical market situation for a given good or service. It tends to quantify the value consumers confer to products by associating that value with the sum of money they are willing to pay. (Kawagoe & Fukunaga, 2001) Researches conducted by CVM offer a specific survey design, especially when they inquire about WTP. They solicit information about consumption behaviour, risks perceptions and experiences, and socio-demographic information. (Mitchell & Carson, 1989; Carson, 1999) Respondents face a hypothetical purchasing situation in which they have to answer how much money they are willing to pay for a given product, or if they are willing to pay a certain premium, expressed either as a sum of money or as a percentage above the reference price. (Carmona-Torres & Calatrava-Requena, 2006)

Before asking respondents, the researcher must define the different price premiums (so called “starting points”). A frequent way of so doing is by conducting a pilot test. Still, other criteria such as iterative selection (Cooper, 1993), random premiums definition (Gil *et al.*, 2000) or questions based on the effective prices at the survey’s points (Ara, 2002) are also common. In the last option, chosen in this study, it is assumed that if the respondent

answers the questions in the supermarket or specialized store where he/she is shopping, they will be on the basis of the prices charged by such supermarket or store.

2.3 Determinants of WTP for Organic Food

Several references³ in papers covering consumers' WTP for attributes linked to food safety and food quality support the use of the Contingent Valuation Method; and many of them especially deal with WTP for organic food.

Most recent studies conducted on the potential market for organic agriculture have tried to establish connections between the WTP of these products and a particular lifestyle (Hartman & New Hope, 1997; Gracia *et al.*, 1998). Consumers segmentation based on those variables has resulted in several profiles of potential organic consumers. Despite the notorious ambiguity of the socio-demographic profile, (Thompson, 1998) generally speaking, these consumers show a purposeful attitude towards a balanced life between their duties and their free time; eating healthy food and decreasing agriculture impact on the environment. The choice of these differentiated foods is definitely related to nature and to the extent in which food safety concerns consumers. (Henson, 2001)

Results from empirical works carried out in countries with a significant level of organic food consumption demonstrate that the main reason why these foods are acquired is associated to health care, either because of disease suffering or disease prevention. (Kuchler *et al.*, 2000) Besides, due to their low pesticide-residue content, these products are considered as beneficial, at least speaking of vegetal-origin products. (Weaver *et al.*, 1992; Baker, 1999) As regard meat products, e.g. chicken meat, the risks perception linked to hormone use along the productive process is remarkable. (Farina & de Almeida; Rodríguez & Lacaze, 2005)

Earlier studies conducted in Buenos Aires⁴ city (Rodríguez *et al.*, 2005; 2006), the most populated city in Argentina, concluded that Argentinean consumers are worried about healthy and nutritive food, unsafe productive processes and health care, which are key factors to organics consumption. Taste and nutritive attributes are other relevant factors mentioned as well.

Argentineans seem to be "Europeanized" in so far as they place no trust in the regulatory system's ability to monitor and guarantee food safety. (Rodríguez *et al.*, 2006) In Córdoba, Mendoza and Mar del Plata cities consumers do not trust organic certification bodies. They usually link organics with local, homemade and handmade food, and, therefore organic producers and retailers constitute important credibility sources, attracting relatively more consumers. (Rodríguez & Lacaze, 2005)

Socio-demographic variables have been widely explored as WTP predictors for organic food products. Gil *et al.* (2000) asserted that the variable that better approximates WTP is lifestyle rather than the usual socio-demographic factors.

Indeed, the relationship between income level and WTP offers controverted and contradictory empirical evidence. A greater degree of confidence in food supply was verified in higher income levels. (Buzby *et al.*, 1995) This would explain and determine, at the same time, the investment of a great proportion of income to purchasing food products perceived as safer and of better quality. (Govindasamy & Italy, 1999) Some studies have

³ Eom (1994); Buzby *et al.* (1995, 1998); Cao *et al.* (1995); Caswell (1995); Cummings *et al.* (1995); Wessells & Anderson (1995); Govindasamy & Italia (1997, 1999); Fox *et al.* (1998); Huang *et al.* (1999); Kuchler & Golan (1999); Gil *et al.* (2000); Shogren *et al.* (2000); Stenger (2000); Govindasamy *et al.* (2001); Ara (2002); Loureiro *et al.* (2002); Corsi & Novelli (2003); Kola & Latvala (2003); Conner & Christie (2004); Traversi & Nijkamp (2004); Goldberg & Roosen (2005); Goldberg *et al.* (2006); Onozaka *et al.* (2006)

⁴ Buenos Aires, capital of the Republic of Argentina, is the most densely populated city and centers most trading activities in the country.

found direct associations between income and WTP either regarding risk reduction, derived from consuming healthier and safer food products, (Jordan & Elnagheeb, 1991; Blend & van Ravenswaay, 1998) or certified quality (Misra *et al.*, 1991; Underhill & Figueroa, 1996).

Educational level turns out to be the most controverted socio-demographic predictor. Misra *et al.* (1991) obtained a negative correlation between education and fresh organic products consumption. Groff & Kreider (1993) observed that those consumers with lower educational instruction considered fresh organic products as of higher quality than conventional ones; and therefore, were willing to pay higher prices for them. Govindasamy & Italia (1999) also obtained an inverse relationship between WTP and education. To explain so, they formulated two observations. On the one hand, the lower the educational level, the higher the risk perception; and, on the other, the higher the educational level, the greater the confidence in production standards. In addition, Eom (1994) found that better educated consumers seem to be more reluctant to modifying their consumption habits, due to the relevance these people ascribe to the information concerning food risks of little or null probability of occurrence. He adds, as an explanation, that better educated people seem to understand scientific information related with food risks, and, therefore, are more skeptical about the alleged benefits that the less risky food would generate. Van Ravenswaay (1995) also affirmed that higher education respondents can easily access to trustful information sources about food risks and benefits and, generally speaking, they are less worried about these issues.

In Argentina, consumers' perceptions about organic food quality are better WTP's predictors than other socio-demographic variables such as respondent's gender or age. (Rodríguez *et al.*, 2006) The better educated consumers, who eat healthy food, and consider food control organisms as 'inefficient', are more likely to buy organic products. According to these results, educated people seem to be more exposed to diet and health information sources, and can better understand and process them.

Several researches have focused on the obstacles hindering organic food demand expansion. Higher prices and products shortage in supermarkets should be mentioned as the most relevant ones (Michelsen *et al.*, 1999; Richman & Dimitri, 2000; Gil *et al.*, 2000) together with the degree of relative satisfaction in relation to conventional food organic products and the level of information about food quality consumers have access to. (Morris, 1996; Roddy *et al.*, 1994; Pearson, 2001) Byrne *et al.*, (1991) asserted that prices are strong restrictive factors against organic market expansion. Govindasamy & Italia (1999) affirmed that the price premiums over conventional prices can become a barrier to those consumers who do not buy organics regularly. Due to the significant differences between WTP and current price premiums, organic food prices constitute a major obstacle to organics trading, at least from a consumers' viewpoint. (Sánchez *et al.*, 1998; Thompson, 1999; Soler, 2000) Rodríguez *et al.* (2006) highlight that Argentinean consumers would increase their organic consumption level if organic food were cheaper. This is explained by consumer price premiums which range from 0% to 250%.⁵ Since higher prices and products scarcity in supermarkets are important constraints to organic consumption in the domestic market, these variables unfailingly affect consumers' willingness to pay more. It is worth mentioning that the degree of relative satisfaction obtained from organic and conventional food constitutes a relevant factor when explaining consumers' choices.

⁵ Price premium is the additional percentage charged for organic products when compared with conventional products prices.

In the EU, the higher prices charged for organic products vary across countries and depending on the product, just like in Argentina. According to available data, in the EU price premiums range from 0% to 300%. (Hamm *et al.*, 2002)

3. Objective

The purpose of this paper is to estimate consumers' willingness to pay for different organic food products available in the Argentinean domestic market. The results yielded by this study are expected to provide some useful governmental evidence to support the promotion of organic production, regulation processes and labelling programs in Argentina so as to contribute to organic food domestic market expansion.

The following *hypotheses* are to be tested:

- As a quality attribute, the risk reduction associated with health care rises consumer's utility level and, consequently, asserts the willingness to pay for organic food products.
- The impact of regulation processes on the willingness to pay for organic unprocessed products is lower than for organic processed products.
- The highest willingnesses to pay for organic food products are not always in agreement with real market prices.

4. Data and methodology

4.1 Data

The data in this study derives from a food consumption survey conducted in Buenos Aires city, Argentina, in April 2005, by applying a semi-structured questionnaire. 301 surveys were completed by trained interviewers who intercepted respondents in the largest supermarket chains and also in an important specialized organic store.⁶ The sample was based on age and gender local distribution pursuant to the last National Population Census in Argentina (INDEC, 2001), for respondents aged 18 or above with a medium-high socio-economic level.⁷ Respondents were surveyed upon leaving the stores.

Table 1 provides the representativeness of the sample in terms of the demographic structure of Buenos Aires city population according to gender and age:

⁶ Supermarket chains: Coto, Disco, Jumbo, Norte and Wall Mart. Specialised organic store: La Esquina de las Flores.

⁷ As defined by the Argentine Marketing Association (AAM). [Available online]
URL: <http://www.aam-ar.com>

Table 1. Sample representativeness in terms of Buenos Aires city demographic structure according to gender and age (18-87 years old)

Comparison between Survey Sample⁽¹⁾ and Population Census in Buenos Aires City			
Demographic characteristics	Categories	Relative frequency	
		Representation in the survey sample	Representation in Buenos Aires City
Respondent's GENDER	Male	32%	44%
	Female	68%	56%
Respondent's AGE (in years)	18-24	15%	14%
	25-34	19%	20%
	35-49	26%	24%
	50-59	15%	15%
	60-87	25%	27%

Proportion of Buenos Aires city population in relation to Argentinean overall population			
	Buenos Aires City	Argentina	
Population	2,174,017	23,927,108	9%

⁽¹⁾ N = 301

Source: Consumption survey, Buenos Aires City/2005 and Population Census in Argentina (INDEC/2001).

The survey sample yields a higher female proportion as may be expected since grocery shopping is mostly a female activity. (Baker, 1999; Ara, 2002; Chen *et al.*, 2002)

A convenience sample was selected and applied due to the difficulty to spot the target population, i.e., individuals who usually (or frequently) shop organic foods (or did in the past). In this type of convenience samples, the probability of being selected is unknown. But with a theory-based model and using relatively balanced explanatory variables, a convenience sample could be used to obtain model-based inferences. (Brewer, 1999; Chow, 2002; Schonlau *et al.*, 2002)

4.2 Methodology

A hypothetical market situation for a good or service is created by means of the Contingent Valuation Method (CVM). Carson *et al.* (1994) documented well the advantages of CVM as the most widely used method for estimating willingness to pay. It constitutes a flexible measuring tool to deal with quality attributes changes. Besides, it is easy to apply and less expensive than other methods. The data used in the procedure derived directly from consumers.

The dichotomous question about WTP was asked following the procedure applied by Ara (2002). Therefore, each respondent was asked at the sampling point if he/she was willing to pay the difference between conventional and organic prices.

In order to obtain the parameters estimates for each selected product, a Binomial Multiple Logistic Regression was applied: Regular Milk, Leafy Vegetables, Whole Wheat Flour, Fresh Chicken and Aromatic Herbs. As a preliminary step, the estimated model was as follows:

$$WTP_{ij} = \alpha + \beta_1(P_j) + \beta_2 Y_j + \beta_3 \pi_j + F(Z_j) [1]$$

Where:

WTP_{ij} i consumer's willingness to pay for j selected food product;
 $\alpha, \beta_1, \beta_2, \beta_3$ Coefficients to be estimated, where P is the organic price premium,⁸

⁸ This variable was calculated as follows: (Average organic price – Average conventional price) / average conventional price. The differences between average organic and

Y	Income level;
π	Risks and quality attributes perceptions;
Z	Socio-demographic characteristics.

This equation was estimated by Maximum likelihood, and WTP was calculated following the procedure used by Hanemann (1984), and applied by several studies (Donovan & Nicholls, 2003; Loureiro & Umberger, 2003; Afroz *et al.*, 2005):

$$WTP_{ij} = H + \frac{1}{\beta_1} \ln \left[\frac{1 + \exp[-(d + \beta_1 H)]}{1 + \exp(-d)} \right] \quad [2]$$

Where:

β_1	Coefficient estimated for P variable (organic price premium);
H	Highest organic price premium observed in the market;
-d	= $\alpha + \beta_2 Y_j + \beta_3 \pi_j + F(Z_j)$, according to [1];
j	Selected food products.

5. Results

5.1 Socio-demographic Sample Characterization

Sixty eight percent of the respondents were female. The average sample age was 44, and the highest absolute frequency ranged between 35-49 years, and 60 years or more.

Thirty four percent of the respondents sustained that they usually consumed organic food or at least had once in the past. These were called “organics consumers”. The remaining 66% stated that they had never consumed organics or that did not know if they had done so. These were called “organics non-consumers”.

Thirty eight percent of the respondents stated that they earned U\$S 500 or less per month, while for the remaining 62%, the household monthly income was above U\$S 500. Still while 67% of organics consumers earned above U\$S 500, these differences are not so significant for non-consumers.⁹

Regarding educational level, 20 percent of the respondents had not completed high school, and more than a half had gone into further education, even though they had not graduated. 29% held a university or postgraduate degree.

The sample descriptive results are shown in Table 2 below.

conventional prices are referred to in the paper as “price premiums”, and expressed in percentages. See Section 5.2 for prices collection procedure and average prices calculation.

⁹ For comparative purposes, notice that in April 2005, an Argentinean citizen living in Buenos Aires city was considered below the poverty line if he/she made less than U\$S 83.35 per month. Therefore, a 4-member family with 2 children had to earn U\$S 285 monthly to be above such poverty line. (INDEC, 2005)

Table 2. Socio-demographic Sample Characterization

Socio-demographic Variables	Total Sample (100%)	Organics consumers (34%)	Organics non consumers (66%)
<i>Respondent's gender</i>			
Female	68%	66%	69%
Male	32%	34%	31%
<i>Respondent's age (in years)</i>			
18-24	15%	16%	15%
25-34	19%	19%	20%
35-49	26%	27%	26%
50-59	15%	16%	15%
60 or +60	25%	23%	23%
<i>Respondent's household's monthly income ⁽¹⁾</i>			
≤ U\$S 500	38%	33%	45%
> U\$S 500	62%	67%	55%
<i>Respondent's educational level</i>			
Unfinished High School	20%	10%	24%
Unfinished University	51%	54%	50%
University or Postgraduate degree	29%	36%	25%

(1) Exchange Rate: 3 Argentinean Pesos (\$) equals 1 U.S. Dollar (US\$).

Source: Author's Calculation. Consumption survey, Buenos Aires City/2005

5.2 Current Organic Price Premiums in the Domestic Market

The price of the five selected food products was provided in the sampled stores. In accordance with the aim of this study, average price premiums were calculated and expressed in percentages.

The selected products' description is displayed in Table 3. This selection is justified by different consumers' perceptions linked to the productive processes risks involved and the confidence the nutritional information in the organic food labels provides.

Table 3. Products' Prices Collection

Selected Product	Description	Packaging	Net Content
<i>Regular Milk</i>	Regular Milk	Carton	1 lt.
<i>Leafy Vegetables</i>	Fresh Leafy Vegetables: Chard, Green Onion, Parsley, Leeks, Cabbage, Rocket and Chicory Escarole	Plastic trays	½ kg.
<i>Whole Wheat Flour</i>	Whole Wheat Flour	Carton	1 kg.
<i>Fresh Chicken</i>	Fresh Chicken	Plastic trays	1 unit
<i>Aromatic Herbs</i>	Tarragon Oregano Black Pepper	Plastic envelopes	15 gr. 20 gr. 50 gr.

Source: Author's Calculation. Consumption survey, Buenos Aires city/2005

Prices result from the interaction of supply and demand, whose relationship is determined by product's availability and demand. Organics price premiums reflect both the higher costs and the consumers' WTP for the product itself. Also, the relative degree of satisfaction between organic and conventional available options, and the market (domestic or foreign) where they are sold.

Price premiums gaps were estimated by comparing current prices data with the results of a previous study also conducted in Buenos Aires city. (Rodríguez *et al.*, 2003) Available data

correspond to 2005-2002, and estimations were offered only in the cases in which the products had been available in both reference years.

Table 4. Organic over Conventional Products Price Premiums Gaps

Organic over Conventional Products Price Premiums Gaps – Argentinean Domestic Market			
<i>Selected Product</i>	<i>2002 Price Premium</i>	<i>2005 Price Premium</i>	<i>2005-2002 Gap Change</i>
<i>Regular Milk</i>	-0.61%	13.66%	↑
<i>Leafy Vegetables</i>	21.80%	83.87%	↑
<i>Whole Wheat Flour</i>	172.31%	6.15%	↓
<i>Fresh Chicken</i>	⁽¹⁾	25.15%	?
<i>Aromatic Herbs</i>	62.35%	201.33%	↑

⁽¹⁾ No data available.

Source: Author's Calculation. Consumption survey, Buenos Aires City/2005.

Table 4 above shows the differences among products. Whole wheat flour is within the narrowest price premium gap. The 10% to 30% premium gap encompasses regular milk and fresh chicken; and finally, leafy vegetables and aromatic herbs yield the widest premium gaps.

Ever since the devaluation of the peso in 2002, the prices of conventional and organic food products have increased; however, in relative terms, higher organic prices seem to be lower. This has led to relative reductions in the premiums between organic and conventional products prices, just as the case of whole wheat flour.

Argentinean production has foreign markets as its main destiny. Therefore, the domestic prices of tradable goods rise in the country as export prices do. This is the case of aromatic herbs.

Organic fresh chicken (unavailable in the domestic market in 2002) yielded in 2005 an average 25% premium price over the conventional fresh chicken price sold in the sampled stores.

While in 2002 organic regular milk seemed to be cheaper than conventional milk, in 2005 the opposite occurred with a 13% price premium. This could be explained by the sharp increase of dairy products since 2003. The same applies to organic leafy vegetables which registered a dramatic rise during 2005-2002.

According to an EU Report,¹⁰ price premiums are in general lower for processed products (e.g. whole wheat flour and regular milk) than for unprocessed products (e.g. fresh chicken and leafy vegetables). If Table 4 is analysed, it can be concluded that this trend replicates in Argentina. Yet, the opposite applies to aromatic herbs, because of the incidence of export prices on domestic prices, as explained above.

¹⁰ Commission Européenne G2 EW – JK D 2005 Report.

5.3 Empirical Results of Binomial Logit Models

The parameters estimates for each selected product were obtained by applying a Binomial Multiple Logistic Regression using the Statistical Package for Social Sciences (SPSS version 11, 2001). Table 5 lists the explanatory variables selected in the Logit Models:

Table 5. Description of Models' Variables

<i>Dependent Variable</i>		<i>Categories</i>
<i>WTP</i>	<i>If the respondent is willing to pay the current price premium for the product</i>	<i>1 = Yes, 0 = Otherwise</i>
Categorical Explanatory Variables		Categories
<i>CONSUMP</i>	<i>If organics are usually consumed in the respondent's household</i>	<i>1 = Yes, 0 = Otherwise</i>
<i>LABELS</i>	<i>If the respondent is used to reading food labels when buying</i>	<i>1 = Yes, 0 = Otherwise</i>
<i>PRESERV</i>	<i>If the respondent perceives the high risks of preservatives in regular milk content</i>	<i>1 = Yes, 0 = Otherwise</i>
<i>HORMONE</i>	<i>If the respondent perceives the high risks of hormones in conventional fresh chicken content</i>	<i>1 = Yes, 0 = Otherwise</i>
<i>PESTICIDDEV</i>	<i>If the respondent perceives the high risks of pesticides in conventional leafy vegetables content</i>	<i>1 = Yes, 0 = Otherwise</i>
<i>PESTICIDF</i>	<i>If the respondent perceives the high risks of pesticides in conventional whole wheat flour content</i>	<i>1 = Yes, 0 = Otherwise</i>
<i>DIFORCON</i>	<i>If the respondent believes that there is no significant difference between organic and conventional food products</i>	<i>1 = Yes, 0 = Otherwise</i>
<i>RISKSCON</i>	<i>If the respondent believes that there are no significant risks when consuming conventional food</i>	<i>1 = Yes, 0 = Otherwise</i>
<i>AVAILABLE</i>	<i>If the respondent would be willing to buy organics if they were more available</i>	<i>1 = Yes, 0 = Otherwise</i>
<i>REGULATION</i>	<i>If the respondent agrees to the need of a food quality regulation system</i>	<i>1 = Yes, 0 = Otherwise</i>
Quantitative Explanatory Variables (in percentages)		
<i>RMPP</i>	<i>Organic regular milk price premium over conventional regular milk price</i>	
<i>LVPP</i>	<i>Organic leafy vegetables price premium over conventional leafy vegetables price</i>	
<i>WWFPP</i>	<i>Organic whole wheat flours price premium over conventional whole wheat flours price</i>	
<i>FCPP</i>	<i>Organic fresh chicken price premium over conventional fresh chicken price</i>	
<i>AHPP</i>	<i>Organic aromatic herbs price premium over conventional aromatic herbs price</i>	

Source: Author's Calculation. Consumption survey, Buenos Aires City/2005.

Tables 6-A to 6-E below display the estimated models. For all products under consideration, models were estimated taking into account two income levels: U\$S 500 or less and more than U\$S 500.

Table 6-A. Results from the Estimated Logit Models – Regular Milk

Model 1: Regular Milk – Respondent's Household's Monthly Income > U\$S 500					
	Parameter estimate (β)	Std. Error	Wald Statistic	p value	Odds ratio (e^β)
CONSUMP	1.085	0.428	6.423	0.011 **	2.958
AVAILABLE	1.394	0.438	10.122	0.001 ***	4.031
REGULATION	1.078	0.523	4.251	0.039 **	2.938
RMPP	0.052	0.029	3.234	0.072 *	1.053
Constant	-2.214	0.729	9.216	0.002***	0.109

$n_1 = 146$ (48% of the total sample) - Notes: Cut-off = 0.50 - *** 1%, ** 5%, * 10% significance levels.

Model 2: Regular Milk – Respondent's Household's Monthly Income \leq U\$S 500					
	Parameter estimate (β)	Std. Error	Wald Statistic	p value	Odds ratio (e^β)
CONSUMP	1.318	0.656	4.039	0.044 **	3.737
AVAILABLE	2.453	0.576	18.142	0.000 ***	11.629
REGULATION	1.538	0.615	6.261	0.012 **	4.657
RMPP	0.084	0.049	2.940	0.086 *	1.088
Constant	-3.418	1.077	10.077	0.002 ***	0.033

$n_2 = 99$ (33% of the total sample) - Notes: Cut-off = 0.50 - *** 1%, ** 5%, * 10% significance levels.

Source: Author's Calculation. Consumption survey, Buenos Aires City/2005.

The following models show the estimated parameters only for high income levels (above U\$S 500), since for U\$S 500 or less, some of the analyzed variables were not statistically significant:

Table 6-B. Results from the Estimated Logit Models – Leafy Vegetables

Model 3: Leafy Vegetables – Respondent's Household's Monthly Income > U\$S 500					
	Parameter estimate (β)	Std. Error	Wald Statistic	p value	Odds ratio (e^β)
CONSUMP	1.231	0.436	7.956	0.005 ***	3.423
PESTICIDEV	-0.982	0.479	4.201	0.040 **	0.375
AVAILABLE	1.645	0.449	13.396	0.000 ***	5.179
LVPP	-0.050	0.027	3.385	0.066 *	0.951
Constant	4.098	2.392	2.936	0.087 *	60.230

$n_3 = 143$ (47% of the total sample) - Notes: Cut-off = 0.50 - *** 1%, ** 5%, * 10% significance levels.

Source: Author's Calculation. Consumption survey, Buenos Aires City/2005.

Table 6-C Results from the Estimated Logit Models – Whole Wheat Flour

Model 4: Whole Wheat Flour – Respondent's Household's Monthly Income > U\$S 500					
	Parameter estimate (β)	Std. Error	Wald Statistic	p value	Odds ratio (e^β)
PESTICIDEF	-1.612	0.491	10.770	0.001 ***	0.200
LABELS	1.503	0.735	4.179	0.041 **	4.494
AVAILABLE	1.589	0.491	10.491	0.001 ***	4.898
REGULATION	1.478	0.596	6.140	0.013 **	4.384
WWFPP	0.232	0.083	7.704	0.006 ***	1.261
Constant	-3.349	1.139	8.649	0.003 ***	0.035

$n_4 = 139$ (46% of the total sample) - Notes: Cut-off = 0.50, - *** 1%, ** 5%, * 10% significance levels.

Source: Author's Calculation. Consumption survey, Buenos Aires City/2005.

Table 6-D. Results from the Estimated Logit Models – Fresh Chicken

Model 5: Fresh Chicken – Respondent's Household's Monthly Income > U\$S 500					
	Parameter estimate (β)	Std. Error	Wald Statistic	p Value	Odds ratio (e^β)
CONSUMP	1.584	0.493	10.330	0.001 ***	4.873
HORMONE	-1.305	0.549	5.650	0.017 **	0.271
LABELS	1.276	0.720	3.138	0.076 *	3.581
AVAILABLE	1.626	0.481	11.431	0.001 ***	5.083
REGULATION	1.589	0.576	7.619	0.006 ***	4.901
FCPP	0.076	0.031	5.797	0.016 **	1.079
Constant	-4.321	1.288	11.251	0.001 ***	0.013

$n_5 = 143$ (47% of the total sample) - Notes: Cut-off = 0.50 - *** 1%, ** 5%, * 10% significance levels.

Source: Author's Calculation. Consumption survey, Buenos Aires City/2005.

Table 6-E. Results from the Estimated Logit Models – Aromatic Herbs

Model 6: Aromatic Herbs – Respondent's Household's Monthly Income > U\$S 500					
	Parameter estimate (β)	Std. Error	Wald Statistic	p Value	Odds ratio (e^β)
CONSUMP	1.636	0.553	8.768	0.003 ***	5.135
LABELS	1.503	0.717	4.393	0.036 **	4.493
DIFORCON	-0.938	0.491	3.657	0.056 *	0.391
RISKSCON	1.129	0.506	4.984	0.026 **	3.094
AVAILABLE	1.325	0.471	7.908	0.005 ***	3.762
REGULATION	1.578	0.586	7.250	0.007 ***	4.848
AHPP	0.017	0.009	4.025	0.045 **	1.018
Constant	-6.996	2.163	10.462	0.001 ***	0.001

$n_6 = 138$ (46% of the total sample) - Notes: Cut-off = 0.50 - *** 1%, ** 5%, * 10% significance levels.

Source: Author's Calculation. Consumption survey, Buenos Aires City/2005.

After testing the Models' Performance, Pearson's Chi-Square Statistic indicates the model adequate fit.

The alternative forms of R^2 for Binomial Logit Models are Cox & Snell's R^2 and Nagelkerke's R^2 . It could be observed that Model 2 yields noteworthy values of 0.352 and 0.454, respectively. (Ryan, 1997; Menard, 2000)

The Overall Predicted Power is above 73% in all Models. The Concordance Index estimates the predictions and outcomes probability of concordance. The Index values are above 0.50 for all the estimated models, indicating that predictions are better than random guessing. (Agresti, 2002) Results are shown in Table 7.

Table 7. Models' Performance

Model	Chi-Square Statistic ⁽¹⁾	Cox & Snell's R ²	Nagelkerke's R ²	Overall Predicted Power	Concordance Index
<i>Regular Milk</i> ⁽²⁾	24.668	0.155	0.217	74.70%	0.72
<i>Regular Milk</i> ⁽³⁾	38.914	0.325	0.454	81.80%	0.84
<i>Leafy Vegetabl.</i>	26.959	0.172	0.241	73.40%	0.74
<i>W. Wheat Flour</i>	37.399	0.236	0.332	77.00%	0.80
<i>Fresh Chicken</i>	38.824	0.238	0.334	75.50%	0.80
<i>Aromatic Herbs</i>	35.912	0.229	0.322	76.10%	0.78

⁽¹⁾ P value = 0.000

⁽²⁾ Estimations for high income level ⁽³⁾ Estimations for low income level

Source: Author's Calculation. Consumption survey, Buenos Aires City/2005.

5.4 Odds Ratio and Willingness to Pay Estimation

The odds ratio analysis, based on the results listed in Tables 6-A to 6-E, is useful to determine the contribution of the explanatory variables in WTP estimation for each selected food.

Models 1 and 2: Regular Milk

For both income levels, organic regular milk WTP is largely explained by the scarce availability of this product in the market, since the highest odd ratio variable is AVAILABLE. Nevertheless, relatively speaking, this explanatory factor is more relevant for lower income levels (Model 2, households whose monthly income is below US\$ 500). Besides, for both models, the need to count on a food regulatory system (REGULATION) ranks as the second explanatory factor.

For all the variables analyzed, the numeric values of their corresponding odds ratio are higher in Model 2 than in Model 1. The fact that the odd ratio corresponding to REGULATION obtained for Model 2 doubles that of Model 1 is striking.

When analyzing respondents' monthly income level and educational level, the fact that, in our sample, lower income households yield a higher relative proportion of lower educational level respondents (28% vs. 10%) and a smaller proportion of university graduates or postgraduates respondents (13% vs. 40%) should not be overlooked. By means of this parallelism, risks perceptions associated to products quality being higher for lower educational levels gets verified and the conclusions reached by some other research works¹¹ validated. This is because those who have attained higher educational level have access to better sources of information, which allows them to relativize the risks advertised and/or to trust more in regulatory standards. Therefore, the value yielded by the odd ratio for REGULATION in lower income levels (4.66) is above that of higher income levels (2.94), and, by so being, its relative weight in WTP estimation for lower income levels (Model 2) is higher.

The variable PRESERV was not meaningful for the model explaining WTP for organic regular milk. In this respect, and in agreement with the conclusions drawn by other research

¹¹ Eom (1994); Van Ravenswaay (1995) and Govindasamy & Italia (1999).

works¹², the positive perception conventional regular milk has, plays a role in consumers' valuations. In other words, and particularly for this product, the degree of relative satisfaction among the available varieties of organic and conventional milk favours the latter. In this regard, and applicable to both income levels, 65% of the respondents ascribed great importance to the brands they choose, as they constitute a confidence factor when it comes to shopping choices.

As seen in Table 8, while higher income level respondents are willing to pay 12.2% (on average) more for organic regular milk than for conventional regular milk, i.e., an extra US\$ 0.08/lt over the conventional milk average price, lower income levels would pay 11.6% more, i.e., an extra US\$ 0.075/lt, for the organic variety. In short, even though explanatory variables operate on a different basis, as each model behaves differently, there would be no substantial differences in the estimated WTP values for both income levels.

It is worth mentioning at this point that both WTPs estimated for lower income levels are below organic regular milk market price; 1% less for higher income levels and 2% for lower income levels.

Model 3: Leafy Vegetables

Among respondents whose monthly income is above US\$ 500, WTP for organic leafy vegetables is mainly explained by the product shortage in the market (AVAILABLE), since respondents would buy more organic leafy vegetables, were they readily available. These results coincide with those found by Michelsen *et al.* (1999) and by Richman & Dimitri (2000). Moreover, knowledge on organics resulting from the consumption of this type of foods (CONSUMP) also contributes to consumers' willingness to acquire organic leafy vegetables.

Without doubt, those who choose these vegetables demand a highly differentiated product in terms of packaging, presentation in container, serving size, origin, etc., and, therefore, their target is expected to be of relatively high income. In this regard, a high proportion of the respondents included in this analysis (78%) considers that knowing leafy vegetables origin keeps up confidence when it comes to shopping decisions.

The above mentioned is also connected with the perception of high health risks associated to pesticides in the conventional varieties of these products. This turned out to be a significant variable in the Model (PESTICIDEV), even though for WTP estimation, its relative importance is lesser. The empiric evidence of these results is consistent with those by Weaver *et al.* (1992) and Baker (1999).

The results in Table 8 demonstrate that higher income levels are willing to pay for organic leafy vegetables 87% more (on average) than for conventional leafy vegetables, i.e., an extra US\$ 0.96/kg over the conventional leafy vegetables average price. Even so, the estimated WTP turns out to be hardly 1% higher than the market price for organic leafy vegetables.

Model 4: Whole Wheat Flour

WTP for organic whole wheat flour of respondents whose monthly income is above US\$ 500 is explained mainly by regular label reading when making their shopping decisions (LABELS). Besides, 78% of the respondents regularly looks for information about products quality, and thinks necessary to count on a quality regulatory system (REGULATION). It is also worth noticing, though to a lesser extent, the scarcity of this product in the market (AVAILABLE). These results are consistent with those by Michelsen *et al.* (1999); Richman & Dimitri (2000); Gil *et al.* (2000) and Pearson (2001).

¹² Roddy *et al.* (1994); Morris (1996) and Pearson (2001).

Consumers perceive whole wheat flour as a natural and healthy product. In this sense, 65% of the respondents affirms that knowing its origin as well as the store constitute confidence factors when it comes to shopping choices.

Even to a lesser degree, WTP is further explained by high health risks perceptions associated to pesticides in the conventional varieties of these products (PESTICIDEF). In addition, 68% of the respondents believes that the greater this product processing, the higher distrust its quality arises.

Table 8 shows that, for higher income levels in this sample, WTP for organic whole wheat flour is, on average, 7.5% higher if compared to the price paid for conventional whole wheat flour, i.e., an extra U\$S 0.05/kg over the conventional whole wheat flour average price; this WTP being below the organic whole wheat flour market price in as much as 3%.

Model 5: Fresh Chicken

High income level respondents assert to be willing to pay price premiums for organic fresh chicken mainly due to the need to count on a quality regulatory system (REGULATION). This result reinforces those previously found in focus groups studies, in which the degree of concern consumers expressed in view of the discretion evidenced in the fattening productive process of some varieties of conventional chicken was evidenced, as well as the notorious lack of state control by regulatory bodies. (Farina & de Almeida, 2003; Rodríguez & Lacaze, 2005)

On the other hand, the scarcity of this product in the market¹³ (AVAILABLE) together with the regular label reading by consumers when they make their purchase decisions (LABELS) play a minor, though significant, role in WTP for the organic variety of this product. Finally, organic food knowledge resulting from frequent consumption of some of these products (CONSUMP) as well as the perception of high health risks associated to hormones present in the conventional varieties of these products (HORMONE) contribute, to a lesser extent, to WTP understanding. In this sense, 60% of the respondents sustains that knowing the product's origin constitutes a confidence factors when it comes to shopping choices, while 68% of the respondents believes that the greater this product processing, the higher distrust its quality arises.

Table 8 shows that, for higher income levels in this sample, WTP for organic fresh chicken is, on average, 20% higher if compared to the price paid for conventional fresh chicken, i.e., an extra U\$S 0.39/kg over the conventional fresh chicken average price; this WTP being below the organic fresh chicken market price in as much as 4%.

Model 6: Aromatic Herbs

WTP for organic aromatic herbs of respondents whose monthly income is above U\$S 500 is explained mainly by regular label reading when making their shopping decisions (LABELS) as well as by the need to count on a quality regulatory system (REGULATION).

It is also worth noticing, though to a lesser extent, the perception of this product shortage in the market (AVAILABLE). This is explained by the fact that most organic aromatic herbs production is exported, as export prices are more profitable. Knowledge and identification of organic food is also relevant, and evidenced in CONSUMP, RISKSCON and DIFORCON. In this sense, 68% of the respondents sustains that knowing the product's origin constitutes a confidence factors when it comes to shopping choices, while 60% of the respondents believes that the greater this product processing, the higher distrust its quality arises.

¹³ Just as mentioned above, the availability of organic chicken in the domestic market is recent and erratic, thereby preventing prices gap trend analysis for the triennium 2005-2002

Table 8 shows that for higher income levels in this sample, WTP for organic aromatic herbs is, on average, 110% higher if compared to the price paid for conventional aromatic herbs, i.e., an extra U\$S 19/kg over the conventional aromatic herbs average price; this WTP being below the organic aromatic herbs market price in as much as 30%.

Table 8. Total WTPs Estimated by Products

<i>Model</i>	<i>Mg WTP</i> ⁽³⁾		<i>Av Prices</i> ⁽⁴⁾		<i>Av WTP</i> ⁽⁵⁾	<i>Relative Difference</i> ⁽⁶⁾
	<i>%</i>	<i>U\$S</i>	<i>Conv.</i>	<i>Org.</i>		
<i>Model 1: Regular Milk</i> ⁽¹⁾	12.2%	0.08	0.65	0.74	0.729	-1%
<i>Model 2: Regular Milk</i> ⁽²⁾	11.6%	0.075	0.65	0.74	0.725	-2%
<i>Model 3: Leafy Vegetables</i> ⁽¹⁾	87%	0.96	1.10	2.03	2.05	1%
<i>Model 4: Whole Wheat Flour</i> ⁽¹⁾	7.5%	0.05	2.03	2.15	2.08	-3%
<i>Model 5: Fresh Chicken</i> ⁽¹⁾	20%	0.39	1.95	2.43	2.33	-4%
<i>Model 6: Aromatic Herbs</i> ⁽¹⁾	110%	19.02	17.29	51.60	36.32	-30%

Exchange Rate: 1 U.S. Dollar (U\$S) equals 3 Argentinean Pesos (\$)

⁽¹⁾ Estimations for high income level ⁽²⁾ Estimations for low income level

⁽³⁾ Extra money people are willing to pay over the price of conventional products, in %/kg (or lt) and U\$S/kg (or lt)

⁽⁴⁾ Average prices of conventional and organic products, in U\$S/kg (or lt)

⁽⁵⁾ The average price of conventional products people usually buy plus the average amount people are willing to pay for the organic product in question, in U\$S/kg (or lt)

⁽⁶⁾ Relative difference between average WTP ⁽⁵⁾ and organic average prices ⁽⁴⁾.

Author's Calculation. Consumption survey, Buenos Aires City/2005.

To sum up, it is worth mentioning that, considering the effective prices when the study was conducted, the WTPs for each organic product analyzed were explained by a set of factors related to food safety concerns involving real or potential quality risks perceptions and, as a consequence, perceived quality expectations and information availability. Still, the relative importance of these factors is different when WTPs are explained for each product. Table 9 below synthesizes the statement above:

Table 9. WTPs' Main Explanatory Factors

<i>Model</i>	<i>Main Explanatory Factors</i>
<i>Models 1 y 2: Regular Milk</i>	Perception of product scarcity in the market. Need to count on a quality regulatory system.
<i>Model 3: Leafy Vegetables</i>	Perception of product scarcity in the market. Knowledge about organics resulting from prior/habitual consumption of this type of foods.
<i>Model 4: Whole Wheat Flour</i>	Regular label reading of goods. Need to count on a quality regulatory system.
<i>Model 5: Fresh Chicken</i>	Need to count on a quality regulatory system.
<i>Model 6: Aromatic Herbs</i>	Regular label reading of goods. Need to count on a quality regulatory system.

Author's Calculation. Consumption survey, Buenos Aires City/2005.

The key factor for organics consumption in Argentina seems to be the concern for a regulatory system. For all the estimated models, even though 74% of the respondents affirms that the regulatory bodies are inefficient, 70% believes that food regulation should be public rather than private.

Regulations concerns with respect to organic fresh chicken, whole wheat flour and aromatic herbs are highly significant. Therefore, the hypothesis #2 *-The impact of regulation processes on the willingness to pay for organic unprocessed products is lower than for organic processed products-* has been rejected.

In relative terms, consumers perceive, to a great extent, the scarcity of these organic products in the market.

Undoubtedly, current prices play a critical part in WTP determination for these differentiated quality products. In all the estimated models, 75% of the respondents states that they would buy organics more frequently, if these were cheaper.

Based on the results listed in Table 8 above, the prices consumers are willing to pay for organic regular milk, whole wheat flour and fresh chicken are below market prices, though near. Hence, if effective prices were slightly reduced, these differences would get reduced as well, and, in consequence, consumers would have greater access to these products of better quality. Therefore, the hypothesis #3 -*The highest WTPs for organic food products are not always in agreement with real market prices*- has not been rejected.

The WTP estimated for organic leafy vegetables is slightly above the effective market price, thereby fostering optimum growth perspectives for its production, even when the regular supply of these vegetables in the market remains a real challenge for producers.

On the other hand, organic aromatic herbs clearly represent a restriction to consumption, due to their high prices in the domestic market, which are exceedingly influenced by the high revenues obtained when exported.

As mentioned before, in Argentina consumers' perceptions about organic food quality are better WTP's predictors than the socio-demographic variables. (Rodríguez *et al.*, 2006)

6. Final remarks

Just as in the rest of the world, organic products consumption in Argentina is explained, to a large extent, by their better quality -in terms of packaging, nutritional benefits and nutritional information-, their market availability -especially for their continuity and variety of supply available-, and by the degree of credibility of the standards applied and certification systems. Yet, these products prices as well as the purchasing power consumers have are also central explanatory factors.

The results of WTP estimates obtained for the selected products indicate that organic products are positively valued in Argentina, since consumers affirm to be willing to pay price premiums to acquire these products of better quality. Such results are undoubtedly conditioned by the effective prices in the domestic market, which, in turn, are conditioned by the incidence of export prices, as the main destiny of organic products production in Argentina is the foreign market.

This study carried out in the main consumption and domestic distribution centre, Buenos Aires city, where the highest absolute and relative income levels are evidenced, verifies that those consumers whose income is above US\$ 500 are worried about products quality as well as about health risks connected to pesticide-residue and hormone-treated product. As a consequence, they look for and persistently request information, demanding the implementation of an efficient food quality regulatory system. The concern consumers express regarding current regulatory and controlling bodies is worth noticing as well as their preference for a public system.

These consumers know what organics stands for, they perceive products scarcity and irregular availability in the market, and they would be willing to increase consumptions if these products were cheaper. The price premiums in the market depend on the product type but, regarding the scrutinised products, they range between 6% and 200%. Taking into consideration that one of the final aims of every food policy should be consumers' health, the high premiums of effective prices question or, at least, condition the purchase of these healthy products, even when an important population sector expresses its true desire to acquire them. On the other hand, the limited possibilities lower income level households have to access organic products are clearly evidenced.

To conclude, scarcity as well as high price premiums are identified as the most difficult obstacles to overcome when it comes to domestic consumption expansion in Argentina.

The involvement of general food retailers in the organic food market is of major importance and should be encouraged in order to increase organic products market share. Therefore, an increase in production levels is a must together with reductions in production, processing and/or trading costs, which, in turn, translate into sale price reductions, and into an increase of organic products consumption. Lower distribution costs constitute a contributing factor, which reduce consumer price premiums by involving general food retailers.

Most countries with lower consumer price premiums have a common national label, and such label recognition by consumers is usually high. Clear recognition is a pre-requisite if organic products are to break free from niche product status. This is another key issue Argentina still has to sort out if it wishes to expand in the organic domestic market.

As mentioned in other studies, pull strategies should be applied to promote organic market growth. To do so, the organic market actors must convince themselves that there is a growing consumer demand for organic food and that any efforts they make to increase the supply of organic products will enhance their competitiveness; however, a high level of market transparency must be assured.

Argentinean current system devotes most of its resources to those enterprises and actors already inserted in the global economic system, and does not contribute to smallholders' farms inclusion through regional development programs, thereby strengthening the asymmetric distribution of benefits. The potential growth of the domestic market should be encouraged as a step towards targeting foreign markets. (Rodríguez, 2005)

Given that scenario, the government goal should be to support already operating markets, assuring an equal development of both supply and demand. As consumers claim, research, consumer food education and counselling programs should be further supported. In Argentina, efficient government actions need be directed towards a stricter control system; a better coordination between public and private organizations and a long-term planning for the organic sector.

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Milk-Marketing: Impact of Perceived Quality on Consumption Patterns

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Summary

Consumers' use of quality characteristics to make milk purchase decisions reveal opportunities to create successful marketing strategies. Such a strategy could concern food quality. In this case, three core areas influence consumers' quality perception: the perception process, the physical product itself and the communication about it (Grunert et al., 1996). Beyond this background, this article analyzes the impact of certain quality characteristics and socio-demographics on consumption patterns regarding whole fat milk, skim milk and organic milk. These milks were chosen because of the increasing awareness of different fat contents in the meaning of lower fat contents being healthier and the increasing importance of the organic food market. Steenkamp's (1990) concept of 'perceived quality' provides as theoretical background. To gather the data a consumer survey with 260 households took place in Germany in 2004. An ordered logit model and a cluster analysis were used for analyzing the data. We find clear differences in consumers' perception of quality characteristics for the different milks. This information can be used to develop demand-oriented marketing activities (Kotler and Armstrong, 1994: 48).

KEYWORDS: milk, marketing, consumption patterns, perceived quality, ordered logit
JEL: D12, Q13, M3

1. Introduction

Today, food companies have to deal with strong competition, while consumers' demand stagnates in many cases. The European agribusiness is characterized by saturated markets and increasingly homogeneous products. Food quality may offer one possibility for differentiation. But, any effort to differentiate products and promote food quality will only be successful if new or advanced attributes can be communicated to consumers (Alvensleben and Scheper, 1997). For consumers, certain qualities have to be visible and understandable in order to reduce uncertainty about the product and to avoid consumer dissatisfaction. To meet consumers' expectations and preferences, it becomes important for producers and retailers to know which quality characteristics are relevant to their customers (Grunert et al., 2004).

To promote food quality the following aspects have to be taken into account. Quality itself is a complex and a dynamic concept (Garvin, 1984). It refers to aspects of the food product and the basic production process that can be measured and documented in an objective way. The quality that consumers associate with a food product is often not equivalent to this objective quality evaluation (Scholderer and Bredahl, 2004). For consumers quality is a subjective concept whose association is based on psychological processes (Steenkamp, 1990). According to Cardello (1995) food quality from a consumer's perspective is a perceptual and an evaluative construct which is related to person, place of purchase and purchase situation. Consequently in developing efficient marketing strategies the understanding of consumer quality perception is a key factor (Olson and Reynolds, 1983). Technological progress and the change of standards and norms as well as the modification of consumers' beliefs and attitudes may cause changes in consumers' perception (Bruhn, 2004). Technological progress and industrialisation may cause alienation and anxieties.

This leads to distrust of food producers, which makes it difficult to communicate credence quality attributes. Furthermore, the fact that the consumer may not be able or willing to judge experience and credence quality attributes might lead as well to an existing uncertainty about food quality (Gierl and Stumpp, 1999).

In the broadest sense all these aspects influence consumer's perception of food quality. This paper considers consumers' perception of milk quality in particular. Thus, we want to investigate consumers' perception process by analyzing which quality attributes influence consumption patterns taking the approach of 'perceived quality' (Steenkamp, 1990) into account. The products of interest for the research object are whole fat milk, skim milk and organic milk. We take into account the different fat contents as health factors. Because of the increasing importance of the organic food market, we are interested in the comparison of consumers' quality perception of organic versus conventional foods. Since 2003 the growth rate of the German market doubled. Market data show, that Germany's sales volume of organic products has increased considerably. It rose from € 2.05 billion in 2000 to € 3.5 billion in 2004 (ZMP, 2006b: 2). Milk was chosen as the focus of the research because it is the organic food product which is most widely distributed in Germany and is available in a great variety of shelf life, packaging, brand etc.

We use an ordered logit model as a framework for identifying the quality attributes that influence consumers' perception of quality. An application to the different milks is made in relation to consumers' consumption frequency of these goods. Furthermore, a cluster analysis was used to segment customers according to their consumption behavior and use of the quality characteristics. Data from a household survey conducted in 2004 in Germany (n=260) allow us to relate consumer behavior to selected demographic characteristics. Finally, marketing recommendations to food producers and retailers can be made in order to promote food quality.

The paper is organized as follows. The second section presents the theoretical background of the quality perception process. Section three discusses briefly the German milk consumption. In the fourth section the ordered logit model and data base is described. The fifth section displays the empirical results. Section six discusses the results and gives marketing recommendations.

2. Background

Following Steenkamp (1990) we use the term 'perceived quality' to stress, that consumers' quality evaluation is dependent on their perceptions, needs, and goals. Perceived quality is regarded as an overall one-dimensional evaluative judgment, which is based on the processing of quality cues in relation to relevant quality attributes. According to this, Steenkamp (1990) developed the model of the quality perception process on which we will base our empirical work. This model of the quality perception process describes the way consumers form perceptions about the quality of a product in purchase decisions. In the model the separation between intrinsic and extrinsic quality cues (Olson, 1978) and between experience and credence quality attributes (Nelson, 1974; Darby and Karni, 1973) is outlined. Intrinsic quality cues refer to everything of the physical product, such as color, odor, fat content. Extrinsic quality cues refer to everything else, such as point of sale, price, and brand. Only quality cues can be perceived and evaluated at the point of sale. Experience quality attributes can be evaluated after purchase or consumption, e.g. taste, and convenience. Some quality attributes can never be evaluated by the consumer him/herself. These attributes are called credence quality attributes, e.g. animal welfare, organic production. Thus, it is important to know what quality characteristics are important for consumers to make the purchase decision. If the results show, that experience or credence quality attributes influence their purchase behavior, quality cues related to those attributes would be needed for marketing campaigns.

The quality perception process is divided into the three sub-processes of cue acquisition and categorization, quality attribute belief formation, and integration of quality attribute beliefs, which are influenced by personal and situational variables (see figure 1).

Insert figure 1 here.

To categorize the quality characteristics used in the analysis we follow an approach by Caswell et al. (1998) which was expanded by Northen (2000) and Bruhn et al. (2005) to indicate the types of attribute sub-sets which exist and examples of attributes within each sub-set. In this approach the quality characteristics are divided into product, process and environmental characteristics. In the survey we took this approach to categorize the characteristics used to explain the impact of certain quality cues and attributes on consumption frequency (see table 1). Note that the examples are by no means exhaustive.

Insert table 1 here.

3. Objectives

From 2003 to 2005 Germany's consumption of whole fat milk decreased while that of skim milk consumption increased. The average prices were relatively stable, with skim milk being cheaper than whole fat milk (see table 1).

Insert table 2 here.

The per capita consumption of whole fat milk and skim milk is depicted in table 3.

Insert table 3 here.

Regarding milk prices organic milk is more expensive than conventional milk (see table 4).

Insert table 4 here.

Moreover, there are differences between average prices in different food retailers. Data show that one litre whole fat milk costs 0.59 EUR at the discounter, 0.65 EUR at the hypermarket and 0.66-0.68 EUR at the supermarket (ZMP, 2002).

4. Methodology and Data

4.1 Model

Consumers' willingness to buy (purchase intention) the three different milk products is expressed in frequency of consumption, such as daily, 5-6 times a week, 3-4 times a week, etc. to measure the corresponding latent utilities. Because the dependent variables are categorical instead of quantitative, we use an ordered logit model with robust standard errors to estimate the probability of consumers' frequency of consumption.

Suppose U_i^m is the utility that consumer i derives from consuming the product m and U_{ij} can be expressed as follows:

$$U_i^m = X_i \beta^m + \varepsilon_i^m ; i = 1, \dots, n ; m = 1, \dots, M \quad (1)$$

where X_i is the design matrix which is a row vector of the i th consumer's characteristics.

These characteristics include socio-demographics and quality attributes. β^m is the coefficient associated with X_i . And ε_i^m is the residual error term that is not captured by design matrix X_i . There are n consumers and M products.

In a survey that asks the respondents' opinion, the respondents' intensity of feelings is dependent on the measurable factors X and unobservables. In many situations, the respondents are not asked to respond to U directly. Instead, they are given only a set number of possible answers, say six, to the question of y . Consumers choose the cell that most closely represents the intensity of response to the question. For example, for product

m , consumer i is asked to choose among the six choices: daily ($y_i^m = 6$), 5-6 times a week ($y_i^m = 5$), 3-4 times a week ($y_i^m = 4$), 1-2 times a week ($y_i^m = 3$), less than once a week ($y_i^m = 2$), and never ($y_i^m = 1$).

The ordered logit model depends upon the idea of the cumulative logit. This in turn relies on the idea of the cumulative probability. Let C_{ij}^m denote the probability that the i th individual is in the j th or higher category for product m :

$$C_{ij}^m = \Pr ob(y_i^m \leq j) = \sum_{k=1}^j \Pr ob(y_i^m = k) \quad (2)$$

Then we turn the cumulative probability into cumulative logit for product m :

$$\text{logit}(C_{ij}^m) = \log\left(\frac{C_{ij}^m}{1 - C_{ij}^m}\right) = \alpha_j^m - \beta^m X_i \quad (3)$$

m =whole fate milk, skim milk, and organic milk.

4.2 Data

The current survey conducted in 2004 at private households analyzes the consumption of milk. The data were collected in Germany in the capital city of the federal state Schleswig-Holstein, Kiel. The randomly drawn sample consisted of 260 participants. The structure of the sample is displayed in table 5.

Insert table 5 here.

5. Results

5.1 Descriptive Results

To investigate impact factors concerning the consumption patterns of conventional whole fat milk (3.5% fat), conventional skim milk (1.5% fat) and organic milk the participants were asked about their consumption frequency. They had to state how many times a week they consume the different milks. Results show that whole fat milk is preferred by 28% of the sample (see table 6).

Insert table 6 here.

To analyze the importance of certain quality characteristics on the consumption frequency interviewees were asked which of the following characteristics they use when making the milk purchase decision (multiple nominations). Table 7 shows the percentage of participants that decided how the given attribute is important regarding the purchase. Characteristics were categorized following Caswell et al. (1998) (see section 2). The results show that shelf-life, freshness and price are main drivers for making milk purchase decisions, while additional information, e.g. recipes, nutrition information and variety seem to have a low impact on consumers' decisions (see table 7).

Insert table 7 here.

These attributes are included in the ordered logit model to show their impact on consumers' consumption and purchase patterns.

5.2 Impact of Milk Quality Perception on Consumption Patterns

With regard to the relation between the use of certain quality characteristics and the consumption patterns stated by the participant an ordered logit seems to be the best solution. Therefore, the attributes (table 7) are included as dummy variables in the ordered logit model to show their impact on consumers' consumption patterns. Furthermore, the socio-demographics are independent variables. Table 8 explains the variables included in the model. We estimated three ordered logit analyses with robust standard errors with the different milks being the dependent variables.

Insert table 8 here.

The estimation results are reported in table 9 and 10. The rows are separated in categories of food quality characteristics and socio-demographics. The columns report the estimated coefficients, standard errors and the respective z-values of the ordered logit model explaining consumption frequency of the different milks. The results show differences for the consumers purchasing the different types of milk. We assume that consumption and purchase are correlated as 70% of the survey participants are always responsible for grocery shopping and 26% are at least sometimes responsible for grocery shopping. We will make assumptions concerning the impact of the quality characteristics on the perceived food quality and consequently on consumption and purchase.

Insert table 9 here.

Insert table 10 here.

All three categories, product, process and environment attributes influence the milk consumption patterns. For marketing recommendations even more important is the impact of quality cues. Both extrinsic and intrinsic quality cues are significant predictors of milk consumption frequency.

The extrinsic cues related to the functional product characteristic of package size increases the frequency of consumption of whole fat milk. We note that there is a lot more packaging variety for whole fat milk than for organic and skim milk. Consumers who require special sizes such as smaller packs for single households or bigger packs for families may choose whole fat milk because they have no similar alternative for organic and skim milk. The extrinsic cues related to the image product characteristic of brand increases the frequency of consumption of whole fat milk and organic milk. We note that there is a lot more brand variety for whole fat milk than for organic milk. This might be useful for communication strategies; especially, as there is no effect of brand to note for skim milk consumption. This leads to the assumption that brands of skim milk should be more often in the focus of advertisement. Furthermore, a positive effect is to state for organic milk with regard to additional information such as information about the production process or animal welfare. To provide this information could increase consumers' benefit and thus increase their positive attitude against the product. Furthermore, the nutrition information on fat content has a significant negative effect for organic milk but a significant positive effect for skim milk. This underlines that health conscious consumers would buy skim milk. Nevertheless, concerns about fat intake may lead consumers to choose other beverages than the dairy at all. Among intrinsic quality cues ingredients discourage skim milk consumption. The effect on whole fat milk and organic milk consumption is also negative, but not statistically significant.

The experience quality attribute related to sensory aspects of freshness has a significant positive effect on whole fat milk consumption. Given the perishable nature of milk, freshness would likely be an important quality attribute. Those that put high value on this attribute are more frequent consumers of whole fat milk.

Regarding credence quality attributes, whole fat milk has a positive effect concerning local production. Consumers who care about the origin of the product in general would rather consume organic milk. Furthermore, those that are more frequent consumers of organic

milk are influenced by the credence quality associated with organic production process. The credence quality attribute organic process has a positive effect on consumption frequency for organic milk. In contrast, for conventional whole fat milk, organic has a negative effect although it is not significant. The significance of 'organic' is important as the study uses self-reported recall of consumption behavior, which might be positively biased as a result of social desirable responses (Verhoef, 2005).

Among significant socio-demographics, education has a significant negative effect on all levels for organic milk consumption. A low education decreases the probability of skim milk consumption. Older consumers tend to consume less skim milk as well. There are no significant effects to state for whole fat milk consumption.

5.3 Segmentation of Consumers according to Milk Purchase Behaviour

To uncover differences in the consumer groups a hierarchical cluster analysis (Ward linkage, Euclidian distance) was applied. The three cluster solution gave best results. Cluster 1 is characterized by higher income, higher education and with children in the household. This cluster contains consumers who are between 20 and 49 years. Cluster 2 has the highest income and a moderate education level. The consumers in this cluster are 58 years on average. Only 12% have children in the household. Cluster 3 has a higher share of male consumers and is between 69 and 89 years old. The income is lower on average and the education level is rather low. There are almost no children in these households. All clusters prefer whole fat milk, but cluster 1 has a higher consumption of skim milk than cluster 2 and 3 (see table 11).

Insert table 11 here.

Regarding the use of quality characteristics cluster 1 pays more attention to food safety and functional attributes than cluster 2 and 3. Image attributes seem to be more important for cluster 3. But the elderly seem to pay attention to brands and price, while younger consumers care only about the price. Those between 50 and 67 years use labels such as seals of approval to make purchase decisions.

'Information seekers' pay lots of attention towards fat content and labels but little attention towards price and appearance. Compared with the participants in the other clusters the participants in the cluster 'health awareness' care more about freshness, health and food safety. They care less about brands and labels. 'Brand shoppers' are more interested in brands than the other clusters but have lower interest in nutrition values such as ingredients in general, calories, fat content (see figure 2).

Insert figure 2 here.

Figure 3 shows differences within the clusters regarding the process quality characteristics. Origin is equally important for all three clusters. Local production is especially important for 'information seeker'. Moreover, this cluster as well as those with 'health awareness' are interested in animal husbandry and organic production.

Insert figure 3 here.

Figure 4 shows differences within the clusters regarding the environment characteristics. Nutrition attributes are especially important for 'information seeker'. Furthermore, this cluster pays attention to additional information. The point of sale and a clean source of supply are equally important for all three clusters.

Insert figure 4 here.

Overall, cluster 1 is most interested in food safety attributes, functional aspects of the product and sensory attributes. Cluster 2 is especially interested in nutritional values, process attributes and all kinds of additional information. Cluster 3 is especially interested in the milk's shelf life and brands.

6. Final remarks

This research investigated the impact of consumers' use of certain quality characteristics and socio-demographics on consumption patterns of whole fat milk, skim milk and organic milk. We found a significant positive effect of the quality cue 'brand'. For milk we can count several brands, retailer as well as manufacturer brands. The significance for brand is even higher for organic milk than for conventional milk. This leads us to conclude that the brand is the cue used by consumers for recognizing the organically produced milk. This shows furthermore that a strong brand could be one method for influencing consumers' purchase decisions even for fresh almost unprocessed food.

The information on fat content has a negative influence on shopping behaviour for organic milk. The results show health conscious consumers chose to buy skim milk. There are different types of fresh milk, e.g. skim milk and non fat milk available. However, there are fewer varieties for organic milk. Thus, there may be opportunities for product line extensions.

Finally, we find that the credence quality attribute 'organic' has a significant and positive effect on consumption of organic milk. Organic production communicated through a label works as an extrinsic quality cue and can be used for marketing activities.

The results of the cluster analysis show that younger consumers are health conscious and this fact could be used for advertisement regarding skim milk and non-fat milk. The older consumers in cluster 2 could be reached by promotional activities in form of leaflets and additional brochures as they are information seekers. The elderly from cluster 3 are concerned with the milks shelf life. Thus, product line extensions such as fresh milk with extended shelf life are the first step to reach this group. Some producers have already been supplying such milks. As this cluster is aware of brands, focus on brand display might be a possibility for grocery store promotions.

7. References

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Tables

Table 1. Subsets of Quality Attributes

Product Attributes					Process Attributes	Environment Attributes
Food Safety	Nutrition	Sensory	Functional	Image		
Pathogens	Fat	Taste	Convenience	Snob	Animal Welfare	Cleanness in the Shop
Residues	Content	Texture	Storage	Value	Biotechnology	Point of Sale
Hormones	Calories	Tenderness		Brands	Organic Production	Added Information
Food additives	Fibers	Juiciness		Labels	Traceability	Recipes
Toxins	Sodium	Freshness			Growth Enhancers	Service
GM	Vitamins				Feed	
Fat/Cholesterol	Minerals					
Physical Contaminants						

Source: Adapted from Northen (2000), Caswell et al. (1998) and Bruhn et al. (2005).

Table 2. Average of Milk Consumption and Prices in Germany 2003 to 2005

	2003		2004		2005	
	Mio. litre	Ø-price (EUR/l)	Mio. litre	Ø-price (EUR/l)	Mio. litre	Ø-price (EUR/l)
Whole Fat Milk	682.8	0.56	630.1	0.56	545.2	0.57
Skim Milk	275.3	0.53	311.8	0.53	356.2	0.53

Source: ZMP, 2006a: 41.

Table 3. Per Capita Milk Consumption in Germany 2000 to 2005

	2000	2001	2002	2003	2004	2005
Whole Fat Milk	39.2	40.5	38.7	39.0	36.9	35.6
Skim Milk	20.5	20.3	21.8	23.0	23.8	25.5

Source: ZMP, 2006a: 41.

Table 4. Average of Milk Prices in Germany 2004 and 2005

EUR/kg	2004		Mark Up Conv. to Organic	2005		Mark Up Conv. to Organic
	Conv.	Organic		Conv.	Organic	
Whole Fat Milk (carton)	0.57	0.85	0.28	0.57	0.88	0.31

Source: Own depiction with data of Verbraucherpreisspiegel ZMP based on GfK-Haushaltspanel, ZMP, 2006b.

Table 5. Structure of the Sample (in %)

Socio-demographics	
Gender	
Female	56
Male	44
Age	
18 – 34	40
35 – 49	23
50 – 64	18
> 64	19
Education	
Low Education	18
Modest Education	27
High Education	35
Very High Education (University Degree)	19
No answer	1
Household Net Income €	
< 400	7
400 – 800	15
800 – 1300	13
1300 – 1800	19
1800 – 2300	11
> 2300	18
No answer	17
Children in Household	20
Concerned with grocery shopping	96
N total = 260	

Table 6. Frequency of Consumption Concerning the Different Milks (in %)

	Daily	5-6 times a week	3-4 times a week	1-2 times a week	Less than once a week	Never
Fresh Whole Fat Milk	28.1	1.9	6.9	10.4	17.3	35.4
Fresh Skim Milk	13.1	2.3	5.4	5.4	16.2	57.7
Organic Milk	3.1	0.0	1.5	2.3	15	78.1

Table 7. Importance of Quality Characteristics on the Purchase of Milk

Categories	Characteristics		
Product	Health	48.8	
	Food Safety	Hygiene at the cooler	31.2
		Food safety	27.3
		Shelf life	86.2
	Functional	Packaging material	46.2
		Packaging size	36.5
		Packaging design	18.5
		Price	62.7
	Image	Labels	21.2
		Brand	20.8
		Fat content	56.9
	Nutrition	Ingredients	27.3
		Calories	18.1
		Sensory	Freshness
	Taste		58.5
Appearance	20.8		
Kind variety	10.4		
Process	Local production	41.5	
	Origin	36.5	
	Animal husbandry	26.2	
	Organic	19.2	
Environment	Clean point of sale	73.5	
	Point of sale	38.5	
	Nutrition information	10.4	
	Additional information	8.1	
	Overall Quality	52.7	

Table 8. Definition of Variables

Variables	Description
Y	Dependent Variables
Whole Fat Milk (model1)	Frequency of consumption, such as daily, 5-6 times a week and so on to measure the corresponding latent utilities.
Skim Milk (model2)	
Organic Milk (model3)	
X	Independent Variables
<i>Attributes from table 5</i>	Dummy variables equal to one if the consumer marks it as Important / used for purchase of the different milks.
<i>Age</i>	Age of the consumer (integer years). (Age squared and log age did not show significant results).
<i>Education</i>	Dummy variables for every category (see table 3). Very high education dropped due to multicollinearity.
<i>Income</i>	Monthly household net income. Dummy variables for every category (see table 3). 1300-1800 EUR and >2300 EUR dropped due to multicollinearity.
<i>Household Size</i>	Number of persons in the household.
<i>Children</i>	Dummy variable equal to one if children in the household.

Table 9. Estimation Results for Ordered Logit Models for Whole Fat and Skim Milk Consumption

		Whole fat milk			Skim milk			
		Coef.	Std. Err.	z-Value ^a	Coef.	Std. Err.	z-Value ^a	
Product	Food safety	0.304	0.397	0.76	0.509	0.376	1.35	
	Food Safety							
		Health	-0.302	0.304	-1	0.505	0.396	1.27
	Functional	Packaging design	0.360	0.385	0.94	-0.289	0.439	-0.66
		Packaging material	-0.186	0.311	-0.6	0.075	0.304	0.25
		Packaging size	0.504	0.284	1.78 *	-0.393	0.319	-1.23
	Image	Shelf life	-0.296	0.414	-0.71	-0.045	0.422	-0.11
		Brand	0.689	0.361	1.91 **	0.474	0.386	1.23
		Price	-0.126	0.286	-0.44	0.245	0.304	0.81
		Labels	-0.371	0.421	-0.88	-0.484	0.501	-0.97
	Nutrition	Calories	0.026	0.406	0.06	0.048	0.425	0.11
		Fat content	-0.443	0.295	-1.5	1.119	0.352	3.18 ***
		Ingredients	-0.111	0.374	-0.3	-0.590	0.363	-1.62 *
	Sensory	Appearance	0.403	0.344	1.17	0.114	0.114	1
Freshness		0.750	0.340	2.21 **	0.416	0.416	1	
Kind variety		-0.225	0.508	-0.44	0.539	0.512	1.05	
Taste		0.382	0.293	1.3	-0.100	0.312	-0.32	
Process	Animal husbandry	0.435	0.442	0.98	-0.084	0.427	-0.2	
	Local production	0.595	0.310	1.92 **	0.233	0.338	0.69	
	Organic	-0.432	0.449	-0.96	0.155	0.482	0.32	
	Origin	-0.005	0.101	-0.05	-0.239	0.182	-1.32	
Environ- Ment	Clean POS	0.213	0.329	0.65	0.510	0.397	1.28	
	Additional information	0.234	0.465	0.5	0.003	0.529	0.01	
	Point of sale	-0.624	0.471	-1.32	0.041	0.507	0.08	
	Nutrition information	-0.513	0.345	-1.49	-0.513	0.344	-1.49	
Socio- demo- graphics	Gender	-0.221	0.263	-0.84	0.146	0.300	0.49	
	Age	0.002	0.009	0.2	-0.018	0.010	-1.84 *	
	HH Size	0.293	0.238	1.23	-0.150	0.256	-0.59	
	Children	0.609	0.580	1.05	-0.005	0.609	-0.01	
	High EDU	0.194	0.397	0.49	-0.348	0.371	-0.94	
	Modest EDU	-0.329	0.389	-0.85	-0.019	0.396	-0.05	
	Low EDU	-0.405	0.489	-0.83	-0.893	0.550	-1.62 *	
	Y400-800	0.122	0.356	0.34	0.057	0.496	0.11	
	Y800-1300	-0.297	0.417	-0.71	-0.220	0.506	-0.44	
	Y1800-2300	-0.457	0.417	-1.1	0.187	0.379	0.49	
Overall Quality		0.133	0.318	0.42	0.116	0.352	0.33	

^a Level of significance: ***p<0.01; **p<0.05; *p<0.10.

^bWald χ^2 (35) = 59.67 (p = 0.0058), Log pseudo likelihood = -358.99, Pseudo R² = 0.0846.

^cWald χ^2 (35) = 59.22 (p = 0.0064), Log pseudo likelihood = -306.52, Pseudo R² = 0.0771.

Table 10. Estimation Results for Ordered Logit Model for Organic Milk Consumption

		Coeff.	Std. Err.	z-Value	P> z	
Product	Food safety	0.286	0.561	0.51		
	Food Safety	Health	0.370	0.480	0.77	
		Packaging design	-0.209	0.484	-0.43	
	Functional	Packaging material	-0.044	0.418	-0.11	
		Packaging size	-0.667	0.449	-1.49	
		Shelf life	0.873	0.670	1.3	
	Image	Brand	1.293	0.493	2.62	***
		Price	-0.244	0.469	-0.52	
		Labels	0.068	0.665	0.1	
	Nutrition	Calories	0.026	0.550	0.05	
		Fat content	-0.837	0.433	-1.93	**
		Ingredients	-0.629	0.464	-1.36	
	Sensory	Appearance	0.150	0.122	1.23	
		Freshness	0.804	0.487	1.65	*
Kind variety		0.189	0.583	0.32		
Taste		-0.458	0.562	-0.82		
Process	Animal husbandry	-0.083	0.458	-0.18		
	Local production	0.300	0.494	0.61		
	Organic	1.997	0.475	4.2	***	
	Origin	0.385	0.155	2.48	***	
Environment	Clean point of sale	-0.610	0.492	-1.24		
	Additional information	0.923	0.573	1.61	*	
	Point of sale	-0.051	0.693	-0.07		
	Nutrition information	-0.138	0.463	-0.3		
Socio-demographics	Gender	0.611	0.424	1.44		
	Age	-0.012	0.013	-0.89		
	HH Size	-0.129	0.283	-0.46		
	Children	-0.313	0.803	-0.39		
	High EDU	-1.036	0.550	-1.89	**	
	Modest EDU	-1.326	0.604	-2.19	**	
	Low EDU	-1.381	0.793	-1.74	*	
	Y400-800	-0.019	0.545	-0.03		
	Y800-1300	-0.675	0.565	-1.19		
	Y1800-2300	0.665	0.726	0.92		
	Overall Quality	-0.410	0.595	-0.69		

^a Level of significance: ***p<0.01; **p<0.05; *p<0.10.

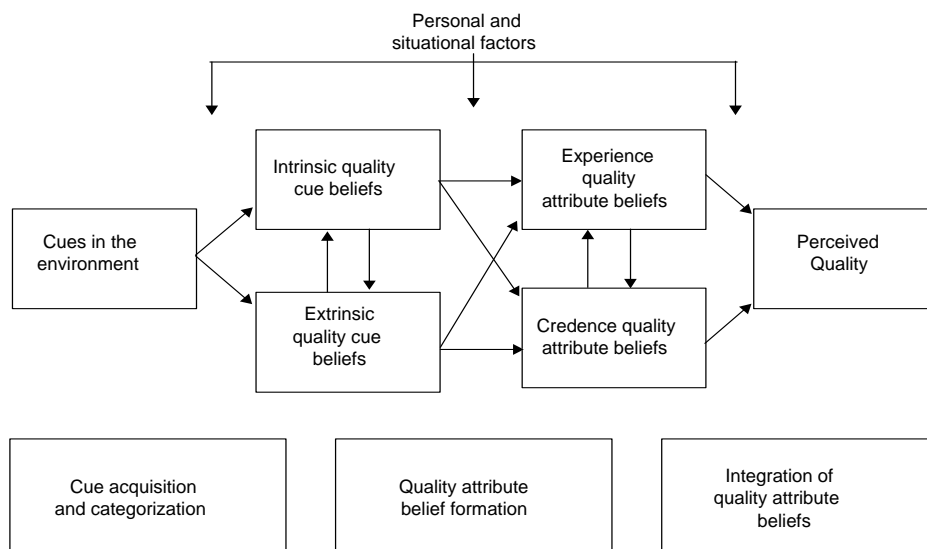
Wald χ^2 (35) = 84.18 (p = 0.0001), Log pseudo likelihood = -153.26, Pseudo R² = 0.1982

Table 11. Segmentation of Consumers according to Milk Purchase Behavior

		Health Awareness	Information Seeker	Brand Shoppers	
		Cluster 1 Obs=136	Cluster 2 Obs=60	Cluster 3 Obs=36	
Consumption	Whole Fat Milk	3.2	2.5	3.5	
	6=daily 1=never	Skim Milk Organic Milk	2.4 1.4	2.0 1.3	1.6 1.3
	Socio- demographics	Y 1800-2300	9.8%	16.7%	8.3%
Y 1800-2300		18.4%	3.3%	5.6%	
Y 800-1300		18.4%	3.3%	5.6%	
Y 400-800		17.8%	10.0%	13.9%	
< Y400		9.8%	1.7%	2.8%	
High EDU		47.2%	13.3%	13.9%	
Modest EDU		21.5%	35.0%	36.1%	
Low EDU		8.6%	31.7%	41.7%	
HH Size (average)		2.2	2.0	1.7	
HH Size (total)		1 to 5	1 to 4	1 to 4	
Children		27.6%	11.7%	2.8%	
Gender (female)		57.7%	60.0%	44.4%	
Age (average)		32	58	77	
Age (range)		20 to 49	50 to 67	69 to 89	
Overall Quality		56.4%	46.7%	44.4%	

Graphs and Diagrams

Figure 1. A Conceptual Model of the Quality Perception Process



Source: Steenkamp, 1990.

Figure 2. Segmentation of Consumers with regard to Product Quality Characteristics

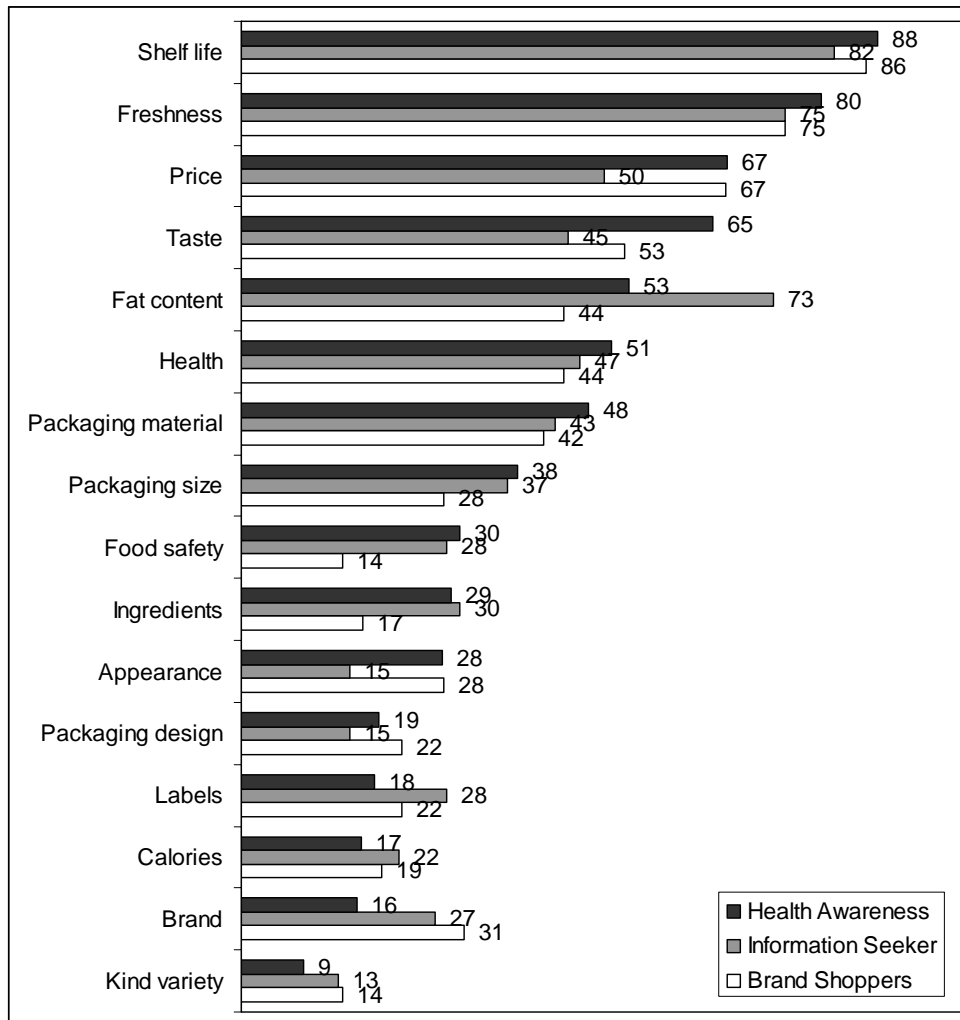


Figure 3. Segmentation of Consumers with regard to Process Quality Characteristics (%)

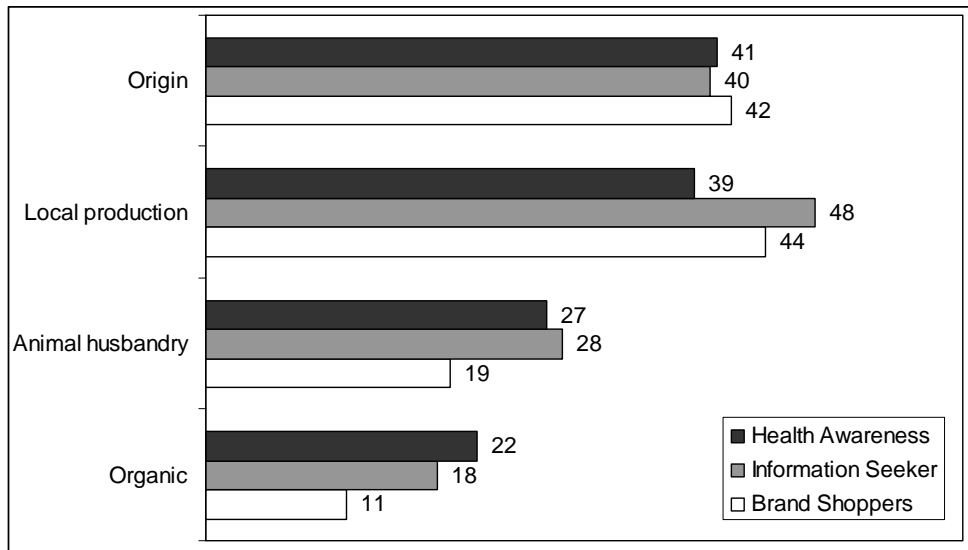
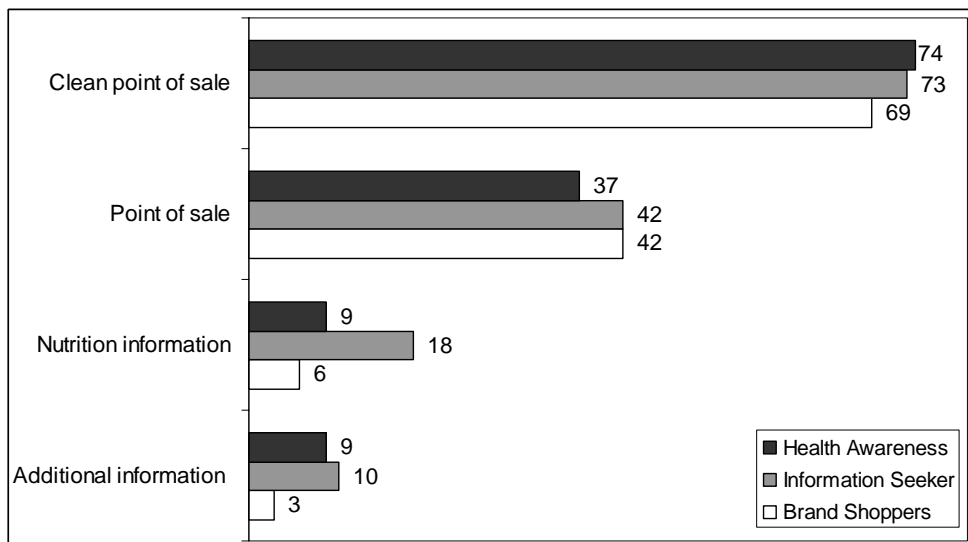


Figure 4. Segmentation of Consumers with regard to Environment Characteristics (in %)



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Impact of international organic markets on small U.S. producers

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Summary

Rapid growth of the organic agricultural sector in the U.S. and implementation of the U.S. Department of Agriculture's national organic standards in 2002 have led to concerns that organic production could become increasingly concentrated on larger U.S. and international farms, disrupting the market access of small domestic organic producers. However, data on the U.S. organic agriculture show that the smallest-scale farms continue to hold a small but stable piece of the organic sector and that U.S. organic farm size has grown slowly. The amount of land under organic production worldwide is growing rapidly, particularly in developing countries producing commodities for export, many of which are not widely grown in the U.S. Small-scale producers using direct markets have likely been least impacted from increased organic imports, while producers of organic oilseeds and cotton have likely been most impacted. Federal and State government agencies and the private sector have launched initiatives to sustain small-farm participation in the U.S. organic sector. Programs to better serve organic producers in the U.S. and to differentiate organic and non-organic imports and exports are being developed at the federal level.

KEY WORDS: organic agriculture, organic certification, small-scale farmers, international trade

Introduction

Supply- and demand-side forces have made organic farming one of the fastest growing U.S. agricultural sectors for well over a decade. Annual growth in retail sales has equaled around 20 percent or more since 1990 and U.S. sales of organic foods were estimated at almost \$14 billion in 2005, with growth forecasted to \$24.4 billion by 2010, according to industry estimates (Nutrition Business Journal, 2006). Retailers have responded to rising consumer demand for variety, quality, and convenience by introducing more product varieties while conventional supermarkets and mass market merchandisers have added organic products to their shelves (Oberholtzer, Dimitri, and Greene, 2005). Because price premiums for organics have held steady during this time and in order to meet supply-side demand, more operations and land have become certified organic in the U.S. and small and medium-sized organic companies have grown (USDA – ERS, 2006; Sligh and Christman, 2003). The U.S. Department of Agriculture's (USDA) national organic standards, which were implemented in 2002, were designed to stimulate growth of the organic industry by building consumer confidence in organic products and facilitating commerce in agricultural products that are organically produced.

The marketing pathways and farm profile of organic agriculture have changed as the sector has grown. Until the early 1990s, the largest outlet for organic products in the U.S. was independent natural foods stores. By 2005, independent natural foods stores represented less than 25 percent of organic food sales, and natural foods chains, conventional supermarkets, grocery stores, mass merchandisers, and club stores together accounted for the bulk of sales (OTA, 2006). The use of direct markets has also declined, from

approximately 22 percent of total organic sales in the early 1990s to 7 percent in 2005 (USDA, 2000; OTA, 2006). The organic farm sector historically has had smaller operations and disproportionately more fruit and vegetable production than in conventional agriculture. With the industry shift toward larger, more concentrated marketing and distribution pathways during the last decade, the number and size of organic operations in the U.S is increasing and is expected to continue doing so into the future. Between 1995 and 2005, the number of certified organic operations has more than doubled and the amount of certified organic land has quadrupled to over 1.6 million hectares (USDA – ERS, 2006).

Small producers have expressed concern that marketplace changes and regulatory measures developed to facilitate domestic and international organic trade, including the USDA National Organic Program, may negatively influence their market access. The national organic standards also refer to their potential impact on small operations, and contain several provisions to mitigate their impact on small producers (USDA – NOP, 2000). Small-scale organic producers are concerned that industry growth will increase competition from larger domestic operations and from international farming operations (Hanson et al., 2004). Small-scale farmers have noted that the fees and paperwork requirements of organic certification inhibit their broader participation in the organic market. And finally, international trade may also be a threat to small organic farms by affecting their market power through increased competition.

Because there are public benefits to sustaining a diverse organic farm sector, a growing number of public and private groups have begun efforts to facilitate the participation of small farms in the U.S. organic market. For example, U.S. certifiers are developing certification programs tailored to small-scale operations and U.S. businesses are expanding opportunities for local, direct-to-consumer marketing. The objectives of this paper are to examine the structural changes in the U.S. organic sector over the last couple of decades, identify the potential impact of international trade on this sector, and assess the potential for small-scale farmers to remain an important component of this sector.

Methodology

To understand the impacts of international trade on the U.S. organic agricultural sector, specifically the impact on U.S. small farms, we first explore recent structural changes in the U.S. organic sector. Organic certification data from the USDA provide the most comprehensive description of the U.S. organic sector. USDA's Economic Research Service (ERS) has published estimates of certified organic farmland and livestock, by commodity and state, since 1997, along with some data on small organic farms. National-level estimates are available since 1992. This data were collected from State and private certification groups and were analyzed to determine changes in the average size of operations as well as to determine whether small organic farms, under two hectares, are in decline. These national data sets were also used to analyze regional differences in the size of organic operations. The National Organic Program does not require organic growers and processors selling less than \$5,000 per year in organic agricultural products to be certified and therefore those producers are excluded from these data.

Comprehensive data about the organic agricultural sector in California is also available, and because California makes up such a large percentage of the overall certified organic production in the U.S., trends and numbers there may reflect the realities of organic operations throughout the U.S. Data about the organic agricultural sector in California was obtained from the California Department of Food and Agriculture's (CDFA) registration data and the California Certified Organic Farmers (CCOF), a non-profit. California certification data is provided to the CDFA by growers and was used to identify changes in

the average size of operations enrolled in organic certification programs in that State from 1992 and 2003, as well as other structural changes in the farm sector. Because the number of organic operations in California is increasing, California registration data describes the size of new operations entering the market, illustrating disproportionate certification by large farms. Data from the CCOF, the largest organic certifier in California, provide information about California's organic sector beginning in 1985.

This paper also explores the current information available on the role of international trade on the U.S. organic agricultural sector and some of the existing, planned, and potential programs and mechanisms developed to ensure the continued participation of small organic farms in the U.S. State agencies, nonprofit organizations, and U.S. food companies are all initiating programs to support small farm organic production as the organic sector grows and changes. Additionally, government agencies are developing projects that will fill information gaps about the U.S. organic sector and the role of international trade.

Organic farm size trends

National trends, based on USDA data

National datasets from 1992 to 2005 of total organic farmland suggest that the amount of certified organic farmland has steadily increased since the early 1990s, with certified organic cropland increasing more rapidly than pastureland during most of this period. On the other hand, the average size of certified organic operations has trended upward fairly slowly, despite rapidly growing demand during the 1990s and the implementation of organic regulations in 2002 which facilitated further growth in the market. For the decade spanning 1992-2002, the number of certified organic operations in the U.S. doubled from 3,857 to 7,323, but the average size of certified organic operations changed by less than one percent from an average size of 105.6 hectares to 106.4 hectares. Some growth in organic cropland is seen when organic pasture is excluded from these averages: from 1992-1995, operations ranged from 45.3 hectares to 56.7 hectares and then grew to an average of 74.9 hectares in 2000. By 2005, the average size of certified organic cropland operations was 82.1 hectares.

Regional Trends, based on USDA data

National-level data can be misleading, since regions specializing in field crops have significantly larger operations than regions specializing in specialty and other high-value crops. To get a better understanding of average farm size throughout the U.S., we have broken the data into ten Regions, based on USDA production categories (Table 1). Regional farm size averages in the Continental U.S. ranged from 23.9 hectares in Appalachia to 536.6 hectares in the Mountain Region in 2000 and from 28.7 hectares in the Southeast to 637 hectares in the Southern Plains in 2005.

Neither the total number of operations in the Region, nor the total amount of certified organic land in the Region was indicative of the average size of each operation (Table 2); in 2005, the Pacific Region contained the third highest amount of certified organic land in the U.S., the highest number of certified organic operations, and had the fourth smallest average size of operation. On the other hand, the Southern Plains ranked fifth in total certified organic land, sixth in the number of organic operations, and yet had the second highest average sized operation in 2005. Three Regions, the Delta, Corn Belt, and Mountain regions, experienced declines in the average size of certified organic operations between 2000 and 2005, ranging from four to 34 percent, while rates of growth in the other

Regions, excluding Alaska and Hawaii, ranged from 17 percent in the Pacific to an almost tripling in size in the Southern Plains.

Table 1: USDA Production Regions

Appalachia	Mountain	Pacific
Kentucky North Carolina Tennessee Virginia West Virginia	Arizona Colorado Idaho Montana Nevada New Mexico Utah Wyoming	California Oregon Washington
Corn Belt	Northeast	Southeast
Illinois Indiana Iowa Missouri Ohio	Connecticut Delaware Maine Maryland Massachusetts New Hampshire New Jersey New York Pennsylvania Rhode Island Vermont	Alabama Florida Georgia South Carolina
Delta	Northern Plains	Southern Plains
Arkansas Louisiana Mississippi	Kansas Nebraska North Dakota South Dakota	Oklahoma Texas
Lake States	Other: Non-Continental U.S.	
Michigan Minnesota Wisconsin	Alaska Hawaii	

Table 2: Average Operation Size by USA Region in 2000 and 2005

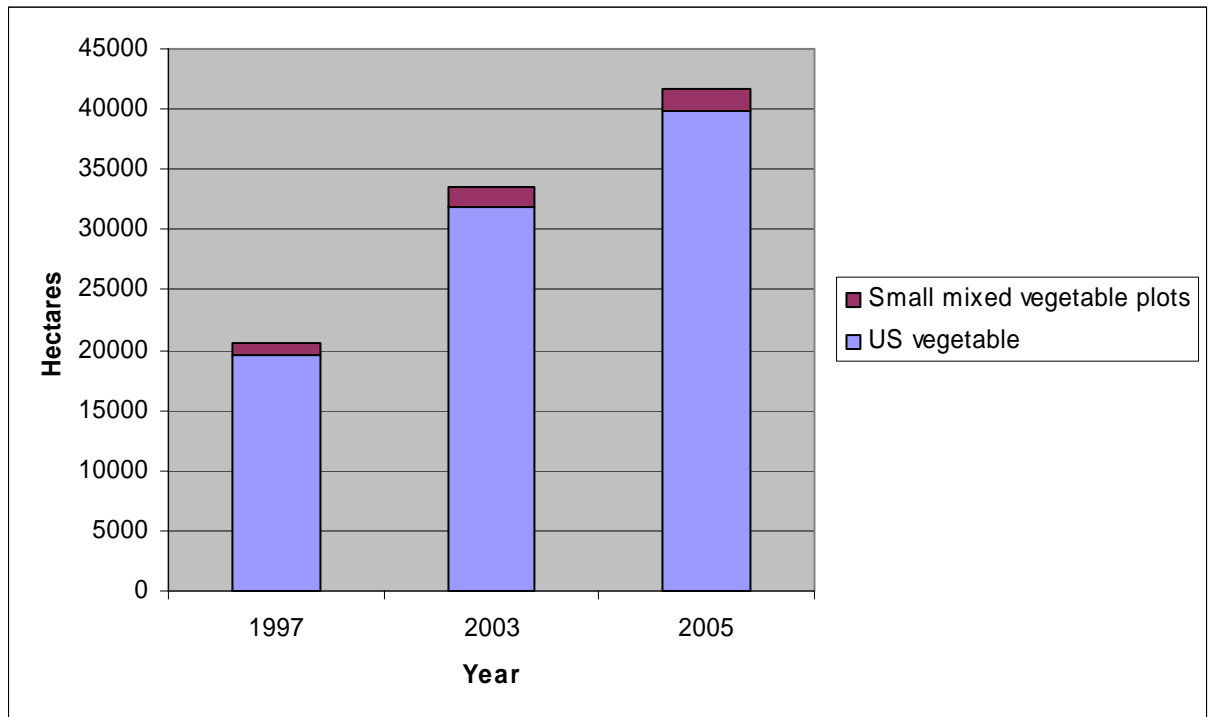
Region	Number of farms	Organic land - hectare	Average farm size - hectare	Number of farms	Organic land - hectare	Average farm size - hectare	Percent change in farm size
Year	2000			2005			2000-2005
Southern Plains	432	42,060	234	449	138,853	637	173
Appalachian	49	7,804	24	39	5,966	38	59
Northern Plains	96	114,425	265	144	174,791	389	47
Lake States	1,322	78,342	82	1,747	119,755	102	24
Northeast	695	45,205	34	656	71,440	41	20
Southeast	327	2,603	24	157	3,968	29	19
Pacific	1,602	90,040	56	2,760	181,266	66	17
Corn Belt	957	59,078	72	1,177	69,690	69	-4
Mountain	108	373,028	537	138	262,846	401	-25
Delta	824	8,202	168	1,008	4,282	110	-34
Continental U.S.	6496	718,400	111	8349	1,047,739	125	46

Mixed Vegetable Summary, based on USDA data

The organic market niche has its origins in premiums that small-scale farmers derived from marketing produce directly to consumers and small health food stores, a niche particularly well-suited to maintaining the profitability of small farms. Small mixed vegetable operations are prevalent in the organic sector, and USDA has tracked those that are smaller than two hectares (five acres) in order to capture trends affecting these small farms. USDA has asked organic certifiers for information about these small operations since 1997, but differences in reporting by certifiers has affected the precision of the data and ultimately, they can only be used to examine trends.

In 1997, mixed vegetables grown on very small plots under two hectares, as reported by certifiers, comprised 5.6 percent of all land dedicated to organic vegetable production in the U.S. The number of hectares operated as small mixed-vegetable plots has continued to expand overall between 1997 and 2005, although as a percentage of total vegetable land they have declined slightly (Figure 1). These very small farms have essentially maintained a small, but relatively stable, share of the overall certified organic vegetable market. Among Regions, small mixed vegetable plots were most likely to be seen in 2005 in the Pacific, Northeast, Mountain, Lake States, Hawaii, Corn Belt, and Appalachian regions.

Figure 1. Small Vegetable Plots Parallel Growth in Overall Organic Vegetable Sector



Certifier Data

California Certified Organic Farmers (CCOF) is one of the few published sources of information about organic farm size prior to the 1990s. CCOF was established in 1973 and was one of the first organizations to offer third-party organic certification services to farmers in the U.S. CCOF certifies more farmers than any other certifier in California, and is the top certifier in the U.S., as well. In 2005, CCOF certified over 60 percent of California’s certified organic farmland, after certifying nearly 77 percent in 1995, and even higher percentages in the 1980s (CCOF, 2006 and Greene, 1992). Because of California’s dominance in U.S. organic production and CCOF’s dominance in certification, CCOF’s data may represent trends mirrored throughout the U.S.

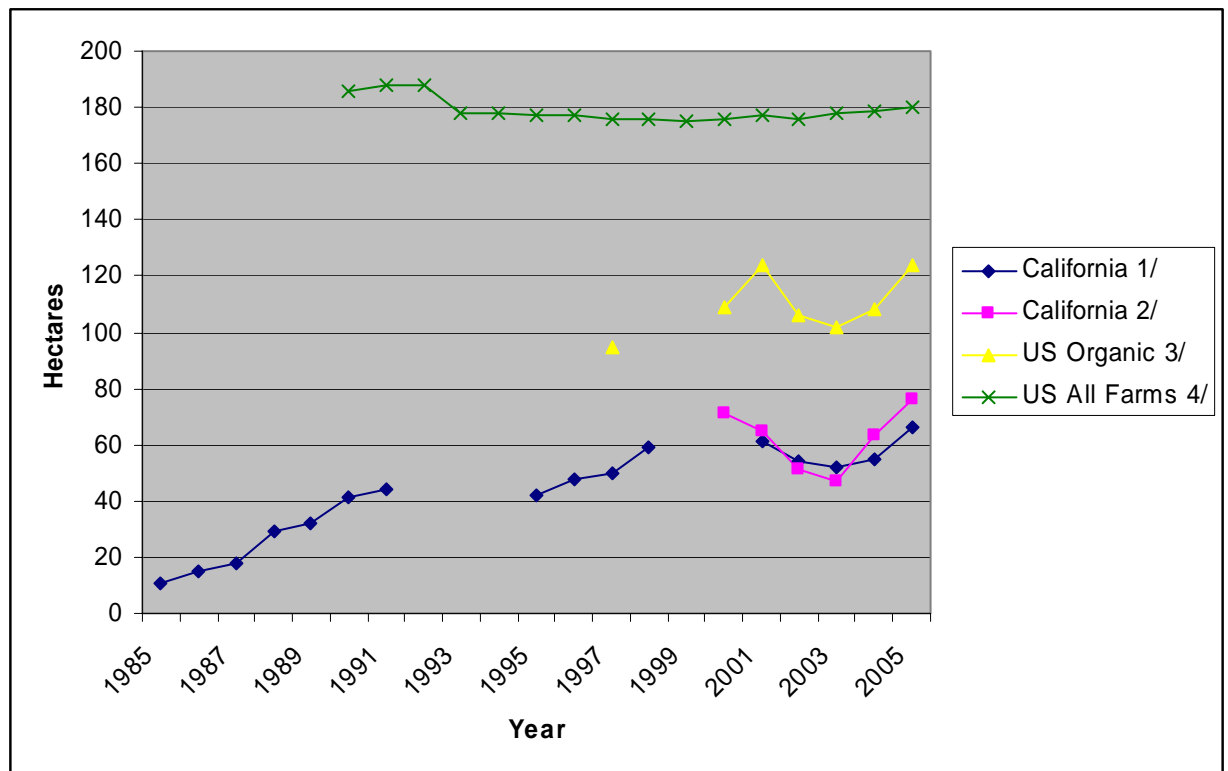
The total number of organic hectares and growers certified by CCOF rose steadily between 1985 and 2005. However, the average operation size of farmers enrolled in the CCOF certification program grew rapidly and then reached a plateau of about 61 hectares per grower in the late 1990s (Figure 2). In 1991, only five percent of CCOF’s growers had organic operations larger than 405 hectares (1,000 acres) (Greene, 1992).

Summary of Average Organic Operation Size

There is no precise information on the average size of organic operations in the U.S., but analysis of a variety of data sources indicates that it is about 60 percent of the size of average U.S. farms. Trends also indicate that the average size of organic operations is generally increasing (Figure 2), but that its growth is not increasing rapidly. University of California studies suggest that over half of the registered organic operations in California were smaller than two hectares throughout the late 1990s and there is no evidence to suggest that this percentage has changed markedly. The certified organic livestock sector

has begun to grow rapidly and it is possible that the average size of certified organic operations might also begin to grow rapidly as pasture is increasingly certified as organic.

Figure 2. Average Size of U.S. Organic Farms.



1/ California data as reported by California Certified Organic Farmers (CCOF)

2/ California data from USDA, Economic Research Service (ERS)

3/ USDA, Economic Research Service (ERS); includes all States except Alaska

4/ USDA, National Agricultural Statistical Service (NASS) and Census of Agriculture

International organic markets and production

The global market for organic products—mostly in the U.S., Europe, Canada and Japan—has more than tripled during the last decade, with retail sales reaching \$30-32 billion in 2005 (Kortbech-Olesen, 2006). According to Willer and Yussefi (2006), the North American organic market is also reporting the highest growth worldwide, indicating that the region will account for much of the global revenues in the foreseeable future. The U.S. had \$14 billion in organic food sales in 2005, nearly 2.5 percent of U.S. food sales and approximately 45 percent of global organic sales (OTA, 2006).

Organic production has expanded rapidly in recent years in developing countries, as well as in developed countries. An estimated 31 million hectares of farmland are managed under organic production worldwide (Willer and Yussefi, 2006). Another 19.7 million hectares worldwide includes areas of certified forest and wild harvested plants. The U.S. has the fourth largest area under organic management in the world (Table 3), behind Australia, China and Argentina. USDA reported that in 2005 over 1.6 million hectares of U.S. farmland (0.5 percent of U.S. agricultural land) was under organic production (USDA – ERS, 2006).

Table 3.—Growth in organic farmland, top 20 countries, 2002—2006

Country	Certified and transitional organic agricultural land				Change 2002-2006	Availability USDA-NOP certification Services (2)+
	2002	Organic/ total	2006	Organic/ Total		
	(hectares)	(%)	(hectares)	(%)	(%)	
Australia	7,645,924	2	12,126,633	3	59	yes
China	40,000	<1	3,466,570	<1	>1,000	yes
Argentina	2,800,000	2	2,800,000	2	-	yes
USA	900,000	<1	1,620,350	<1	80	yes
Italy	1,040,377	6	954,361	6	(8)	yes
Brazil	803,180	<1	887,637	<1	11	yes
Germany	546,023	3	767,891	5	41	yes
Uruguay	1,300	<1	759,000	5	>1,000	yes
Spain	380,838	1	733,182	3	93	yes
UK	527,323	3	690,272	4	31	yes*
Chile	3,301	<1	639,200	4	>1,000	yes
France	371,000	1	534,037	2	44	--
Canada	340,200	<1	488,752	<1	44	yes
Bolivia	13,918	<1	364,100	<1	>1,000	yes
Austria	271,950	9	344,916	13	27	yes
Mexico	85,676	<1	295,046	<1	244	yes
Peru	27,000	<1	260,000	<1	863	yes
Greece	24,800	<1	249,488	3	906	yes
Ukraine	N/A	--	241,980	<1	N/A	--
Czech Republic	165,699	4	160,120	6	(3)	--
<i>All countries 1/</i>	<i>17,156,455</i>		<i>31,000,000</i>	--	<i>81</i>	

* The U.S. has recognition agreements with six countries, including the UK.

Source: Yussefi (2006) and Yussefi and Willer (2002); U.S., USDA-ERS.

1/Most recent estimates available in 2002 and 2006.

2/USA-National Organic Program (NOP) accredited certification services.

U.S. organic trade

Data on organic imports and exports is incomplete because U.S. Customs does not differentiate between organic and non-organic trade. USDA estimates that the value of U.S. exports was between \$125 and \$250 million in 2002, while the value of U.S. imports was between \$1.0 and \$1.5 billion, and organic imports now exceed exports by a ratio of approximately 8 to 1. (USDA – FAS, 2005). U.S. exports have stagnated as domestic demand has risen and competition for international markets has increased. However, the U.S. was likely a net exporter during part of the 1990s, with exports estimated at approximately 200 million by 1994 (Natural Foods Merchandiser, 1995), and at \$200-\$300 million in the late 1990s (Fuchshofen and Fuchshofen, 2000).

The U.S. National Organic Program (NOP) streamlined the certification process for international as well as domestic trade when it was implemented in 2002. Organic farmers and handlers anywhere in the world are permitted to export organic products to the U.S. if they meet NOP standards and are certified by a public or private certification body with USDA accreditation. Since 2002, USDA has accredited 40 certifiers in 19 countries outside the U.S., mostly in Latin America, Europe, and Canada, and currently has recognition agreements with six countries. In addition, nearly a dozen U.S.-based groups with USDA accreditation provided certification services in 30 countries in 2006. Among the top twenty countries with certified organic farmland, sixteen have USDA-accredited certification services available from international certifiers based in the U.S. and/or domestic certifiers located in the producing country (Table 3).

U.S. imports of organic products accounted for approximately 12 percent of the U.S. organic market in 2002 (USDA – FAS, 2005), and have likely grown substantially in the last four years. According to USDA's Agricultural Marketing Service, out of the 20,000 organic clients of USDA-accredited certifiers operating worldwide in 2006, approximately 9,000 were located outside the U.S. (USDA – AMS, 2006). The U.S. organic market has increased 15-20 percent a year since 2002 (OTA, 2006), and imports have increased as U.S. farmers struggle to keep pace with demand in the face of strong market competition. Organic food production is often labor-intensive, and developing countries with lower farm labor costs than those in the U.S. have a competitive advantage in organic production.

According to FAS, Canada is the main market for U.S. organic exports, while countries in Latin America, including Mexico, Brazil, Argentina, and Uruguay, along with China and other countries in Asia are major sources of organic imports. Among the top twenty organic countries with certified organic farmland, the countries with the fastest growth in organic production are mostly those that produce organic products for export. The amount of land under organic production systems in China, Bolivia, Chile, Uruguay, and the Ukraine for example, increased well over 1,000 percent between 2002 and 2006, while organic farmland in Europe and North America showed more modest expansion (Table 3). Worldwide, organic farmland increased approximately 81 percent between 2002 and 2006. While many developing countries were starting from a low base of certified organic farmland in 2002, several, particularly in Latin America, now manage a higher proportion of their farmland under certified organic farming systems than the U.S.

While some U.S. organic imports compete directly against similar U.S. products, many are products that are not widely grown in the U.S., such as coffee and winter produce. The impact of U.S. organic imports varies widely among commodity sectors. Small-scale farmers producing a wide variety of horticultural products—and increasingly livestock products—for sale in direct markets have likely seen the least impact from increased imports. Organic consumers at farmers markets, independent restaurants, small food shops, and other direct markets are explicitly seeking locally-grown organic products. However, some fruit and vegetable growers who marketed to natural foods grocery stores during the 1990s have reported losing some of their markets to imports as well as to larger domestic producers as these stores have expanded (Hanson et al. 2004).

U.S. organic grain and oilseed producers also face market competition. U.S. organic cotton producers began losing market share in the 1990s to countries with lower labor, input, and technology costs (Greene and Kremen, 2003), and U.S. organic soybean production started declining several years ago as low-cost production began to increase in developing countries. However, U.S. cropland for wheat is still expanding, even as organic wheat production grows rapidly in the Ukraine and other parts of Eastern Europe.

Small Farm Organic Initiatives

About 94 percent of all farms in the U.S. are considered small, with gross sales under \$250,000 (Perry, 1998), and a survey of organic producers in California in the mid-1990s showed a similar proportion (Klonsky et al., 2002). Most federal and state governments generally view organic initiatives as a mechanism to assist small producers. During the 1990s, U.S. policy on organic agriculture focused on facilitating consumer market access to a differentiated product, and national organic standards were developed during this period. More recent state and federal organic initiatives—expanding organic production and marketing research, technical assistance, and data development—are aimed at expanding market opportunities for producers.

Government research and policy initiatives often play a key role in the adoption of new farming technologies and systems. A number of federal agencies have expanded programs since the late 1990s to develop organic crop insurance, expand organic export programs and services, and broaden their intra-mural or inter-mural research on organic farming and marketing systems.

Congress also included several first-time research, conservation, and marketing assistance provisions aimed at assisting small organic farmers in the 2002 Farm Act, including cost-share funds to assist growers with the cost of organic certification, and the USDA recently proposed expanding a number of these provisions.

State support for organic farmers and handlers has also been expanding. For example, the number of States offering organic certification services—mostly at subsidized rates—has risen from 12 states in 1997 to 19 states in 2005. Several states, such as Minnesota and Iowa, began offering small subsidies for conversion to organic farming systems in the late 1990s as a way to capture the environmental benefits of these systems. The funds for these programs have mostly been from federal sources, by designating organic production as a priority for conservation cost share coverage under the federal Environmental Quality Incentives Program (EQIP) program. Additional states are now using or considering EQIP program funds for this objective. Also, at least one county—Woodbury County in Iowa—is now providing tax rebates for those who convert from conventional to organic farming practices. In 2003, the National Association of State Departments of Agriculture released a policy statement on organic agriculture expressing support for a wide range of activities that would expand public-sector organic research and education and provide technical assistance to organic and transitional farmers.

U.S. food companies are also developing innovative programs to encourage organic marketing opportunities for small farmers. For example, Whole Foods Market, the leading retailer of natural and organic foods in the U.S., announced several initiatives in 2006 to support local agriculture. The company supports weekly farmer markets in locations adjacent to their stores in many areas and developed and dedicated an annual budget of \$10 million to offer long-term loans at low interest rates to support smaller scale agricultural entrepreneurs (Whole Foods Market, 2007). It is far too early to know the impact of these loans on small farms in the U.S., but Whole Foods Market has seen positive results when implementing similar loans through their Foundation in developing countries. Whole Foods Markets has encouraged individual and small groups of stores to develop on-going relationships with small, local farms for over 25 years.

Conclusions

During the process for implementing mandatory national organic standards for organic agriculture, the U.S. Department of Agriculture was concerned organic production could become more concentrated with larger farms if some small organic operations chose to exit

the industry and others became reluctant to enter (USDA, 2000). Many U.S. organic farmers expressed similar concerns. However, since the USDA rules were implemented, data on U.S. organic agriculture shows that the smallest-scale farms continue to hold a small but stable piece of the organic sector, and organic farm size has grown, but fairly slowly. Average organic farm size is still much lower than overall farm sizes in the U.S. Overall, the U.S. organic farm sector is still steadily expanding, with cropland for fruits, vegetables, and many grains more than doubling between the late 1990s and 2005, despite rapidly increasing competition for global and domestic markets.

Gaps in the data prohibit an exhaustive description of the U.S. organic farm sector, and improved data collection is necessary to better monitor the effect of international trade and growing markets on small organic producers in the U.S. in the long run. However, progress is being made. USDA recently initiated a project to expand its annual economic survey of producers to include statistically-reliable samples of organic producers, and is working with other agencies to encourage the differentiation of organic and non-organic products as they enter and exit the country.

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Exploring hybridity in food supply chains

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Summary

In recent years, a number of dynamic aspects of food supply chains have attracted great interest among social scientists investigating rural restructuring and change. These include: the expansion of organic agriculture; the development of new value added enterprises at farm level and the revitalisation of traditional and new-old artisanal production practices; the expansion from a low base of the market share of 'alternative' short supply chains, such as farmers' markets; and the so-called quality turn, riding on the heels of another turn in rural social research - the consumption turn.

All of these changes come together in a vision of alternative agro food networks (AAFNs) that has been built around empirical and theoretical work from a number of predominantly European social researchers, centred on Wageningen, but conducted in a number of countries in Europe. These and other associated changes in the composition of farm-based economic activity are seen to be constitutive of a new paradigm of rural development comprising an alternative network of producers, consumers and other actors in relation to the mainstream agro-food system (Van der Ploeg et al. 2000; Van der Ploeg and Renting 2004; Renting et al. 2003).

The theorisation surrounding this work on AAFNs has been sharply criticised by Goodman (2004). He challenges the vision of certain European social scientists of an alternative food sector rising like a phoenix from the ashes of the commodity-based food system to constitute a new paradigm of rural development. He notes their view of AAFNs as:

'innovative precursors of paradigm change, of a more endogenous, territorialized and ecologically embedded successor to the allegedly crisis-ridden modernisation model of conventional industrialised agriculture.' (Goodman 2004:6)

In particular, he challenges the binary categorisation into alternative and mainstream and is deeply sceptical as to the existence of a new paradigm while, at the same time, highly cognisant of dynamic changes within the agro-food sector.

This paper is motivated by a desire to explore the extent to which different theories can help interpret and explain some of the most dynamic areas of agro-food systems that belong neither in the mainstream food supply chains and networks, nor in the alternative food supply networks. We review two areas where we argue that hybridity is evident in food supply chains and networks, and draw conclusions as to the research needs in a field where too often dualistic interpretations have prevailed.

Hybridity

In this paper, as elsewhere in the social sciences and more widely, hybridity is characterised by 'both, and' categories rather than 'either, or' categories. Thus, rather than exploring opposites, whether expressed as ideal type categories or nature:culture type dualisms, the exploration of hybridity entails the identification of co-constitutive socio-economic and biophysical phenomena. It constitutes a challenge and a deconstruction of previous dualistic thought (Cloke 2003).

The original use of the term hybridity in social sciences is found in the literature surrounding the study of post-colonialism. Since the rather specific early use of hybridity, the variety of contexts in which the term has been used have multiplied (Whatmore 2002). In particular, the term is widely used in Actor (or Actant) Network Theory, which draws together the study of the natural and social worlds in a mutually constitutive study of process and practice. This study of co-constitutive relationships is often described as an exploration of hybridity. This recognition of complex hybrid mixes of people, animals, plants and things challenges the previous one dimensional exploration of political economic structures (Cloke 2003: 6). Much of the discussion of hybridity is framed within heterogeneous interactions of heterogeneous actors (both human and non-human) in networks. Networks, in Murdoch's view are necessarily hybrid (Murdoch 2003: 269).

Additionally, the term hybrid is used to describe situations where elements of more than one policy perspective manifest themselves, not as separate entities but as interconnected parts of the same policy or governance framework or where theoretical explanation draws on more than one theoretical perspective to explain socio-economic phenomena. In essence, the exploration of hybridity entails the study of relationships between phenomena frequently categorised in terms of opposites and which are often theoretical constructs or ideal types, rather than observable realities. Thus, the exploration of hybridity necessarily entails exploring straddling, crossing and threatening conventional categories of and approaches to analysis.

The term hybridity has been used in a rural context by Higgins and Lockie (2002) and Lockie and Higgins (2007). In their work, the term hybridity refers to the emergent forms of governance in natural resource management, where elements of neo-liberal economic policy are juxtaposed with social and environmental resource management practices constituted at local level. This intermixture of policies is seen to underpin the operation of the neo-liberal policy agenda through hybrid 'policies of rule' (Higgins and Lockie 2002: 420). This same sense of mixing of values is evident in the way UK and Italian governments in the early 2000s have fostered a neoliberal policy regime whilst at the same time nurturing localised food supply chains through specific policy means (De Puis and Goodman 2005).

We assert that the areas of dynamic change in food markets, whether in AAFNs or the mainstream conventional sector are often better understood through an analysis of hybridity rather than through representation as inflexible dualisms. Food is a core context in which hybrid theories have been explored whether in relation to technical human natural interactions in Callon's work (1986) or in more recent studies of GM food (Whatmore 2003: 120ff.).

Understanding food supply network change: the role of theory

This section briefly reviews some of the competing theoretical perspectives that have been used to explore change in food supply networks. Some of these theoretical perspectives are rooted in economics, some in political economy and some in rural sociology. Some theoretical perspectives such as globalisation transcend the narrower disciplinary boundaries and span many of the social sciences; whereas other theories belong to a narrower disciplinary tradition. In each case, the consideration ends with brief observations on their limitations as comprehensive explanatory models.

Neoclassical economic theory

Neoclassical theory focuses on resource allocation and price determination in food markets. The principal lessons that can be drawn from neoclassical economic analysis of developed country food markets are: an expectation that food purchases will absorb a reducing share of the consumer's pound (following Engels' Law); an expectation that, of that pound, a greater share will be spent on eating out as part of expanding expenditures on leisure (because of the positive income elasticity of eating out); Additionally, a cost price squeeze is widely evidenced in the primary production sector, largely a result of supply curve shifts in the face of an inelastic demand for most commodity products. However, there may remain scope for niche and speciality products to absorb an increasing share of the affluent consumers' retail pound spent on food.

Because of the dependence of much food production on biophysical resources and the attendant uncertainties of the natural world, yields can vary and prices can prove very volatile. Further, the movement of resources out of the farm sector is often impeded by factors that induce asset fixity¹, which compounds the free market outcome of low and declining farm incomes and exacerbates the cost-price squeeze. Buffered as they have been by decades of protectionist policies, Western European commodity food production has become relatively high cost compared to Latin America, Australia or New Zealand. However, there is a long tradition of long-distance food imports into the UK from its former colonies, which was challenged by the policy consequences of the UK's entry into the European Union. However, as the GATT and WTO have turned their attention to agricultural protection over the last decade, so the more highly supported commodity agriculture support regimes have come under intense adjustment pressure. Especially in certain sectors such as poultry meat, sourcing has globalised

¹ For example a dairy farmers fixed assets in milking machinery and parlour are not much use for other enterprises.

and significant imports arrive in the UK from Brazil and South East Asia. The inevitable consequence in highly supported markets has been a search for a new rationale for farming, either through niche production or the delivery of environmental services. This search for alternative production and supply chain models can be seen as a defence and survival mechanism against the seemingly inexorable forces of globalisation, exacerbated as they are by the new global policy settlement. Indeed, Marsden et al. (1999: 295) suggest that AAFNs can “create positive ‘defences’ for rural regions against the prevailing trends of globalisation and further industrialisation of markets”; while Winter (2003) suggests that some of the emergent AAFNs can be described as ‘defensive localism’ (Winter, 2003).

The nature of contemporary food market structures, with their increasingly concentrated power, coupled with the inevitable tendencies of a primary industry with a tendency to overproduce, has exerted general downward pressure on food raw material prices. This downward pressure, coupled with a growing interest in speciality and local food, has undoubtedly triggered a push factor into farm-level diversification and value-added projects and a range of initiatives, some collectively organised and often with public sector support assisting the realisation of these new opportunities. AAFNs are thus both demand-driven by the emergent markets, a supply response to the cost-price squeeze in contemporary agriculture, a lifestyle choice for some food producers and a policy response to the increased support given to local and regional food initiatives.

However, mainstream food markets are vulnerable to volatility from a number of sources, not only to climatic events and more widely climate change which affect supply, but also to demand shifting factors such as changing tastes and consumer responses to food scares. The national and international imperatives to address global warming are likely to trigger substantial demands on land currently used for food production for biofuels. As such, some observers have predicted rising prices of food commodities triggered both by global warming impacting on production levels and the policy responses at national level to increase land-based renewable energy production. Interestingly, this might have a rejuvenating effect on commodity production in Europe, shifting production systems away from localised value adding enterprise to regional scale commodity energy raw material production thereby reducing the supply of commodity products that have often been facing long-term declining prices. This may weaken the push factor towards alternative food production in developed western countries.

Whilst market analysis through the neoclassical lens can expose disequilibria and enhance understanding of market prospects, it is less able to explain the drivers of demand change and the new institutional structures which have emerged to support AAFNs. Neither can neoclassical economics readily explain the remarkable shifts in market power towards the food retail sector, away from processors and producers. Instead of stagnation in food markets as a result of the food sector absorbing a declining share of the retail pound, as might reasonably be predicted, the food retailers have been amongst the most dynamic and rapidly growing businesses in Europe, although much of their recent dynamism is not only to do with food, but broader diversification.

Political economy of agriculture

The political economy perspective, with its roots in Marxian political economy, posits that there are inherent monopolistic tendencies in capitalist markets and that there are likely to be periodic crises in their operation. Inequalities in power and access to resources will lead to adjustments in the structure and organisation of food production and distribution. In addition, a general process of subsumption has been observed in the farm sector which has drawn farming into wider circuits of capital and subordinated farming interests to those of more powerful agents in the agro-food sector. These processes have been described by Goodman *et al.* (1987: 2) as *appropriationism* “in which elements once integral to the agricultural production process are extracted and transformed into industrial activities and then re-incorporated into agriculture as inputs”: and *substitutionism* “in which agricultural products are first reduced to an industrial input and then replaced by fabricated or synthetic non-agricultural components in food manufacturing”.

Although not exclusively a concept within the political economy perspective, the concept of globalisation can be seen as the outcome of a set of internationalised processes in food production, processing and distribution. Supported by an internationalisation of policy regulation by the WTO, itself underpinned by a broadly neo-liberal economic and political agenda, both commodity and speciality food can be expected to figure prominently in international trade. The evolving food market

entails global sourcing and the characteristic time-space compression observed in globalisation, with substantial long distance movement of food to meet the diverse and increasingly de-seasonalised demands of consumers and retailers.

Inter alia, the political economy perspective stresses the changing structural and power relations in the food sector, the globalisation of food procurement and the unequal relations between capital and workers.

AAFNs can be seen as a multi-stranded counter-culture which challenges the hegemony of the corporate giants in the food sector. The early origins of many AAFNs were extra-market phenomena, such as the pursuit of self sufficiency through organic farming. Over time, AAFNs have developed substantially as market phenomena, driven by the antagonism of some consumers towards large-scale food production, who are 'voting with their mouths' in preferring alternative production and distribution models. However, the alternative sector is by no means clearly differentiated from the mainstream and is subject to corporate predation, when profitable niches expand.

With its focus on the large-scale structures, the political economy perspective in many ways fails to pick up the micro-dynamics of AAFNs. Whilst political economists might have foreseen the concentration of corporate power within the food supply chain, it is less evident that the dominance of the retail sector was so readily predictable. Further, the rapidly expanding niche of AAFNs could not reasonably have been predicted. In addition, the nature of lifestyle businesses and the different ethical drivers of many actors in AAFNs rather undermines the notion of self-interested, profit-seeking behaviour which underpin the political economist's conception of the farm or food business.

New institutional economics

New institutional economics focuses on transaction costs and the institutions that underpin the operation of markets. Transaction costs are the costs of using the market that include information costs, negotiation costs and enforcement costs. Transaction cost analysis can provide 'an explanation for the structure of forms and for the nature of vertical co-ordination within a supply chain' (Hobbs 1996). The contemporary major food retailers have managed to strip out transaction costs by reducing the number of actors in food supply chains. However, emerging new technologies also afford new opportunities for smaller operators to reduce transaction costs and develop new AAFNs, for example through internet marketing.

Among the drivers of change in the mainstream food sector, it is clearly evident that reducing the costs of using the market is an important factor. The reduction in the number of food chain actors and the field to shop control of production processes helps large retail firms reduce transaction costs and has dramatically weakened some of the traditional components of marketing chains such as wholesale markets. However, in their past pursuit of homogenous standards and year round availability of commodities by retailers, supply chains have been lengthened in physical distance terms and this has generated much debate, especially in the UK, about food miles.

Many traditional food retailers have suffered against the competitive supply chain efficiencies introduced by the large retailers, and there are likely to have been negative impacts on some AAFNs operating outwith the mainstream sector. However, there are several reasons deducible from the analysis of transaction costs that expose why AAFNs might now constitute preferred marketing channels for some primary producers. First, the corporate muscle of the retailers can drive down prices received by farmers. The Observer (28th January 2007) cites evidence from the UK Milk Development Council of the declining farmers share of the retail value of milk from 58% of the retail value in 1995 to 36% in 2005. This enormous change might be expected to incentivise the development of alternative short food chain marketing channels or the development of value-adding enterprises by primary producers as survival strategies for deeply pressured farm businesses arising at an individual farm level or through collective action by groups of farmers. Second, supermarkets are regarded by many critics as agencies which undermine local food systems and generate a wide-ranging but similar offer to the consumer (NEF 2003), undermining traditional food outlets such as bakeries, butchers and green-grocers as well as competing with emergent AAFNs. The path dependency created by their national level distribution systems (particularly in the UK) may limit the opportunities for exploitable local niches for alternative supply channels. Third, constellations of local agencies have sometimes come together to address these problems and new alliances have emerged, often with public funding, to

build constructive partnerships which support the partial relocalisation of food markets. A partial public sector shift from sectoral to spatial policy has enabled new locally based coalitions and new forms of rural governance to shape at least some facets of rural support.

It is possible to explore the possibilities of AAFN development through the lens of transaction costs, both to explain the rejection of the mainstream marketing channels and the emergence of the new networks. However, it seems likely that competitive localism- essentially different regions competing in the regional food market (see Morris and Buller 2003) might increase the total transaction costs of AAFNs and that, rather than offering an opportunity of reducing transaction costs the development of AAFNs may constitute an exercise in self-interested rent seeking by powerful or articulate local interests who are able to extract public money from a range of sources. Although new technologies such as the internet offer new means of marketing speciality food which potentially lower direct marketing costs, the transaction costs of some AAFNs are likely to be relatively high and underpinned by public sector action.

Endogenous development

Since the early 1990s, an alternative model of developed country rural development has been actively promoted both at a theoretical and a policy level. Indeed, this model can be seen as the intellectual underpinnings of the new European paradigm of rural development (van der Ploeg and Renting 2004). The endogenous development model is articulated as both a survival strategy and development option for farmers and as a redoubt against the modernisation model. It is seen as development from within or from the bottom up, built on locally nuanced farming systems and value added production and the cultivation of rural distinctiveness.

Over the early 1990s, a research group at Wageningen-led an EU project (Van der Ploeg and Long 1994) which endeavoured not only to explore the agro-technical manifestations of endogenous development, but also to provide a theoretical rationale for both its existence and its dynamic potential in a wider rural development context. Van der Ploeg and Long (1994) explicitly challenge a unilinear model of development, arguing that at any point in time a farmer faces choices and that certain critical decisions can move the farm to a more developed state either by adopting modern farming practices, essentially buying into the modernisation of farming; or alternatively, developing the market potential of endogenous enterprise. Amongst the diverse observable styles of farming, it is often possible to identify some farmers who retain elements of traditional practice and engage in a process of deconstructing and reconstructing core knowledge and adapting it to their specific circumstance. This is the antithesis of the modernisation approach and offers scope for a range of value-adding and/or differentiated forms of production and marketing.

It is possible to rationalise the development of endogenous enterprise by reference to transaction costs or by reference to the new market opportunities created, *inter alia*, by rural repopulation, rural tourism and the development of local and/or distant niche markets. It is further possible to explain the existence of endogenously rooted enterprise by recognition of different farming styles (van der Ploeg 2003). Van der Ploeg's rationalisation is principally rooted in an analysis of the supply side- the farmer's attributes, indigenous technical knowledge and the desire to develop effective survival strategies in the face of market price pressure - rather than in acknowledgement of changing demand, although the changing demands patterns and the decline of trust in the commodity food system are also now articulated as major drivers of change.

In one of van der Ploeg's examples of an endogenous enterprise, an Italian wine producer is described whose wine is highly regarded and widely purchased by locals who understand and appreciate the growers' chemical-free production methods. In this example, the low transaction costs of using direct marketing and the build up of trust mean that a relatively labour-intensive production system can be sustained by use of an alternative route to a local market. This general model has been rolled out in somewhat different formats as a wider developmental model for the local food sector (see van der Ploeg and Renting 2004) and provides an exemplar for the sustenance and development of AAFNs. Other forms of AAFNs have emerged: for instance, farmers markets have been re-established to reconnect producers to final consumers via short supply chains; organic box schemes have been developed; and many farmers have developed value added small-scale food enterprises, often selling a significant proportion of their production to the final consumer.

The articulation of the endogenous development model as a vehicle for sustaining traditional agricultural and food processing practices is not without some foundation. In fact, in some areas, in particular in areas with residual traditional agricultures that were less fully penetrated by the processes of modernisation a significant proportion of the food system may revolve around AAFNs. However, over large swathes of Europe, the endogenous mode of production has been marginalised to such an extent that a neo-endogenous model seems more apposite, whereby farmers or small-scale processors and retailers (or indeed any development actors) assert a distinctive regional provenance, whether or not it is rooted in traditional practice (Ray 2003). However, the scale of endogenous and neo-endogenous enterprise is such that it has not become a major driver of rural change in north-west Europe, though it probably figures more prominently in countries and regions where old and traditional production practices can be effectively melded to new demands from counter-urban growth or tourism. The scope for neo endogenous development may be enhanced by incursions of urban wealth and purchasing power, whether through tourism or residence in rural areas.

Some evidence of hybridity in UK food supply chains

The above theoretical explanations of change in food supply chains offer an economic or political economy context in which these changes can be framed. However, the tendency to polarise the food chain into two components: a mainstream and the AAAFN sector tends to obscure the analysis of the interface between the two. This section explores two important arenas where hybridity in contemporary food supply chains is strongly evident. First, the growth and change in the organic farming sector is examined in a UK context. Second, the backward-reaching of the highly concentrated food retail sector towards speciality products is explored.

The conventionalisation of the organic farming sector

In the early 1990s, one of the authors was working on a project to explore the potential for the development of the organic sector in the Highlands and Islands of Scotland (Daw et al. 1991). Part of this study involved looking at another region of the UK with more highly developed organic supply chains. South West Wales had emerged as a leading region in the development of organic food in the UK. As part of the research project, a number of key actors were interviewed and it was evident at that time that there was much disagreement in the organic sector in Wales between the purist organic farmers whose ambitions were to create an alternative food system and whose motivations were more ethical than commercial and another set of pragmatists who were prepared to develop global sourcing in order to feed the demand from supermarkets. This debate is highlighted by Morgan and Murdoch (2000: 168-169) who argue that organic "producers face a Faustian bargain: while the supermarkets provide a large and ready market, they seek to tailor organic produce to the conventions of the industrial market....This problem is especially acute with regard to 'quality' conventions: supermarkets set a premium on cosmetic appearance, which in turn leads to waste and packaging. In contrast, the organic community understands 'quality' in terms of taste and nutrition, and it accepts blemishes as natural and sees little or no need for packaging".

This dualistic division into purists and pragmatists is clearly a simplification, but over the last decade and a half a debate has continued with the purists still driven by a desire to create an alternative food supply system and the pragmatists eager to sell through supermarket channels. The debate was revitalised in the autumn of 2006 as the result of an agreement by the increasingly pragmatic Soil Association to certify organic salmon farms, which was widely criticised by purists as a sell-out to powerful retailers, which condoned a completely unnatural and rather intensive production system.

On that same visit to Wales in the early 1990s, Rachel's Dairy, a dynamic West Wales organic business that had developed through adding value to organic milk on the first Soil Association certified organic dairy farm in the UK, was held up by local academic researchers as an exemplar of what organic agriculture could do for local development (see Lampkin 1990:482-485). Indeed, there are reports that there are now around 150 jobs in West Wales associated with the development of the business. Its website still asserts its local embeddedness and the narrative on the website is a personal history of its founders (<http://www.rachelsorganic.co.uk/about/history.html>) and their connection with the un-named current owners. Nowhere on that website is it mentioned that in 1999 a large US-based organic milk company, Horizon, had taken over Rachel's Dairy in a multi-million pound deal. Rachel's Dairy now supplies a range of supermarkets, as well as international hotel chains.

The growth and concentration of organic production and retailing has led to the emergence of two major box scheme suppliers in southern England (Abel and Cole and Riverford Organic Vegetables) who both use large articulated lorries in the relatively long-distance transport of their products, even though the origins of the box schemes were to provide a mixed box of local food, occasionally supplemented by bought-in extras, in order to keep food miles to a minimum and freshness to a maximum. The local franchises of these schemes may still use a significant proportion of local produce but the scale of enterprise and the business models used suggest anything but alternative food networks. This transformation of what were historically highly localised distribution systems may reduce some of the generally accepted environmental benefits and weaken the close ties with consumers which have been identified as two of the key characteristics of AAFNs.

At various times, organic farming has been incentivised by policy support, largely on the basis of widely asserted beneficial effects of organic farming on the environment, as well as a range of other asserted benefits relating to rural employment, and other more controversial assertions about benefits to health. This public support has led to organic farming methods being adopted by new entrants for narrower commercial reasons, rather than embracing the traditional organic ideologies that might resonate more closely with those associated with AAFNs. Indeed, the current minister of agriculture in the UK (David Miliband), a strong advocate of the adoption of radical environmentally friendly policies and of the Worldwide Fund for Nature's One Planet Living, has recently (January 2007) dismissed organic agriculture as a 'lifestyle choice' by consumers. In the light of those comments, the debate about the merits of organic farming has been widely aired in the public arena and organic advocates have used both environmental and health reasons for justifying their approach to farming.

Although organic food is only 4% of the UK food market, it has experienced rapid growth and as such has become increasingly contested territory between purists and pragmatists. It has also become a symbolic battlefield amongst the major retailers who are using organic products to jockey for position with food purchasers. At various times it has been used as a loss-leader to give particular supermarkets a green identity. The rapid growth in demand has required overseas sourcing of many products (about 70%) which is necessarily underpinned by long-distance food supply chains. The resultant hybridity of food supply chains/networks in the organic sector is an inevitable consequence of this contestation being played out in the market place. This is not exclusively a UK issue, as work in both the US and Australia has explored what is termed the 'conventionalisation debate' with the implication that there is an actual or potential morphing of the original values of organic practitioners as they are drawn into conventional food networks (e.g. Guthman, 2000; 2004; Lockie et al. 2000).

There are many features of the organic sector that display hybridity between the apparent in the tensions between its original 'purist' form and the current manifestations of organic food supply chains/networks. Our contention is that those areas of the organic sector the fastest growth and greatest potential to contribute to rural development can often be found in the boundary area between purists and pragmatists and in the evolving marketing structures associated with this hybridity.

The growth and adaptive capacity of major retailers

There are widely discussed concerns about the market power of supermarkets, both in relation to the tendency towards monopoly at a local level, (where in some towns in the UK single firms have a market share in excess of 60%), their buying power and ability to drive down prices received by suppliers (including farmers), and their control over development land through speculative purchase which might lead to the exclusion of competition. Many supermarkets in the UK have also entered the local convenience store market where it has been argued that they have created even greater pressure on small independent food retailers. It is also asserted that 'water-bed pricing' occurs, with food suppliers having their margins forced down by supermarkets and then raising their prices to smaller and weaker retail customers. Supermarket power is undoubtedly a concern of regulatory bodies dealing with workable competition in many countries, but supermarkets have also been at the forefront of introducing regulatory practices with respect to food hygiene and safety. There have been several inquiries into monopolistic practices by food retailers in the UK and one is currently under way, but the evidence to date is inconclusive, except in the areas of land banking (accumulating development land possibilities in ways that restrict competitors' access) and in recognition of their ability to drive a hard bargain with farmer suppliers.

In general, until recently, supermarkets in the UK have not exhibited a marked tendency to purchase significant volumes of produce from the immediate locale. In the UK, at least, this is often attributed to their centralised distribution systems and onerous quality control systems (Vorley 2006), which may require the long-distance movement of supplies from a region of production to a central distribution point and then back to the same area for consumption. This contrasts somewhat to other European countries where in France, for example, considerable shelf space is committed to local and regional produce and the organisation of procurement is very different.

Taking the UK as an example, the 'big four' supermarkets now control 71% of the food retail market, with the largest, Tesco, now accounting for roughly one out of every three pounds spent on food purchases in the UK. Supermarkets such as Tesco use sophisticated customer profiling techniques to maintain customer loyalty and are acutely aware of their customers' aspirations and interests regarding food. Tesco have moved from the 'pile it high sell it cheap' business approach that it used to break into the food market place in the 1960s, and now offers a highly differentiated range of products and encroach substantially into the market space captured partially by speciality food producers. They have, like most other supermarkets, adapted their offer to include quality labels and have made efforts to present themselves as a convenient exchange location between the individualised farmer producer and the final consumer, wherein convenience is largely based on a one-stop-shop and a wide ranging offer. The complex relations between consumers and those from whom they buy their food are beyond the scope of this paper, but it is clear that the supermarkets have tried to personalise their shopping space with images of farmers who produce exclusively for them to promote an image of quality and personal relationships between farmer and consumer. The overall evidence suggests that the so-called quality turn regarding food has not so much led to a decline of supermarkets as their continued expansion.

Given supermarkets' capacity to garner market information, it is unsurprising that they should adapt their offer to changing consumer demand, and they may, through various means, be able to help shape demand. Given their highly motivated profit-seeking behaviour, they have accommodated the growing demand for food with a local provenance. The UK supermarket chain, Waitrose, has pioneered the development of short speciality food supply chains and has recently extended this from speciality to more mainstream produce, but all supermarkets are now showing signs of trying to connect to local food suppliers, particularly but not exclusively in speciality food in order to broaden their offer to the customer. In some cases, the supermarkets will provide substantial support in product development to the supplier. The capacity of supermarkets to sell significant quantities of speciality product is a strong incentive for the small speciality supplier to engage with them. The disincentive to the producer is their dependence on a limited number of buyers with power to impose exacting demands with the associated risk that failure to comply with these demands could lead to the loss of a major sales outlet.

Supermarkets have thereby entered into new relationships with speciality food producers and small-scale suppliers. How many food products now retailed by supermarkets constitute genuinely locally grounded (endogenous) products and how many, rather than being genuinely traditional, are the invention of marketing consultants or imaginative farmers is not entirely clear. For example, the highly successful Yarg cheese, which is produced in Cornwall is not a traditional product rooted in the valleys of Cornwall, but a marketing opportunity seized by an outward-looking farmer who developed a clearly differentiated cheese product to enhance his survival prospects in a dairy sector feeling the cost price squeeze. Even many of the local food initiatives in a country with a deeply traditional food economy such as Italy can often be seen as quite recent examples of innovation and attempts to develop niche products.

As well as the corporate giants that dominate the UK food retailing sector, there are also some regionally based supermarkets that operate regional procurement strategies, which have underpinned their commercial success. Booths, a supermarket chain in North West England, is perhaps the best example of this in the UK and in Germany the Tegut supermarket chain has long been operating a similar regional procurement strategy with its food suppliers (Schaer et al. 2006). It is apparent that current market drivers are forcing supermarkets to reduce the dualism between commodity and speciality food. However, we would suggest that this process has actually been going on for some time, with retailers intent on achieving competitive advantage through strategies of differentiation, often involving place. In the case of regional speciality food and drink, the supermarkets have long stocked these products. This is particularly evident in the delicatessen and alcoholic drink sectors where *Appellation d'Origine Contrôlée* (AOC) and *Protected Designation of Origin* (PDO) foods have long been widely stocked.

The extension of regional labelling principles more widely has expanded the major retailers' scope to market regional speciality produce.

Several studies have pointed to the capacity of larger actors, normally supermarkets to expropriate the economic surplus of small scale producers. De Puis and Goodman (2005: 364) note how AAFNs have become a setting for a struggle for the economic rent created by the new market opportunities and talk earlier in the same article about the vulnerability of small producers to corporate 'co-optation'. Tregear et al. (2007) echo the general concerns about who actually controls local product designations and point out how conflictual such attempts to create local food certification can be. Mutersbaugh and Klooster (2005) also explore the development of quality certified products and note the increased dominance by the new and powerful private actors mainstreaming strategies that seek to increase the quantity of certified products sold through conventional markets.

In the case of organic produce, supermarkets now command a very significant share of the UK market at between 65 and 70% of the market (Firth et al. 2004). Sainsburys is contended to be the market leader in organic sales at c. 30% of the supermarket share of organics but proportionately, Waitrose has an even bigger organic proportion of their total food sales. Both firms now offer organic boxes, which have long been a distinctive feature of the traditional short chain direct selling of organic food from producers and this represents a further morphing of the dualism between the alternative food sector and a conventional or mainstream food sector. Interestingly, the organic market share of supermarkets has dropped in recent years, reflecting at the margin a preference of some consumers for alternative marketing channels (see Firth et al. 2004).

Certain supermarket procurement practices begin to challenge some of the stereotypical views of globalised food supply chains. Given their scale, in some senses it could be argued that they have a greater capacity to engineer a sustainability-enhancing relocalisation of food markets than AAFNs. It is possible to detect emergent hybridity in their FSCs, including their partial and ongoing reconnection to local producers and processors; again, notwithstanding issues of downward price pressures and an overdependence on a single outlet for local producers.

Hybridity in UK food chains and networks- implications for rural development

This section draws together evidence from the theoretical perspectives and the available evidence to make the case for the existence of dynamic hybridity in the UK food sector. We extend the debate about hybridity in its narrower ANT context to embrace the possibility of hybrid forms, of hybrid theories and hybrid policies. As early as the mid 1990s, Lowe et al. (1995) were arguing that the simplistic endogenous: exogenous dualism had limited explanatory power. This judgement has been endorsed recently by a range of commentators from Goodman (2004) to Lockie and Halpin (2005). We too endorse this assertion.

The brief review conducted in this paper of the principal economic macro-theoretical lenses which have been used to explore change in the food sector reveal a hotly contested debate. On the one hand, the neoclassical paradigm offers a world in which some types of AAFNs might be expected to emerge from the crisis-ridden farm sector, but where the evident market power of the major retailers limits the scope for expansion of AAFNs. A political economy reinforces this assertion of a challenging business and economic environment for AAFNs because of their predatory capacity on other food chain actors. On the other hand, a much more positive view of rural renaissance can be found by the adherents of the new rural development paradigm who assert that at the heart of rural development are new agrarian and food production and marketing practices, rooted in locale, both in terms of farming style and market output, which offer an economic keystone of the new rural economy. The political economy perspective posits a danger of expropriation of surplus value by larger food chain operators. Such firms can predate on those small scale producers and processors who have developed successful products. The often lifestyle individualism of many small-scale processors offers a free market-testing laboratory for the more market-oriented businesses, which will predate, not always successfully, on the small-scale producer should a bigger market opportunity present itself.

In spite of an enormous amount of literature, there is no unitary body of social science theory explaining rural development. This is to be expected. Different disciplines have addressed rural development through different lenses. Different lenses may throw different light on different facets of

rural change in what are acknowledged to be highly differentiated rural areas. In relation to the interactions between food markets and rural development is questionable whether any single meta theory from new rural development in the Wageningen agrarian model, to new rural development in the OECD consumption-driven rural economy model (OECD 2006), to ecological modernisation can adequately embrace the complex range of adaptive responses of rural social and economic actors and their reflexive engagement with new institutional forms and approaches to governance. If a theory is needed it must accommodate the uncertainty of outcomes and the complex interactions of actors. Around the same time as Lowe et al. (1995) were criticising the simplifying dualisms that prevailed at the time, so Marsden and Arce (1995:1277) were proposing Actor-Network Theory as a lens through which to explore the interaction of local and globalised food supply chains, again pointing to the restrictions of conventional dualisms. Ten years on the dualistic models and polarities have resurfaced with vigour, but there are at least a few examples of the application of Actor Network Theory, which reveal something of the complexity of hybrid forms and the uncertainty of food network outcomes.

Network analysis has been extensively utilised within the social sciences to understand relations between social actors, as well as the take up of new technologies, but ANT can be understood as “a hybrid of these two more traditional forms” (Murdoch 1994: 3) which allows network construction to be viewed in action (Law 1992). ANT, or ‘the sociology of translation’ (Callon 1986), was conceived by its originators (most notably Michel Callon, Bruno Latour and John Law) as a means of understanding how scientific, technological, natural and social components can form into an interdependent and coherent network. There is no preconceived frame of reference, simply an exploration of network formation that is recognised as negotiated and contingent, whereby “if the proponents of a new theory fail to gather a large enough network of allies then, in the long run, it will be unsuccessful” (Comber et al. 2003: 303). Crucially, ANT makes no *a priori* distinctions between the various components of a network, thereby allowing for the breakdown of modernist ontological dualisms, such as those between nature and society, structure and agency, production and consumption, and macro and micro-level perspectives (Lockie and Kitto, 2000). In so doing, it facilitates the scrutiny of networks that may be composed of ‘hybrid collectives’ of actors and mediations in relation to the development of particular food supply chains (Goodman, 1999).

The hybridity of food supply chains is evident in the complex and dynamic relations between small scale localised and often regionally certificated producers and national or even international food retailers. This is exhibited in the early hybridisation of organic food supply chains where the idealism of the early producers has been increasingly compromised by the market penetration practices of the pragmatists. The sector is now characterised by a range of forms of marketing from traditional local direct sales, to the hybrid box schemes, to mainstream supermarket channels. Organic food is shipped in large volumes over enormous distances and forms a symbolic engagement with the AAFNs. Whilst some, such as Lockie and Halpin 2005, assert that the evidence for conventionalisation is limited, their study does not consider the European context where substantial subsidy has attracted new entrants for opportunistic reasons, who may even have cynically used organic subsidies as a fallowing strategy.

In other work, Lockie with Higgins (Higgins and Lockie 2002; Lockie and Higgins 2007) explores hybridity in governance, where elements of neoliberal farm policy are hybridised with community based agri-environmental policy. We detect similar forces in the UK food sector where substantial support is being given to local food initiatives by regional development agencies in a political climate in which neoliberal values and a widening of international trade opportunities are widely extolled.

Interim conclusions

The postulation of a new rural development paradigm based on the relocalisation of food supplies seems to be based more on normative constructions than strong empirical evidence. It is not that these relocalised food chains are absent, but that their overall impact is uncertain and the calculations of economic impacts to date are anything but robust. It is undeniable that the competitiveness of many rural areas will be contingent on the valorisation of local assets (OECD 2006) but likely that these assets may depend on much more than the food producing capabilities of the farm sector. The agricentricity of the Wageningen school’s new rural development paradigm differs substantially from the more multi-sectoral consumption-driven OECD perspective. The bulk of evidence about rural demographic and economic change supports the idea of an increasingly consumption-driven rural economy rather more than the impending triumph of a localist counter hegemony (De Puis and Goodman 2005: 361).

AAFNs have attracted enormous research attention in Western Europe and more widely. This interest is evident not least because this model affords possibilities of at least providing an alternative livelihood strategy for some farmers, but because they may act as a harbinger to a stronger relocalisation of food systems. Further, these AAFNs are often contingent on new institutional forms which are often spatially circumscribed and thus different to the predominantly sectoral development policies which have hitherto prevailed. However, this does not of itself amount to the underpinnings of an alternative or new rural development paradigm. It simply exposes a developing arena of interesting activity in food markets, which is perhaps most highly developed in the European Union than elsewhere because of Europe's policy history, though it is by no means an exclusively European phenomenon. Instead of a new paradigm of rural development, we see important development prospects evident and emerging in the hybrid zone, both in relation to policy and practice.

The examination of organic farming shows how in practice many of the core ideologies of the organic movement can be compromised by the scaling up of organic production and the engagement with major food retailers. Lockie and Halpin (2004: 304) have argued with some conviction that: 'we need to unpack the concept of conventionalisation and avoid an uncritical aggregation of multiple dualisms between small and large, artisanal and industrial radical and regulatory local and international, regenerative and substitutionist and so on.' However, they also argue that the values of established and new organic farmers in Australia are not significantly different, suggesting that if some elements of organic farming's supply chains are scaled up and internationalised, this does not necessarily impact on the core values of the organic farmers involved.

Although the mainstream food system has been challenged by 'food scares' and deserted by some 'discerning' consumers who have shifted their allegiance to alternative production systems and markets, the mainstream food sector still appears to be resilient, in good financial health, and quick to adapt. The evidence of the impending demise of the mainstream food supply chain system may be much exaggerated, although the imbalances of power in favour of the retailers have put supply chain intermediaries under enormous pressure. The historic success of major supermarkets in recent decades is probably based more on their ability to deliver convenience and variety to consumers than abuse of corporate power. Their success is testament to their adaptive capacity in driving a tough bargain with producers and stripping cost (and other supply chain actors' profit) out of food supply chains and in developing sophisticated awareness of consumer needs. Their short supply chains may be short in terms of numbers of links but still often long in terms of distance, but there is some evidence of the short localised chain development, not all of it successful. Their market development often involves increased engagement with what have been described as alternative food sector actors who are experiencing pressures of conventionalisation.

An array of arguments has been levelled against the mainstream food sector (primarily but not exclusively the retailers) in the academic and popular press. These include: their tendency to use the cheapest supplier; their unwillingness to factor in environmental costs including road miles to their operations; their willingness to use their corporate muscle to establish quasi monopolies and coercive practices to stifle competition; their willingness to purvey food to consumers often with hidden ingredients such as trans fats, high levels of sugar and salt, as well as with numerous 'e numbers' of additives, stabilisers and preservatives. These criticisms are not without some foundation.

This same sector has been highly innovative in its response to the recognition of local and regional foods. They have developed relationships with many suppliers of speciality regional foods. They have adapted their offer so that the consumer is now confronted by an enormous range of choice. They have pioneered the expansion of the organic food market. They have recognised the public concern about traceability and (with public support and policy requirements in the wake of the BSE/vCJD crisis) now operate rigorous traceability systems. With their enormous care in market research and product development, they have moved on from simple quality control of commodities to embrace other dimensions of quality with new 'taste the difference' or equivalent brands.

The supermarkets have both the power to predate on the producers who might normally be associated with AAFNs and to provide outlets for their produce. For the supplier of a high quality food or food raw material currently operating in AAFNs, there are at least two possibilities: to engage and accept the significant loss of independence but counter this with the increased capacity for growth; or to reject any overtures and use alternative marketing channels and remain within AAFNs. In effect, the production

and processing parts of AAFNs offer the supermarkets a free food science laboratory on which they can predate, except where some 'rebel' producers refuse to sing to their tune². Further, although there are concerns about the path dependencies established by supermarkets' predominantly national and regional distribution systems which compromise (or at least delay) the development of local trading arrangements, their record of flexibility suggests a continued capacity to extract a high proportion of even the discerning shoppers' retail expenditure on food.

Both Goodman (2004) and van der Ploeg and Renting (2004) argue for 'actor-oriented and behaviourally grounded research'. The former argues that this does not yield evidence of paradigm shifts in rural development; the latter argue that it does. In a Delphi-based study by Ilbery et al. (2004), respondents questioned the emergence of 'an agrarian based rural development dynamic'. Ilbery et al's uncertainty reinforces our uncertainty, while recognising, as he does, the potential rather than the actuality of new/alternative supply chains to promote rural development.

We are left wondering why the advice not to get hooked into binaries and dualisms has been so repeatedly ignored. The real interest in food chain dynamics should be in the existing and emergent hybrid relationships between AAFNs and the mainstream. Perhaps the paradigms and theories outlined above represent rather partial takes on the complexities of change and through a process of bagging their own decoys, the hunters are not really finding anything novel in form or process. This is a great pity, because we believe that in this negotiated territory between mainstream and AAFNs, there are profound changes afoot, which will manifest themselves in different ways in different places in different hybrid forms. In the emergent food system we anticipate a dynamic response to emerging policies that address sustainability generally and climate change specifically. This will probably lead to a degree of regionalisation of food supply, in a retail system which remains dominated by major retailers, which will continue to offer a mix of commodities and specialities and which will increasingly incorporate local demand in their offer through connecting to local supplies. We anticipate continued buoyancy in AAFNs but argue that there will be pressures for scaling up, during which some of the factors that predicated the development of AAFNs will be absorbed into the mainstream system, further heightening the tendency towards hybridity. We conclude that it is necessary to reject the dualistic interpretations of contemporary food systems and better understand the expanding elements of hybridity in both process and form.

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² The case of Tyrells crisps is an interesting example. Implicating Tesco in the demise of an earlier enterprise, the owner of this highly successful SME refuses to allow Tesco to stock his product

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The UK Consumer's Attitudes to, and Willingness to Pay for, imported Foods

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Summary

We report results from an investigation into consumer preferences for locally produced foods. Using a choice experiment we estimate willingness to pay for foods of a designated origin together with certification for Organic and GM free status. Our results indicate that there is a preference for locally produced food which is GM free, Organic and produced in the traditional season.

KEYWORDS: imported food, seasonality, willingness-to-pay, choice experiment

1. Introduction

This paper reports the results of a UK-wide consumer survey conducted in 2005, aiming at assessing consumers' attitudes towards, and willingness to pay for, local and national foods compared to imported alternatives.

The current literature on issues surrounding consumption in relation to the origin of products consists of four main focus areas. The first two are generally more transactional economic studies using techniques such as cost-benefit analysis or choice experiment: price, willingness to pay, labelling and traceability, and accessibility and convenience on the one hand; the concept of food miles on the other. The second two areas are more consumer behaviour (or socio-psychological) oriented: ethical and moral issues (including fair trade, animal welfare, the environment), and patriotism or food ethnocentrism based on culture, religion or politics (Bruning, 1997) on the one hand; information, knowledge and the use of extrinsic cues on the other (Grunerts, 1997; Hobbs, 2003).

Previous research focusing on consumers' perceptions of the country of origin of products has generally classified consumer behaviour issues in terms of either two components or three dimensions. The components include country of origin as a cue for quality, dependability, reliability about a product when there is little or no other information available; and secondly, relating to a person's group identity or national pride (Bruning, 1997). Nes and Bilkey (1993) noted that country of origin should not be discussed as the sole issue regarding product purchase, as it is merely one of several attributes which may influence purchase decisions. In order to compare and measure, the importance of locality of production of the food needs therefore to be placed alongside other attributes which may influence purchase, such as ethical standards (e.g., organic or GM-free production), or seasonality of the product.

Our research focuses on two products, lamb chops and strawberries. Initial results from focus groups indicated that the decision to accept or reject local foods is based partly on factors such as the price relative to imported food, and any ethical and environmental factors associated with production of the food (e.g., organic, GM free). In addition, individual characteristics of consumers such as their socio-psychological approaches and demographics may influence the decision about whether to buy local food.

Choice modelling is an attractive way of approaching the issue of local foods purchase, as choices are presented in a manner that takes into account the multiple attributes of food and highlights the trade-offs between them. The questionnaire also included questions on the

psychological and sociological determinants of choice of local food relating to attitudes and social norms. The choice experiments model consumers' utility from food as a function of price, location of production, seasonality and whether the food is organic or GM free.

2. Background

Our questionnaire was designed following explanatory research: four focus groups conducted at the University of Reading in June 2005 provided primary information about consumers' attitudes to, and willingness to pay for food attributes such as place of production and seasonal availability. Key findings from these focus groups were that local foods were perceived to be of better quality and fresher than national or imported foods. Participants, especially female, felt as well that local food in season was tastier. Local foods were however perceived to be more expensive and inconvenient, as well as less available. Older participants appeared more aware and interested in the origin of their food, especially males, who preferred to buy British, rather on ethnocentric grounds than issues of quality and taste.

We focused on two products: a 500-gram pack of fresh lamb chops and a 500-gram pack of fresh strawberries. After piloting, five attributes were chosen to create an unlabeled experiment, each attribute presenting either 2 or 4 levels; these are summarised in table (1).

Table (1) here

We are dealing here with one linear effect, price, and four non-linear effects which require a higher number of degrees of freedom for consistent estimation. As a consequence, a full factorial design would have imposed too many questions on each respondent,¹ and we therefore opted for a fractional design, reducing the number of cards to 25. As this was still too high, it has been decided to present each respondent with 12 choice questions for lamb, and another 12 for strawberries. We opted for three-option choices in each question, with no status quo or no consumption option. Three sets of 25 cards were independently generated in SPSS, so as to ensure orthogonality of the design. Questionnaires were then created by randomly selecting from those three sets to generate as many choice sets as required, following the technique suggested by Louviere, Hensher and Swait (2000). Table (2) gives an example of a choice question for lamb, while a complete example questionnaire is given in appendix.

Table (2) here

3. Data

A nationally representative survey across the UK was conducted in late 2005, on a total of 222 respondents stratified for four socio-economic groups. The sampling unit was the household, the respondent being the person in charge of food purchasing; the survey was carried out through face-to-face in-home interviews, thus ensuring a near maximum response rate (only one response had to be dropped, upon request of the respondent). The questionnaires also included a section addressing respondents' behavioural perceptions and values designed following the theory of planned behaviour (TPB), and a more general section about each respondent's characteristics, such as age, household composition, *etc.*

The gender ratio is quite unbalanced, with 71% female: this can be explained by the fact that the person in charge of buying food for the household was targeted. The age mean is 44 years, with a median at 41, the youngest respondent being 18 (male), the eldest being 93 (male). Nationality was recorded as well, with 79% of the sample being British, 6% being

¹ A total of 256 possible cards per product, and a grand total of over 16 million unique choice sets if each card were to be presented with another two to choose from.

from another country of the European Union, 5% being from Bangladesh, 5% from an African country.

Annual income was recorded as brackets of £10,000: 45% of our sample is below £10,000 per year, and 77% below £30,000. Concerning education, 57% have a secondary school level, 15% a tertiary school level, 20% graduated from university while 8% have no formal education. Fifty-six percent are employed, either full-time (37%) or part-time (19%), while the others are mostly looking after their home (19%) or retired (15%); unemployed account for 7%, students for 3%. Of those employed, more than 76% are employees, either manual (30%) or not (46%), 11% are self-employed professionals, 7% are executives.

The average household size is 3 (median = 3), with a minimum of 1 and a maximum of 8; just under half of the households have children under 18 years of age, 46% of which have a least one child under 3, 81% have at least one child between 3 and 10, and 83% at least one child between 10 and 18. Weekly spending on food was recorded as well, with 63% spending between £50 and £100 per week, 26% less than £50, and 12% more than £100. Postcode information allowed us to determine that one third of our sample have a rural dwelling, while the other two thirds are urban, 40% of the total living in the Greater London area. Finally, 12% of respondents reported the presence of at least one vegetarian in their households.

Seven-point scales were used as well to assess people's concern for food origin, which appears as high, with a mean score of 3.5 on a scale from 0 to 6; local foods were also deemed to be tastier and fresher. Respondents also tended to agree that by purchasing local foods they would be helping local farmers; to a lesser extent, they also tended to agree that buying local meant limited choice.

Respondents were then asked how strongly they agreed or disagreed with statements relating to their own evaluation of shopping for local foods. Mean scores suggested that they were fairly neutral; they tended to disagree that their lifestyle was an impediment to buying local foods. Although they strongly agreed that seasonality was restricting their choice, they only slightly agreed that local foods were difficult to find and relatively expensive.

4. Methodology

The choices made by consumers can be described by the random utility model (Greene, 2003): the utility of option j , $j=1, \dots, J$ for respondent i , $i=1, \dots, N$ is:

$$U_{ij} = X'_{ij} \beta + \varepsilon_{ij} \quad ,$$

and the consumer chooses option j when:

$$U_j > U_k \quad , \forall j \neq k \quad ,$$

where X_{ij} is the vector of attribute levels, β is the vector of coefficients to be estimated, and ε_{ij} is the disturbance term. It is further assumed that the error terms are independently and identically distributed following a Weibull distribution. Following results by McFadden (1973), the probability $P(Y=j)$ of option j to be chosen over the others is then:

$$P(Y = j) = \frac{\exp(X'_{ij} \beta)}{\sum_{j=1}^J \exp(X'_{ij} \beta)} .$$

This probability can be used as the basis of a likelihood function which can be used for estimation.

5. Estimation & Results

Some questionnaires were discarded prior to analysis, due to missing values (respondent being vegetarian or allergic to strawberries for instance). Following an accepted technique (see, for instance, Burton and Pearse, 2002), questionnaires presenting a marked lexicographic bias have also been discarded: some individuals responded only to price, always choosing the cheapest of the three options presented to them. These people are likely to have a different utility function from the rest of the sample and have therefore been removed from our analysis, leaving us with 185 exploitable choice questionnaires for lamb, and 187 for strawberries. It is to be noted that such a bias did not significantly appear for certification attributes, due to the way the questionnaires were created: for any particular choice question, all three products could be certified or not, thus making it impossible for a respondent to always choose certified products.

As origin and season are non-linear attributes in their levels, they had to be coded as dummy variables for each of the levels but one, which is therefore implied as a reference. The GM free and organic variables are coded as 1 if the product is certified either GM free or organic, and 0 otherwise.

Statistical analysis of the conditional logit model was carried out using Limdep, different specifications being tried for each product. Normalised results for main effects only are presented in table (3).

Table (3) here

Main effects estimates have similar signs and magnitude for both lamb and strawberries, and offer generally high significance. In both cases, willingness to pay for local products is high, 88 pence per 500 grams for lamb, and 97p per 500g for strawberries, and there is a prejudice against EU imports (-53p per 500g).

Seasonality yields different results according to the product considered, with spring lamb being more valued than summer then autumn, whereas strawberries are more valued in the summer, then spring then autumn. Willingness to pay for summer strawberries is also higher (29p) than it is for spring lamb (16p); prejudice against autumn does not differ between the two however (-26p and -25p for lamb and strawberries, respectively).

There is an overall higher willingness to pay for certification in the case of strawberries, adding up to 52p against 44p for lamb; while there is a stronger preference for organic over GM free strawberries (32p vs. 20p), the preference is reversed in the case of lamb, GM free being more valued than organic (30p vs. 15p).

Further specifications including interaction terms have been estimated. Sections of the survey relating to the socio-demographic background of the respondents provided us with added information such as age, gender, etc., which could be introduced in our model as interactions with the main effects variables. Some of these variables are linear and could be used directly (e.g., age, size of the household, number of children), while others, although not strictly linear have been assumed to be (e.g., household income and weekly spending on food, which are recorded as brackets); other variables had to be modified and coded as dummy variables: education level was coded as 1 for people having attended FE college or university; dwelling was coded from the post code information as 1 for urban area. Gender was coded as 1 for male, 0 for female. For each product we report a model which has the

highest number of significant interaction terms. These results are presented in tables (4) and (5) for lamb and strawberries, respectively.

As several respondents could or would not communicate information such as their annual income for instance, the number of questionnaires available for analysis was reduced to 136 for lamb, and to 141 for strawberries.

The results show that most main effects estimates lose their significance when interaction terms are introduced in the model, some changing even sign: this may be due to a multicollinearity problem as a result of the introduction of the interaction terms.

Let us consider lamb. Concerning certification, willingness to pay for a GM free product is associated with younger, more educated and people with lower annual incomes; organic certification is associated with more educated people as well, mainly urban and having a larger weekly budget for food. Concerning the origin of the product, local is valued by older rural people with higher incomes and no children under 18; while no significant interaction term could be identified with nationally produced lamb, imports from within the EU are significantly rejected by older people. Concerning the season of production, people with a higher income are more willing to pay for spring lamb, and less willing to pay for autumn lamb; people with a higher weekly spending are more willing to pay for autumn lamb. As far as price is concerned, older people with children are more willing to pay for lamb, especially men; larger households however are not.

In relative terms, interactions involving organic or GM free certifications have the highest absolute values (*GM free*education* = 70p, *Organic*dwelling* = 43p, *Organic*education* = 38p), followed by *Local*dwelling* (-47p) and *Price*gender* (27p). The remainders, although all significant, are less important in absolute terms.

Let us consider results for strawberries. Willingness to pay for certified products, either GM free or organic, is more valued by educated people with children under 18,² and, in the case of organic, by younger people.

There is a significant willingness to pay for locally produced strawberries among older less educated people with a higher income, and, to a lesser extent, by women.³ Summer is more valued by women with a higher income

Regarding price, urban households with children and a lower income are more willing to pay for strawberries.

In relative terms and absolute values, willingness to pay is higher for certification attributes, as in the case of lamb (*Organic*education* = 70p, *GM free*education* = 50p), followed by *Price*dwelling* (48p), *Local*education* (-30p), and *Summer*gender* (-24p). The remainders are under 10 pence.

Table (4) here

Table (5) here

6. Final remarks

To a large degree, results accord with our expectations: local products are valued over imported, whilst products in season are preferred to those out of season. Certification attributes are valued positively and price is negative.

In line with our assumptions, there is a strong willingness to pay for locally produced goods: estimates for the attribute Local are positive and present the highest absolute value after Price, to the detriment of EU estimates, which present the lowest willingness to pay.

² The interaction *Organic*children* is not significant at the 10% level, although the *p*-value is very close to significance (*p* = 0.102).

³ The estimate for *Local*gender* is negative but not significant (*p* = 0.121).

Comparatively, the season of production is of little interest to respondents with much lower estimates; it appears however that, as far as lamb and strawberries are concerned, production in autumn or winter is undervalued as compared to spring and summer: as could be expected, spring lamb has the preference of respondents, while strawberries are more valued in summer.

Ethical values present a positive willingness to pay relatively more important than that of the season of production. Interestingly, while a GM free lamb is preferred to an organic one, the opposite applies to strawberries.

As far as interactions are concerned, and in line with results from the TBP part of our survey,⁴ Age appears to be characteristic of respondents who most value locally produced goods: the interaction Local*age was present in all the specifications we tried, with positive and highly significant coefficients every time. The same applies to Local*income. These hint towards a more traditional eating lifestyle, although we have no strong evidence to support this hypothesis. Other factors that could influence the willingness to pay for local products are the absence of children in the household—which could be a mere consequence of the age effect—, a lesser education level, and a rural dwelling, the latter being probably an availability constraint.

For ethical attributes Age plays a role as well, younger people being more willing to pay for GM free or organic products: this was expected, inasmuch as younger generations are commonly assumed to be more environment-conscious than their elders. A higher education level has a significant impact as well for both lamb and strawberries, which can be explained by a larger access to information educated people have. To a lesser extent, the presence of children in the household, an urban dwelling and a higher weekly budget on food have also a positive influence on the willingness to pay for product with ethical values: people who are willing to pay more on food are probably more concerned about the quality of what they—or their children— eat, and are thus ready to pay more for organic or GM free items; living in an urban area may play a positive role in the accessibility of such products too.

Income appears to be the most influential factor on the attitude towards seasonality: wealthier household are more willing to pay for products that are in season; women are more willing to pay for summer strawberries, and households spending more on food are keener to purchase lamb in autumn.

⁴ Cf. Lobb, Arnoult and Chambers (2006).

7. References

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Tables

Table 1: Attributes and levels chosen for the choice experiment.

Levels	Attributes					
	Price		Origin	Season	Type 1	Type 2
	Lamb	Strawb.				
L1	£3.99	£2.49	Local	Spring	GM free	Organic
L2	£4.49	£2.99	National	Summer	nothing stated	nothing stated
L3	£4.99	£3.49	European Union	Autumn	-	-
L4	£5.49	£3.99	Rest of the World	Winter	-	-

Table 2: Example of a choice set for lamb chop: “Please look at the choices and tell me which 500-g packet of four fresh lamb chops you would prefer to buy.”

Attributes	Choice A	Choice B	Choice C
Price	£3.99	£4.49	£4.99
Origin	Rest of the world	Local	National
Season	Summer	Autumn	Winter
Type 1		GM free	
Type 2	Organic	Organic	

Table 3: Normalised parameters estimates for main effects, for both lamb and strawberries. Log likelihood = -2169.868 (lamb); -2182.269 (strawberries).

	Lamb				Strawberries			
	Coeff.	Std Error	p-value		Coeff.	Std Error	p-value	
Price	-1.000	0.046	0.000	***	-1.000	0.046	0.000	***
Local	0.877	0.037	0.000	***	0.972	0.037	0.000	***
National	0.206	0.040	0.001	***	0.124	0.041	0.053	*
EU	-0.529	0.045	0.000	***	-0.533	0.045	0.000	***
Spring	0.157	0.039	0.009	***	0.109	0.040	0.083	*
Summer	0.065	0.041	0.302		0.291	0.040	0.000	***
Autumn	-0.258	0.043	0.000	***	-0.246	0.043	0.000	***
GM free	0.296	0.048	0.000	***	0.199	0.047	0.008	***
Organic	0.146	0.048	0.046	**	0.318	0.047	0.000	***

**Table 4: Normalised parameters estimates for main effects and interactions for lamb.
Log likelihood = -1526.350**

		Lamb		
		Coeff.	Std Error	p-value
Main effects	Price	-1.000	0.239	0.000 ***
	Local	0.287	0.198	0.169
	National	0.208	0.048	0.000 ***
	EU	0.055	0.162	0.750
	Spring	-0.082	0.092	0.401
	Summer	0.021	0.049	0.691
	Autumn	-0.250	0.147	0.107
	Organic	-0.744	0.204	0.001 ***
Interactions	Price*age	0.008	0.004	0.045 **
	Price*HH size	-0.104	0.056	0.077 *
	Price*children	0.171	0.066	0.014 **
	Price*gender	0.269	0.121	0.036 **
	GM free*age	-0.011	0.004	0.010 **
	GM free*education	0.705	0.138	0.000 ***
	GM free*income	-0.135	0.039	0.001 ***
	Organic*education	0.381	0.116	0.002 ***
	Organic*spending	0.117	0.053	0.035 **
	Organic*dwelling	0.435	0.133	0.002 ***
	Local*age	0.012	0.003	0.001 ***
	Local*children	-0.116	0.032	0.001 ***
	Local*income	0.088	0.025	0.001 ***
	Local*dwelling	-0.474	0.099	0.000 ***
	EU*age	-0.010	0.004	0.008 ***
	Spring*income	0.066	0.027	0.018 **
	Autumn*spending	0.087	0.044	0.065 *
Autumn*income	-0.067	0.030	0.035 **	

Table 5: Normalised parameters estimates for main effects and interactions for strawberries. Log likelihood = -1618.491

		Strawberries		
		Coeff.	Std Error	p-value
Main effects	Price	-1.000	0.143	0.000 ***
	Local	-0.167	0.158	0.429
	National	0.124	0.047	0.049 **
	EU	-0.434	0.051	0.000 ***
	Spring	0.028	0.047	0.652
	Summer	0.018	0.091	0.882
	Autumn	-0.152	0.049	0.020 **
	GM free	-0.128	0.084	0.256
	Organic	0.377	0.202	0.163
Interactions	Price*children	0.092	0.039	0.076 *
	Price*income	-0.098	0.032	0.021 **
	Price*dwelling	0.483	0.121	0.003 ***
	GM free*education	0.498	0.112	0.001 ***
	GM free*children	0.104	0.041	0.055 *
	Organic*age	-0.011	0.004	0.041 **
	Organic*education	0.700	0.113	0.000 ***
	Organic*children	0.092	0.042	0.102
	Local*age	0.016	0.003	0.000 ***
	Local*education	-0.304	0.098	0.020 **
	Local*income	0.137	0.029	0.000 ***
	Local*gender	-0.180	0.087	0.121
	Summer*income	0.098	0.025	0.003 ***
	Summer*gender	-0.239	0.088	0.043 **

Appendix

SECTION 2

In this part of the survey we would like to gain some insights into the choices you make when purchasing foods – the two examples given here are lamb chops and strawberries – please complete both sets of questions regardless of whether you actually purchase either of these products or not.

4. Which packet of 4 x fresh lamb chops (500g pack) would you prefer to buy?

Please choose only one in each question – circle your choice: A, B, or C.

Ref_L1

Question	Choice A	Choice B	Choice C
4-1	Produced outside the EU £3.99 Purchased in summer	Produced locally £4.49 Purchased in autumn GM free Organic	Produced nationally £4.99 Purchased in winter

Question	Choice A	Choice B	Choice C
4-2	Produced locally £3.99 Purchased in winter GM free Organic	Produced nationally £4.49 Purchased in spring	Produced in the EU £4.99 Purchased in summer GM free Organic

Question	Choice A	Choice B	Choice C
4-3	Produced nationally £5.49 Purchased in winter GM free	Produced in the EU £3.99 Purchased in spring Organic	Produced outside the EU £4.49 Purchased in summer GM free

Question	Choice A	Choice B	Choice C
4-4	Produced in the EU £5.49 Purchased in spring	Produced outside the EU £3.99 Purchased in summer GM free Organic	Produced locally £4.49 Purchased in autumn

Question	Choice A	Choice B	Choice C
4-5	Produced outside the EU £3.99 Purchased in spring	Produced locally £4.49 Purchased in summer GM free Organic	Produced nationally £4.99 Purchased in autumn

Question	Choice A	Choice B	Choice C
4-6	Produced in the EU £3.99 Purchased in autumn Organic	Produced outside the EU £4.49 Purchased in winter GM free	Produced locally £4.99 Purchased in spring Organic

Question	Choice A	Choice B	Choice C
4-7	Produced in the EU £3.99 Purchased in spring GM free Organic	Produced outside the EU £4.49 Purchased in summer	Produced locally £4.99 Purchased in autumn GM free Organic

Question	Choice A	Choice B	Choice C
4-8	Produced outside the EU £5.49 Purchased in autumn GM free Organic	Produced locally £3.99 Purchased in winter	Produced nationally £4.49 Purchased in spring GM free Organic

Question	Choice A	Choice B	Choice C
4-9	Produced nationally £3.99 Purchased in spring GM free	Produced in the EU £4.49 Purchased in summer Organic	Produced outside the EU £4.99 Purchased in autumn GM free

Question	Choice A	Choice B	Choice C
4-10	Produced outside the EU £4.49 Purchased in winter	Produced locally £4.99 Purchased in spring GM free Organic	Produced nationally £5.49 Purchased in summer

Question	Choice A	Choice B	Choice C
4-11	Produced locally £4.49 Purchased in spring Organic	Produced nationally £4.99 Purchased in summer GM free	Produced in the EU £5.49 Purchased in autumn Organic

Question	Choice A	Choice B	Choice C
4-12	Produced nationally £4.99 Purchased in summer Organic	Produced in the EU £5.49 Purchased in autumn GM free	Produced outside the EU £3.99 Purchased in winter Organic

5. Which packet of fresh strawberries (500g pack) would you prefer to buy?

Please choose only one in each question – circle your choice: A, B, or C.

Ref_S1

Question	Choice A	Choice B	Choice C
5-1	Produced nationally £2.99 Purchased in spring Organic	Produced in the EU £3.49 Purchased in summer GM free	Produced outside the EU £3.99 Purchased in autumn Organic

Question	Choice A	Choice B	Choice C
5-2	Produced outside the EU £2.49 Purchased in summer	Produced locally £2.99 Purchased in autumn GM free Organic	Produced nationally £3.49 Purchased in winter

Question	Choice A	Choice B	Choice C
5-3	Produced outside the EU £3.49 Purchased in spring GM free Organic	Produced locally £3.99 Purchased in summer	Produced nationally £2.49 Purchased in autumn GM free Organic

Question	Choice A	Choice B	Choice C
5-4	Produced locally £3.49 Purchased in autumn	Produced nationally £3.99 Purchased in winter GM free Organic	Produced in the EU £2.49 Purchased in spring

Question	Choice A	Choice B	Choice C
5-5	Produced in the EU £3.99 Purchased in spring	Produced outside the EU £2.49 Purchased in summer GM free Organic	Produced locally £2.99 Purchased in autumn

Question	Choice A	Choice B	Choice C
5-6	Produced in the EU £3.49 Purchased in winter	Produced outside the EU £3.99 Purchased in spring GM free Organic	Produced locally £2.49 Purchased in summer

Question	Choice A	Choice B	Choice C
5-7	Produced nationally £2.49 Purchased in autumn	Produced in the EU £2.99 Purchased in winter GM free Organic	Produced outside the EU £3.49 Purchased in spring

Question	Choice A	Choice B	Choice C
5-8	Produced in the EU £2.49 Purchased in autumn Organic	Produced outside the EU £2.99 Purchased in winter GM free	Produced locally £3.49 Purchased in spring Organic

Question	Choice A	Choice B	Choice C
5-9	Produced locally £2.49 Purchased in spring	Produced nationally £2.99 Purchased in summer GM free Organic	Produced in the EU £3.49 Purchased in autumn

Question	Choice A	Choice B	Choice C
5-10	Produced in the EU £2.99 Purchased in summer GM free	Produced outside the EU £3.49 Purchased in autumn Organic	Produced locally £3.99 Purchased in winter GM free

Question	Choice A	Choice B	Choice C
5-11	Produced locally £2.49 Purchased in summer GM free	Produced nationally £2.99 Purchased in autumn Organic	Produced in the EU £3.49 Purchased in winter GM free

Question	Choice A	Choice B	Choice C
5-12	Produced locally £3.99 Purchased in summer Organic	Produced nationally £2.49 Purchased in autumn GM free	Produced in the EU £2.99 Purchased in winter Organic

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Competitive positioning and value chain configuration in international markets for traditional food specialties

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Summary

In this paper we discuss the relations between the increased quality standards of traditional food products and the structuring and management of the value chain. We address the importance of different quality dimensions, and how they are combined in superior strategic configurations to achieve competitive advantage in particular in up market segments. We elaborate on the competitive positioning tools and the resource configuration of the value chain necessary for creating sustainable competitive advantage for small and medium-sized enterprises. We present results from 11 in-depth interviews with representatives from the fragmented Norwegian value chain for lamb products. The results show that to achieve customer-oriented differentiation focus effect and at the same time be competitive on price you have to include rigid regimes of coordination and control throughout the value chain. Implications for management of the value chain and contract relations between the actors in the chain are discussed.

KEYWORDS: quality differentiation, value chain, configuration, management, contracts

Introduction

Several industries experience significant changes in market structure and competition. This paper focuses on strive towards new competitive tools through expanded quality standards related to origin and ethical or ecological production. The agro-business sector has traditionally been regarded a fragmented industry characterized by regional dispersion and limited, cross-national activity (Porter, 1986).

Only a few studies have so far centered on the business-strategy patterns of fragmented and regionally dispersed industries. The main focus of strategy research during the 1980s and 1990s has been the strategic action of firms that have expanded into international markets (McDougall et al., 1994) or firms that have been “global born” (Knight & Cavusgil, 1996). In particular, the global strategies of multinational corporations (MNCs) have been reviewed in detail (Dess & Davis, 1984; Hambrick, 1983a; Kim & Lim, 1988; Morrison & Roth, 1992).

Today's up market consumers are increasingly quality conscious in their product choice among the rising range of food products available. Quality aspects like different sensory attributes based on traditional conservation and processing methods, regional food culture and an ethical sound production chain has caught the attention of the postmodern consumers. This opens for new opportunities for countries with a marginal, small scale food production, focusing on the potential for increased export of agriculture small-scale products based on natural resources and traditions. Quality aspects such as clean nature and plant and animal health are also stressed as comparative advantages. The marketing of the immaterial quality dimensions have consequences not only for the processing and end product. It also means that we have to develop a strategy emphasizing the new quality standards throughout the value chain. The objective of this paper is to show how the increased quality standards of traditional food products and the competitive strategy positioning needed have consequences for the structuring and management of the whole value chain.

In this paper we address the importance of each of the different quality dimensions, and how they are combined in superior strategic configurations to achieve competitive advantage in particular in up market segments. An important challenge is that quality dimensions included in such advanced product concepts demand adaptation of production

throughout the value chain. We consider both the competitive positioning tools and the resource configuration of the value chain necessary for creating sustainable competitive advantage for small and medium-sized enterprises within these segments. The central research questions are: 1) How do up-market consumers react on combined higher-order quality dimensions related to environment, production methods and traditional recipes? 2) How should different higher-order quality dimensions be integrated into a combined competitive positioning concept? 3) What consequences have the combined positioning strategy as to the configuration and the management of the whole value chain?

In section two we present relevant theory for the discussion of competitive tools and configuration of the value chain. In section three and four we present the methodology and the results of case studies within two value chains. In the final section, we conclude and discuss both scientific and practical implications.

Theory

To understand how a small- and medium-sized firm should adapt to new market challenges we need a broad understanding of strategic tools and how they are generated within the organization. Strategy researchers have made significant efforts in categorizing strategic adaptation in different industrial settings. In particular, the development of the strategy-structure-performance perspective has provided an understanding of how firms adjust to environmental challenges (Ansoff, 1971; Hofer & Schendel, 1978; Porter, 1980; Ginsberg & Venkatraman, 1985). This study adds to this tradition by analyzing the strategic features of firms competing in more niche oriented markets with strongly differentiated products.

To improve both the rigor and relevance of the strategy construct, several authors contend that business strategy should be conceptualized according to sub strategies at the level of the business unit. This approach would facilitate the study of strategy from a managerial perspective, and would reduce the risk of creating models that are too simplistic (Chrisman et al, 1988; Hofer & Schendel, 1978; Morrison, 1990). The sub strategy approach may also provide a general manager with a more useful set of tools with which to make the strategic decisions.

Earlier studies of integrated and global industries have been focused on competitive positioning tools in particular. A competitive positioning sub strategy is the implementation of tools that relate the firm to customers in the market and restrict competition through the creation of entry barriers (Porter, 1980; 1985). It includes finding the geographic setting of the firm's products, deciding whether to compete on price or customer differentiation, the degree of active marketing efforts. Not the least, we have to include degree of focus on niche orientation, where specialized markets or geographic areas are served (Carter et al., 1994).

Limiting the study to positioning could prove insufficient. We have to look into the organizational and managerial configuration of the firm to see if the firm manages to enter more complex differentiation strategies (Chandler & Hanks, 1994; Brush & Chaganti, 1998).

Hofer & Schendel (1978) stated that a business strategy should include at least three interrelated substrategies; competitive positioning, organizational and political. Reve (1990) emphasized the need for an integrated model, which included both competitive positioning and strategies for the organization of the unique resources within a firm. A resource-focused organizational substrategy include the structural configuration of the value-chain, functional parts within the firm, as well as parts of the value chain controlled through cooperative relations with other organizations that facilitate the development of mutual resources across organizational borders to create scale and scope advantages.

Strategic positioning and organization

The choice of market strategy is a complex task within small firms. While larger firms may have the resources available for a fine-grained positioning adapted to power play in the market, the smaller firms often have to be more creative in applying existing resources through organizational and governance oriented tools (Borch et al., 1999). We should therefore look at both the competitive tools and the resource configuration of these firms to decide upon their opportunities for creating sustainable competitive advantage (Bamberger, 1999; Rangone, 1999). When it comes to competitive strategy, Porters's (1980, 1985) theory of generic competitive strategy has been among the most influential for the last two

decades. According to this theory firms have three specific choices; differentiation, cost leadership and focus. For very small firms in the food industry a focus strategy, and especially entering niche markets with a differentiation focus strategy, has been recommended (Borch & Forsman, 2003).

According to Porter's (1980, 1985) theory, firms failing to choose between the alternative strategies of cost leadership and differentiation risk being ousted on all fronts. However, there has been a critique of the normative postulate inherent in the dominant Porter-inspired paradigm. This critique is related to the opportunities for combined differentiation and cost leadership strategies (Murray, 1988) and the possible success of following a non-distinct flexibility strategy (Cambell-Hunt, 2000).

In competitive markets with increasing internal rivalry, the producer needs to develop additional tools in order to secure future competitive advantages. The increased rivalry from other firms, import products and substitutes, and the increased negotiation power of the wholesaler-retailer chains imply a high degree of focus on the cost dimension *together* with the efforts towards differentiation (Borch, 1999; Borch & Brastad, 2003).

New organizational resources may increase flexibility in choosing among strategic tools. One may expect extra opportunities for enterprises that are flexible on different tools to meet new opportunities and changing trends (Borch et al., 1999; Cambell-Hunt, 2000; Rangone, 1999). In particular, when few financial resources are available for buying new resources cooperative strategies are at hand. Through including cooperative relations, the small firm may develop bundles of internal and external resources that may increase the range of competitive tools for the small firms including mixed cost and differentiation strategies and non-distinctive flexibility strategies. The strategic advantages of closer links with other firms in the value chain compared to the traditional arm-length market exchange have been highly emphasised within small business research (Borch, 1999).

Day & Wensley (1988) and Spender (1993) criticized strategy research for not sufficiently addressing the conversion of organizational skills and resources into positional advantages in the market. Including the resource-based dimensions of competence, routines and working culture may accentuate the intra-organizational premises for achievement and the maintenance of competitive advantage (Barney, 1991; Black & Boal, 1994; Leonard-Barton, 1992). An integrated organization and resource base substrategy is defined as the immaterial quality of an organization in terms of competence, routines, personal commitments and working culture inside the organization and in the interplay with partners outside the firm (Cooper, 1993; Brush & Chaganti, 1998)

The configuration of the value chain

Implementing a more customer oriented adaptation of products with a strongly differentiated strategy implies higher dependency of a quality approach throughout the value chain. As the firm may not easily achieve internal control over the whole value chain, there is a need to have inter-organizational coordination mechanisms. Also, within larger firms the value chain is split into several companies working more or less independently within the corporation. Thus, superior communication, coordination and control mechanisms are needed both inside the single production unit and between all the companies taking part in the value chain of the quality-differentiated products in question.

In this study we emphasize the need for quality improvements throughout the value chain and how this is achieved through new organizational mechanisms.

In the study of Stabell and Fjellstad (1998) three alternative value configurations are proposed as a foundation for a theory of value configuring for competitive advantage. Theirs work is building upon Porter's (1985) original value chain framework and Thompson's (1967) typology of long-linked, intensive and mediating technologies. Stabell and Fjellstad (1998) propose that the *value chain* models the activities of a long-linked technology, further that the *value shop* models firms where value is created by mobilizing resources and activities with the purpose of resolving a particular problem related to the consumer, and finally the *value network* models firms that create value by facilitating a network relationship between their customers using a mediating technology. By introducing these three configurations it's also stated that there'll be a need for transforming the value chain analysis into a value configuration analysis (Stabell & Fjellstad, 1998).

All three configurations focus upon critical value activities, the distinction between primary and support activities, and the analysis of cost and value drivers. Stabell & Fjellstad, 1998 suggest that the value chain requires a machine bureaucracy organization of primary activities, then that the value shop is organized according to either the professional bureaucracy of the operational adhocracy, and that the value network often is organized according to an administrative adhocracy, particularly when the technology of the infrastructure is complex and requires highly specialized development activities.

Mason et al. (2005) focus upon supply chain configurations shifting from traditional vertical integration to virtual integration, known as networks, shamrocks, value added partnerships, alliances and virtual integration. All of these, configurations becoming more and more common and adopted by large, successful and international firms like Dell, Benetton and Nike.

(Mason et al. 2005 suggest three main implications for managers. First, there's the appropriate selection of integration typologies in order to facilitate a demand driven supply chain configuration. Second, there's the recognition of the need for careful identification of supply chain partners in order to facilitate supply chain influence. Finally, there's the way firms define and manage supply chain influence with partnering firms. This study support the theory that the level of market orientation achieved will be significantly affected by the relationship focus, channel power, channel leadership, communication, and co-ordination technology present in quasi-integrated forms.

The use of the value network configuration as an alternative to the value chain is discussed in a study by Fjeldstad and Ketels (2006). They state that introducing multiple value configurations e.g. value chain and value network reflects the view that firms differ systematically in the way that activities relate to each other according to their underlying value creation (Fjeldstad & Ketels, 2006:110). Further, they state that the choice of this value creation has implications for the development of the business strategy. Value creation occurs differently within the value chain and the value network. In a value chain, the value creation derives from products implied that the products match customers needs. On the other hand, value networks create value by enabling exchanges. Competitive advantage occurs when the network matches the needs of its members (Fjeldstad & Ketels, 2006). A value chain product or service properties are at the centre, whilst in a value network the customer is set in the centre.

These findings have three important implications. First, the activity model, either value chain or value network, will not be effective in use if it's not in accordance with the representations of the firm nor been seen as valid by its executives. Second, different value configuration are suggested to become the starting point for gaining a more systematic understanding of which of these choices are critical, and how they interact for different classes of companies. Finally, it's said that in certain situations the value network configuration may prove to be a more appropriate tool than the value chain configuration.

“The value chain sell something that they produce, while the value network sell something that they organize but don't technically own “ (Fjeldstad and Ketels, 2006:126).

The concept of netchains is introduced among others by Lazzarini et al. (2001) in order to fill the voids of the supply chain analysis literature and the network analysis literature. A netchain is defined as a set of networks comprised of horizontal ties between firms within a particular industry or group, such that these networks are sequentially arranged based on the vertical ties between firms in different layers (Lazzarini et al. 2001). An important aspect of netchain is the fact that this concept explicitly differentiate between horizontal and vertical ties, to point out how agents are related to each other, either within the same layer or between the different layers. The purpose of the netchain is to integrate both the supply chain analysis and the network analysis. This is to be done through recognizing that complex inter-organizational settings includes different kinds of interdependencies associated with sources of values like strategic variables yielding economic rents, and associated with coordination mechanisms involved in an inter-organizational collaboration (Lazzarini et al. 2001).

The netchain perspective suggests that the assessment of interdependencies in a given inter-organizational setting should be the first analytical step in a rent creation system. Further they encourage managers to develop social ties where activities are mutually adjusted instead of planned, at the same time as they're pursuing flexibility to position their firms in valuable networks to benefit from new information and knowledge diversity. Moreover, the

netchain perspective insists that the design of interdependencies is the first step in the formation of inter-organizational strategies (Lazzarini et al. 2001).

In this study we take as a starting point the basic value chain and look at the changes in value configuration as the complexity of the production increases due to higher quality ambitions. We emphasize that there may be more configurations present simultaneously to manage the demands of both efficient production, continuous improvements of the present products, and for more explorative activities towards new product platforms.

Methodology

We present results from in-depth studies of Norwegian companies exporting lamb products to Italy. Data were collected through 11 interviews with actors throughout the value chain. The interviews were either made by telephone or in person with representatives from each part of the value chain, e.g. farmers, managers of slaughtering, processing, distribution and sales. The persons interviewed represented the value chains of two different locations in Norway, named value chain A and value chain B in the following.

An interview guide was constructed in advance building upon relevant theory and all the respondents were asked the same questions and given keywords according to the specific part of the value chain they represented. First, the questions concerned their individual idea of a special quality of lamb meat products. Second they were asked about basic adaptations in their part of the value chain when dealing with an extra ordinary quality. Then questions concerning adaptations inside their organization were given followed by questions on adaptations in other parts of the value chain. Finally the respondents were asked to answer questions regarding the consequences the adaptations had for their performance in addition to cost implications.

The interviews were conducted over a three month period of time, all of them audio recorded with a length lasting from half and hour until two hours. The persons interviewed were recruited through the reference group of an interdisciplinary research project covering the whole value chain of lamb meat products.

Data and Analysis

The table below provides the results from the two value chains studied.

Table 1: Summary of results from value chain A and value chain B

	Value chain A					Value chain B				
	<i>Quality dimensions</i>	<i>Adaptations basic production</i>	<i>Intra organizational adaptations</i>	<i>Inter organizational adaptations</i>	<i>Performance Cost implications</i>	<i>Quality dimensions</i>	<i>Adaptations basic production</i>	<i>Intra Organizational Adaptations</i>	<i>Inter Organizational adaptations</i>	<i>Performance Cost implications</i>
Farming phase	Willingness to pay Meat body Fat content Directly from outfield “Organic” Pure product	Follows ordinary production Keep lambs off public roads Grazing geography in accordance with trademark	One day of extra work Hired extra personals Register lambs as specialities and label them to be sent to special processor	Deliver to special processor Register that lambs are to be separated from others at the slaughters Extra labelling Extra documentation	Must follow specific standards Increased costs related to traceability Special agreement with processor Need of increased competence	Mountainous taste Wild game flavour Willingness to pay	Sorting the lambs Weighting Extra infield pasture	Hire extra personals	Sorting the lambs More work in processing part	Increased costs Crop reduction Special Agreements More documentation
Slaughtering	Origin: artic environment Grazing area Appearance of the lambs Meat body Fat content Physical quality	Follows ordinary routines Classification Labelling Documentation Region of origin specifications Guidelines as to cutting Time of slaughtering during the day Extra sorting Extra labelling	Extra alertness and awareness among staff of the quality Extra control routines Updating and management of cutting depart. Enough resources Extra skilled workers More work separating and keeping special produce from	Extra work for shops and chains to promote these products Interested and enthusiastic producers <i>Farmer:</i> cooperation Documentation <i>Processor:</i> Takes the whole animal.	More demanding specifications No increased costs More work Increased wages Lack of raw material to own products Extra cost of buying more raw material	Slaughtering quality Meat quality Eating quality; meat body, fat content, tenderness	Follows routines as for ordinary production Keep the stream of animals at a steady motion	Extra planning as to transport Extra sorting and handling into a small stream of goods Extra measuring of pH, temperature Competence Create an attitude of understanding for small streams of goods	Producer’s side, gain satisfying animal growth to gain tender meat	Marginal increase in cost because of small streams of goods

			ordinary produce							
Processing	Feed Mountain grazing History Grazing conditions Handcraft Raw material Fat content Tradition	Full control of animals Process animals one farm at a time Labelling Communicate message of differentiation Make safe food Products made by hand Special spices Special packaging design Name of trademark Traceability	Long term strategies To influence our framework conditions Adapt our systems Trained, skilled personals Handling of small streams of goods Employed product and marketing coordinator Started a new business out of an old one	<i>Farmer:</i> Lambs directly from outfield <i>Slaughters:</i> get animals slaughtered within limited timeframe – extra costs Coordination Transportation Reporting Buy services from the farmer, slaughters, sale and marketing Special classification from slaughters Cooperation with cutters To train every part of value chain to act in accordance with our standards	Special agreements with the farmers; increased costs Increased production cost Time consuming work More following up Special agreements with sales firm	Access to raw material of good quality	Separate department for specialities Weather conditions – no use of machines New packaging and labelling	Employees have specialities as their special field of competence Small, integrated administration	<i>Farmer:</i> Specification of weight and fat content. No infield grazing No illnesses No medicine use <i>Slaughters:</i> Fulfil extra demands	Special agreements with suppliers Extra costs of personals Networking with slaughters
Distribution Promotion (Both value chain A and B)	Physical quality; meat body, fat content, bone Delivering at the right moment Origin/ Storytelling Health aspect	<i>Farmer:</i> Slaughtering outside the season Avoiding freezing <i>Slaughters:</i> Avoid stress Anatomic cutting	Special group of products Separate focus area Extra personals: sales managers, product manager, retail chain		Capacity slaughters Distinction in the streams of goods Computer systems					

	Outfield grazing No illnesses No medicine used	Hygiene Sort male/female <i>Processing:</i> Durability Temperature <i>Sale/Distrib.:</i> One location only Presentation Stable deliverance	negotiator.							
Export (Both value chain A and B)	Origin Health Outfield grazing No illness No medicine use	Positioning in up market segment Choose the best animals Thoroughly cutting Transport Distribution system	Established export department Economy systems Language barriers To be professional in an up market	Special agreements with farmers, slaughters <i>Farmer:</i> Pasture Feed Illness <i>Slaughter:</i> Measuring pH Classification Selection <i>Processor:</i> Packaging	Increased costs Differentiation Selling the worlds most expensive product Everyone has to take responsibility					

The data in table 1 shows that there are several extra quality dimensions included. This has consequences for the handling within the primary production and at the organizational level

It also has performance implications increasing the costs throughout the value chain, and at the same time increasing price in the final distribution part.

Quality dimensions

As shown in table 1 above, different quality dimensions both material (physical) and immaterial are listed by the respondent according to where in the value chain they are positioning. Also, there is some degree of overlap between the different phases of the value chain.

In every phase of the two value chains, there are a focus upon the physical quality aspect of the product, e.g. meat body, fat content, tenderness and so forth. The terminology differs, however, in the different parts of the value chain referring to it as either eating quality, meat quality or physical quality. This creates communication challenges throughout the value chain. Then there's the aspect of immaterial quality dimensions that varies in focus in the different parts. Aspects like origin, history or storytelling, and tradition are to be considered as central findings appearing in our data material in different forms. However, these quality dimensions may dominate in the primary (farm) part of the value chain and downstream towards the marketing of the end product.

In the farming-, slaughtering- and processing we found in value chain A much emphasis on the grazing conditions and weather of not the animals come directly from outfield to the slaughters. This is seen as a competitive advantage within the above mentioned phases of the value chain. The manager of one of the processing companies explained this as:

You become what you eat. If the lambs eat garbage before they are slaughtered it reflects on the quality. If they eat herbs etc. that grows in the mountain areas, then it shows in the meat.

When looking into distribution, sale and export, the health aspect becomes important, in relations with demands of absence of illness or medicine use. These parts of the value chain also mention origin and history as important quality dimensions. One representative of the slaughtering houses put this in the following way:

The origin factor from the environment we are in, the arctic environment. And the unique part of the country we live in. Then to use this as an advantage in building a trademark. Grazing areas here should also be seen as an advantage.

Farmers in both of the value chains believe that willingness to pay for their products are linked to the immaterial quality dimensions. In addition, they're concerned with the flavour of the meat being in accordance with the wilderness and a pure organic product. The slaughtering houses are, not unexpectedly concerned with the physical quality of the meat in a more material way than the others. The processors in both of the value chains mention raw material as an important aspect. In one way the raw material is important for the processing process because of it being done like handicraft work, and in another way the access of the raw material is seen as a quality aspect.

Looking into the distribution and sales, the representatives are very concerned with the ability to deliver the products at the right moment according to the market. This is a concern nobody else was taking into account.

To sum up, there are a combination of material- and immaterial quality dimensions are preferred and practised within the whole value chain. Further, this aspect of immaterial quality dimensions can occur in different ways according to which part of the value chain that is studied. As to differences between value chain A and B, there is more focus towards immaterial dimensions in value chain A compared to B. This may be linked to the fact that these two value chains represent two distinct parts of the country, the southernmost value chain having less distinct immaterial benefits.

Adaptation in primary value chain

In every part of the value chain there seems to be a common agreement concerning labelling as a central part of the adaptations in the primary value chain. This is accounted for in both value chain A and B. There's also interesting to see that several of the respondents initially claims not to adapt in a special manner, but states that they're following ordinary production routines and regimes. This is mostly true for those representing the slaughters as shown below with quotes from two different managers:

"Most of the time we run the same arrangements, at least in the season."
(Manager value chain B)

"As a starting point, there are no significant adaptations that we need to do."
(Manager value chain A)

When investigating this further, there is no doubt that they actually do make adaptations. Another finding that represents several of the respondents is the fact that they sort out the production, one way or another. For instance, in the slaughtering part of the value chain, the animals are slaughtered at a specific time during the day, sometimes also at separate weekdays than what's the reality of ordinary production. Then for the processors part, a separate department is handling these special products. The same occurs for the distribution and sales part of the value chain, where the production of specialities is placed at one regional division only.

In value chain A there is a strong emphasis on looking after the aspect of origin, through adaptations for the farmer to let the animals graze in a certain geographically area. Then for the slaughtering houses there are adaptations as to extra classification, labelling, documentation. In both value chains the processors make adaptations to process their products the old fashion way. In addition, the processors mention adaptations as to packaging and labelling, with special emphasis on the element of design. The representatives of both value chains focus upon anatomic or correctly done cutting of the slaughtered animals.

To sum up, every part of the value chain has made adaptations, even if they might claim not to, initially. Most of the adaptations in the basic value chain have to do with sorting the animals in the farming- and slaughtering face, followed by extra labelling and a more thoroughly made packaging in the part of sales and distribution. One other thing to take notice of is the fact that some activities in some parts of the value chain A and B are put at special locations.

Adaptations in the administrative support level

Overall, the results show that in almost every part of the value chain there has to be done adaptations regarding labour, personals, staff etc. In the farming face there's a need for hiring extra personal, but in the slaughtering face there's a need of more skilled and trained personals, with special focus on this type of production. This can be described with the following statement from the processing part of the value chain:

(...) this was done by informing and talking to those who do the practical work and for them to become aware of their work and how it affects the raw material in the next part of the chain. In this kind of production line, the product is never better than our weakest link!

Competence among the workers is important independently of which part of the value chain the workers are part of. In addition, adaptations like extra control routines, extra communications with updating and additional management capacity for coordination are also mentioned as important to consider.

In both value chains A and B, in the farming face, there are focus upon the need of extra labour. In the slaughtering- and processing face there are focus upon the handling and understanding of dealing with small streams of goods. One of the managers of the slaughters put it the following way:

The biggest need for adaptation is within competence. To create understanding that there's a need for the small streams of goods. During season, they're regarded upon as dirt in the machinery. It creates irritation and then you increase understanding."

Performance implications

All the adaptations mentioned above, have performance implications for the different parts of the value chains. Most of these implications have to do with increased costs. This is the case of every part of the value chain except from the slaughtering part, which claims to have only marginal increased costs when dealing with production which needs special adaptations. The main reason why there is an increased cost combined with production of speciality products, has to do with the handling of small streams of goods. The following statement from the farmer of the value chain A explains why there are additional costs related to this kind of production:

I must follow specific standards. Increased costs are related to traceability. Special agreement with processor is needed. There is a need of increased competence.

The next statement shows how the increased costs are related to another farmers production in value chain B:

There is a crop reduction, and a need for special contracts. You also need more documentation.

In the slaughtering part of the value chain they face more demanding specifications which leads to more work. Despite this they don't claim to have increased costs, but that a bigger problem for them handling these special products..

For the processors part, there is the aspect of time. A handicraft production like they do is more time consuming work. Further, both in value chain A and B they focus upon the need for more work following up on the other parts of the value chain. To be able to do this, there has been made special agreements and contracts, and to some extent networking.

Conclusions

In this paper we have shown that the market positioning tools have to intertwine quality dimensions at different levels, with an increasing degree of immateriality towards ethical, cultural and emotional dimensions. At the same time the core product has to satisfy the highest standards. The intertwined quality dimensions including a high degree of immateriality towards ethical, cultural and emotional dimensions increase the technology level, and the strain on efficiency within the value chain

The findings imply that we have to emphasize rigid quality emphasized throughout the value chain and that an increase in the range of competitive tools has significant consequences for the configuration of the value chain. New resources both at operational and administrative level have to be included to manage the increased complexity following expanded quality marketing efforts. Within each phase of production special adaptation measures has to be taken.

The measures that make it possible to direct actions towards more targeted competitive strategies also have administrative and strategy implications. These are related to specific technical and operational adaptations in each part of the value chain, and administrative efforts to coordinate between the different parts. This also included increased uncertainty and needs for reciprocal communication to solve new problems that emerges, and feedback loops from the following stages in the production process as to how the previous steps have performed.

Also, there will be a need for close follow up as to the choice of customers and competitive strategy. Quality orientation, input quality focus and close customer relations are positively related especially to perceived customer satisfaction. These results imply that tools improving the firms' downstream relations towards the end user are critical in small firms within a mature industry setting. Consequently, the firms have to become more customer-oriented and put more effort on relationship marketing and reaching the customer through different and innovative marketing channels.

A very important strategic decision is the acceptance of increased costs, especially in the development process. Earlier studies (Borch & Forsman, 2004) have shown indications of negative relations between product development capability and perceived financial performance. The added quality dimensions will increase product costs strongly especially in the earlier phase of strategic reorientation. Small firms in particular will not have much slack to costly R&D and new product development processes; hence the products introduced have to be in line with customer needs from

the very beginning. This implies strong customer relations form the beginning of the product development process to reduce failure rate.

From an organizational perspective there may be a need for changes in the whole organization at its links to cooperation firms. The advanced layers of quality also have consequences as to the configuration of the value chain. There has to be frequent changes and improvements in both primary production procedures, the environment where production takes place, value added processing and marketing. The processing part of the value chain plays a special role in coordinating both upstream and downstream. The value chain may take the form of a value shop in the fulfillment of combined differentiation focus strategies. The value chain may take the form of value network in the start up and product development phase. The three types of value configurations may be active at the same time. To conclude, the combined high quality differentiation demands high organizational flexibility. Different value chain configurations may be working in parallel. There will be increased complexity towards both value shops and value networks has to be built into the organization. There will be a need for new organizational resources and dynamic strategic capabilities. Also, one has to be open for periodic reduction in efficiency in the basic value chain operation

The results reveal that increased customer satisfaction through quality differentiation has to be a task for the whole organization. What is of utmost importance is that the configuration of the firm gives increased efforts and strains on the whole organization. There may be a need for new type of coordinative competence at both primary level and at middle management to deal with the increased communication and control efforts between the different parts of the value chain. Also the top management has to be more dynamic in their strategic decision-making process with frequent considerations of the match between customer satisfaction, competitive tools and organizational configuration. Each level of differentiation has to be followed up by analysis of the costs of adaptation versus the opportunities for increased income within the new niches chosen.

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China: A Tiger only in the East or a World Player in High Quality Fresh Produce Exports?

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Summary

This paper examines patterns of recent change in China's international export trade in high quality fresh-vegetables between 2002 and 2005 since its WTO membership and some of the underlying determinants that will determine its future export opportunities. Concepts of product quality are first reviewed and the key characteristics of China's international trade in fresh produce are outlined based on a detailed analysis from the UN Comtrade international trade data at the 2, 4 digit and finally 6 digit levels. High quality fresh and chilled vegetables are identified through their average unit export values. In 2005, China was the 4th largest exporter of vegetables in the world with a 9.8 percent share of world trade, and almost a 6 percent share in fresh and chilled vegetables. The competitiveness of China in world trade in high value fresh produce is assessed through a trade-shares accounting and decomposition approach which enables both structural and performance effects on China's exports to be isolated, and the contributions its major trading partners have made to changes its share of world trade. China's aggregate market share rose by over 1.5 percentage points over the period, and there is evidence of an emerging orientation in its trade shares from E Asia to SE Asia, and to further progress in the Russian Federation and US markets. China's underlying comparative advantage in such labour-intensive products is reflected in the positive performance effect on the increase in its market share.

KEYWORDS: China, vegetables, international trade.

1. Introduction and Objectives

In December 2001 China acceded to the WTO, thereby rendering its agricultural and food sectors more open to international competition through imports, but also cementing China's food sector more firmly into the global trading economy as an exporting nation. Indeed China's Ministry of Agriculture (MoA, 2004: 49) was particularly positive about its WTO membership, recognising that it presented not only challenges (especially in soybeans and cereals), but also opportunities. In particular, it would be entitled to most favoured nation treatment in its international trade and access to a WTO regulatory framework for settling trade disputes, have a potential to reduce its costs in international trade in farm produce, and also it would be able exploit its cost advantages in the production (and processing) of certain agricultural, aquatic and horticultural products.

OECD also observed (OECD, 2005) that China had a comparative advantage in the production of labour intensive products such as vegetables and fruit and that WTO membership had created high expectations within China for its labour intensive agricultural sectors to exploit new export markets and export growth. Vegetable production costs in 2004 were reported at less than \$0.07 per kg (Huang et al., 2006). Furthermore, a consequence of WTO membership has been to enhance and accelerate inward investment into China by overseas firms, and such Foreign Direct Investment (FDI) in turn has stimulated growth and development in food processing and in multiple-retailing. This is already having ramifications for the development of China's internal agri-food supply chain

organisation and logistics sectors, and in the longer run, consequently for its potential ability to export fresh produce.

The objectives of this paper are thus to examine patterns of recent changes in China's international export trade in high quality fresh-produce since its WTO membership between 2002 and 2005, and to identify some of the underlying changes that have taken place in the competitiveness of its exports, and to see whether the initial expectations of positive gains in exporting fresh vegetables have been realised thus far, and what adjustments in China's global trading patterns have emerged in this sector.

Concepts of product quality are first reviewed. However, in the context both of international trade and consumer behaviour theory, the identification of quality products or their attributes is neither straightforward, nor is there universal agreement on what constitutes a "quality product". The paper then examines the key characteristics of China's international trade in fresh produce, and places this in the context of developments in its overall trade in vegetable products and of world trade in fresh produce. The paper also assesses changes in the competitiveness of China in world trade in high value fresh produce since its WTO membership through the application trade-shares accounting methodology, and examines developments in the regional and country orientation in its exports of high value fresh vegetables. Finally, the significance of the emergence of "Green Food" in China, and the potential for development of specific organic exports is considered.

2. Background

Within the societies in both developed and in many emerging economies, issues of healthy eating and food safety have risen to prominence over the past decade. Much emphasis has been placed on fruit and vegetables and their contribution to maintenance of a balanced and healthy diet. Some consideration of recent developments in international trade in vegetables would seem justified on these grounds alone. In the fresh produce sector, there has also been strong growth in the demand for organic vegetables reflecting consumer concerns about a range of issues including sustainability of production, pesticide and herbicide residues or perceived taste and flavour, not least in China (China Business News, 2007; Mei et al., 2006). However, despite rapid growth from a low baseline, organic produce still only accounts for a small share of total consumer spending on fresh vegetables within Western (and Chinese) diets.

Furthermore, we focus on China because, as Table 1 shows, it is a major player in international trade in vegetables. In 2005, exports of fresh, chilled, frozen and preserved vegetables from China were valued at \$3.1 billion and China ranked as the 4th largest exporter in the world of unprocessed vegetables, with a 9.8 percent share of the world market, compared with an 8.1 percent share in 1998 (Liu et al., 2006).

Table 1 about here

A brief explanation of the international trade data analysed in this paper will at this point be helpful in clarifying subsequent definitions and discussion relating both to fresh vegetables and high quality vegetables. The UN online Comtrade Database (United Nations, 2007) has provided the source trade data using the Harmonised System HS 2002 classification at the 2, 4 and 6 digit levels. The aggregate 2 digit category HS07 contains "*All Edible Vegetables and Certain Roots and Tubers*". At the 4 digit level, codes HS 0701 to HS 0709 categorise fresh or chilled vegetables into broad product groups, the primary focus of this paper. Thus for example, HS 0703 contains "*Onions, shallots, garlic, leeks and other alliaceous vegetables*" and HS 0708 "*Leguminous Vegetables, shelled or unshelled, fresh or chilled*". Codes HS 0710 – HS 0713 relate to frozen, provisionally preserved or dried vegetables. These are not considered in this paper, in part because more significant product

transformation has taken place which makes a like-for like comparison of unit export values difficult, and also because in general fresh produce will usually command a premium over frozen and preserved product. Likewise, vegetable preparations and processed vegetables (HS 20) are not considered. Moving to the 6 digit level data enables identification of specific vegetables, such as for example HS 070320 “*Garlic*” or HS 070970 “*Spinach*”, and has been used to focus on particular high quality products.

The value of world vegetable exports grew at annual rate of 13 percent between 2002 and 2005 (Table 2), with no difference between fresh and chilled and the frozen, dried and preserved groups. Fresh and chilled vegetables accounted for over 70 percent of the value of all unprocessed vegetable exports, with other vegetables, tomatoes, and onions the major categories traded.

Table 2 about here

Vegetables are also a major source of China’s primary agricultural food export earnings and accounted for 39% by value of China’s exports of primary (i.e. unprocessed) agricultural food products in 2005. As Table 3 reveals, China’s total vegetable exports have grown at 17.5 percent p.a. since 2002, and fresh and chilled vegetable exports at over 22 percent p.a., both significantly higher than world exports for these product groups. The value of China’s fresh and chilled vegetable exports in 2005 was \$1.7 billion, and accounted for almost 41 percent of its total vegetable exports. Onions, shallots and garlic (HS 0703) are the most important product exports, making up over 23 percent of China’s total 07 exports, and around 58% of its fresh and chilled exports, with root vegetables (HS0706) and other vegetables (HS0709) the other major product groups.

Table 3 about here

For fresh and chilled vegetables, China’s share of world trade was almost 6%, up by 1.2 percentage points from 2002 (Table 4). There were however significant and strong increases in its shares of world trade in both onions and root vegetables.

Table 4 about here

Around one-third of China’s total vegetable exports go to Japan, but evidence is later presented to show that even within the period 2002-2005, some noticeable shifts in the shares of China’s fresh produce exports in particular markets have taken place. Other East and SE Asian markets are also major destinations. Overall, the top 14 export destinations account for a slightly greater share of China’s fresh vegetable exports compared with its total exports of vegetables. It is noticeable that the export shares of China’s HS 07 (i.e. all vegetables) exports to Japan, the EU¹, Malaysia and the USA are greater than the respective shares for fresh produce only, implying a relatively greater penetration in these markets of frozen, preserved and dried product.

Table 5 about here

3. Data and Methodology

International trade statistics and product category definitions are somewhat generic in nature and within any specific product reporting code, there is no means of differentiating directly between high and low quality exported product. This is because the Comtrade database only gives total volumes and trade values for the range of products within a given HS code. Nor for example, are other qualities of products identified (beyond their states of freshness, preservation and processing). Hence, organic fresh produce is not specifically identified. Of course, texture, appearance, colour and flavour /taste are important quality attributes, but cannot be readily observed other than through experimental and survey data.

¹ Those countries that regularly import vegetables from China viz. France, Germany, UK, Italy, Spain, Denmark, Netherlands.

However, of the range of extrinsic and intrinsic attributes (Fandos and Flavian, 2006) which contribute to the overall judgement of quality by consumers, product freshness rates highly (Revell and Kupiec, 2001). This is one descriptor available within the trade data. Price can be another clear identifying attribute associated with product quality, with higher quality products generally commanding a higher price. Of course, a high price may also reflect scarcity and/or high production costs expressed in the supply schedule, but in general, it will also be a reflection of relative market demand.

Whilst we cannot distinguish between product qualities within individual HS category codes it is possible to differentiate between products in both the same and different HS categories using their average unit export values as proxies for prices. This study therefore focuses on those fresh vegetable export products with relatively high prices as an indicative expression of some measure of their quality (albeit arbitrary and incomplete), whilst recognising that there will still be other quality differences in such products, and also some products with high quality characteristics which may have lower export prices. The paper initially identifies the main higher-priced fresh vegetable groups at the 4 digit level, and then subsequently focuses on individual products at the 6 digit level.

A trade-shares accounting methodology (Gehler and Vollrath, 1997; Liu et al., 2003, 2004, 2006) is then used to measure changes in China's world trade shares of high value fresh produce on a product by product basis. These are decomposed in relation to both aggregate changes in world trade and the recipient country compositional shares of world trade, and to changes in China's competitiveness in penetrating specific importing country markets. The approach also breaks down the changes in China's aggregate market share of fresh produce attributable to its major country trade partners and on a regional basis.

Define an exporting country i 's share of importing country j 's market for a product as:-

$$p_{ij} = \frac{X_{ij}}{X_{wj}} \quad (1)$$

where X_{ij} represents the value of exports from i to j , and X_{wj} the value of world (w) exports of the product to country j .

Define P_j as country j 's share of world trade of for the product, i.e. its *structural share*.

$$P_j = \frac{X_{wj}}{X_{ww}} \quad (2)$$

where by definition $\sum_j P_j = 1$

Let exporting country i 's *aggregate market share* (AMS_{iw}) of total world trade for the product be :-

$$AMS_{iw} = \frac{\sum_j X_{ij}}{X_{ww}} = \frac{X_{iw}}{X_{ww}} \quad (3)$$

$$\text{So that } AMS_{iw} = \sum_j p_{ij} P_j \quad (4)$$

and if for simplicity we define $AMS_{ij} = p_{ij} P_j$, then (4) can be expressed as:-

$$AMS_{iw} = \sum_j AMS_{ij} \quad (5)$$

Over a period of time τ between a base period $\tau = \beta$ and final period $\tau = \Phi$, the **total effect** (TE_{iw}^τ) of a change in i 's AMS can be decomposed into its individual country shares as follows:-

$$TE_{iw}^\tau = \sum_j E_{ij}^\tau \quad (6)$$

$$\text{Where } E_{ij}^\tau = \Delta AMS_{ij}^\tau \text{ and } \Delta AMS_{ij}^\tau = AMS_{ij}^\Phi - AMS_{ij}^\beta \quad (7)$$

The change in AMS can also be decomposed into the sum of two effects, a **structural effect** (SE) reflecting changes in structural shares of world trade (i.e. within the share mix of importing countries) relative to the base period, and a **performance effect** (PE), reflecting the changes in i 's country shares of trade. Three separate measures of the AMS are needed: what the AMS would have been with fixed base-period country shares and final period structural shares (Eq.8), together with the base and final period AMS . Equations 8-10 define them:-

$$AMS_{iw}^{f\beta} = \sum_j p_{ij}^\beta P_j^\Phi \quad (8)$$

$$AMS_{iw}^\beta = \sum_j p_{ij}^\beta P_j^\beta \quad (9)$$

$$AMS_{iw}^\Phi = \sum_j p_{ij}^\Phi P_j^\Phi \quad (10)$$

The structural effect is given by:-

$$SE_{iw}^\tau = AMS_{iw}^{f\beta} - AMS_{iw}^\beta \quad (11)$$

the performance effect by:-

$$PE_{iw}^\tau = AMS_{iw}^\Phi - AMS_{iw}^{f\beta} \quad (12)$$

and the total effect by

$$TE_{iw}^\tau = SE_{iw}^\tau - PE_{iw}^\tau \quad (13)$$

Hence, the structural effect can be thought of as the change in the exporting country's AMS that would have taken place if its market shares in its individual country export markets in the final period had remained similar to those in the base period. This thus reflects the impact of changes in the importing country shares of world trade over the period. The performance effect, then measures the AMS change attributable to changes in the exporting country's market shares of its importer-countries, having adjusted for their changing shares of world trade. Equations (7) and (13) thus represent alternative views of the changes in the AMS , with Equation (13) reflecting both changes in global trade and in i 's individual country market shares adjusted for changes in their shares of world trade.

It should also be noted that where an exporting country has more than a minor share of world trade, it is necessary to subtract the exporting country's exports from total world exports, in order to avoid a trade bias effect through the dominant exporter.

4. Results

Table 6 presents the first pass filter at the 4 digit level to identify those fresh vegetable groups with relatively high average unit export values. As stated above, it is a somewhat arbitrary decision as to what is a product with a "higher price", and a lower threshold of \$0.25/kg has been used. HS 0703 *Onions...*, HS 0708 *Leguminous Vegetables..* and HS 0709 *Other Vegetables..* are clearly the highest priced groups of fresh and chilled product, with HS 0704 *Cabbages..* and HS 0706 *Carrots..* also with somewhat higher unit export values.

The subsequent analysis in this section concentrates on these five categories of fresh vegetables –the “*high quality group*”.

Table 6 about here

Table 7 provides detailed 6 digit level information about the specific products within these five highest-priced 4 digit categories –the “high quality group”. Garlic, leeks, peas, other legumes, asparagus, mushrooms (and agarics), and truffles were China’s highest priced fresh vegetable exports. HS 70959 *Other Mushrooms*, at over \$3 per kg generated significant export earnings for China in both total value and volume in 2005, although HS 70320 *Garlic* was China’s principle fresh vegetable export in value terms. Nevertheless, there is still considerable variation in individual product export prices within each of the 4 digit categories, and for example, eggplants and onions are relatively low-priced. Products within the higher-priced 4 digit groups.

Table 7 about here

Figure 1 presents both the average unit export values and annual growth rates in exports between 2002 and 2005 for the 4 digit code aggregates and 6 digit individual products. The vertical arrow denotes the average annual export growth rate for all-fresh vegetables over the same period. It also enables us to gain an insight, albeit somewhat of a quasi-BCG analysis (BCG, 1970), into the strategic positioning potential of China’s fresh vegetable product exports. Spinach, although accounting for a tiny share (<0.5%) of the value of fresh high-quality exports, has exhibited high growth and high prices. Mushrooms and agarics, had slightly below average growth but very high prices and made up over 11% of export earnings from this high quality group, whereas exports of asparagus and truffles, also in the relatively high price group have exhibited negative growth over the period, and only make up 0.4% of export earnings. Although the growth rate in garlic exports was slightly below the average of all fresh vegetables, the price is firmly within the mid-price zone, and garlic contributed some 48% of export revenues from the high quality group. Leeks accounted for almost 3% of export earnings in this group, and realised above average prices and growth rates. However, despite high growth rates for Root Crops and the Brassica Groups (Cabbages etc), prices were relatively low, although carrot exports themselves nevertheless contributed almost 9% to China’s export earnings from high quality fresh produce.

Figure 1 about here

In summary, China has some products such as leeks and spinach, currently relatively small contributors to export earnings in the fresh produce sector, but with future growth potential as “stars” within the high quality group. They have been realising relatively high prices and growth rates. Other products, such as carrots and cauliflowers are somewhat more important in terms of total export earnings and have shown above average export earnings growth rates, but are in the mid to lower price ranges in this high quality group. Fungi and garlic represent China’s “cash cows”. They contribute a large share of its export earnings, are highly priced, but have shown only around average growth rates over the period. Products such as peas, other leguminous vegetables (excluding beans), artichokes and peppers would appear to have some future development growth potential, though less so than for leeks and spinach and a comparatively more low priced.

Focusing on the highest priced products - mushrooms, truffles, agarics, asparagus and spinach - Table 8 shows that EU countries, viz. France, Italy, Germany, Spain and Netherlands, feature strongly within China’s top 5 markets for these products, except for spinach, where Asian countries are the main recipients. Furthermore, the top five markets for each of the highest value products account for over 90% of China’s export earnings for that category. The Japanese market however still takes the greatest overall share of China’s exports for these products.

Table 8 about here

Table 9 presents the results of the trade shares accounting and decomposition of China's performance in the high quality fresh vegetables sector between 2002 and 2005 and also for all vegetable exports (HS 07) as a comparator. Although China's AMS for all vegetables has risen by just under 0.5 percentage points since 2002, that for its high quality vegetables increased by over 1.65 percentage points. There was strong growth in its export market shares for onions etc (HS 0703) and root vegetables (HS 0706), but it lost ground within the leguminous (HS 0708) and other vegetables (HS 0709) categories.

Changes in China's main export markets' shares of world trade in vegetables (especially for non-high quality, frozen and preserved categories) have contributed to a negative structural impact on China's AMS for total HS 07 exports since WTO membership, whereas the structural effect for high quality vegetables was marginally positive. There was an especially strong positive structural effect in the market for the alliacious product group (HS 0703). In contrast, in the HS 0708 and HS 0709 groups, there have been adverse structural effects in China's main export markets.

The increased competitiveness of China in world vegetable trade between 2002 and 2005 can be seen in the positive performance AMS effects both for high quality vegetables and all vegetables groups as a whole. China's penetration of its traditional markets has thus improved in general over the period. We note that the significant increases in AMS for root vegetables (HS 0706) was largely driven by an strong increase in the performance effect of China its main markets, and indeed the performance effect for China's high quality exports was positive for all but the HS 0709 Other Vegetables category. In contrast, the 12 percentage points increase in its AMS for HS 0703 was driven largely by structural changes in its markets. Only for leguminous fresh vegetable exports, has China suffered a decline in competitiveness.

Table 9 about here

Table 9 also shows changes that China's country and regional markets have made to its overall AMS over the period. The relative importance of China's traditional markets of Japan and PRC Hong Kong, have declined since China's WTO membership, and for Hong Kong, even for China's high quality vegetable exports. The strongest contributors to China's AMS increases in high quality products over the period have been in the Republic of Korea, Indonesia (largely driven through an increase in HS 0703), Malaysia, the Russian Federation and the USA. At the regional level, there has been a marginal fall in its AMS in the E Asian region, where its competitive advantage and geographic proximity is greatest. However, there is evidence of an increased orientation towards SE Asian markets, from where it has gained its largest increase in AMS. It is also noticeable that China has achieved some success since WTO membership in diversifying its export market base to the rest of the world (ROW). A recent Australian study observed that "*China currently had no strong links in the EU market nor any clear-cut competitive advantages*" (ABARE, 2006: 219), whilst OECD commented on the moderate average tariffs for fruit and vegetables and entry price regime which would also act as a barrier to China's export growth into the EU for these products(OECD, 2005:125-127). The small increase in contribution to China's AMS over the period for high quality fresh vegetables derived from its exports to the EU would seem to bear out these conclusions.

5. Final Remarks

China's trade gains in the high value fresh vegetable sector since 2002 have thus been positive, and there is some evidence that it is diversifying its customer base beyond traditional East Asian markets. Even within the E. Asian region, there has been some relative re-orientation within its market growth towards South Korea and away from Hong Kong. The Japanese market has made a positive contribution to China's high quality

vegetable AMS growth, in contrast to a negative impact on its AMS for vegetable exports as a whole, although it still dominates as China's major customer. Similarly, there has been expansion into the S.E. Asian market which has made a positive contribution to China's AMS growth. Market share growth has also emanated from the Russian Federation and USA, but less so within the EU market.

Product safety remains one of the greatest limiting factors to China realising the full potential of its competitive cost advantage in fresh produce. Pesticide residues are a primary problem in fresh produce production in China, and there was considerable disruption to China's exports of spinach to Japan in 2002-03 as a consequence of such residues. The Chinese government has been making great efforts to improve the registration system for pesticides and fertilisers, and encouraging farmers only to buy from registered suppliers (OECD 2005). The Chinese Government is also updating laws to cover consumer food products. However, national laws are subject to enforcement by provincial officials which can be variable in the extreme.

FDI by Japanese and Korean businesses, particularly into joint ventures with Chinese producers and key processing and marketing enterprises in which there is a degree of vertical integration has been oriented towards the production of fresh produce for export (Calvin et al., 2006). The joint venture model is also one (Zhou, 2003) which is regarded as having been most successful for the development of organic vegetables, and in 2003, some 80 percent of organic vegetables were estimated as being for export, mainly to Japan. Anecdotal evidence also suggests a number of EU countries also beginning to explore sourcing of organic fresh vegetables within China, in part as a consequence of the need to ensure year-round supplies into supermarkets. However, it should be noted that an important driver for organic or "green" produce is also domestic Chinese consumer concerns over food safety, although Chen 2006 observes that the market is still in its infancy, and prices are 3 to 5 times higher than for equivalent conventional products.

Food safety is also linked in part to what is as yet a relatively undeveloped chill supply chain within the country. FDI by western supermarket chains such as Carrefour, Tesco, Walmart will in the longer run result in changes to the logistics infrastructure for fresh produce as they work with specialised farming companies for direct supply, or through specialised wholesalers (Revell et al. 2006). Currently there is a dearth of both centralised cold storage facilities and also refrigerated transport, both of which are essential for the efficient handling and transportation of fresh produce. There is also an undeveloped market in load back-hauling which raises overall transportation costs.

Enhancements to its food safety systems and in supply chain organisation and management will also however add to the costs of final delivery for fresh produce within and from China, and erode some of its competitive edge, unless there are considerable scale economies to be gained. Many of these developments are capital, rather than labour-intensive, which is where the current cost advantage to China resides. Furthermore, China at present benefits from a relatively undervalued exchange rate for the Yuan RMB, and longer run pressures driven by its internal economic growth will be towards exchange rate appreciation. There is also some recent evidence that ethical concerns (not necessary well based in economic rationale) over air-freighting of fresh produce may cast a shadow over the future potential of exports of organic fresh produce from China into parts of the EU, notwithstanding the effects of increases in overall costs of fuel on air transport. Hence there are a number of factors which in future may serve to constrain the rate of growth in China's high quality fresh vegetable exports and its steady rise in the aggregate share of the world market over the past decade.

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Tables

Table 1 World Exporters of Vegetables HS 07 2005

	Value US\$ mn.	Share of World total
Spain	4,308	13.8%
Netherlands	4,258	13.7%
Mexico	3,122	10.0%
China	3,052	9.8%
USA	2,421	7.8%
France	1,813	5.8%
Belgium	1,801	5.8%
Canada	1,714	5.5%
Italy	1,056	3.4%
Poland	624	2.0%
World Total	31,144	

Table 2. World Exports of Fresh Vegetables 2005

Product	HS Code	Value \$ US mn.	Growth 02-05 % pa	Share of 07
Potatoes	0701	1765.9	3.6	5.7%
Tomatoes	0702	4924.6	13.3	15.8%
Onions, shallots, garlic, leeks	0703	2518.6	14.5	8.1%
Cabbages, cauliflowers, edible brassicas	0704	1413.5	12.3	4.5%
Lettuce and chicory	0705	1709.6	14.9	5.5%
Carrots, turnips and edible roots,	0706	845.4	14.3	2.7%
Cucumbers and gherkins	0707	1418.6	16.1	4.6%
Leguminous vegetables, shelled or unshelled	0708	538.4	13.4	1.7%
Other vegetables	0709	6925.7	14.1	22.2%
Total Fresh and Chilled	0701-0709	22060.2	13.0	70.8%
<i>Total All Vegetables</i>	07	31143.7	13.0	

Table 3 China's Exports of Vegetables in 2005

Product	HS Code	Value \$m	Share of 07	Share ch. 2002-05 %pts	%pa growth 02-05
Potatoes, fresh or chilled.	0701	45.5	1.5%	0.8%	49.1
Tomatoes, fresh or chilled.	0702	18.0	0.6%	0.2%	36.0
Onions, shallots, garlic	0703	713.7	23.4%	2.0%	21.0
Edible brassicas	0704	76.1	2.5%	1.3%	49.5
Lettuce (and chicory)	0705	9.3	0.3%	0.2%	91.1
Carrots, edible roots	0706	139.4	4.6%	1.7%	37.8
Cucumbers, gherkins	0707	3.4	0.1%	0.0%	14.3
Legum. veg.	0708	20.7	0.7%	0.1%	20.5
Other veg	0709	220.7	7.2%	-1.5%	10.1
<i>Total Fresh and Chilled</i>	<i>0701-0709</i>	<i>1246.9</i>	<i>40.9%</i>	<i>4.7%</i>	<i>22.4</i>
Veg. (uncooked), frozen.	710	445.7	14.6%	-1.3%	14.2
Veg. provis. preserved	711	177.9	5.8%	-2.1%	6.1
Dried veg.	712	702.0	23.0%	3.1%	23.4
Dried legum. veg.	713	388.2	12.7%	-4.2%	6.7
Manioc and similar	714	91.5	3.0%	-0.3%	14.0
Total 07		3052.1	100.0%		17.5

Table 4 China's Share of World Trade for Fresh and Chilled Vegetables 2005

Product	HS Code	World Trade Share	Share change % pts
Potatoes	0701	2.6%	1.7
Tomatoes	0702	0.4%	0.2
Onions, shallots, garlic, leeks	0703	28.3%	4.3
Cabbages, cauliflowers, brassicas	0704	5.4%	3.1
Lettuce and chicory	0705	0.5%	0.4
Carrots, turnips and edible roots,	0706	16.5%	7.1
Cucumbers and gherkins	0707	0.2%	0
Legum. vegetables, shelled/ unshelled	0708	3.9%	0.6
Other vegetables	0709	3.2%	-0.4
Total Fresh and Chilled		5.7%	1.2
<i>Total All Veg Fr., Ch., Froz, Preserved</i>	<i>07</i>	<i>9.8%</i>	<i>1.1</i>

Table 5 China's Principal Export Markets for All and Fresh Vegetables in 2005

	\$ million US	% share China's fresh exports	% share China's total 07 Exports
WORLD	1246.9		
Japan	334.8	26.8%	33.3%
Indonesia	128.1	10.3%	4.5%
Malaysia	117.7	9.4%	5.0%
Rep Korea	72.2	5.8%	7.1%
Russian Federation	71.4	5.7%	2.9%
PRC Hong Kong	65.2	5.2%	5.2%
EU "7"	56.8	4.6%	9.2%
USA	52.8	4.2%	6.9%
Brazil	39.4	3.2%	1.7%
Thailand	32.7	2.6%	2.1%
Vietnam	29.9	2.4%	1.5%
Pakistan	29.3	2.3%	1.6%
Philippines	26.9	2.2%	1.2%
Singapore	15.6	1.3%	1.2%
Total of top 14	1072.8	86.0%	83%

Table 6 Unit Values of China's Vegetable Exports in 2005

Product	HS Code	Unit value \$/kg
Potatoes, fresh or chilled.	0701	\$0.19
Tomatoes, fresh or chilled.	0702	\$0.21
Onions, shallots, garlic, leeks and other alliaceous vegetables	0703	\$0.40
Cabbages, cauliflowers, kohlrabi, kale and similar edible brassicas	0704	\$0.28
Lettuce (<i>Lactuca sativa</i>) and chicory (<i>Cichorium</i> spp.)	0705	\$0.16
Carrots, turnips and similar edible roots,	0706	\$0.29
Cucumbers and gherkins, fresh or chilled.	0707	\$0.19
Leguminous vegetables, shelled or unshelled, fresh or chilled.	0708	\$0.62
Other vegetables, fresh or chilled.	0709	\$0.57
Vegetables (uncooked), frozen.	0710	\$0.80
Vegetables provisionally preserved	0711	\$0.70
Dried vegetables, whole, cut, sliced, broken or in powder	0712	\$2.90
Dried leguminous vegetables, shelled	0713	\$0.45
Manioc, arrowroot, sweet potatoes and similar roots	0714	\$0.52

Table 7 China's 6 Digit High Value Fresh and Chilled Vegetable Exports in 2005

	HS code	Value \$ mn.	Volume '000 t	Unit value \$/kg	Value Growth % pa 02-05
Onions, shallots, garlic, leeks etc	703	713.7	1,784.1	<u>0.40</u>	21.0
Onions & shallots	70310	117.6	570.0	<u>0.21</u>	37.7
Garlic	70320	562.5	1,155.6	<u>0.49</u>	17.7
Leeks	70390	33.6	58.5	<u>0.57</u>	37.3
Cabbages, cauliflowers, kohlrabi, brassicas.	704	76.1	273.3	<u>0.28</u>	49.5
Cauliflowers , headed broccoli	70410	47.6	131.8	<u>0.36</u>	46.7
Brussels sprouts	70420	4.1	23.7	<u>0.17</u>	18.0
Cabbages, kale, kohl rabi etc	70490	24.3	117.7	<u>0.21</u>	67.7
Carrots, turnips , edible roots	706	139.4	477.0	<u>0.29</u>	37.8
Carrots & turnips	70610	103.8	389.9	<u>0.27</u>	61.8
Beetroot, salsify, celeriac, radishes	70690	35.6	87.1	<u>0.41</u>	7.3
Leguminous vegetables, shelled or unshelled	708	20.7	33.5	<u>0.62</u>	20.5
Peas	70810	11.9	14.5	<u>0.82</u>	17.1
Beans	70820	0.0	0.1	<u>0.41</u>	-34.3
Other Leguminous vegetables	70890	8.8	18.9	<u>0.47</u>	26.8
Other vegetables, fresh or chilled.	709	220.7	387.7	<u>0.57</u>	10.1
Globe artichokes	70910	0.0	0.0	<u>0.25</u>	52.6
Asparagus	70920	1.9	1.2	<u>1.63</u>	-12.2
Aubergines (egg-plants)	70930	3.2	24.7	<u>0.13</u>	13.1
Celery	70940	1.6	5.8	<u>0.27</u>	51.0
Mushrooms (Agaricus)	70951	8.3	2.7	<u>3.03</u>	12.6
Truffles	70952	1.7	1.1	<u>1.46</u>	-18.5
Other Mushrooms	70959	129.8	40.6	<u>3.19</u>	16.9
Peppers Capsicum/Pimenta,	70960	10.2	39.4	<u>0.26</u>	34.5
Spinach	70970	3.3	2.2	<u>1.46</u>	44.4
Other Vegetables	70990	60.8	269.8	<u>0.23</u>	-1.8

Table 8 Export Destinations of China's Highest Quality/Value Fresh Vegetables

Product	Share of total
Asparagus (70920) \$1.9mn	
Japan	51%
Netherlands	13%
Belgium	12%
Spain	10%
France	7%
<i>Top 5 total</i>	<i>93%</i>
Agaricus Mushroom (70951) \$8.3mn	
Italy	65%
France	8%
Japan	7%
Malaysia	6%
Netherlands	5%
<i>Top 5 total</i>	<i>91%</i>
Truffles (70952) \$1.6mn	
France	34%
Japan	24%
Germany	19%
Rep. of Korea	8%
Spain	7%
<i>Top 5 total</i>	<i>92%</i>
Other Mushrooms (70959) \$129.8mn	
Japan	80%
USA	6%
France	3%
Italy	3%
Rep. of Korea	2%
<i>Top 5 total</i>	<i>94%</i>
Spinach (70970) \$3.2mn	
PRC HK	66%
Malaysia	27%
Japan	3%
Singapore	1%
Myanmar	1%
<i>Top 5 total</i>	<i>100%</i>

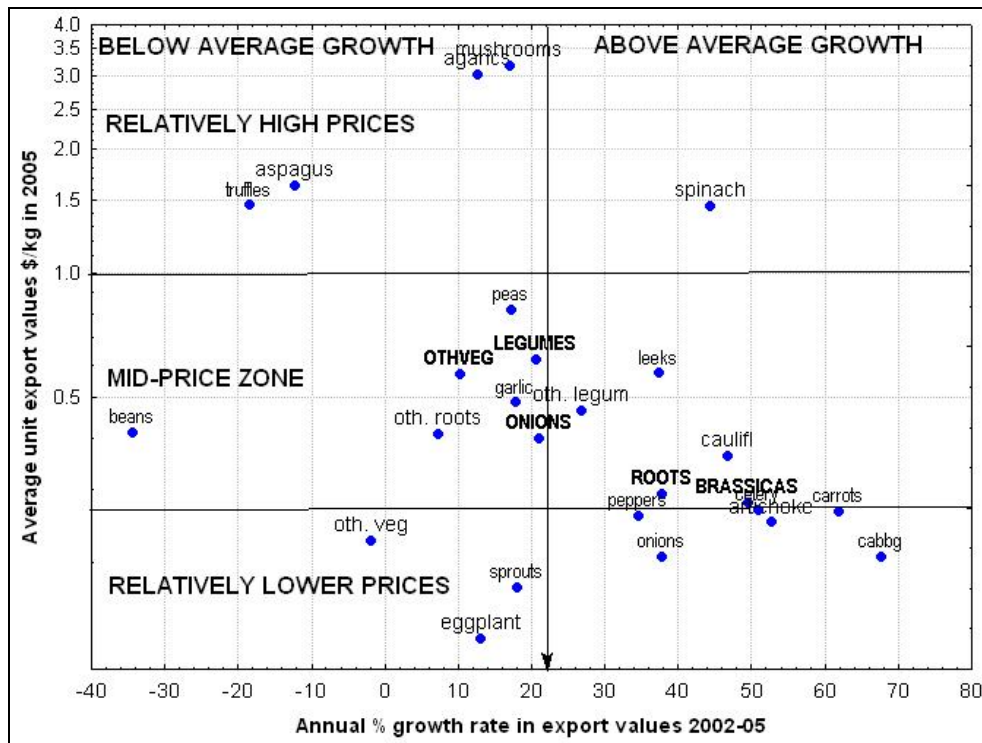
Table 9 Decomposition of China's AMS for High Quality/Value Exports

Product: HS	0703	0704	0706	0708	0709	High Quality/ Value	All 07
China's AMS 2005	37.47	11.20	19.95	4.01	3.61	10.76	10.26
Structural Effect	10.77	-2.37	0.06	-1.87	-1.06	0.05	-1.01
Perf. Effect	1.62	4.11	8.84	-0.07	0.28	1.60	1.45
Total AMS Effect	12.39	1.74	8.91	-1.94	-0.78	1.65	0.44
Japan	3.16	0.70	1.75	-1.80	-0.54	0.18	-0.67
Hong Kong	-0.10	-0.69	0.03	-0.25	-0.52	-0.41	-0.23
Rep. Korea	0.22	0.29	2.59	***	0.01	0.21	0.20
E ASIA						-0.02	-0.71
Indonesia	1.96	***	0.18	***	0.04	0.25	0.10
Malaysia	0.69	0.84	1.56	-0.11	0.09	0.31	0.14
Philippines	0.47	***	-0.12	***	***	0.04	***
Thailand	0.29	0.23	1.66	0.07	0.01	0.18	0.12
Singapore	-0.04	0.35	0.20	-0.23	-0.01	0.01	-0.02
Vietnam	0.11	0.04	***	-0.12	***	***	0.01
S E ASIA						0.80	0.35
Denmark	0.03	***	***	***	***	***	***
France	-0.07	***	***	***	***	-0.01	***
Germany	0.18	***	0.01	***	***	0.03	-0.02
Italy	0.14	***	***	***	***	0.01	0.03
Netherlands	0.14	0.01	***	***	0.03	0.04	***
Spain	0.12	***	***	***	***	0.02	0.03
UK	0.04	-0.02	***	0.02	***	0.01	0.05
EU "7"						0.10	0.09
Russian Fedn.	0.95	0.20	0.84	***	0.08	0.24	0.19
USA	1.62	***	-0.10	0.01	0.02	0.23	0.17
Brazil	0.86	***	***	***	***	0.11	0.06
Rest of World	1.60	-0.20	0.30	0.50	-0.00	0.20	0.31

*** < |0.01%|

Figures

Figure 1 China's High Quality Vegetable Exports : Unit values and Growth Rates



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Relationship between ethics and Fair Trade supply chain organisation and performance: the case of Italian Alternative Trade Organisations (ATO's)¹

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Summary

Fair Trade related import from developing countries is quickly growing although it still represents a small share of the total import. Its influence on the development of rural areas in developing countries is related to both quantitative growth and the respect of its ethical code. Large food multi-national companies are increasingly interested in Fair Trade; part of the Fair Trade movement considers the risk of a related loss in the products' identity; others consider the refusal of a more "professional" approach to Fair Trade management as a constraint to its growth. This debate is particularly felt in Italy. The goal of this paper is to evaluate how the most important Italian Fair Trade importers (ATO's) business models influenced their growth strategies; transaction costs analysis and logistics performance indicators were adopted to measure the supply chain coordination efficiency and performance. The results showed that the ATO's growth strategies, and logistics performances, seemed more influenced by their value propositions, than the lack of managerial skill.

KEYWORDS: Fair Trade, Logistics, Alternative Trade Organisations

1. Introduction

The introduction of Fair Trade in the agricultural products international trade can positively influence the developing countries socio-economic conditions. Fair Trade increases the level of welfare and reduces economic and social inequalities (Becchetti L. Costantino M., 2006), (Becchetti L., Paganetto L., 2003), (Ronchi L., 2002), (Castro J.E., 2001). The negative impact for the less competitive countries (e.g. sub-saharian Africa) and producers (small producers in remote rural areas) due to the reduction in agricultural international trade barriers (Conforti P., Velazquez B.E., 2004), (Robbins P., 1999) can also be reduced. Fair trade contributes in fact to the products' differentiation, positively affecting their demand. Promoting a Fair Trade related international agricultural trade is also a way to increase the consumers awareness of their role in defining a more sustainable model of development under many aspects: social, environmental and economic.

2. Background

The consumption of Fair Trade products is quickly growing in the industrialised countries (Krier J-M., 2005 p. 7). The size of this market, and its impact on the rural communities in developing countries, is still quite small. The total Fair Trade sales in 2005, amounted to approximately US\$ 1.4 billion worldwide, a 37 % year-to-year increase over 2004 (FLO, 2006), but a mere 0.01% of the total world trade (US\$ 10,511 billions (WTO, 2006).

¹ The authors jointly prepared this paper; Lorenzo Paluan particularly contributed to paragraphs 2 and 6, Cesare Zanasi particularly contributed to paragraphs 1, 3, 4 and 5.

However, the interest in Fair Trade is growing in large national and trans-national food companies (supermarket chains, fast-food chains among others). It is not a case that the only countries where Fair Trade products (coffee and bananas), gain a significant market share are Switzerland and United Kingdom, where the supermarket chains play a key role in Fair Trade distribution (Krier J-M., 2005 pp. 30-31). As a consequence Fair Trade is facing a “growth crisis” which can be summarised by the debate between the “product certification” supported by FLO (Fairtrade Labelling Organizations International) and its FairTrade Mark, and “organisations certification” supported by IFAT, (International Fair Trade Organizations) and its Fair Trade Organisation Mark. IFAT is critical on the inclusion of supermarket chains and other non specifically Fair Trade oriented organisations in the distribution, unlike FLO which stresses the importance of a relevant quantitative growth of the Fair Trade market size. This debate is particularly strong among the Italian Alternative Trade Organisations (ATO’s) (Liberomondo, 2004), (Commercio Alternativo, 2005). Fair Trade products are “credence goods” and also “merit goods” which heavily rely upon an effective communication, and certification, of the benefits that their consumption generates for the whole of the society. The demand for these products can consequently be affected if a conflict among Fair Trade organisations arises, reducing the consumer trust in the positive externalities for the society related to the Fair Trade. The interaction between market growth and ethics has therefore become a major concern for the Fair Trade movement. This problem is particularly felt in Italy where the size of the World Shops’ distribution channel, strictly connected to IFAT, is still bigger than the Fair Trade distribution through the supermarket chains.

A study from Barbetta G.P. (Barbetta G.P., 2006 p.p13÷19) provides an insight on the main problems the Italian World Shops and Fair Trade importers are facing:

- small economic size;
- relative scarcity of financial and human resources with respect to the range of professional skills required and variety of products sold;
- little transparency in the price formation mechanism and in the supply chain economic and technical relationship;
- need to increase external economies of scale and collaboration between Fair Trade companies, both vertically and horizontally.

The ATO’s (and World Shops) business model deserves a closer examination in order to evaluate the consequences on their economic and ethical sustainability.

Different business solutions have been experimented or discussed in order to guarantee a growth respectful of the Fair Trade principles:

- differentiation in the products’ distribution and marketing strategies between world Shops and supermarket chains. Supermarket chains will be mostly oriented on the quantitative growth, selling Fair Trade food and non food products on a large scale. World Shops should be more involved in the Fair Trade values communication and promotion.
- World Shop specialisation in a selection of few products (e.g. clothes, cosmetics and/or high quality artisan or food) following the traditional retailing specialising path of the last decades.

The respect of the principles of Fair Trade should in any case include, collaboration, transparency, and the promotion of the marginalised rural communities in the developing countries. A good starting point to encourage collaboration and transparency should be the reduction of barriers to the different agents communication. To this end logistics are of paramount importance thanks to their influence on the development of an efficient management of the physical goods and information flows along the supply chain (Pinna, R., 2005: 75). This will positively affect the competitiveness of the supply chain not only in cost reduction terms but also by increasing the product value for the consumer through, among others, an efficient communication of the values differentiating Fair Trade products. A more efficient information flow reduces information asymmetry and the risk of

opportunistic behaviour, supporting the reduction of inequalities in the income distribution along the supply chain, mainly for rural communities. In order to assess the influences of the growth strategies on the development of both the Fair Trade market size and the implementation of its ethical goals, the analysis should then involve an integration of a logistics and supply chain management approach with the transaction cost theory.

3. Objectives

The goal of this paper is to determine how the influence of the ATO's business models on the supply chain management performance (in particular logistics), influenced the growth strategies and potential support to agricultural Fair Trade flows.

4. Data and methodology

The most important Italian ATO's, almost exclusively operating in the Fair Trade market, are analysed. The variables have been collected through the ATO's websites², and by interviewing the ATO's management. The interviews were finalised to collect quantitative and qualitative information on the companies structure, performance, and to an in depth analysis of their strategies, organisation and management. The analysis was carried out in three different steps. In a first part the different degrees of vertical coordination needed by the ATO's, for an efficient supply chain management was assessed. The Hobbs e Young approach to the analysis of the relationship between transaction cost and vertical coordination was considered (Hobbs J. E., Young L.M., 2000).

²<http://www.altromercato.it/> ; <http://www.commercioalternativo.it/> ; <http://www.liberomondo.org/> ; <http://www.equomercato.it/> .

The authors consider that transaction costs are influenced by the level of uncertainty related to the relationship between the characteristics of the products traded and the type of transaction (see scheme 2).

Scheme 2) Relationship between product characteristics and type of transaction

	Transaction characteristics						
	Uncertainty for buyer: quality	Uncertainty for buyer: reliable supply timeliness and quantity	Uncertainty for buyer and seller: price	Uncertainty for seller: finding a buyer	Frequency of transaction	Relationship specific investment	Complexity of transaction (variety of outcomes)
Product Characteristics							
Perishability	V	V		V	V		V
Product differentiation	V	V	V	V		V	V
Quality variable and visible		V	V	V			V
Quality variable and invisible	V	V	V				V
New characteristics of importance to consumers	V	sometimes	V	V		V	V
Regulatory drivers							
Liability	V			V		sometimes	V
Traceability				V		V	V
Technology drivers							
Company -specific technology						V	sometimes

Source (Hobbs J. E., Young L.M., 2000)

Higher uncertainty leads to higher transaction costs and, consequently, to the need of a stronger vertical coordination within the supply chain. This approach can be summarised as follows:

Uncertainty associated to the type of transaction: it is linked to product quality and accessibility in terms of timing, quantity available and price level; level of specialisation of the investments needed to produce and distribute the product, (the higher the specialisation the higher the risk associated to the transaction) frequency of the transaction and its administrative and technical complexity

The uncertainty associated to the transaction is in turn influenced by the products characteristics: perishability, product differentiation, quality variability and visibility, need to trace the product, specific production technologies associated to the product.

Apart from ubiquitous Fair Trade products characteristics, affecting mostly the regulatory drivers, other ATO's structural variables were examined, in order to assess their different levels of vertical coordination need:

- the share of products sold by perishability: fresh food, other food, no-food;
- the turnover by type of distribution channel;
- the number of transactions.

In a second part the ATO's supply chain relationships were analysed in order to evaluate how they correspond to the supply chain coordination level required. The theoretical vertical coordination need was then compared to the actual level of coordination for each ATO. To attain this result the partnership relations along the supply chain were examined by interviewing the ATO's management and from the websites company's presentations.

The results of these first two steps were combined with the ATO's strategic goals analysis and supply chain performance indicators; this allowed appreciating how the ATO's managed to harmonize the consideration of the Fair Trade values with the necessity to compete, and grow, in a market economy. The logistics indicators reported by Vignati (Vignati G., 2002) were considered.

In particular the capacity of the ATO's to efficiently implement an adequate level of coordination was evaluated analysing their customer relationship:

- n. of clients, destinations and deliveries
- orders management in particular the communication technologies adopted for the orders transmission.
- logistics performance indicators; the performance indicators are considered relevant as efficient logistics reduces the risks and costs related to transactions; they increase a company (or supply chain) competitiveness by reducing the costs and increasing the market access. It also affects non monetary aspects like the communication of the company values (e.g. respect for the producers and consumer needs for safety, reliability, punctuality).

The logistics indicators reported in this paper are consequently mainly oriented towards the reliability, efficiency, timeliness and productivity of the internal and external logistics of the ATO's.

1) Delivery Reliability

- A1 stock breaking index: it indicates the frequency with which the demand cannot be satisfied from the stock.
- A2 % of orders fulfilled/ total orders
- A3 % of orders unfulfilled/total orders
- A4 % orders fulfilled with multiple deliveries
- A5: % of orders fulfilled within the customer's requested date (delivery performance to request date)

2) Inventory management performance

- E1 Inventory Turnover by product category : is the ratio of the cost of annual sales to the average inventory level. The higher the inventory turns, the better the firm uses its inventory assets. Measuring the index by products categories allows a better evaluation of the different products supply chain management performances (Cost of Sales / Average Inventory Level)
- E2 Days of supply by products category: n.of days the demand for the different products categories can be satisfied by the existing inventory (Average inventory / cost of a day's sales).
- E3 Use of available warehouses areas and volumes: (e.g. % pallet racks area/ total warehouse area). Indicates the warehouse operative efficiency. E.g. pallet racks can be used from 45-50% up to 90% of the warehouse area and volume. The higher the area covered the higher the space utilisation efficiency (Vignati G., 2002 pp. 232 -233).

3) Order fulfilment timeliness

- T1 Delivery Lead Time: The total time that elapses between an order's placement and the products delivery.
- T2 actual delivery date/ agreed delivery date ratio

4) Warehouse operational efficiency

- P1 Reception operational time (e.g.: handling units³ received/time)
- P2 Placement operational time (e.g.: handling unit placed/time)
- P3 Picking operational time (e.g. n° of daily deliveries; n° of pallets picked and delivered ;)
- P4 Wrapping and Packing operational time
- P5 Vehicle uploading operational time

The Business models structure (business model building blocks) as defined by Osterwalder (Osterwalder A., 2004 p.43) provided a useful tool for organically collect and describe the variables influencing the analysis.

5. Results

First of all the ATO's *value propositions* and *target consumers segments* were examined to provide information on their ethical principles and business strategies.

Value propositions

Fair Trade objectives defined by FINE⁴ are a common value proposition for the ATO's: "Fair Trade is a trading partnership based on dialogue, transparency and respect that seeks greater equity in international trade. It contributes to sustainable development by offering better trading conditions to, and securing the rights of, marginalized producers and workers - especially in the South. Fair Trade organizations (backed by consumers) are engaged actively in supporting producers, awareness raising and in campaigning for changes in the rules and practice of conventional international trade."

The objectives of Fair Trade imply, among others, a progressive reduction of the role of raw material agricultural export as an engine of growth, encouraging local communities' social, environmental and economic development. The products characteristics and services should therefore be designed to meet the expectations of an ethical consumer. Fair Trade "incorporates values in their products" (Becchetti L., 2006)

The ATO's examined include some level of differentiation regarding their approach towards the consumers, affecting the value of the product, in particular

- CTM Altromercato and Commercio Alternativo stress the importance of integrating the ethical principles of solidarity, social and economic justice with a sound management and organisational capacity making Fair Trade companies competitive (Commercio Alternativo, 2007). The growth in the market size, obtained through collaboration with non Fair Trade companies (e.g. supermarket chains) also represents an important strategic difference with the other ATO's.
- Liberomondo and Equomercato are more oriented towards the social and political consequences related to Fair Trade. Equomercato stresses the importance of building a political alternative to the market economy supporting cooperation as opposed to competition and promoting the Fair Trade values through the education of consumers and producers (Equomercato, 2007). Liberomondo, a social cooperative, is more oriented towards the social impact of Fair Trade as a tool to enter the labour market for socially marginalised people both in developing and developed countries and to create an integrated "ethical supply chain". (Liberomondo, 2007). It links the international circuits of Fair Trade to the Italian social economy.

Target customer segments

All sectors of society are represented: students (17%), office workers (16%), housewives (14%) and blue-collar workers (14%); the remaining are managers, professionals, farmers,

³ Handling units: pallet, cartons etc.

⁴ FINE is an informal network that involves the Fair Trade Labelling Organizations International (FLO), the International Federation for Alternative Trade (IFAT), the Network of European Shops (NEWS!) and the European Fair Trade Association (EFTA)

teachers and intellectuals (Musso D. 2004). The profile of the typical Fair Trade consumer is the “ethical” consumer, often engaged in volunteer associations and generally interested in alternative model of consumption; this attitude influences the level of awareness of the social contents of Fair Trade and significantly affects consumption (Becchetti, 2006).

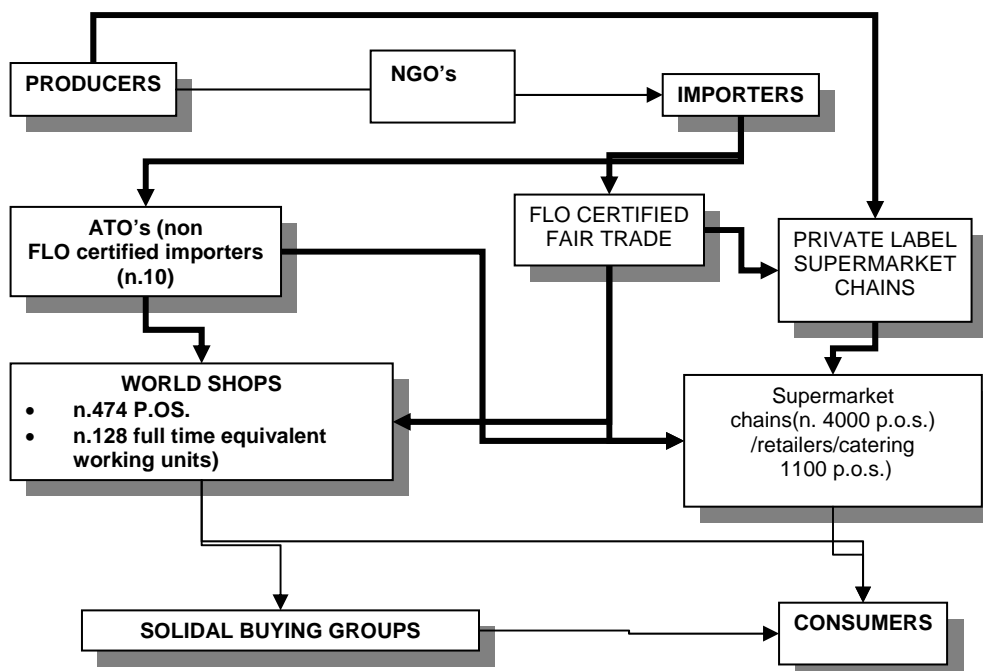
The analysis of the needs for and effectiveness of, vertical coordination along the ATO’s supply chain gave the following results.

Vertical coordination need

Distribution channels

The Italian Fair Trade distribution structure (Scheme 1) is basically defined by two main channels, partially overlapping, mirroring the two different strategic approaches to Fair Trade above examined. At the producers level these differences are not relevant: the producers start up phase is nearly always supported by NGO’s or other international cooperation organisations; their role is important as Fair Trade involves not only production and distribution, but also social and environmental projects for the local community development, funded by the premium granted by the Fair Trade labelling system managed by FLO. Once the producers become FLO registered they can directly sell to traders. The distribution involves a complex relationship between importers and retailers. A network of 474 World Shops operates in Italy, sometimes related with solidal buying groups; these shops are managed by 347 different organisations representing non profit-associations or social cooperatives; food represents 40-50% of their total turnover (Musso D., Perna T., 2005, p. 17).

Scheme 1) Structure of Fair trade distribution channels in Italy



Source: The Fair Trade Advocacy Office, our survey

Fair Trade products are also sold by the traditional retailing sector (shops and supermarkets); they buy their products either from FLO licensed importers and in few occasions from the ATO's, not necessarily FLO certified, or directly from the producers (acting as importers). The ATO's are mostly supplying the World Shops network. They buy raw material from FLO registered producers and sell their products sometimes as private labels for supermarket chains; part of the World Shops (about 50) sell also FairTraded Mark products following the FLO standards.

The large agro-food companies involvement in the Fair Trade market is growing while the most important Alternative Trade organisations (ATO's) and World Shops growth is slowing down (tab.1).

The data on the ATO's turnover from 2001/02 2005/06 showed that CTM Altrmercato is by far the main player; in the year 2004/2005 CTM concentrated 76% of the total turnover of the companies considered; the remaining three ATO's have a much smaller economic size. The turnover growth was negative for CTM from 2002/03 to 2005/06 while the other small ATO's grew at a very quick pace (table 1). The importance of the still relative small size of Fair Trade should not be underestimated when studying the variables influencing its development. These trends were in fact strongly influenced by conjunctural aspects. The main cause of CTM negative performance was in fact due to a reduction in CTM's main client orders of bananas. The behaviour of one client (a supermarket chain) influenced the trend of the entire Italian Fair Trade market growth.

Tab 1) Main Italian Fair Trade Importers Turn over (€current)

	2002/03	%	2003/04	%	2004/05	%	2005/06	Var. 2002/03- 2005/06 %
CTM Altromercato *	31.820.000	82	34.240.000	79	31.253.000	76	30.309.301	-4,7%
Commercio Alternativo **	4.275.488	11	4.962.215	11	5.221.088	13	5.200.000	21,6%
Liberomondo **	1.698.181	4	2.711.909	6	3.053.166	7	3.480.305	104,9%
Equomercato **	1.135.458	3	1.394.936	3	1.415.188	3	1.393.610	22,7%
TOTAL	38.929.127	100	43.309.060	100	40.942.442	100	40.383.216	3,7%

* For CTM ALTROMERCATO, Commercio Alternativo and Equomercato the fiscal year ends on June the 30th, for Liberomondo fiscal year and solar year coincides.

** Liberomondo balance sheet includes around 200.000 € due to the direct participation in the management of two World Shops.

Source: our survey

Moreover, Fair Trade is growing thanks mainly to volunteers operating in a relatively large numbers of small ATO's and World Shops which still represent the most important clients for the main ATO's, including those linked to the supermarket chains.

The ATO's turnover by distribution channels (see tab. 2) confirmed the role played by the World Shops as the most important retailing channel of Fair Trade products. Following the different values proposition CTM Altromercato and Commercio Alternativo showed a higher share of products sold to the supermarket chains (21% and 30% respectively). Commercio Alternativo is developing new distribution channels like coffee shops, small restaurants and Fair Trade dedicated supermarkets, while CTM is distributing its products through catering companies (5%).

Liberomondo and Equomercato sell their products nearly exclusively to the World Shops (90%) and other small retailers.

Tab.2) Turnover by distribution channels (%) year 2004/2005 (2005/2006)

	World Shops	Supermarket chains	Retailers	Catering	export	other
CTM Altromercato	56 (60)	21 (13)	7 (6)	5 (6)	(11)	(4)
Commercio Alternativo	70	30				
Liberomondo	90		10			
Equomercato	90		10			

Source: our survey

The products sold are mainly food; at Commercio Alternativo and Liberomondo 70% of the references are non perishable food and 30% fresh food. Similarly 59% of CTM' references are non perishable food, and 21% fresh (food is mainly sold to the supermarket chain) while 16% are non-food references. CTM entered the Fair Trade cosmetics market, as a strategy to find new markets for the developing countries non food agricultural products (agave oil, essential oils and herbal remedies)

Liberomondo represents the only exception: 90% of the references sold are in fact non-food (handicrafts) and 10% (non fresh) food.

Tab. 3: Turnover by products categories - % (n° references) year 2004/05

	Food	Fresh food	Non – food
CTM Altromercato	59 (230)	21	16
Commercio Alternativo	70 (300)	30	
Liberomondo	70	30	
Equomercato	10		90

Source: our survey.

Theoretical vs. actual supply chain vertical coordination

The business model analysis showed a general need for strong vertical coordination for the whole of the companies involved in Fair Trade; the factors affecting to the same extent the level of transaction costs are related to the Traceability and partially to the New characteristics of importance to consumers (see scheme 2). The influence of the New

characteristics of importance to consumer (that is the Fair Trade values) is related to the share of product traded under the Fair Trade Organisation Mark; this Mark involves all the supply chain agents, and no official external certification body, encouraging a stronger vertical coordination when compared to FLO certified products.

Other factors influencing at different levels the need for coordination among the ATO's examined are perishability, product differentiation, quality variable and visible, quality variable and invisible, associated mainly to fresh products (e.g. fruits) but also to preserved or processed food (e.g. tea, coffee) whose quality can be affected by the presence of microorganisms. Higher transaction costs seem to apply to CTM Altromercato and Commercio Alternativo.

According to the Hobbs approach these higher costs are related to these ATO's:

- larger share of fresh (perishable) products traded; this also positively affects the share of quality variability, both visible and invisible and the traceability costs associated to food trade.
- larger share of business to business relationships involving more demanding trading relationship (supermarket chains, coffee shops, restaurants etc...); the risks related to the right timing, quantity and quality in the orders management are consequently higher;

The same conditions partially apply to Liberomondo; this ATO is oriented towards fresh food trading and is related to a very high number of small clients (World Shops and small traditional retailers). The need for coordination is however less demanding in terms of management, including the monitoring, when compared to more "conventional" clients like supermarket chains or catering.

Equomercato has a relatively lower need for coordination, given the prevailing trade in non food products; these products are generally non perishable. Liberomondo and Equomercato trade involve only the IFAT Fair Trade organisation Mark; a strong vertical coordination, in terms of transparency and information sharing, is thus necessary to reduce the uncertainty related to the respect of the Fair Trade principles along the different supply chain stages. However this is less influent on the necessity to grant an efficient flow of physical goods through better logistics management.

The supply chain partnership analysis showed that all the ATO's manage cooperation development projects with local producers from developing countries, directly or through NGO's; the contractual relationship is therefore a long term one; they provide technical, managerial and financial support. The creation of cooperatives among local producers is encouraged not only to increase the economic efficiency but also to promote social welfare and ethic values (workers rights, justice, and equality). Equomercato is strictly related to working children organisations around the world; it supports their activity by importing their products, realized under working conditions respectful of their dignity and educational needs, and information campaigns on the children organisation activity. Very often processing companies are related to the ATO's through strategic alliances and the ATO's are directly involved with the management and/or property of the retailers (World Shops). CTM Altromercato is a consortium of 130 associations and social cooperatives; they manage more than 350 World Shops.

Commercio Alternativo is a cooperative among 50 different organisations including World Shops (which in turn directly import and distribute Fair Trade products, like Equoland and Ravinala) and NGO's involved in cooperation projects in developing countries .

A certain amount of networking among ATO's procurement also exists; in case they cannot meet the demand with their stock they buy product from other ATO's.

A high level of coordination between the ATO's and the other supply chain agents resulted. The ATO's seem to play a central role in the supply chain management.

Efficient management of the supply chain relations

The business model analysis showed a correspondence between the coordination needs and the client/supplier relationship structure, along the different ATO's supply chains, and

between ATO's. Some specific features in the supply chain relationship (Customer and suppliers relationship) were examined to assess how effectively the coordination is managed.

Customer and suppliers relationship

The complexity of the ATO's customer trading relationships is confirmed by the analysis of the number of their clients, destinations and deliveries in the year 2004/2005 (tab.4). The data relate to Commercio Alternativo and Equomercato. The ATO's managers interviewed confirmed they are representative of the entire ATO's performances. The fragmentation is very high, Commercio Alternativo shows an average 10 shipments/year/client; the average shipment value is 673€ The number of shipment for each destination is 5. The yearly Commercio Alternativo turnover/n.of clients is 6600€, even lower the Equomercato figure: 2500€

Tab.4) Clients, destinations, shipments

	Clients (n.)	Destinations (n.)	Shipments (n.)	Turnover/Clients (€)	Turnover/Shipments (€)	Shipments/ Destinations (n.)	Shipments/Clients (n.)
CTM Altromercato							
Commercio Alternativo*	786	1580	7760	6643	673	5	10
Liberomondo*							
Equomercato	571			2478			

Source: our survey

It was not possible to calculate the distribution of the clients/destination/shipments by size. According to Christopher (Christopher M. 1998) it is reasonable to assume that the Pareto distribution apply to these cases (80% of the sales comes from 20% of clients/destinations/shipments and vice versa). Therefore many of the shipments involve very small volumes and/or values.

Another relevant indicator of the customer relationship management efficiency is the orders transmission/management mode (tab.5). The on-line mode is largely adopted by the ATO's; only Liberomondo relies (at least up to the year 2004/2005) upon e-mail and other off-line modes.

Tab.5) Order preparation/transmission mode (%) year 2004/2005

	On line	e-mail	other
CTM Altromercato	99		1
Commercio Alternativo	35	45	20
Liberomondo		50	50
Equomercato	50		50

Source: our survey

CTM Altromercato uses CRM software and practically the entire Customer relationship management is on-line. The on-line order transmission mode regards 50% and 35% of the orders of Equomercato of Commercio Alternativo respectively. The amount of Commercio Alternativo orders on line has lately improved thanks to the introduction of new CRM software. The use of CRM software encourages a better and more transparent logistic management both internal and external (outbound in this case). The off-line orders reaching Equomercato (50% of total orders) are generally fulfilled by an on-site (warehouse) order transmission and/or consignment.

The analysis showed an extensive use of ICT's (Information and Communication technologies); this reduces the technological constraints to an efficient supply chain management, influencing the efficiency of the client customer interface.

On the negative side the large share of food traded, the high number of references, clients, deliveries, orders and shipments involved, and the differentiation in their activity, increase the complexity and costs related to the logistics and administration. On the supply side the product flows from farmers in developing countries and the international carriers' availability were taken as exogenous variables.

An efficient logistics management could reduce not only the costs but also improve the access to a growing market by reducing the constraints to the products flow along the supply chains. To this end an analysis of the ATO's logistics has been carried out.

Tab. 6a) Warehouse management, indicators adopted

	A1	A2	A3	A4	A5	E1	E2	E3	T1	T2
CTM Altromercato	X				X	X		X	X	X
Commercio Alternativo	X							X	X	X
Liberomondo								X	X	X
Equomercato								X	X	X

Sources: our survey

The data refer only to the usage of reliability, timeliness, flexibility and productivity indicators (see tabb. 6a e 6b). The actual values were not available. The amount and type of indicators adopted by the different ATO's can be considered as a proxy of their logistic management efficiency. This information was integrated by interviewing the ATO's managers who provided insights on the reasons leading to their choice of monitoring level and on the logistics performance.

The number of indicators adopted seems positively related to the ATO economic size and transaction costs level. In particular CTM shows a much higher number of logistics indicators adopted, when compared to the other ATO's.

Focusing our attention on each indicator the following results emerged:

indicator A1 (the stock breaking index) and A2-A3 (orders fulfilled and unfulfilled/total orders) are adopted by CTM Altromercato and Commercio Alternativo. They are very useful in order to measure the ATO's efficiency with respect to the adjustment of the inventory level to the demand flow and the order fulfillment reliability.

In particular CTM has a special contractual agreement with its customer concerning the food trade. A constant stock availability for the 50 more demanded references is granted; this should prevent these products from stock breaking. The risk of supply shortage is in fact generally high when dealing with developing countries, particularly with those countries facing instability due to human or natural causes.

The need to grant a reduction in the stock breaking led Commercio Alternativo to build a new warehouse specifically dedicated to the most important references. At the moment the increase in warehouses spaces specifically dedicated to increase the food stock, represents the most important investment in order to grant a better logistic service to their clients. Index A4 (orders fulfilled with multiple deliveries) is not measured by any of the ATO's examined.

CTM Altromercato is the only ATO measuring the % of orders fulfilled within the customer's requested date (indicator A5).

To better appreciate the influence of the monitoring of these indicators on the ATO's performances it must be remembered that CTM and Equomercato clients directly manage the orders on line, on the base of the stock availability; the orders from the clients are directly printed for the picking, the order form information are automatically sent to the invoice and accompanying documents. The chance of stock breaking or of problems related to the order fulfilment is consequently close to zero. Commercio Alternativo and

Liberomondo, do not measure the amount of orders partially fulfilled, in any case they do not fulfil orders with multiple deliveries.

The inventory management performance indicator E1 (inventory turnover by product category) is only measured by CTM Altromercato.

No ATO's measure indicator E2 (days of supply by products category); CTM used to measure it but is now considered not relevant. So far Commercio Alternativo did not calculate inventory management performance indexes. As a consequence of the recent investments in a new warehouse and implementation of a customer relationship management and logistics software, these indicators will be adopted.

Index E3 (% of available warehouse areas and volumes used) is measured by all the ATO's examined.

The order fulfilment timeliness T1 and T2 (delivery lead time and actual delivery date/agreed delivery date) is taken into consideration by the ATO's, but not on a regular basis.

tab. 6b) Warehouse productivity, indicators adopted

	P1	P2	P3	P4	P5
CTM Altromercato	X	X	X	X	X
Commercio Alternativo					
Liberomondo					
Equomercato					

Source: our survey

The warehouse productivity (Tab.6b) was only measured by CTM Altromercato in the year 2002/2003, to verify the opportunity to externalise the picking. The result was that the internal management of picking was considered more efficient. Other ATO's considered that the measurement of the warehouse productivity as an excess of control over the workers.

6. Final remarks

The ATO's business model analysis provided information on the different companies' strategies and capacity of managing a sustainable ethical and economic growth. The relationship between their strategic goals, supply chain organisation and management, in particular the logistics performance indicators, were useful to this end.

The ATO's examined showed a level of vertical coordination compatible with their coordination needs, values assumptions and economic size.

When considering the strategies of growth the analysis showed two different types of ATO's. One is more oriented towards increasing the volume of goods traded not only by promoting the consumers awareness towards the ethical content of Fair Trade products, but also competing on the more traditional ground of quality and managerial efficiency. This implies the adoption of more sophisticated supply chain and logistics management tools

and procedures, a closer relationship with more traditional distribution channels also emerged. These type of ATO's partially match the definition of "imprese sociali del Cees" (Fair Trade social enterprises), as proposed by Barbetta when analysing different types of World Shop (Barbetta G.P., 2006 p. 38). These ATO's are oriented to increase their investments in logistics.

On the other hand the smaller ATO's maintain a business model based on a small size, little interest in competing within the traditional market as a strategy to increase their turnover. The focus of their strategy is in fact the definition of an alternative way of dealing with economic activity by promoting the ethical awareness of the consumers and the social development of the whole of the agents in the Fair Trade supply chain.

This led to an exclusive relationship with the World Shop circuit, whose structural characteristics are less efficient in granting access to a large number of consumers, when compared to conventional trading and retailing channels; it also implied a marketing policy "producer oriented"; the support to the marginal farmers in the developing world is in fact considered a priority with respect to the consumers need for reliability, timeliness and affordable prices. This influenced the logistic integration that does not seem to be encouraged to the same extent in the smaller ATO's.

The risk associated to this strategy, whose goals are projected in a relatively distant future, is that more traditional trading and retailing big companies meanwhile can greatly increase their market dominance, also taking advantage of the Fair Trade values promotion coming from the ATO's and World Shops.

The ATO's growth strategies seem more influenced by their value propositions than the lack of managerial skill or unfavourable market conditions, at least in the smaller ATO's.

The analysis confirmed that the supply chain organisation is not "neutral" but is influenced by the company values and in turn influences the company economic as well as "ethic" sustainability.

The conflict between an organisation necessity of growth (or survival) to grant its economic sustainability in the long run, and the respect of its ethical code is far from being solved.

A contribution to overcome this apparent contradiction could be related, in our opinion, to the consideration of the entire range of theoretical and operational tools available to business management, without prejudices. An efficient flow of goods and information along the Fair Trade supply chain is in fact necessary both to the more ethical and "market oriented" ATO; in this sense the Fair Trade values, oriented towards transparency and collaboration, represent a potential competitive advantage with respect to conventional supply chains. The importance of opportunistic behaviour, as an obstacle to the flows of information and to a collaborative management, should be in fact smaller.

Future research developments should therefore investigate the monetary and non-monetary variables affecting the efficiency and sustainability of Fair Trade inter firms' relationships (clusters, networks, supply chains etc...).

A more specific field of investigation should be oriented towards the analysis of the Fair Trade flows from developing countries both in terms of goods and information. A fair income distribution and in general economic and social justice need transparency and therefore a full, fast and clearly organised access to relevant information and knowledge.

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Evolution of trade flows for sheep milk cheese: an empirical model for Greece

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Summary

This research examines Feta cheese trade flows, having as raw material sheep milk. The findings of the implementation of the gravity model demonstrate the significance of trade flows for Greek Feta worldwide. It will be a very useful instrument for examining the trading potential of Feta cheese, on the condition that there will be a positive outcome on the judicial and political level for the product in the WTO negotiations. The findings of the gravity model will be very helpful for an analysis which follows, in order to show off the strengths and weaknesses of the sector, as well as the opportunities and threats the market creates.

Finally, there is a list of proposals – suggestions which focus on increasing the competitiveness of the sector and on armouring it with all the essential quality and safety reassurances. This is done in order to avoid, in the future, attempts from competitors to jeopardize once more all this effort that has been done up till now. These proposals form an action plan which provides viable solutions to the quality and safety issue, as well as an aggressive marketing plan for gaining market shares in both EU and non-EU countries, utilizing the competitive advantage the product gains, as PDO.

KEYWORDS: Trade flows, quality, competitiveness

1. Introduction

The cheese sector is one of the most important productive procedures of the Greek primary sector. This importance is due to the fact that, the sheep and goat population is quite significant, not only for national, but for EU standards as well. The sheep and goat milk is the raw material for numerous types of cheese and the most popular and well known is Feta cheese. It is well known that there was a quite long litigation between Greece on the one hand and Denmark, Germany, UK and France on the other, regarding which country has the right or not to produce cheese named Feta. Finally, in 2002, Greece won the case and after October 2007, will have the exclusive right, in the EU, of producing white cheese named Feta from sheep and goat milk (R1829/2002).

The exclusive production rights in the EU are now a fact for Greece, but it is not a fact on an international level. On the ongoing negotiations of the Doha Round of the WTO, the EU made an official request for increased protection of products with *Geographical Indications (GI's)*. For that reason, there is a wish list with wines and spirits and other products, being presented at the Cancun conference (WTO, 2005). These products have been already labelled as PDO in the EU, but on an international level up till now, there is no protection for these products from competitors who wish to produce them and take advantage of their reputation for their unique quality and flavour characteristics. In this wish list there are two Greek products, Ouzo (an aperitif) and Feta cheese. Up till to present, there are serious and quite strong oppositions for the EU demand, especially for wines and spirits on the list. This happens because the French want to have the exclusive rights of production and marketing of products like *Champagne, Bordeaux, Bourgogne*, etc, the Italians want the alcohol products *Chianti, Grappa* etc and other products like *Mortadella Bologna, Mozzarella, Parmigiano*, etc. All these products are recognisable worldwide with these

names and so far they have been produced not only at the specific European areas, but all over the world. For the Greek issue, regarding Feta cheese, serious reactions come from New Zealand, Canada and the US. In these countries there is a tradition of producing white cheese with cow milk as raw material and marketing it as Feta cheese. If the EU request is satisfied, this marketing practice will stop and this cheese will be in the market as *White cheese in curd* and not as Feta.

This study has as target to research the trade flows of Feta cheese world wide and show off the positive and negative parameters for this trade. The findings of the implementation of a gravity model, which is used for this research, are quite useful for the implementation of the SWOT analysis, in order to set off the strengths and weaknesses of the sector and the opportunities and threats of the trading environment of the product. Finally, there are some policy recommendations for the most serious obstacles the sector faces, during its development procedure.

2. Background

One of the major disagreements between the parties involved in the case of Feta *cheese* was that the northern European countries are using cow milk as raw material for the production of their Feta. Greece convinced the court that the name Feta is not a generic name for cheese, but it is a name for a traditional Greek cheese being produced by using a mixture of sheep and goat milk and not cow milk at all. That is the main argumentation for labelling the product as PDO (Product Designated of Origin), in 2002. This parameter is crucial for international trade of the product, because until now firms producing Feta outside Greece were using this name for promoting their product, without following the traditional recipe for preparing it. The first attempt from Greece to include the Feta cheese in the EU PDO list was in 1994. In the same year the committee which was responsible for this task adjudicated for the demand of the country. In 1996 the EU PDO committee reached the same conclusion and Feta cheese became a PDO product by laying into force the R1107/96. France, Denmark and Germany opposed immediately this Regulation, by using as argumentation that Feta is a generic name for cheese for the EU market and it is impossible for a product to be named as PDO referring to a region which is almost all the Greek territory. This litigation lasted until 2002 when the EU court adjudicated that Feta cheese is not a generic name and only continental Greece and the island of Lesbos will produce and trade Feta in the EU market. This decision established a transitional period of five years for the EU countries to fully comply with this decision and this period ends in October 2007. This decision enclosed in the EU legislation by the R1829/2002.

Since 1930, Denmark started to produce Feta cheese, using as raw material cow milk, mainly for exports, France started in 1931, using both sheep and cow milk, for domestic consumption and exports and Germany started in 1972, using basically cow milk, mainly for export reasons. In order to achieve considerable market shares globally, two countries, Denmark and Germany have used, the EU export subsidy mechanism for a long period of time. Target markets were mainly the US, Canada and Arabic countries, where the demand for the product was significant.

All the parties involved in the Feta production sector realised that the product was characterised by increased competitiveness and there was a great lose for the Greek economy, as a whole, when firms outside Greece were using the name of Feta to increase their sales, without producing following the traditional way. Another very important issue was that the consumers were misinformed about the ingredients and the original flavour of the product, the white cheese from cow milk tastes differently from the original Feta cheese and this situation creates an unfavourable trading environment for any attempt from the Greek side to gain market shares in these countries. The difficulty is based upon the perception the consumers already have about the product, and it is not an easy target to

convince them about which is the original product and which is an imitation (Babcock, 2003).

The implementation of the gravity model for Greek trade flows of sheep milk cheese appears as a crucial necessity for researching the trading environment of the product. This trading environment has two dimensions. The first one is the EU market, where there are no trade barriers and the second is the global market where there are numerous importing regulations (tariffs, TRQs, technical barriers etc) applied for the product by each country. In order to reach feasible policy recommendations in a heterogeneous trading environment, it is necessary to show the most important export destinations and estimate the significance of each factor affecting trade dealings and performances.

3. Objectives

The first objective of this research is to show the most important trade flows of Feta cheese worldwide. By applying a gravity model many parameters can be taken into account, affecting international trade. Studying the impact of each factor affecting international trade at this period of time, is essential for the implementation of a new trading policy for the product, given that soon enough there will be a new trading policy, under the WTO current negotiations. In the EU market there will be serious changes too, because the transitional period for the name Feta to be used by other countries, except Greece, expires in October 2007 and a new status quo will be formatted afterwards.

The second objective is to measure the importance of each economic factor affecting Feta trade. The factors which have been studied for affecting Feta trade are distances, quantities exported and imported, total trading quantities, value of exports and imports, evolution of GDP per capita, and population.

The third objective is to evaluate the importance of the non economic parameters affecting Feta trade. Such parameters are the existence or not of Greek immigrant societies, cultural similarities with Mediterranean diet and evolution of tourism having Greece as their destination.

The fourth objective is to verify which policy recommendations are most effective for a rapid improvement of international trading performances of Feta. This part of the research is crucial, because up till now there was not a total trading and exporting policy for Feta cheese in Greece. Responsible for this situation is mainly the EU CAP, as it was applied by the ministry of agriculture, because there was given priority for expansion of arable crops, which were tailored with subsidies. The animal production was isolated into mountainous areas only, where it was impossible to develop such cultivations. This situation led the sector to be characterised by low productivity and to be incompatible to follow the contemporary trends related to food security, quality certification and animal welfare.

4. Data and methodology

In order to provide a comprehensive empirical analysis of Feta's trade flows world wide, the well-known gravity model has been used. This model developed simultaneously by Tinbergen (1962) as well as Pöyhönen (1963) and Pulliainen (1963) is actually considered as the most appropriate and popular instrument in order to explain bilateral trade flows. Even in 1979, Anderson affirms that "the gravity model is probably the most successful empirical trade device of the last twenty years". The interest of such an approach is effectively the existence of a vast literature and numerous empirical models based on gravity equations, investigating the main socio-economic and geographical determinants of international trade. From the beginning of the decade 1960, a lot of studies used the gravity model to estimate the total volume of bilateral trade (aggregated exports and imports). More recently, Bergstrand (1989) and other authors has specified the gravity equation in order to estimate bilateral trade flows of specific goods.

Beyond the empirical interest of the gravity equation, Deardorff (1995) within the framework of the Heckscher-Ohlin model highlighted that the gravity equation not only characterized many empirical models but also can be justified from standard trade theories. In fact, since the end of the 1970s, several authors have developed alternative approaches so as to give theoretical support to the model. Anderson (1979) whose theoretical analysis was at the aggregate level develops a gravity model that assumes product differentiation, using a trade-share-expenditure system with Cobb-Douglas (or CES) preference functions for all countries while utility functions are weakly separable between traded and non-traded goods. Bergstrand (1985, 1989) proposed a theoretical approach of bilateral trade, giving a microeconomic foundation to the gravity model within the framework of a general equilibrium model of world trade. In this case, gravity equations are associated with simple monopolistic competition models.

If the gravity equation is generally a popular tool to characterize the pattern of bilateral trade flows (aggregated or not), on the contrary it has been scarcely used in the investigation of the determinants of agricultural trade in the world (Paiva, 2005). The following analysis is effectively focused on a specific livestock product, the Feta cheese, which is also a PDO (Protected Designation of Origin) for the EU market.

According to the law of universal gravitation discovered by Newton in 1687, the gravity model can be applied to a wide range of problems such as migrations, foreign direct investment, tourism etc. The gravity equation is often used in international economics especially in order to explain bilateral trade. It stipulates that the importance of trade flows between two countries is (a) positively related to their demographical and economic size and (b) negatively to the geographical distance between them. The population and the GDP can be interpreted as indexes of mass, in other terms as the potentiality to participate to international trade while the distance, as a measure of the geographical proximity, reflects the difficulties that countries can encounter in order to develop exchanges because of transport cost and duration as well as difficulty to access to the appropriate information. In other terms, the geographical distance captures the resistance factor for two countries to develop bilateral trade. In its initial form, the gravity equation is expressed as:

$$EXP_{i,j} = a_0 \frac{Y_i^{a_1} \cdot Y_j^{a_2}}{D_{i,j}^{a_3}}$$

with $EXP_{i,j}$ is the volume of exports from the country i to the country j , Y_i and Y_j reflect the GDP of the two countries while $D_{i,j}$ measures the geographical distance between the two countries' capitals.

Considering the extensive literature produced at least during the last 20 years and relative to the estimation of gravity equations, it appears that the econometric specification of the above gravity equation has been improved by the introduction of different explanatory variables as well as dummy variables¹. Linnemann (1966) in the H-O framework considered that economies of scale and technology differences – instead of the well-known differences in factor endowments – are determinant factors in order to evaluate comparative advantages. In this context, the author postulated that potential trade is dependent on differences in population size. After Linnemann, most of the empirical studies will introduce variables relative to the population size of the countries. Tinbergen's model (1962) introduced dummy variables for neighbouring countries and membership to a preferential trade area. Aitken (1973) introduced a dummy variable to the above equation in order to measure the effect for trade partners to be member of Regional Trade Agreements as EEC. In most of cases, the addition of dummies variables reflecting historical, cultural

¹ An extensive review of the literature relative to the refinement of the explanatory variables and the addition of new ones is proposed by Martinez-Zarzoso and Nowak-Lehmann (2002).

and institutional characteristics of the specific trade flows analyzed, seems to improve appreciably the quality of the model.

In the case of Greek exports of Feta cheese, we consider that at least two dummy variables have to be introduced in order to take into account the two following facts:

- trade partners of Greece are or not members of E.U. This dummy variable can be interpreted as the existence of an institutional proximity and,
- some countries have for a long time an important Greek community. This dummy variable reflects the existence of an alternative form of proximity, not based on geographical criteria but on relational one. Different authors (Gould, 1996, Head and Ries, 1998, Dunlevy and Hutchinson, 1999, Belair, Gauthier, 2004) have put into evidence the relative importance of immigrant links to the home country that is the preference for typical home country's products. Feta cheese fits well in such a preference pattern for the Greek diaspora.

In the specification used in the present paper, the Greek exports of Feta cheese depend on the size of the partners' respective economies, their population, their geographical proximity to Greece (distance) and a set of dummies variables capturing the above mentioned institutional and cultural characteristics relative to the specific trade flows of Feta cheese. For estimation purposes, the exports of Feta cheese by Greece are expressed in log-linear form:

$$lEXP_{G,i} = b_0 + b_1.lY_i + b_2.lPop_i + b_3.lDis_{G,i} + \sum_k c_k .D_{i,k} + \varepsilon_{G,i}$$

where:

l denotes that variables are expressed in natural logs,

Y_i indicates the GDP per capita of the trade partner i . GDP per capita is based on purchasing-power-parity (PPP). The per capita GDP is usually chosen for the estimation of bilateral exports for specific products while total GDP is often used in the case of aggregated exports' estimation (Martinez-Zarzoso, Nowak-Lehmann, 2002). We are expecting a positive relation between the level of per capita GDP and the volume of trade flows (b_1 positive)

Pop_i is the population of the trade partner i . In this case, we are also expecting for a positive relationships (b_2 positive)².

$Dis_{G,i}$ indicates the geographical distance between Greece and its trade partners (from capital to capital)

The last term of the equation: $\sum_k c_k .D_{i,k}$ is a sum of dummy variables taking the value

one when the specific condition (belonging to UE or belonging to countries with significant Greek diaspora) is satisfied and zero otherwise. The coefficients relative to these dummy variables are expected to be all positive.

The data set covers 23 trade partners (from which 13 are EU members) who imported during the period 1990-2004, cheese Feta from Greece. Since the data concerns two distinct periods – namely the average in 1990-1992 and the average over 1999-2001, a supplementary dummy variable has been introduced in order to specify the observations during the last period.

² Data for the two variables: per capita GDP based on PPP (billions international \$) and population (000 persons) have been collected from the World Economic Outlook

5. Results

Estimation with SPSS software was done through Ordinary Least Squares (OLS). The main results are presented in the table 1. As it appears, the model has a relatively low explanatory power with R^2 of 0,60. In other words, only 60% of the variation in the exports of Feta is explained by our selected specification of the gravity equation. Comparatively to other empirical models of trade flows, the above power is effectively not so performing. Moreover, we have to take into account that Feta cheese for non Greek consumers is not a common product and in a certain sense, it can be considered as an “exotic” good, justifying the fact that non-economic factors can be as well as pure economic ones, determinant to measure such specific trade flows.

The results show that all the coefficients of the basic gravity equation are statistically significant at level less than 5% and have the expected sign:

- Exports of Feta to the trade partners of Greece are positively affected by their economic and demographic size. Exports flows of Feta cheese increase in a greater proportion compared to the change in GDP per capita (coefficient = 1,60) and in a lower proportion compare to the change in population (coefficient = 0,64). If we accept that Feta cheese is not for the majority of countries a common product, this result confirms that in countries with higher standard of life, the consumers are not only oriented towards subsistence products and they have the economic capacity to develop consumption of “exotic” products.
- The distance variable appears as a “resistance factor”: Feta exports are negatively affected by the geographical distance and the magnitude of the coefficient is quite high in absolute value (-0,90). In fact, we can suggest that the negative impact of geographical distance is not only due to transport costs – even if this aspect is really important for fresh products as Feta – but indirectly reflects also a “cultural distance” and a lack of information.

Finally as regards the selected dummy variables, capturing institutional and geopolitical characteristics, it appears that the impact of EU is not significant for the exports of Feta: the fact that a partner is member of EU does not seem to be determinant and to contribute to more exports. At the contrary, the existence of an important Greek diaspora - as it is the case in countries as Germany, Australia or USA - has a positive and significant impact of trade flows. This point is particularly interesting because it shows that even if Greek emigration is a relatively old phenomenon, the links that the diaspora maintains with its country of origin remain quite strong while at the same time, it is possible to consider that this population mainly contributes to promote the “typical” Greek products.

Table 1: OLS Results for the gravity equation

Independent variables	Coefficients
Constant	-10,901
Per capita GDP (in PPP) of importer countries	+1,601 (2,137)**
Population of importer countries	+0,644 (2,134)**
Distance between Greece and importer countries	-0,900 (-2,015)**
EU members	0,164 (0,263)
Importer countries with significant Greek community	2,147 (2,171)**
Adjusted R ² = 0,603, F-test = 7,681***, d = 2,175	

All variables except dummies are expressed in natural logarithms. Estimations use White's heteroskedasticity-consistent covariance matrix estimator. t- Statistics are in parentheses. ** denotes significance at 5% and *** significance at 1%.

6. *Final remarks*

The results of the application of the gravity model mentioned above are quite supportive in forming policy recommendations which can improve the international trade of Feta. In order to complete the sheep milk production scheme, it is essential to include in this research some information referring to the internal environment of the sector. The internal environment is being characterised by positive and negative aspects with direct influence on the trading performance of the product in both the internal and external market.

The exclusive rights of producing and trading Feta cheese in the EU market is a very important factor for the protection of the product against unfair or unethical competition and an essential precondition to incorporate the added value the product can gain from the market. It is now a fact, for the EU legislation, that the use of the name 'Feta', by firms that do not follow the traditional way of processing and use as raw material cow milk, misinforms the consumers, being at the same time an act of unfair competition.

After the recent structural changes of the EU CAP, where the vast majority of subsidy payments have been decoupled from the production procedure, there is a significant turn of farmers from crop production to animal production and especially to the sheep breeding sector. The reason for this turn is the lack of competitiveness of cultivations which, until recently, dominated the most fertile agricultural land, like durum wheat, cotton, corn, sugar beet etc.

Decoupled payments give the opportunity to market forces to shape a different primary production structure, where products with increased competitiveness gradually gain shares in agriculture. This tendency follows the sheep milk processors too, by investing in new infrastructure and in quality reassurances, with the latter action obligatory for them now and not voluntary.

Another very important factor is the existence of Greek sheep races with satisfactory productivity characteristics. One of the corner stones of the argumentation of the EU court naming Feta cheese as Greek PDO product, which is at the same time a crucial precondition as well, was that only Greek races of sheep have to be fed for the production of the product, because the milk they produce gives unique and special characteristics to the product. Even

nowadays the majority of Greek sheep populations have no pedigree, and only new investments use genetically grade up sheep. The most well known Greek sheep races are “Chiotiko” and “Karagouniko” which are now used for milk production with satisfactory productivity and quality characteristics (R1829/2002).

All the above advantages of the sector are not enough for a rapid increase of market shares on an international level. The most serious problems the sector faces create obstacles to the quality reassurance procedure, which is essential in the markets where there is demand for the product. The first problem is that the animal welfare preconditions are not fulfilled, at the majority of Greek sheep-folds. Until the end of 2007 every sheep-fold, which will remain in action, must satisfy these preconditions, otherwise it has to be demolished. Animal welfare is the first of a group of tasks that have to be fulfilled, in order the raw material of Feta cheese to be certified with a quality certification. This task is very important though, because if a sheep breeder does not have a legitimate sheep – fold, soon enough, he will not have the ability to sell the milk he produces to a processing unit. Since 2006 an animal breeder who does not have a legitimate sheep – fold cannot be subsidised by any investment program. Of course animal welfare does not refer only to the quality of the sheep – fold but it takes into account a series of subjects related to the quality of life the animals have. There are specific procedures for feeding, transporting, slaughtering, etc and EU legislation becomes stricter on this issue by 2010 (EU Commission, 2006). It must be understandable that this entire legal and regulation framework has to be a reality as soon as possible in Greece, otherwise both animal breeders and Greek state will face serious legal and market problems and will jeopardise the funds and credibility in the Feta case.

Not complying with the animal welfare issue has direct negative consequences to other important issues too. It is practically impossible in low quality sheep – fold the use of milking machine which gives the opportunity to the breeder to keep high quality standards the milk he produces. When such technology cannot be used the quality of milk is being downgraded quickly, especially when temperatures are high, and sometimes there is a danger that this milk will be in poor condition for processing. All these problems make impossible now the satisfaction of a total quality certification scheme from the sheep – fold to the market shelf, something that it is required, if the target is increased market shares where consumers are willing to pay for increased added value embodied in the product.

Until the recent changes of the EU CAP the majority of the processing units were focused on the Greek market, and only few of them had an exporting orientation. The decoupled of payments of subsidies, combined with the positive outcome of the litigation for the name issue, created increased anticipations for exports to both EU and non-EU countries. The target of a rapid increase of exports is quite complex and a series of obstacles related to this achievement have to be overcome first. One of the most difficult tasks to overcome is the rapid increase of production. If Feta producers want to gain market shares where non Greek cheese is being sold now under this name, they must have the ability to fulfil this demand with Feta. The current situation in both the milk production and processing sector does not give the ability such a target to be satisfied immediately. Another serious issue is the implementation and recognition of different quality certification protocols worldwide. If an exporting enterprise does not want to jeopardise non acceptance of Feta cheese, just because it has used for quality certification a protocol which is not recognisable, it must choose first the destination country and then use the appropriate quality reassurance protocol. This status quo creates administrative problems in enterprises with exporting orientation, because there might be a necessity for application of different and more than one quality protocols, when country destinations do not cooperate on that issue. It is a problem which affects many products traded internationally, and can be enclosed in the technical barriers to trade portfolio of the WTO. Non – Greek firms traditionally focused on exports of Feta cheese, have realised soon enough that serious changes on EU and non EU level have the impact to affect seriously enough market shares they possess up till now in high added value markets, like the US, Canada or Australia. Consumers in these countries

have accepted that Feta cheese must have the specific flavour and it is not an easy task to persuade them that this flavour is not the original one, because the raw material for this cheese is cow milk and not sheep milk. These enterprises are trying to prolong consumers' loyalty to their product by gradually change the package, having as target to make them familiar with the brand name of the enterprise than with the name "Feta" (Kerr, 2006). The significant difference in flavour between the two products, in accordance with the above marketing strategy, require an equivalent marketing strategy from the Greek side, capable enough to reverse the current market structure. The implementation of such a strategy is not an easy task, being at the same time costly. Greek enterprises, as units, cannot afford such costs and the only feasible alternative is a joint attempt which can gather more funds and epimerise cost and anticipations for better exporting performance.

From the above analysis, combined with the information extracted from the implementation of the gravity model, it is obvious that the inclusion of Feta in the EU PDO list and in the WTO wish list, cannot satisfactorily account for a rapid increase of exports. The serious problems the sheep milk production sector faces must be solved as soon as possible. Until the end of 2007 every sheep – fold must fulfil the animal welfare conditions being described by the EU legislation. In legitimate sheep – folds genetically grade up sheep can be bred which are more productive, increasing by this way profitability of breeding units. The quality certification issue is another task that has to be faced immediately. The establishment of producer groups can help in various ways the certification procedure with the most important ones being the decreased certification cost per unit, as well as useful consultancy services which will help them add to their product desired characteristics by the processing units and the final consumers. All these actions have to be finished in a short period of time, because while they exist as weaknesses, they can be the corner stone of a new argumentation in litigation against Greece for Feta cheese, on a different level this time, examining the food security issue for the product.

The other important parameter is the implementation of an exporting policy, combined with aggressive marketing strategy. The major foreign markets for Feta cheese is the US, Canada, Australia, the Middle east and Arabic countries as well as EU countries like Germany, France and UK. The reasoning for these strong trade flows for Greek and non Greek Feta, is the existence of Greek immigrants, cultural similarities with the Greek diet and increased number of tourists visiting Greece for vacation and getting familiar with the product. The marketing strategy must be based upon these elements, as well as promoting the positive influence of Greek diet to human health. The marketing strategy must have as target to coincide Greece and Feta to the consumers' perception. Another task is to convince consumers about the originality of the product. The promotion strategy, as part of the marketing mix which will be implied, must show off the traditional way of breeding sheep, producing milk and processing it for Feta production, in accordance with the highest food security standards requested in these markets. Consumers not familiar with the product and with no linkages, like the ones mentioned above, request more intensive promotion strategy, providing information about the unique flavour and nutrient characteristics the product has, presenting it as an integral part of Greek and Mediterranean diet, which is better advertised worldwide and consumers are more familiar with it. An additional important task is the increase of use of Feta in foreign markets. Until now the dominant use of Feta is as a part of Greek salad. Increased selling price can be achieved if the product is in a cube shape and top quality product is the one which is sold in perfect cubes, without missing any corners. Increased consumption can be achieved by providing the consumers with new ways of using it, these ways are traditional recipes in Greece, presenting them on the packaging of the product, by distributing leaflets with relevant information at the selling points, or by using the internet, something which is being done today at many gourmet sites. Always there is space for improvement, for promoting these recipes.

It is obvious, that Feta cheese is a product with great potential for the Greek primary sector, especially now, after the implementation of the EU CAP changes. This research proves that

many issues in both the internal and the external environment have to be improved and an advanced synchronism of all the relevant parties is now more important than ever. Animal breeders must comply immediately with the EU legislation and in close cooperation with all the other parties being involved in the marketing channels the product follows, must armour Feta with the necessary quality reassurances, because now, this is the most important weakness the product faces. The PDO identity is quite useful, but is not enough on its own to improve the product's competitiveness on an international basis. This is the reason for all the above policy recommendations, which have the ability, in cooperation with the high protection of the name, to increase exports and strengthen and expand the current trade flows the gravity model showed.

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Consumers' Willingness To Pay for Value-Added Food Products

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The increasing importance of food quality and food safety has led to an increased consumer concern for certified quality products. However, the market share of certified quality products still remains very small. The aspect of "quality" has also been accepted as an important ingredient of marketing that offers producers a great opportunity to differentiate themselves in the market and add value to their products (Jervell and Borgen, 2004). In the case of agricultural products producers may view a quality certification (either it is a certification of traceability or a quality label) as a tool that protects them in an environment of distrust and as a promotion strategy that will add value to their products and justify higher prices for them. However, in order for value-added markets to be successful an effective communication must be promoted. This means, that consumers must be aware of the existence and meaning of these commodities and also have a favorable attitude towards them. In addition, consumers must be willing to pay an extra amount of money for such products. It is therefore, of major importance to better communicate with the consumers and gain a better understanding of their attitudes, needs and perceptions (Preston and McGuirk, 1990; Kuznesof et al., 1997; Walley et al., 1999; Van Ittersum et al., 2000; Grunert, 2002; McEachern and Willock, 2004).

The aim of this paper is to examine consumer attitudes and behaviour towards two different quality foods: the organic and the traditional speciality guaranteed (TSG) products. A survey of Greek consumers was carried out to examine perceptions of food quality, level of awareness and attitudes towards food certification. Furthermore, an attempt is made to compare the socioeconomic characteristics and attitudes that affect consumers' willingness to pay (WTP) a premium for these two different food products.

Data were collected in February 2006, using a cross-sectional questionnaire survey. The survey took place in the metropolitan area of Thessaloniki (northern Greece) and only those consumers who were responsible for purchasing their household's food were interviewed. In total, 414 valid questionnaires were used in the analysis.

Results indicate the high level of consumer awareness and knowledge about organic and TSG products. The majority of consumers are buyers of organic and of TSG products (55 per cent and 67 per cent respectively). Sociodemographic factors (gender, age) are positively associated to consumers' willingness to pay a premium for organic products, whereas nutrition and freshness positively affect consumers' willingness to pay for TSG products. The findings are considered to be useful to food policy makers and marketing practitioners, since effective methods of marketing would increase the demand of the studied products

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Study on Problems Faced by Xinjiang Organic Producers and Solutions

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Summary

Presently the behavioral features of the organic producers could be concluded as the fact that they are quite confident of the prospects for organic agriculture, while heavily dependent on the guidance and support of the local governments; are in great demand for technological innovation, while in the distinguished intimacy and poor pricing capacity. Such problems as low economic benefit, the imperfect marketing network and serious external economy, are threatening the healthy development of organic agriculture in Xinjiang. In this essay, it is suggested that the government should, taking full advantage of its rich natural resources, pay great attention to the organic development in the local region; establish an efficient organic marketing network; apply the innovation mechanism as a proper compensation for the external economy; promote organic circle economy.

KEY WORDS: organic agriculture; problems; policy inspiration; Xinjiang

1. Introduction

In December, 2003, the county was honored as the Model County for Organic Food Production by Xinjiang Environmental Protection Administration. In order to promote the development of organic agriculture smoothly, the county established a leading team for the construction of the Model County and an office in charge of the supervision and administration of the organic production in this county, and then all the townships owned their leading teams and administrative institutions correspondingly. Furthermore, the county improved the natural environment for organic agriculture, organized to apply for the certification of the organic products and production, and laid down the corresponding technical specifications and procedures in the production. In between 2004 and 2005, 8 agro products were successfully certificated. At present, the organic products in scaled production in the county include LaoMao Lake late-maturing sweet melon and TuKuo salty lake mutton, whose production has initially formed the pattern of "Enterprise + farmer". And the products are purchased, inspected, dispatched and packed by the enterprise and then sole in the specialty stores.

Taking the case of the organic agriculture in Yiwu County, the essay is intending to analyze the behavioral characteristics of the producers, the economic benefit of the organic production; furthermore illustrate the problems faced by the producers and make some recommendations for the development of organic agriculture in Xinjiang. All the data in this essay are taken from the survey in Yiwu County taking place in January, 2007. Among all the 57 effective questionnaires, 21 are for the producers of LaoMao Lake late-maturing sweet melon at Xikan Second Village; 20 for the producers on the verge of the transformation into the organic ones at the newly-built villages and the development zone; 10 for

the traditional producers; 6 for the breeders of TuKuo salty lake organic sheep at the Salty Lake Township.

Through the survey, the essay provides a basic idea of the organic development in Yiwu County. Based on it, the second part of the essay makes a comparative analysis on the behavioral characteristics and the economic benefits; the third part tells us about the problems and the possible reasons; the final part illustrates some policy recommendations for the organic agriculture development in Xinjiang.

2. Analysis on behavioral characteristics of the organic producers in Yiwu County and economic benefits

2.1 Behavioral characteristics of the organic producers

Survey shows the following behavioral characteristics:

2.1.1 Heavily dependent on the local government and have strong intimacy preference

In 2003, the farmers in Xikan Second Village began producing LaoMao Lake late-maturing sweet melon, the earliest organic sweet melon producers in Yiwu County. The farmers in the newly-built villages and the development zone began producing LaoMao Lake late-maturing sweet melon in 2006. In Table 1, the percentage of the chosen producers because of the promotion activity by the government is 38%.

Reasons Farmer Sources	Government promotion	Good economic benefit	Follow others
Xikan Second Village	38	35	27
Newly-built villages & Development zone	17.4	60.9	21.7

Considering the fact that in 2003 the producers were unable to evaluate the economic benefit according to the production situation at that time, the producers formed their judgment on the organic production mainly affected by the governmental propaganda. Therefore, it can be concluded that the earliest organic producers of the melon are encouraged by the local government.

In Xikan Second Village, 27% of the farmers take the attitude of following others to choose the organic production; but three year later, in 2006, still 21.7% in the newly-built village and the development zone are doing so. This indicates that the farmers' attitude of following others is still very strong, and in these places, the influence of the government is weakening, because the farmers in these places have noticed the economic benefits brought to the Xikan Second Village. The percentage of the farmers choosing to produce the organic melon is 60.9%. It is shown that the farmers, constrained by their capacity of developing themselves, strongly depend on the government, and as the typical risk escapers, the farmers have the distinguished intimacy preference.

2.1.2 Strong technical demand

In Table 2, the farmers from both the sources are in strong demand for organic production technology. Most of them have the "little" knowledge of the relevant technology and their technical support is

mainly from the technical promotion agencies in the government. Notably, in the newly-built village and the development zone, the farmers knowing nothing about the organic production technology are 18.5% more than the farmers of the same kind in Xikan Second Village and 41.7% of the farmers learn and master the relevant technology through self-education. From this distinction, it can be found that the newcomers in the organic production need more technical instruction, but the technical service from the government is inadequate.

Table 2 Demand and supply of organic production technology (%)

Farmer sources \ Item	Degree of knowledge on technology			Technical source		Demand for technology	
	Very well	little	Not at all	Self-education	Governmental technological service	Yes	No
Xikan Second Village	25	65	10	19	81	5	5
Newly-built village & Development zone	16.7	55.8	28.5	41.7	58.3	100	0

The same idea could be shown in the aspect of the satisfaction degree of the farmers on the technological service. Table 3 indicates that the farmers are dissatisfied of the service of the agricultural technology servants, esp. in the newly-built village and the development zone, 15% of farmers directly express that the servants could solve any practical technological problems.

Table 3 Farmers' evaluation on the technological service (%)

Farmer sources \ Item	Can solve the practical problems	Sometime can, sometime can't	Can't solve any practical problems
Xikan Second Village	52	48	0
Newly-built village & Development zone	45	40	15

It is shown that the producers have a strong technical demand, but the technical supply from the government is relatively inadequate, esp. that for the new organic producers is declining.

2.1.3 Singular selling mode and poor pricing capacity

Table 4 and 5 show that the prevailing selling mode for the organic producers in Yiwu County is still on-the-site bargaining, which has been lasting for more than 20 years in China. Although, practically, this mode could embody the property relationship under the household contract responsibility system and guarantee that the producers could completely own and handle their output, the defects of the system are becoming obvious.

On the micro scale, when the Shortage Economy in China is over, this selling mode is placing the farmers in the situation of a seller's market. Each producer is only a price taker and do not have a powerful pricing capacity. This is the reason why more than 55% of the farmers are not satisfied with the trading price. On the macro scale, the mode is making the Chinese agriculture in the contradiction between the small-scale production and a big market.

Table 4 Selling channels (%)

Item \ Farmer sources	On-the-site trading	Whole sale	Through intermediate service	Through leading enterprise
Xikan Second Village	76.9	7.7	15.4	0
Newly-built village & Development zone	73.9	4.4	17.4	4.4

Table 5 Selling mode and price satisfaction degree (%)

Item \ Farmer sources	Selling mode		Price satisfaction degree	
	bargaining	Order price	satisfied	dissatisfied
Xikan Second Village	90	10	40	60
Newly-built village & Development zone	100	0	45	55

2.1.4 Producers hold an optimistic attitude toward the prospects of organic agriculture

Among the subjects in Xikan Second Village, 70% think that the demand for organic products will be on the rise and the road to organic agriculture is hopeful, with the increasing requests on the life quality; only 30% think it is still gloomy. Meanwhile, among the subjects in other two places, 90% of the farmers think the future for organic agriculture is bright; only 10% are not clear about it. From the above, we can see that the expectations from the organic producers are inspiring.

2.2 Analysis on costs and benefits deriving from organic products

2.2.1 costs and benefits deriving from organic sweet melon

Survey shows that the organic sweet melon producers, compared to the traditional ones and those in the transformation into organic producers, have 25% and 24.52% , respectively, less income per hectare, and 40% and 43%, respectively, less profit per hectare. The main reason is low yield and high total cost. (See Table 7) Although the price of the organic sweet melon is one Yuan higher than other sweet melon, the margin can not offset the loss because of the decline of the yield, profit and income. The total cost per hectare of the organic sweet melon is 1.6% higher than the traditional sweet melon, because of the increase of field labor cost and the manure cost when planting the organic sweet melon.

The costs in these two aspects are 109.46% and 190%, respectively, higher than that of the traditional sweet melon.

Table 6 Comparison of the benefits between different sweet melons

Types Items	Organic S.M	Transformational S.M	Traditional S.M.
Total cost (Yuan/ha.)	17115	18345	16845
Yield (Yuan/ha.)	22500	30000	32190
Price (Yuan/ha.)	1.35	1.35	1.25
Income (Yuan/ha.)	30375	40500	40245
Profit (Yuan/ha.)	13260	22155	23400

2.2.2 Cost and benefit of the organic sheep

The production of the organic sheep in Yiwu County depends on the natural pasture and the traditional nomadic pattern. For the herdsmen, there is no technical obstacles in front of them for organic production and impact on the change of the production patterns. The production of Tukuosalty lake mutton brings a positive brand effect and so stimulates the sales of the mutton in the whole county. The price of the mutton in Salty Lake Township in the county ranges from 13 Yuan/kilo to 19 Yuan/kilo, averaging 16 Yuan/kilo. After packaging, the price rises to 30 Yuan/kilo.

3. Problems faced by the organic producers in Yiwu County

3.1 Low economic benefits

As mentioned, the benefits from the organic sweet melon are much lower than that of the traditional sweet melon. As the producers, who are always pursuing the maximum benefits, their rational choice is to abandon the organic production and divert to the traditional production. However, the survey shows that quite a lot of farmers, esp. in the transformation period, in practice, claiming that their products are organic while they are still utilizing a certain amount of chemical fertilizer in the production. By doing so, they could benefit from the higher price of the labeled organic products and good sale prospects, and at the same time, would not reduce the yield. There are two reasons for this : 1. the consistency of the aims of both the government and the farmers. For the government, its goal is develop the production and increase the farmers' income. For the farmers, it is the benefit maximization. With the same objectives, it is sure that the implementation and inspection of the organic production procedures will be weakened. 2. the traditional selling mode. The bargains on the site of the field make it difficult to effectively inspect the intrinsic quality of the products. Due to all these, the speculative behaviors of the farmers are allowed and prevailing.

3.2 It is hard for farmers to benefit from the organic agriculture

60.53% of the subjects in the survey think it is difficult to sell the organic products. And there are mainly two difficulties.

(1) difficult to the price acceptable as the organic products

Due to the immature organic market system and marketing network, the scattered farmers are in the inferiority when bargaining. The buyers are asking for the price for the traditional price although they are attracted by the brands of the organic products.

(2) In the mode of Enterprise+ farmers, the relationship between the enterprises and farmers is like the one between the buyers and sellers. The company is taking the property right of the brand, for example, Tukuosalty lake mutton, and so take most of the benefits.

(3) Serious external economy

The certificated area of the LaoMao Lake late-maturing sweet melon is only about 235 hectares. The brand of Tukuosalty lake mutton is only used in Salty Lake Township, or the sheep in the neighborhood villages, after the inspection, processing and package by the company, could be labeled with the brand. The imperfect organic market and the defected market mechanism of self-inspection and self-perfection make the government take the responsibility of inspection and administration. But the cost of inspection and administration is rather high and the initiative is weak. In this case, the governmental inspection and administration are inadequate and leave ample room for speculation in the eyes of the organic producers. In Yiwu County, almost all the sweet melon producers claim their products are organic and all the sheep breeders are claiming their mutton are in the brand of Tukuosalty lake mutton. This external economy is spoiling the benefits of the real organic producers and furthermore threatening the development of the organic agriculture.

4. Inspirations on the development of the organic agriculture in Xinjiang

In Xinjiang, a big agricultural province in China, the traditional and modern production modes are co-existing. From 1998 on, in the premise of the constructive surplus of agro product supply in China, the competitiveness of the agro products in Xinjiang, because of its special geographical location, far away from the main consumption markets and centers, is not strong and is blocking the increase of Xinjiang farmers' income. The essay thinks that developing unique agriculture and organic agriculture is the way to get Xinjiang agriculture out of trouble. From the development of organic agriculture in Yiwu County, we can find some constructive inspirations:

4.1 Taking advantage of rich natural resources, developing organic agriculture.

Because of its special geographical location the terrain, Xinjiang is in the good position of developing the organic agriculture. Taking its advantages of rich natural resources, Xinjiang may find opportunities to mend the traditional production mode so as not only to meet the technical demand of the farmers, but to suit their capability of absorbing the proper technologies in the present phase of the development.

4.2 Establishing an organic product marketing network

It helps to enhance the power of self-inspection and self-development in the market, regulate the organic market and promote the development of organic agriculture. What is needed is to perfect the certification system and improve the credibility of the producers and traders; reinforce the publicity of

the organic products and organic agriculture, develop the consumption market; increase specialty stores and counters, and the degree of acceptance and trustworthiness of the organic products in the market.

4.3 The leading role of the government

With certain properties of the public economy, the organic agriculture needs the government to play a unique role and take special responsibilities in the development of organic agriculture, which include: (1) to lay down the standards in the organic agriculture, set up the systems of inspection and monitoring so as to have an overall supervision and administration on the whole process. An effective certification and reimbursement system will guarantee the quality of the organic products and prevent the violators. (2) to support the technological research and development. Through different target projects, the researchers could completely learn the technologies on seed breeding, planting, storing and processing of the different crops in different areas, and go on with the work of training, demonstration and promotion. (3) to ascertain some regions for developing organic agriculture and place them on the list of important places with the special attention to environmental protection. The focus is the surrounded areas and the main threats are polluted water and air. (4) to undertake and share some transaction costs. On one hand, the administrative agencies should periodically release the information about the organic agriculture, such as the producers, the products and the market; on the other hand, the government should take some favorable policies on the production and sales of the organic products, for example, tax deduction and subsidies.

4.4 Compensation for externalities

As for the external economy deriving from the organic agriculture, the government should compensate so much as to assure the benefits of the producers in favor of the organic agriculture. The compensation principles should be “Whoever benefits from it should pay for the compensation. That is, if the beneficiary is the public, the government should pay. The externalities in the aspect of the environment should be compensated by the governments located in the benefited regions. If the region is in a county, the government in this county should compensate; if it is multi-regional, the compensation could be shared after the negotiation between the county governments.

4.5 Developing organic circle economy

Follow the circle economy principles of plant production, animal conversion and microorganism reduction to realize the coupling development between the different industries; pursue to establish the circle economy chain to extend the industries. Under circle economy mode, the organic agriculture will certainly optimize the industrial construction, promote the industrial upgrading, improve the industrial benefits and accelerate the construction of the environment-friendly society.

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Agrifood safety standards, market power and consumer misperceptions

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Summary

This paper analyzes how the implementation of a food safety standard affects firms' strategic behaviour within the context of a food chain. We provide a formal analysis, which considers that the sanitary risk results from a strong heterogeneity of upstream production conditions and the final demand depends on consumers' risk estimations (given that consumers may underestimate or, conversely, overestimate the sanitary risk).

We show how downstream (processing or retailing) firms may be prompted to play a positive role with respect to food safety, either by selecting only the safest upstream producers or by encouraging the improvement of suppliers' production conditions.

When the degree of consumers' risk misperception is relatively low, then a downstream firm may adopt the latter strategy and increase the marketed quantities as the food safety standard is improved. However, we show that the actual contamination risk is not necessarily decreasing in the level of the food safety standard.

KEYWORDS: food safety standards, market power, risk misperception

Introduction

Over the last decade, public concern over the safety of food has increased as a result of sanitary crisis (Mead et al., 1999, Roe et al., 2000). As a consequence, increasing food safety regulation has arisen, which covers a broad range of regulatory techniques, from public to private and from low interventionist to highly prescriptive obligations.

On the one hand, public authorities have tightened food safety legislations and created new control procedures. The classical rationale for government regulation in the risk and environmental area is the presence of externalities. Indeed, the operation of business often generates health pollution, water pollution and toxic waste. Health, safety and environmental regulations thus specify the technological requirements that must be met or the pollution standards that cannot be exceeded. Thus, it is well known that the main feature of regulation is that it directly controls economic agent's behaviour and affects an activity before the externality is generated (see for example Viscusi, Harrington and Vernon, 2005).

On the other hand, private systems and certification programs have been implemented by processors or distributors, aimed at meeting customer expectations in terms of food safety. These "strategies" are often implemented to respond to higher consumer requirements and are attempt to achieve improved both product safety and quality characteristics (Bazoche et al., 2005, Havinga, 2006, Fulponi, 2006).

As it was noticed by Henson and Caswell (1999), there are a lot of arguments for coordinating the incentives of public with those of private systems. Moreover, these authors point out that private systems may act as a mechanism to increase market share by delivering higher or more dependable quality, but they may act also to protect current market share from erosion. In both cases, there are incentives for the adoption of private controls by individual operators in the food supply chain and it is well obvious that

standard requirements affect the strategic behaviours within the vertical relationships, between producers and retailers.

Given these premises, the objective of this paper is to evaluate the impact of safety standards on the strategic behaviour of economic agents in the context of agri-food chains. We develop our analysis in the framework of the theory of industrial organization and examine a vertical relationship, where upstream producers (farmers) have to adopt a process standard. This process standard requires a minimum level of equipment which could lead to high investments by certain producers. We show how the compliance with this standard depends also on the strategic behaviour of the downstream firm, who processes and distributes the product. Then, with respect to the strategic interactions among the supply chain participants, we highlight some unexpected effects of these standards, namely a positive effect on the number of producers who accept to adapt their equipments to the standard. We also show some possible perverse effects, namely we point out that the actual contamination risk is not necessarily decreasing in the level of standard.

Two main hypothesis delimit our framework. At first, we suppose that a downstream firm does not have any possibility to fix its own private norm to reinforce the standard defined by the public authority, but, conversely, completely maintains its strategic flexibility to select the best equipped up-stream producers. Secondly, we assume that consumers are informed about the efforts that firms exert along the production-commercialization process, but they may underestimate or, conversely, overestimate the sanitary risk arising from economic activities¹. The firms thus have to adapt their strategic behaviour by taking into account the foreseeable distortions on the final market.

Background

There exists a large swathe of the literature concerning the process of compliance of firms to the food safety regulation and the effects of food safety standards on firms' strategic behaviour.

With respect to the first issue, Henson and Heasman (1998) focus on the process by which firms comply with food safety regulations and illustrate a model of compliance process. The authors show that firms decide to comply if the perceived marginal benefit of compliance is equal to, or exceeds, the perceived marginal cost. However, the decision whether to commit depends on adaptation costs and represents a long-term decision. These authors also argue that the compliance decision is affected by the extent to which firms are aware of cost-benefit relationships associated with regulations.

Loader and Hobbs (1999) address the question of firms' responses to changes in food safety legislation and suggest the necessity for firms to respond rapidly to food safety issues – as they directly affect the marketability of products – to assure consumers that their products meet safety requirements. Moreover, these authors point out the necessity to take into account the role of vertical relationships. In fact, they argue that food safety regulation encourages firms to follow an organisational strategy aimed at building closer supply chain relationships. In this spirit, Unnevehr and Jensen (1999) show that the use of mandating HACCP may create incentives for vertical coordination to control food safety throughout

¹ The issue of consumers perception of sanitary risk has been examined by several contributions. See for example, McCarthy and Henson (2005), for an analysis of the major facets of perceived risk for beef among Irish consumers. Yeung and Yee (2002), show that health loss is the most important component of perceived risk, followed by psychological, financial, time and taste losses. Lobb, Mazzocchi and Traill (2007) suggest a statistical strategy for explaining how food purchasing intentions are influenced by different levels of risk perception and trust in food safety information. Costa-Font and Mossialos (2007) focus on how individuals learn about the risks and benefits of genetically modified (GM) food, along with the influence of information sources on the formation of both risk and benefits perceptions. See also Krystallis and Arvanitoyannis (2005) for the analysis of Greek consumers' beliefs, attitudes and intentions towards GM food products and Rosati and Saba (2004) for an analysis of public perception of risks associated with different food-related hazards and perception of reliability of various sources providing information on food-related risks.

the production process. Moreover, it may pose a greater burden on small firms, due to the large investments needed, and thus result in concentration processes (see also Henson and Caswell, 1999).

Following a quantitative approach, Antle (1999) provides an analytical framework for the measurement of the costs of regulations and discusses the use and limitations of currently available benefit and cost information for quantitative regulatory impact assessment. Indeed, several contributions examine the economic implications of food safety regulatory standards using a cost and benefit analysis (see for example Caswell and Kleinschmit, 1997; Viscusi, 2006). This cost-benefit research attempts to measure the cost for firms of implementing food safety regulations and compare it to the benefits in terms of the reduced societal costs of consumers mortality and foodborne illness.

With respect to the effects of food safety standards on firms' strategic behaviour, some contributions have taken into account the dimension of firms' behaviour in the context of vertical relationships. These studies often refer to a context of moral hazard. Thus, they take into account the opportunistic behaviour of upstream sellers, who exploit the fact that many food products characteristics remain uncertain to downstream buyers in the course of market transactions. Hence, buyers run the risk to pay a premium price for inferior products or to use, or consume, substances which are harmful (health risk). Incentive systems must thus be designed to induce compliance with specified regulations and standards. For an example of this type of models in the context of food chains, see Hirschauer (2004), who specifies the conditions at which optimal control intensity and price can be determined. In this line of research, Starbird and Amanor-Boadu (2007) use a monopsonistic principal-agent model in the context of adverse selection to examine how contracts that include traceability can be used to deter unsafe producers, within the context of a food chain. They show that the motivation for the processor to select against unsafe producers depends on the magnitude of the failure costs and the proportion of them allocated to producers.

Furthermore, it is well known – in the literature concerning the analysis of safety regulation – that as firms engage in externality-creating activities, then they may derive a profit (or private benefit) from it. They also may reduce the risk, by exerting precaution efforts and supporting the related costs. Thus, the implementation of safety standards, as a means of controlling risky activities, affects firms' strategic choices. Nevertheless, to our knowledge, a few papers analyze the effects of standards on firms' strategic behaviour. For example, in a recent theoretical paper, Shavell (2007) analyzes the effects of the level of legal standards on the parties' level of activity, this latter representing whether or how much a potential injurer engages in a particular (risky) activity. It is shown that overly strict legal standards may discourage parties from engaging in socially desirable activities, when standards are required by the regulatory system.

Nevertheless, the market dimension (that is, the effects of food safety regulation on firms' strategic behaviour in terms of quantity and price) is often neglected by this kind of models. Therefore, the effects of consumers' attitudes towards a risky product are not taken into account and furthermore, the willingness to pay of consumers for food safety is often ignored.²

However, in a seminal paper, Polinsky and Rogerson (1983) have studied this issue by fixing, from a theoretical point of view, the basis of the formalization that we propose at the beginning of our paper. Indeed, these authors argue that introducing the market dimension requires to take into account consumers' risk misperceptions (several analysis of consumers' risk perception within the food sector are provided in the literature; see for example McCarthy and Henson, 2005, Yeung and Yee, 2002, Lobb, Mazzocchi and Traill,

² Some models have been used in order to derive expressions for willingness to pay (WTP) for reduced risk (Harrington, Portney, 1987, Cropper, Freeman, 1991, Berger et al. 1997). Several studies have shown an increase of consumers' WTP for products characterized by a lower risk of contamination (Buzby, Read, Skees, 1995, Fox et al., 1995).

2007, Costa-Font and Mossialos, 2007, Krystallis and Arvanitoyannis, 2005, Rosati and Saba, 2004).

As far as markets react to the perceived and not to the actual risk, then consumers' risk misperceptions may affect the strategic behaviour of economic agents and thus the design of the regulation. In this paper, we show how both the strategic behaviour of firms within the context of vertical relationships and the consumers' risk misperception may influence the effectiveness of the food safety regulation.

Objectives

The objective of this paper is to evaluate the impact of safety standards on the strategic behaviour of economic agents in agri-food chains. We develop our analysis in the framework of the theory of industrial organization and study the strategic interactions among food chain participants (upstream producers, downstream processing or retailing firm, final consumers), when the sanitary risk results from the upstream production conditions.

For this purpose, we study a vertical relationship where upstream producers (farmers) have to adopt a process standard. This standard requires a minimum level of equipment which could lead to high investments by certain producers. We consider that the downstream firm does not have any possibility to fix its own private norm to reinforce the standard defined by the public authority, but, conversely, completely maintains its strategic flexibility to select the best equipped upstream producers. Moreover, consumers are supposed to be informed about the efforts that firms exert along the production-commercialization process, but they may underestimate or, conversely, overestimate the sanitary risk arising from the economic activities. Thus, the final demand depends on consumers' risk estimations.

Methodology

Statements of the formalization

We consider a vertical relationship between J upstream producers and one downstream retailer. Following Giraud-Héraud, Hammoudi and Soler (2006), the upstream producers are differentiated according to their equipment level, which is represented by a one-dimensional parameter e , assumed to be uniformly distributed within the interval $[0,1]$, according to the density function $f(e) \equiv 1$. Each of the upstream producers can offer one unit of the good in the intermediary market. However, this unit is more or less risky, according to the equipment level of the producer. Thus, the contamination risk results from upstream production conditions.

The contamination risk arising from each individual producer, whose equipment level is e , is given by $\sigma(e)$, where $\sigma(\cdot)$ is a decreasing function of e . For the sake of simplicity, we consider that $\sigma(e) = 1 - e$. We then have $\sigma(0) = 1$ and $\sigma(1) = 0$. Hence, the risk is certain with a producer characterized by the minimum level of equipment and null with a producer characterized by the maximum level of equipment. As we consider that each producer always supplies the same quantity of product (non-elastic individual supply), the contamination risk is given by:

$$\sigma = \int_0^1 \sigma(e) f(e) de = \frac{1}{2} \quad (1)$$

We consider that σ defines the probability of crisis in the end market. This initial probability can be modified if at least one of the producers changes his equipment over the course of time. Then, the density $f(e)$ will shift to a density $f'(e)$ and change the level of σ given by (1). We will refer to σ as the contamination risk in the rest of this paper.

We suppose that, in order to enter the intermediary market, an upstream producer must, at least, reach a certain level of equipment e^s , which corresponds to the food safety standard implemented in the selected market. We assume that the fixed cost for each producer of type e , who wants to participate in the intermediary market with a level of standard e^s , takes a linear form $Max\{0, e^s - e\}$. Then, each producer is assumed to be price taker in his decision to enter or not the intermediary market.

In the end market, consumers are identical and risk neutral. Let σ be the true probability of crisis in the end market. Following Polinsky and Rogerson (1983), we define by $(1-\lambda)\sigma$ each consumer's perception of σ , where $\lambda \leq 1$. Since larger values of λ correspond to lower estimates of the contamination risk, λ may be interpreted as a measure of the extent of the consumers' risk misperception. Three representative degrees of consumers' risk misperception are identified: $\lambda = +1$ (maximal underestimation³), $\lambda = 0$ (no misperception) or $\lambda = -1$ (overestimation)⁴. Then, the aggregate inverse demand for the product, when the risk perception is $(1-\lambda)\sigma$ is given by:

$$\left\{ \begin{array}{l} p = \beta(\alpha, \lambda, \sigma) - x \\ \text{with} \\ \beta(\alpha, \lambda, \sigma) = \alpha - (1-\lambda)\sigma l \end{array} \right. \quad (2)$$

Equation (2) considers that the maximum level of price $\beta(\alpha, \lambda, \sigma)$ which consumers are willing to pay, that we denote "consumers's reservation price", depends both on the actual level of risk and on the degree of consumers' risk misperception. The parameter l represents the monetary loss for consumers for each unit of the product which is contaminated.

The quantity x is bought by the monopsonist in the intermediary market and supplied to the end market. We suppose that the monopsonist can always select the producers in order to obtain the quantity x with the best levels of equipment within the interval $[0, 1]$. Thus, we denote by \tilde{e} the threshold of equipment starting from which the producers are selected by the monopsonist:

$$\tilde{e} = 1 - \frac{x}{J} \quad (3)$$

The risk assessment on the market corresponds to the knowledge of the relative position of \tilde{e} and e^s . As a result, the level of risk depends on the level of quantity x demanded by the monopsonist on the intermediary market.

Let us denote by $\hat{x} = J(1 - e^s)$, the quantity asked by the monopsonist, such that all the initially well-equipped producers are selected (that is $\tilde{e} = e^s$). Using (3), we verify that $\tilde{e} \geq e^s$ if and only if $x \leq \hat{x}$.

³ This case represents the particular case in which consumers treat the good as if it were perfectly safe.

⁴ Consumers' purchase decision is affected both by the degree of risk's misperception and by the trust in food safety information (Lobb, Mazzocchi, Traill, 2007). Consumers' risk misperception can be interpreted as a psychological trait of consumers. They may under- or overestimate the contamination risk according to several determinants; namely perceived product's consistency, interest in cooking, interest in the product, experience and confidence in purchase location (McCarthy and Henson, 2005), health loss, followed by psychological, financial, time and taste losses (Yeung and Yee, 2002). Moreover, advertisement and communication campaigns potentially influence risk perceptions (Costa-Font and Mossialos, 2007).

Therefore, if $x \leq \hat{x}$ (that is $\tilde{e} \geq e^s$), no selected producer has to modify his equipment in order to supply the intermediary market. The statistical distribution of producers' equipments on the support $[\tilde{e}, 1]$ is then unchanged (with $f(e) \equiv 1$).

If $x > \hat{x}$ (that is $\tilde{e} < e^s$), the producers which are initially located between \tilde{e} and e^s have to modify their equipment in order to supply the intermediary market. As a result of the equipment's upgrading for producers such that $\tilde{e} \leq e \leq e^s$, the statistical distribution of the producers' equipment on the support $[\tilde{e}, 1]$ changes and is given by:

$$f'(e) = \begin{cases} 0 & \text{if } \tilde{e} \leq e < e^s \\ e^s - \tilde{e} & \text{if } e = e^s \\ 1 & \text{if } e^s < e \leq 1 \end{cases} \quad (4)$$

Definition 1. A strategic choice of quantity x is denoted "Equipments non-affecting" (ENA) strategy if x is such that no selected producer modifies his equipment, that is $x \leq \hat{x}$, or "Equipments affecting" (EA) strategy if x is such that some producers modify their equipments, that is $x > \hat{x}$.

Let us denote by $\bar{\sigma}(x, e^s) = \int_{\tilde{e}}^1 \sigma(e) f(e) de$ the contamination risk for a given level of food safety standard e^s and for a quantity x demanded by the monopsonist on the intermediary market. Using (3) and (4), we then obtain :

$$\bar{\sigma}(x, e^s) = \int_{\tilde{e}}^1 \sigma(e) f(e) de = \begin{cases} \frac{1}{2} \left(\frac{x}{J}\right)^2 & \text{if } x \leq \hat{x} \\ (1 - e^s) \left[\frac{x}{J} - \frac{1}{2}(1 - e^s) \right] & \text{if } x > \hat{x} \end{cases} \quad (5)$$

Using (5), we verify that the risk is an increasing function of the supplied quantity.

When the ENA strategy is implemented, the contamination risk $\bar{\sigma}(x, e^s)$ does not depend on the level of the food safety standard e^s , as the monopsonist only selects producers with a level of equipment higher than e^s .

Conversely, when the EA strategy is implemented, the great quantity demanded by the monopsonist implies that also initially not well-equipped producers are selected (that is producers with a level of equipment lower than the standard e^s). These producers have to upgrade their equipment levels in order to comply with the food safety standard e^s . As a result, the contamination risk depends on the standard e^s . In any case, for a given level of e^s , the contamination risk $\bar{\sigma}(x, e^s)$ is an increasing function of the quantity x demanded by the monopsonist, as an increase of the quantity demanded on the intermediary market implicitly leads to an increase of the number of producers involved.

The contamination risk affects the monopsonist's profit. Namely, it affects the reservation price and thus, the level of demand. Let us denote by ω the price paid by the monopsonist on the intermediary market. The monopsonist's expected profit $\pi_\lambda(x, e^s, \omega)$, when the consumers' risk misperception is λ , the demanded quantity is x , the intermediary price paid for that quantity is ω and the food safety standard on the intermediary market is e^s , is thus given by :

$$\pi_{\lambda}(x, e^s, \omega) = [\alpha - (1 - \lambda)\bar{\sigma}(x, e^s)]l - x - \omega]x \quad (6)$$

The quantity choice affects the monopsonist's expected profit by different ways. On the one hand, the quantity directly affects the inverse demand function. On the other hand, the quantity affects the contamination risk on the final market. As a result, the quantity has an indirect effect on the inverse demand function (by affecting the reservation price), whose magnitude depends both on the level of risk and on the consumers' risk misperception.

Monopsonist's optimal procurement strategy

We assume that the monopsonist has complete negotiation power towards upstream producers in the definition of the intermediary price ω . In other words, if the monopsonist chooses to buy the quantity x on the intermediary market and sell it to the end market, then he optimally determines a level of the intermediary price $\omega(x)$, so as to involve the number of producers required to get and sell the quantity x .

The monopsonist selects the producers characterized by equipments between \tilde{e} and 1 . However, when the *ENA strategy* is chosen, there is no producer which modifies his equipment ($\tilde{e} \geq e^s$), thus producers can accept a null intermediary price in order to supply the intermediary market. If the *EA strategy* is chosen, the producers which are initially located between \tilde{e} and e^s have to invest in a higher equipment ($\tilde{e} < e^s$). In particular, the producer located in \tilde{e} is the last (less equipped) producer which upgrades his equipment by investing $e^s - \tilde{e}$. Hence, he does not participate in the market if the intermediary price is lower than $e^s - \tilde{e}$. Then, we have $\omega = e^s - \tilde{e}$ and the intermediary price is given by $\omega(x, e^s) = e^s - \tilde{e}$. Using (3) we then obtain:

$$\omega(x, e^s) = \begin{cases} 0 & \text{if } x \leq \hat{x} \\ \frac{x}{J} - (1 - e^s) & \text{if } x > \hat{x} \end{cases} \quad (7)$$

Let us underline that if an *ENA strategy* is implemented, then all the producers located within the interval $[e^s, 1]$ agree to enter the intermediary market. Hence, the monopsonist has to select only the highest equipments in order to get the quantity x . If an *EA strategy* is implemented, then the monopsonist chooses an intermediary price $\omega(x, e^s)$ such that only the producers between \tilde{e} and 1 accept to join the intermediary market.

Using (5), (6) and (7), we then determine the optimal quantity chosen by the monopsonist as a function of the level of the standard e^s .

For every degree of consumer's risk misperception λ , there exist two levels, \underline{e}_{λ} and \bar{e}_{λ} , of the food safety standard such that the optimal quantity $x_{\lambda}^*(e^s)$ chosen by the

monopsonist, when the food safety norm is e^s , is given by:

$$x_{\lambda}^*(e^s) = \begin{cases} J[1 - \underline{e}_{\lambda}] & \text{if } e^s \leq \underline{e}_{\lambda} \\ J[1 - e^s] & \text{if } \underline{e}_{\lambda} \leq e^s \leq \bar{e}_{\lambda} \\ J\Psi_{\lambda}(e^s) & \text{if } e^s \geq \bar{e}_{\lambda} \end{cases} \quad (8)$$

setting :

$$\Psi_{\lambda}(e^s) = \frac{1}{4} \left[\frac{(1-\lambda)l(1-e^s)^2 + 2(\alpha + 1 - e^s)}{(1-\lambda)l(1-e^s) + (J+1)} \right] \quad (9)$$

The property $\Psi_{\lambda}(\bar{e}_{\lambda}) = 1 - \bar{e}_{\lambda}$ is verified.⁵

Results

Using (8), we can easily determine the expressions of the other variables:

the threshold equipment $\tilde{e}_{\lambda}(e^s)$, obtained by (3)

the contamination risk $\sigma_{\lambda}(e^s)$, obtained by (5)

the intermediary price $\omega_{\lambda}(e^s)$, obtained by (7)

the total upstream producers' profit $B(e^s, \tilde{e}, \omega)$, given by⁶:

$$B(e^s, \tilde{e}, \omega) = J \left\{ \int_{\tilde{e}}^{e^s} [\omega - (e^s - e)] de + \omega(1 - e^s) \right\} = J \left[\omega(1 - \tilde{e}) - \frac{(e^s - \tilde{e})^2}{2} \right] \quad (10)$$

- and the consumers' surplus $S_{\lambda}(e^s)$, given by :

$$S_{\lambda}(e^s) = \begin{cases} \frac{J^2}{2} [1 - e_{\lambda}]^2 & \text{if } e^s \leq e_{\lambda} \\ \frac{J^2}{2} (1 - e^s)^2 & \text{if } e_{\lambda} \leq e^s \leq \bar{e}_{\lambda} \\ \frac{J^2}{2} \Psi_{\lambda}^2(e^s) & \text{if } e^s \geq \bar{e}_{\lambda} \end{cases} \quad (11)$$

Using the expression of the optimal quantity $x_{\lambda}^*(e^s)$, given by (8), we then define the following three types of food safety regulation, which can be implemented by the public authority.

Definition 2. A regulation whose level of food safety standard is given by e^s , is denoted “*weak*” if $e^s \leq e_{\lambda}$, “*moderate*” if $e_{\lambda} \leq e^s \leq \bar{e}_{\lambda}$ and “*strong*” if $e^s > \bar{e}_{\lambda}$.

The expressions (8) and (9) characterize the monopsonist's optimal strategy, given the type of regulation chosen by the public authority. Using this terminology, we provide in the next sections, an analysis of the effects of each type of regulation in terms of both food safety and surplus of the different agents.

⁵ This property allows to verify that the optimal quantity choice of the monopsonist is continuous in e^s .

⁶ By substituting (3) and (7) into (10), we easily obtain the expression of the total upstream producers' profit

$B(e^s)$ as a function of the food safety standard.

Food safety regulation, monopsonist's selecting strategy and the level of contamination risk

Starting from the monopsonist' optimal quantity choice associated with each type of food safety regulation and by comparing it to the quantity $\hat{x} = J(1 - e^s)$, we obtain the following results.

Result 1. *If a weak regulation is implemented, then the monopsonist chooses an ENA strategy. Neither the optimal quantity nor the contamination risk are affected by the food safety standard.*

Weak regulations do not affect the upstream equipments levels. Thus, as only the initially best equipped producers are selected by the monopsonist, then no equipments' upgrading is required for producers to participate in the market. Furthermore, if no specific production conditions are required to access the market (that is, if the food safety standard is fixed at zero), then the exceeding supply reinforces the monopsonist's negotiation power. Hence, the intermediary price equals zero (see Figure 1 below⁷).

Moreover, if this type of regulation is implemented, an improvement of the food safety standard does not affect either the monopsonist's optimal quantity choice or the contamination risk, regardless of the degree of consumers' risk misperception. From this point of view, weak regulations result in the same effects which would arise from a passive attitude of the public authorities towards food safety (that is, in the benchmark situation $e^s = 0$).

[insert Figure 1]

Result 2. *If a moderate regulation is implemented, then the monopsonist chooses an ENA strategy. However, the contamination risk is lower than in the context of a weak regulation and decreasing in the food safety standard.*

As the weak regulations, the moderate ones do not affect the upstream equipments levels. Indeed, the monopsonist selects all the initially well-equipped producers and does not pay them any remuneration. However, the level of food safety is improved with respect to the context of weak regulations. Moreover, an increase of the food safety standard – within the context of moderate regulations ($e_{\lambda} \leq e^s \leq \bar{e}_{\lambda}$) – affects the monopsonist's strategic behaviour, which in turn determines a food safety improvement. Indeed, if the food safety standard is reinforced, the contamination risk decreases.

This result can be explained as follows. As the food safety standard increases, the monopsonist anticipates that by implementing an *EA strategy* he could have an action on the reservation price (through an action on the contamination risk), but he would have to pay a positive remuneration to the upstream producers. Moreover, this remuneration would increase in the level of the food safety standard (see Figure 1). The monopsonist thus prefers to improve demand by reducing the supplied quantity, rather than by implementing an *EA strategy* and paying the producers a positive remuneration.

Result 3. *If a strong regulation is implemented, then the monopsonist chooses an EA strategy. The contamination risk is not necessarily lower than in the context of weak regulations and is not necessarily decreasing in the food safety standard.*

⁷ Figures 1-5 are created according to values of the parameters which are consistent with the basic model's assumptions; namely, they have been chosen within consistent ranges of each variable, that is quantity, price and probability of crisis ($J = 100$, $\alpha = 200$, $l = 50$). The following representative degrees of misperception have been represented : overestimation ($\lambda = -1$), perfect estimation ($\lambda = 0$), and maximal underestimation ($\lambda = +1$).

If a strong regulation is implemented, the monopsonist selects also initially not well-equipped producers and pay them a positive remuneration, in order to support their equipments' upgrading. As a result, the strategic behaviour of the monopsonist affects the contamination risk and thus the reservation price. We show that, if this type of regulation is implemented, the food safety is not necessarily improved with respect to the context of weak regulations.

Figures 2-3 and 4 below illustrate the effects of the food safety regulation on the monopsonist's strategic choice of quantity, on the contamination risk and on the final price.

[insert Figures 2-3-4]

The monopsonist's reaction to a reinforcement of a strong regulation and the consequences on the contamination risk are affected by the degree of consumers' risk misperception. Namely, the improvement of the food safety standard implies a decrease of quantity when risk's misperception is relatively high and an increase of quantity conversely. Figure 3 shows that in latter case, the contamination risk is not necessarily decreasing in the food safety standard.

In the context of strong regulations, the effect of a reinforcement of the food safety standard on the optimal quantity depends on two key-factors. One the one hand, as the intermediary price is increasing in the food safety standard (Figure 1), then the monopsonist has an incentive to decrease the quantity if the food safety standard becomes more demanding. On the other hand, as the reservation price increases in the standard (through the reduction of the contamination risk), the monopsonist has an incentive to increase the quantity if the standard increases.

The degree of consumers' risk misperception affects this monopsonist's trade-off. Namely, the lower is the degree of misperception, the higher is the increase of reservation price which can be obtained through a reduction of the contamination risk. As a result, when misperception is relatively low, the second effect dominates the first one. Thus, the monopsonist's may have a strategic behaviour, such that he takes advantage of a relatively low degree of consumers' risk misperception (and of the related marginal effect on the reservation price) and increases the demanded quantity in response to a food safety standard improvement (see Figure 2). Conversely, as the degree of consumers' risk misperception is relatively high, then the second effect does no longer dominate the first one and quantity decreases in the food safety standard, even if the action of the monopsonist on the contamination risk may improve reservation price.

Moreover, in the particular case such that consumers completely underestimate the risk ($\lambda = +1$) – that is they treat the good as if it were perfectly safe – then the second effect completely disappears. That is, the monopsonist has no longer the possibility to improve demand by having an action on the contamination risk. Hence, the monoposonist's quantity choice is only affected by the evolution of the intermediary price according to the level of the food safety standard (see Figures 1 and 2).

Then, the monopsonist's response to a food safety improvement – in terms of quantity – affects the level of contamination risk. The effect of a reinforcement of the food safety standard on the contamination risk is thus strictly arising from the monopsonist's quantity choice. Moreover, the contamination risk is a function of the food safety standard. As a result, the effect of the food safety standard on the contamination risk depends on two key-factors. One the one hand, the contamination risk increases in quantity, as an increase of the quantity demanded on the intermediary market implicitly leads to an increase of the number of producers involved. One the other hand, as an *EA strategy* is implemented, the contamination risk is a decreasing function of the food safety standard. Thus, the contamination risk may increase in the food safety standard, namely as far as the first effect dominates the second one. We verify that the first effect is greater, the lower is the degree of misperception (see Figure 3). Thus, food safety regulation may have a contradictory effect with respect to the objective of a food safety's improvement; namely when the degree of risk's misperception is relatively low.

In addition, Figure 4 shows that – for a given type of regulation and level of food safety standard – relatively low degrees of misperception imply higher levels of final price. However, when the degree of misperception is relatively low, a strong regulation does not necessarily imply a higher price, with respect to a weak regulation. Moreover, a strong regulation may determine a food safety improvement and – at the same time – a lower final price (with respect to the weak regulation).

If underestimation is maximal ($\lambda = +1$), then the implementation of a food safety standard implies a greater quantity restriction on the end market with respect to the absence of standard (Figure 2). Moreover, as the quantity restriction increases in the food safety standard, then the final price increases if the standard becomes more demanding (Figures 2-4). As a result, when consumers treat the good as if it were perfectly safe, a food safety standard improvement determines a decrease of consumers' surplus⁸ and an increase of final price.

Food safety regulation, monopsonist's strategic behaviour and participation of upstream producers

Given the food safety standard e^s , the monopsonist optimally defines the quantity $x_{\lambda}^*(e^s)$, which in turn determines *de facto* the number of upstream producers, which are excluded from the market. Let us thus denote by $\bar{e}_{\lambda}(e^s)$ the threshold equipment starting from which upstream producers are involved in the market (participating producers), when the level of misperception is λ and the food safety standard is e^s .

Result 4. *The number of producers selected by the monopsonist is not affected by the food safety standard if a weak regulation is implemented but decreases in the food safety standard if a moderate regulation is implemented.*

Figure 5 below shows the effects of the food safety regulation on the number of producers selected by the monopsonist. A relatively great reinforcement of the food safety standard (switching from weak to moderate regulations) implies a decrease of the number of upstream producers participating in the market, regardless of the degree of consumers' risk misperception.

[insert Figure 5]

A switch from weak to moderate regulations, does not affect the monopsonist's selecting strategy: the monopsonist continues to exert his negotiation power towards upstream producers and pay them a null remuneration, even if the food safety standard increases. As the monopsonist decreases quantity in order to improve demand (see Result 2), then the number of producers participating in the market decreases.

Result 5. *If a strong regulation is implemented, then the number of upstream producers involved increases (decreases) in the food safety standard when the degree of misperception is relatively low (high).*

If the Government is supposed to minimize the threshold equipment, in order to minimize upstream producers' exclusion, then the analysis of the threshold equipment as a function of the food safety standard points out an important policy implication, which is illustrated by the following result.

⁸ Using (8), (9) and (11), we easily verify that consumers' surplus varies according to the quantity chosen by the monopsonist.

Result 6. *An exclusion-minimizing Government chooses a weak regulation (or $e^s = 0$), when the degree of consumers' risk misperception is relatively high and the strongest regulation ($e^s = 1$) when the degree of consumers' risk misperception is relatively low.*

If the Government is supposed to minimize the threshold equipment, in order to minimize upstream producers' exclusion, then he has two opposite strategies. He chooses either a null or a maximal standard, according to the degree of consumers' risk misperception. Namely, if misperception is sufficiently low, then paradoxically producers' exclusion is minimized by imposing the most demanding standard (Figure 5).

Let us detail the link between consumers' risk misperception and upstream producers' exclusion. The consumers' risk misperception affects the monopsonist's strategic behaviour, which in turn affects the exclusion of upstream producers.

On the one hand, it is shown that – for a given type of regulation and a given level of standard – relatively low degrees of misperception favour the choice of a food safety standard such that producers' exclusion is relatively high (Figure 5). In fact, the exclusion is decreasing in the degree of consumers' risk misperception, for a given type of regulation and level of standard. On the other hand, when the degree of misperception is relatively low, strong regulations do not necessarily imply a higher exclusion with respect to weak regulations. Indeed, we verify that for a relatively high level of standard, within the context of strong regulations, the participation of upstream producers is higher than in the case of weak regulations (Figure 5).

Moreover, when the degree of misperception is relatively low, we show that two different levels of food safety standard may exist (in the context of strong regulations) such that the same contamination risk arises and the more demanding standard corresponds to a lower upstream producers' exclusion (Figures 3 and 5). That is, paradoxically, a lower upstream producers' exclusion may be achieved by choosing the more demanding standard as a condition to access the market. As a result, the monopsonist's strategic behaviour, such that the quantity increases in the standard, may generate a positive effect in terms of upstream producers' market access.

Moreover, we show that the upstream producers' exclusion may be minimized by choosing the most demanding standard, that is $e^s = 1$, which in turn determines the choice of an *EA strategy* by the monopsonist. As a result, relatively low degrees of consumers' misperception favour the participation of initially not well-equipped producers (as the monopsonist has interest in paying them a positive remuneration in order to have an action on the reservation price).

In addition, we show that, paradoxically, a strong regulation may determine a food safety improvement and – at the same time – a decrease of producers' exclusion (with respect to the absence of regulation).

Final remarks

In this paper, we have provided a normative analysis of the effects of food safety regulation within food chains, when the sanitary risk results from the upstream production conditions. Our formal analysis has allowed to illustrate the complex strategic interactions among food chain participants (upstream producers, downstream processing or retailing firm, final consumers). We have shown why the effectiveness of food safety regulation, in terms of contamination risk's reduction, results from a good anticipation of firms' strategic behaviour. A downstream firm may adopt different procurement and commercialization strategies (consisting of upstream producers' selection and remuneration, choice of quantity and final price), according to the level of the food safety standard fixed by the public

authority. These choices affect not only the level of contamination risk, but also the allocation of value among supply chain participants.

The firms' reaction to the level of food safety standard is also affected by market's response to the firms' efforts aimed at improving food safety; namely by the consumers' risk misperception. Hence, with respect to upstream producers' participation in the market, downstream firms react positively to highly demanding food safety standards, when the degree of consumers' risk misperception is relatively low. Moreover, we have shown the economic conditions such that a food safety improvement is consistent with the economic interests of the other supply chain participants (upstream producers and consumers).

Furthermore, our paper provides an original contribution in the sense that it explicitly takes into account the heterogeneity of upstream producers' capacities to comply with the food safety standard. If a food safety improvement is intended to be achieved, this heterogeneity may result in two possible scenarios. The first one consists of strongly selecting upstream producers, without encouraging an improvement of production conditions. The second one consists of driving an improvement of initial production conditions. The first scenario – which results in a great upstream producers' exclusion from the market – is no longer encouraged by the public authority when social reasons or agriculture multifunctionality issues are put forward. Nevertheless, the second scenario may be highly costly and require overly high public funding. However, we have shown how a highly demanding regulatory standard may allow to partially transfer these costs to firms.

The selecting strategy which we have examined (corresponding to the *ENA strategy*) is frequently observed within vertical relationships in food chains. This strategy allows the downstream firm to access to the safest quantity procurement. When it is possible (from a technical, legal and economic point of view), the same quantity may be obtained by implementing a private food safety standard, more demanding than the legislation (indeed a development of private food safety standards from processing and retailing firm has been observed). Taking into account this type of strategy in our model, would allow to analyze the complementarity and substitutability of these two types of strategies and provide a further element to the analysis of firms' strategic behaviour.

Moreover, public authorities often implement other types of regulatory tools, which consist of making firms liable for food safety damages, by imposing them penalties if a sanitary crisis occurs. The main idea behind this kind of regulation consists of making firms liable and thus encouraging them to exert precautionary efforts aimed at minimizing the risk of contamination damages. This is the reason why a large swathe of the literature aims at comparing this “ex-post regulation” to the “ex-ante regulation”, which we have examined in this paper by considering that a minimum level of equipment is required for upstream producers to access the market⁹.

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⁹ Several contributions analyze the substitutability and complementarity of these two regulatory tools as means of controlling externality-creating activities (see for example, Shavell, 1984, Kolstad et al., 1990, Schmitz, 2000, Innes, 2004). Nevertheless, except for a few contributions (see for example, Hiriart, Martimort and Pouyet, 2004, Boyer and Porrini, 2004), the market dimension and the role of vertical relationships are often neglected.

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Figures

Figure 1 - Effects of the food safety standard on the intermediary price

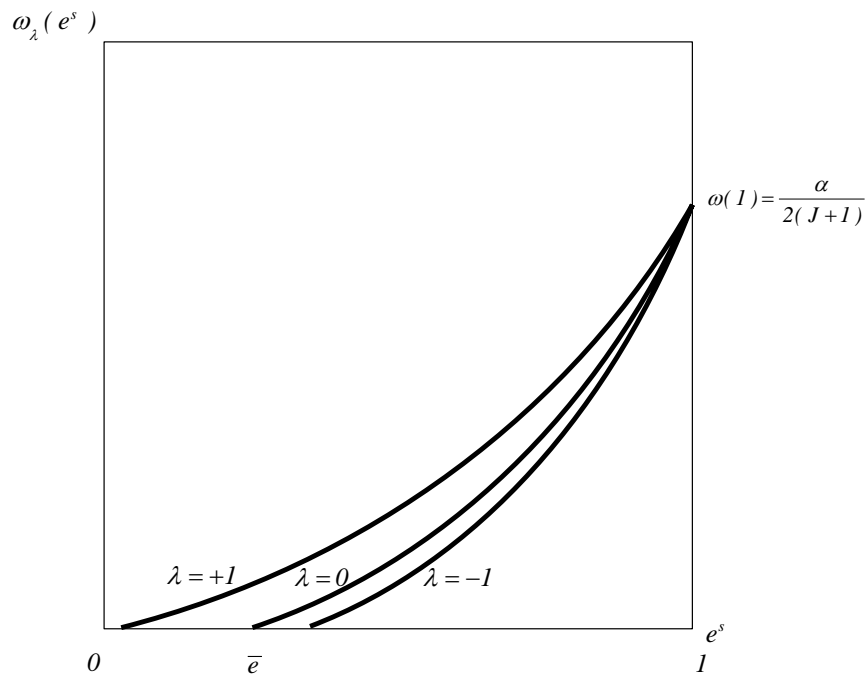


Figure 2 - Effects of the food safety standard on the monopsonist's quantity choice

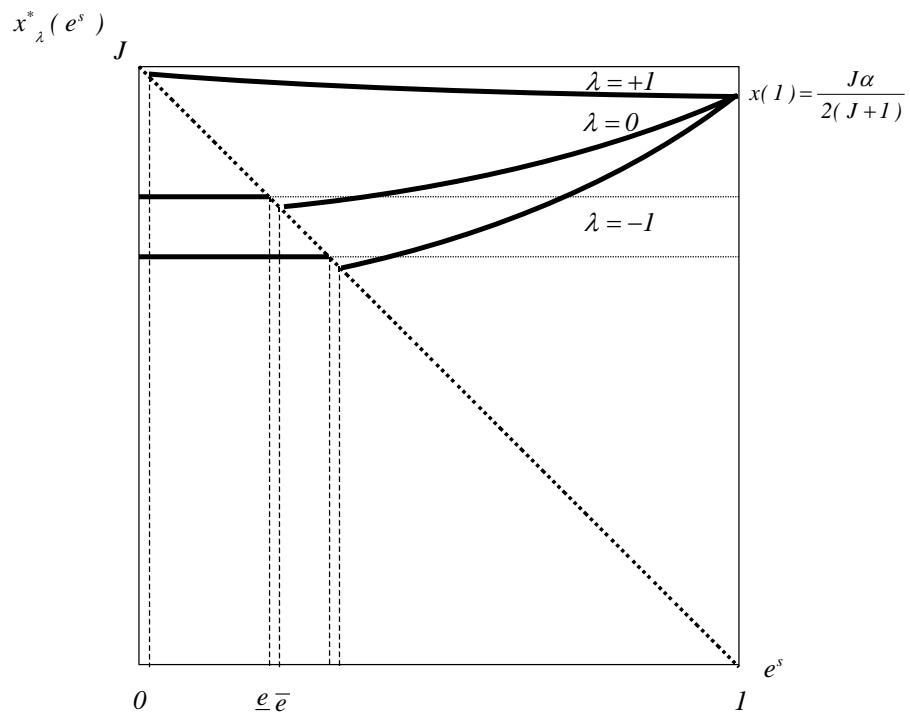


Figure 3 - Effects of the food safety standard on the contamination risk

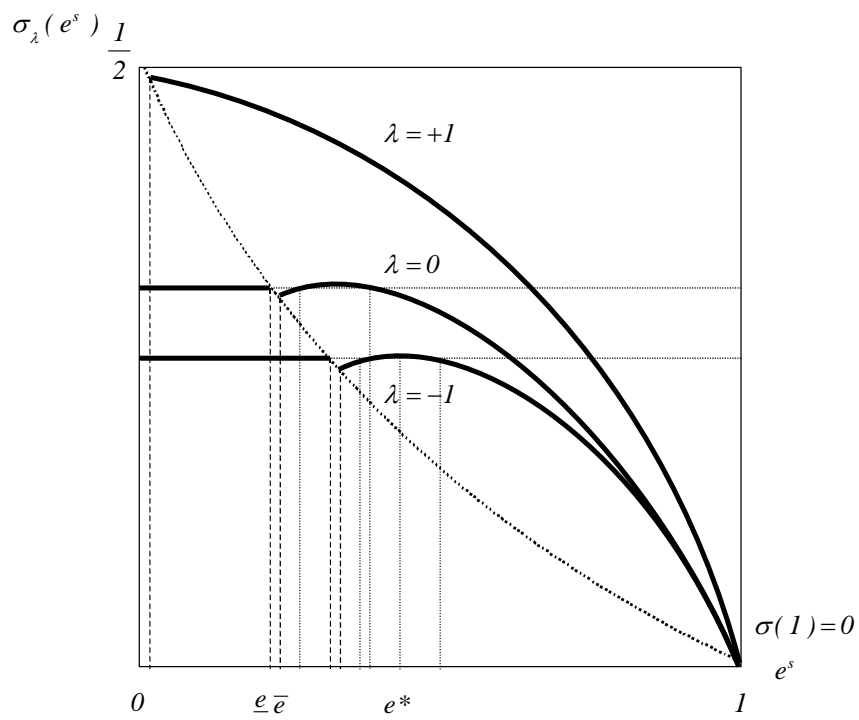


Figure 4 - Effects of the food safety standard on the final price

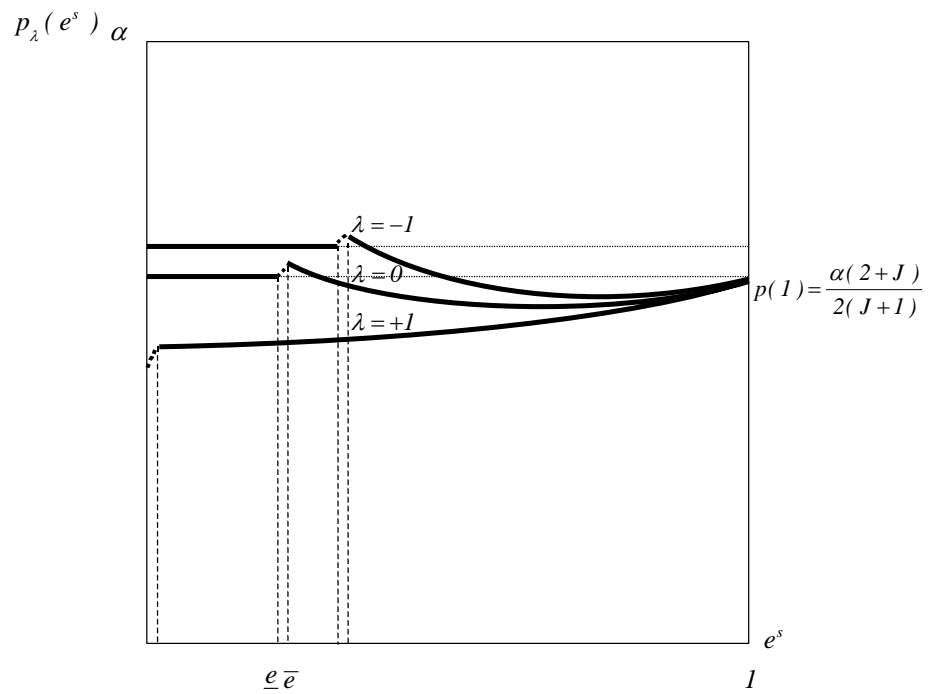
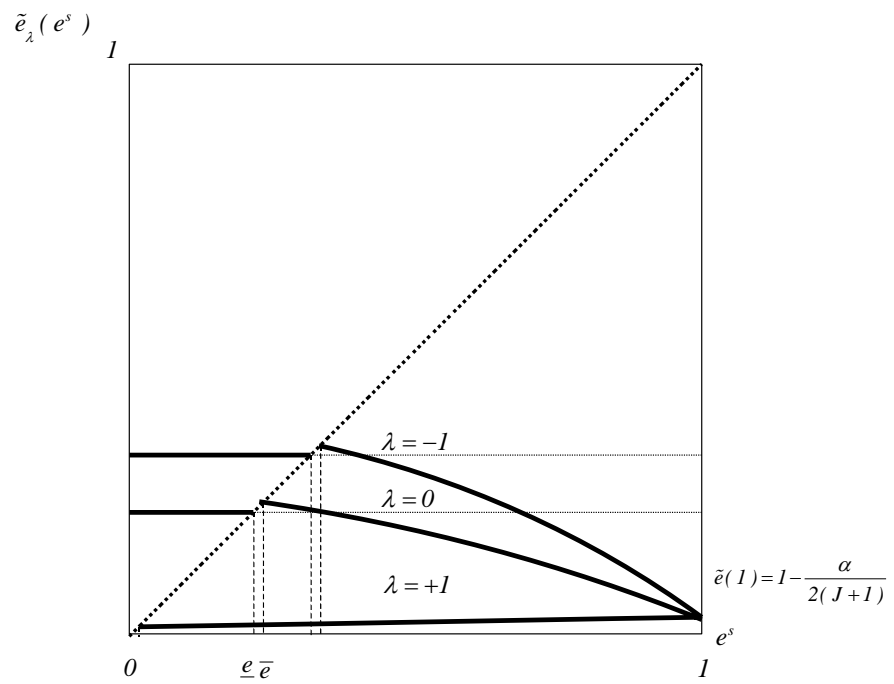


Figure 5 - Effects of the food safety standard on the upstream producers' exclusion



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Vocational training in the field of agriculture: empirical results

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The pressure of change within agriculture confronts farmers with regularly upcoming and new challenges: the structural changes as well as technical, economical and ecological improvements increase the requirements for the farm manager's knowledge. Thus, being successful in profession and business is not only a matter of qualified and fundamental professional knowledge but also of the constant participation in vocational trainings (N. N. 2006). Therefore the trend of lifelong learning, being already realised and traced in other fields of economic, has now also become a must in the business of agriculture (KRUSE 2003).

However, it appears that this development is only slowly and limited adopted by those working in the business of agriculture and forestry. Current studies again and again are showing that a backlog demand concerning the participation in vocational trainings exists. For example, in a statement about the employment situation in agriculture, the EUROPEAN ECONOMIC AND SOCIAL COMMITTEE (2004) declared that agricultural labour – compared to the average of all employees in the European Union (EU) – are taking less frequently part in vocational trainings. Especially the new EU member states denote a high demand on qualification for techniques, technologies and social competencies (ibid.). Not least by reason of this awareness is vocational training an essential element of the promotion of the rural development by the EU: the new European Agricultural Fund for Rural Development (EAFRD) for 2007 up to 2013 ascribes a high value to vocational training (EBERHARDT (2005): 198).

Up to now hardly any studies on agricultural vocational training exist. Statements and information on to what extent the offered vocational trainings correspond to the farmer's requests and cover the demand on vocational training are missing. For this reason we evaluated the demand on vocational training of German farmers using an empirical study. The investigation gives information on how farmers estimate the current offerings for vocational trainings in agriculture and points out the farmer's requirements.

During our study 2.000 farms were invited to take part in the survey and an online questionnaire was pointed out to them. The rate of return reached 6,1 % means an absolute number of 122 completely filled in questionnaires.

First of all, the survey points out that the agricultural vocational training market is altogether seen as transparent and that the offering is classified as multifaceted. The relevance of vocational trainings and their positive effects on the economical development is basically realised by the asked farmers. Even though vocational trainings are not seen as a waste of time, the factor time is always categorised as critical. Due to this fact, the questioned farmers showed only limited participation in vocational trainings for the last two years. After all, 89% stated to have taken part in a one-day speech based seminar. Seminars lasting for several days were only attended by 47 % and 29 % respectively. At this stage, the beforehand statement of the European Union, concerning the attendance frequency of vocational trainings, is approved. Regarding the vocational trainings quality (seminars, speeches, courses), the questioned farmers have made middling experiences. A majority of 53 % is rather unsatisfied with the attended event. Nevertheless, 42 % of the questioned participants are planning to attend more vocational trainings for the future.

To enable a deeper picture and to identify target groups for the vocational training market, a factor analysis was conducted subsequently. As a result, three factors were extracted. Once more, all of them described the basic advantage of vocational training, the willingness of the farmers to spend money on trainings and the opportunity costs as well as the estimation concerning the offering. On the basis of the factor analysis' results, concerning the overall attitude towards agricultural vocational trainings, a cluster analysis was accomplished. In the context of the cluster analysis, four groups were identified (table 1):

Cluster 1 36,6 %	Satisfied with the offer, cautious regarding investigations and the interest in vocational training, „ <i>satisfied and modest persons</i> “
Cluster 2 27,7 %	Regarding the sense reserved, high price acceptance, unsatisfied with the offer, „ <i>investment prepared market customer</i> “
Cluster 3 8,9 %	„ <i>severe adversaries</i> “
Cluster 4 26,8 %	High perceived benefit, low price acceptance, estimate the offer as rather poor, „ <i>Smart-Learner</i> “

Table 1: Results of the cluster analysis

The accomplished analyses highlights that the customer's high price acceptance has been „spoiled“. However, on the farmer's part an increased interest and basically a positive attitude towards the participation in vocational training exist. Altogether, the questioned farmer's categorise it as a necessity to optimize the current seminars. Consequently the providers of the agricultural vocational trainings are confronted with the challenge to up value the quality of their seminars. Anyway, it seems to be questionable whether those providers run by the government are able to bear the challenge, taking the declining subsidy into account. Not to forget the fact that even the agricultural associations are facing a precarious budget caused by the shrinking number of members. Moreover, vocational training is normally not a core competence of those institutions. Last but not least, the low price acceptance neither contributes a solution to this dilemma nor supports the upgrading of professionalism.

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People, trade and training: the needs of Morocco agricultural enterprises facing EU markets

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Summary

The Mediterranean area is the core of an increasing exchange of goods and people. A distinctive feature of present trends in international relationship is the importance of factors that are beyond the mere exchange of goods. In particular, foreign investment, the creation international enterprises and training and personal growth of actors that are involved in the production process are key elements of the present scenario. The objective of this paper is to discuss the need of education and training in Morocco agricultural and agri-food enterprises in view of the increasing connection with the EU economy. In particular, attention is focused on the need brought about by the increased product quality requirements and by the installment of EU and US enterprises in Morocco. The study is carried out as a preliminary activity of the TEMPUS project STRIDE 4, through a survey of about thirty Morocco enterprises. The preliminary results show a strong need for training and information. The questionnaire shows a high degree of awareness about gaps and problems in meeting EU consumer expectations. At the same time, most respondents already show a clear positive strategy toward meeting such needs and many enterprises in fact are already adequate to many quality requirements. The main focus of the training required is on the interface between technical and marketing activities. Continuous education and life long learning are also perceived as major needs.

In the background, the research shows the need of a more consistent understanding of each other's institutions and cultural settings, as well as of a long term process of learning through collaborative training, production and research.

1. Introduction and objectives

The Mediterranean area is the core of an increasing exchange of goods and people. The perspective of an open exchange area and the strong historical tradition as place of north-south and east-west exchange makes of this area a particularly important node of future international trade, particularly for Italy.

A distinctive feature of present trends in international relationships is the importance of factors that are beyond the mere exchange of goods. In particular, foreign investment, the creation of international enterprises and training and personal growth of actors that are involved in the production process are key elements of the present scenario. The development of future markets and economic opportunities will depend on the structure taken by transnational networks and by the ability to build human and social capital able to connect different economic areas of the world.

The objective of this paper is to discuss the need of education and training in Morocco agricultural and agri-food enterprises in view of the increasing connection with the EU economy. In particular, attention is focused on the need brought about by the increased product quality requirements and by the installment of EU and US enterprises in Morocco. The study is carried out as a preliminary activity of the TEMPUS project STRIDE 4 Développement d'un nouveau Master en Management Agricole", (2004-2007) CD_ JEP 31019-2003.

In section 2 a short overview of the issue of chain development and training is provided. The methodology adopted in this paper is illustrated in section 3, followed by the results in section 4. A short discussion is provided in section 5.

2. Background: human resources, training and the development of agro-food chains

The development of international relationships and markets is accompanied by a profound change in the structure of food chains. Beyond delocalisation and specialisation, an evolution of production networks can be observed.

A relevant issue in the evolution of such networks is the development of human resources. This is recognised as an important point in EU enlargement and integration with neighbouring economies, as well as in the literature about firm development in the last decade. An area of attention has to do with the role of education in creation of firms networking (e.g. Butera, 1997). Different papers highlight and discuss the role of training in competitiveness (e.g. Mumma et al, 2000; Jiayanthi et al., 1996; Jatib et al. 2003). More in detail, Wang (2003) emphasizes technology innovation and human resource management as determinants of organisational performance. The specific role of training in relationships with quality management is discussed by Reardon & Farina (2002).

The complexity of the issue was widely experienced and discussed in the process of transition and enlargement of Eastern Europe. On one hand, the issue of labour cost is a key driver of investment. On the other hand, local and foreign personnel requires a strong learning process in order to be able to deal with the changing working environment and to be able to collaborate to govern and orient such changes (EBRD, 2001a; 2001b). The need for human capital development goes beyond the simple transfer of knowledge and involves the whole strategy of the firms as well as the evolving role of the public administration (Viaggi, 2002; 2003).

At the same time, this issue touches the complexity of firm-training institutions relationships. This has been the object of a strong evolution in the last years, though the degree of collaboration does not appear satisfactory. Different patterns of interaction between enterprises and education systems are in place and may adapted from case to case to deal with specific vocational training activities (Chen et al., 2004).

3. Morocco agro-food system

Morocco is an important country in the development of agri-food chains in the Mediterranean. Internally, agriculture plays a major role in Morocco economy. In 2004, agriculture accounted for 16% of the GDP and about 40% of the labour force. Agriculture grows at approximately the same speed of the other sectors, though with ups and downs due to a large extent to climate conditions. In 2004 agriculture and food accounted for about 20% of exports and 9% of imports. Export from agriculture mainly includes fruit and vegetables. The main export partners are France and Spain (World Bank, 2005; CIA, 2006). Morocco is an obvious target for southern EU countries, both as a trade partner and as a place for delocalisation of agricultural production, particularly fruit and vegetables. Morocco, on his side, strongly encourages external investments.

The result is a growing network of local enterprise with commercial connections with Europe, foreign enterprises producing in Morocco, mixed companies. In most cases, the reference market for these companies is Europe, as long as quality standards and consumer expectations are concerned.

4. Methodology

The analysis is carried out through a survey of Moroccan enterprises. The survey was carried out in 2006 on a sample of about thirty farms. The sample includes mainly farms that are technological and strategically advanced and that normally have already important links with the markets. Small and subsistence farms are not included in this work.

The survey enquiries on a number of issues, beyond the description of the enterprise specialisation and activities. In particular, sections of the questionnaire are dedicated to the present strategy of the enterprise, to the vision about future exchange opportunities and problems. A part of the questionnaire deals directly with enterprise activities concerning human resources, in particular training policy and future training requirements.

5. Results

The interviewed represent enterprises working normally in multiple fields of activity, with a slightly prevailing focus on farming and related activities (Figure 1).

Figure 1 – Main fields of activity of the enterprises interviewed

<i>activities</i>	<i>n</i>	<i>%</i>
research	12	40.0
development	14	46.7
activity related to agriculture	20	66.7
agro-industries	19	63.3
agricultural cooperative	13	43.3
international relationship	15	50.0

The enterprises interviewed are mainly large ones, with about half of them between 50 and 500 employees (Figure 2).

Figure 2 – Size of enterprises in terms of employees

<i>workers</i>	<i>n</i>	<i>%</i>
< 20	7	23.3
20 - 50	2	6.7
50 - 100	8	26.7
100 - 500	6	20.0
>500	2	6.7
no answer	5	16.7
<i>total</i>	30	100.0

In the majority of cases the interviewed are satisfied with the respective economic results, high confirms how the general economic trend reflects also in farming-related activities (Figure 3).

Figure 3 – Current economic results of the enterprise

<i>current results</i>	<i>n</i>	<i>%</i>
very satisfactory	3	10.0
satisfactory	11	36.7
on average satisfactory	10	33.3
no satisfactory	3	10.0

There appear to be no clear relationship between size and economic results, though intermediate size seem to be related to a wider distribution of economic results and small have a relatively higher share of less than satisfactory results (Figure 4).

Figure 4 – Relationship between economic results and number of workers

<i>current results</i>	<i>workers</i>						<i>total</i>
	<i>< 20</i>	<i>20 - 50</i>	<i>50 - 100</i>	<i>100 - 500</i>	<i>>500</i>	<i>no answer</i>	
very satisfactory			1	1		1	3
satisfactory	1	2	3	3	2		11
on average satisfactory	5		4			1	10
no satisfactory				2		1	3

Expectations about an increased opening of markets reveal a prevailing positive opinion, with about 60% of the interviewees (Figure 5).

Figure 5 – General effects of open markets

<i>open market effect</i>	<i>n</i>	<i>%</i>
positive	18	60.0
negative	4	13.3
none	8	26.7

Only four respondents see potential negative effects prevailing and 8 expect no change. However, results become more complex when getting to more specific effects of market opening (Figure 6).

Figure 6 – Specific effects of open markets

<i>forecast (row %)</i>	<i>reduction</i>	<i>small reduction</i>	<i>stable</i>	<i>small increase</i>	<i>increase</i>	
export		7.69	23.08	15.38	53.85	
import			7.69	23.08	46.15	23.08
work quantity	18.75	6.25	25.00	18.75	31.25	
work quality	11.76		17.65	17.65	52.94	
new technology			23.53	35.29	41.18	
water availability	21.43	7.14	28.57	7.14	35.71	
life quality			33.33	41.67	25.00	
training	6.67		26.67	26.67	40.00	
economic and policy relation with UE	6.67			46.67	46.67	
economic and policy relation with Maghreb countries	7.14		21.43	35.71	35.71	
economic and policy relation with arabian countries	7.14		35.71	21.43	35.71	
economic and policy relation with other countries			28.57	21.43	50.00	

Here divergences are more clear and appear in negative expectations about work quality and quantity, as well as resources availability. New technologies and quality of life, as well as economic and policy relationships with other countries are the issues on which positive expectations appear more evident. Notably, changes in international relations increase is stronger for non-neighbours

Training is perceived as important and most of the interviewed show interest on multiple aspects of training (Figure 7).

Figure 7 – Interest for training-related activities

<i>training</i>	<i>n</i>	<i>%</i>
organise training course	7	23.3
contribute to training course	13	43.3
training participation list	15	50.0
accept stageir	16	53.3
relation with training institute	17	56.7
free a cadre to attempt a course	17	56.7
engage a cadre	5	16.7

In most cases, enterprises are interested in freeing an employee for attending a training course, or to establish relationships with training institutions. They are also willing to contribute to training courses and a relevant number of interviewed revealed that their enterprise supplied teachers for courses.

The choice is not clearly related to size, though freeing personnel to attend courses or accept people in stage tends be of higher interest for enterprise with more than 50 employees (Figure 8).

Figure 8 – Relationship between preferred training activities and number of employees

<i>training</i>	<i>workers</i>						<i>total</i>
	<i>< 20</i>	<i>20 - 50</i>	<i>50 - 100</i>	<i>100 - 500</i>	<i>>500</i>	<i>no answer</i>	
organise training course	1		2	2		2	7
contribute to training course	5		4	1	1	2	13
training participation list	4		6	2		3	15
accept stageir	4	1	6	4		1	16
relation with training institute	4	1	4	5	1	2	17
free a cadre to attempt a course	4		5	6	1	1	17
engage a cadre	2		2	1			5

Among preferred competences, marketing manager, quality manager and food safety expert prevail (Figure 9).

Figure 9 – Preferred competences of trainees

<i>preferred competence</i>	<i>n</i>	<i>%</i>
marketing manager	14	46.7
administration and finance	9	30.0
development expert	7	23.3
audit expert	4	13.3
agronomic expert	6	20.0
environmental expert	4	13.3
quality manager	12	40.0
food safety expert	11	36.7

In fact, the main focus of the training required is on the interface between technical and marketing activities, hence showing the need for a consistent development of production and commercial activities. Training and education are expected to help in forming people through enterprise-university interaction and using alternative education instruments, such as stages. Continuous education and life long learning are also perceived as major needs.

Enterprises requiring quality manager are more often those that believe that liberalisation will bring stronger integration with the EU. This may hint at the idea that quality and quality-related training is possibly to be considered a very biased strategy related to the access to the EU markets.

Also, those requiring quality manager are often the same that offer to contribute to training courses as teacher and to free cadres to attend courses. This second features also suggest that quality training may more often than other fields require interaction and merging of competences between the enterprise and the educational institution.

6. Discussion

The background of the survey reveals Morocco as an interesting business environment, where at least the cluster of firms considered is happy with present results and sees mainly opportunities from economic integration with the EU.

The questionnaire shows a high degree of awareness about gaps and problems in meeting EU consumer expectations. At the same time, most respondents already show a clear positive strategy towards meeting such needs and many enterprises in fact are already adequate to many quality requirements.

The awareness for training needs is relatively high and supported by ongoing experiences. This is already a multifaced issue, where firms interact with education bodies through different combinations of traditional training and stages, providing students as well as teachers and places for stages. This opens the perspective of a challenging field of activity where innovation in human resources development is required and in which training directly fits into the mechanisms of interaction between firms and countries.

The connection between training and quality issues is clearly highlighted by the high degree of priority attributed to quality issues. This however opens the way to further research activities in qualifying such connection, also in relationship to different consumer perception on specific issues (e.g. animal welfare), to the international strategy of the firm and to the potentially varied patterns of interaction between educational institutions and the firms.

In the background, the research shows the need of a more consistent understanding of each other's institutions and cultural settings, as well as of a long term process of learning through collaborative training, production and research.

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Analysis of Italian High Quality Wine Exports using the Gravity Model Approach *

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Summary

Italian wine firms are facing a significant reduction in wine consumption and increasing competition in international markets. In fact, markets are becoming increasingly liberalized and producers of non-EU countries adopt even more aggressive strategies to increase their competitiveness. Nevertheless, demand for high quality wine which includes a large number of Italian wines, is increasing.

The aim of this work is to explain the magnitude of the trade flows for high quality wine from Italy to its main importing countries. This objective has been reached by establishing an appropriate econometric model derived from an extended form of the "Gravity Model". This model has been broadly applied to the analysis of international trade because it provides robust estimates. Note that applications to the specific products' trade are still limited in number.

The results obtained and the model itself are useful in forecasting potential trends in the exportation of high quality Italian wines. Moreover, it is possible to identify the growing markets where Italian ventures could exploit certain promotional and communication strategies. Finally, with respect to Italian high quality wine these estimates give a quantitative evaluation of the export gains that could result from the enlargement of the EU and from an increasing liberalization in international trade.

KEYWORDS: Gravity Model, High Quality Wine, Export Analysis, Italian Wine

1. Introduction

Competition in international wine markets has recently become more intense due to the progressive and consistent reduction in world-wide wine consumption coupled with the addition of new wine producing countries. Australia, Chile, the USA and South Africa (the so called New World wine producers) have quickly entered the international arena, challenging the market share held by traditional wine exporters, such as Italy, France and Spain (Old World wine producers). The increase in their wine exports has its legitimate causes. In fact, Australia, the USA and South Africa, combining appropriate technologies, optimal climate and growing conditions, have recorded a rapid growth in production but a commensurately slow growth of internal consumption. On the other hand, South American wine production has increased slowly in some countries while decreased in others, in addition to a drop in overall domestic consumption (Zanni, 2004).

It is necessary to underscore that, while the total world-wide consumption of wine has been declining, the demand for high quality wine, which comprises a large number of Italian wines, is in fact increasing. Wine consumption, traditionally linked to the nutritional aspects of eating habits, has been changing with changes in life-styles (urbanization, decreasing caloric needs, increasing importance of leisure time and social activities, etc.).

* The authors are jointly responsible for this paper; however, G. De Blasi has coordinated the work and wrote paragraphs 1 and 6, A. Seccia wrote paragraph 5, D. Carlucci wrote paragraphs 3 and 4, F.G. Santeramo wrote paragraph 2.

Thus, sensorial pleasure, symbolic value and psychological attitudes are becoming the most important determinants for wine consumption.

EU countries identify their high quality wines by using the Origin Denomination system, in which a product's differentiation is supported by specific characteristics of the land and the processing method. In this manner, it is possible to differentiate wines when referring to a precise market segment, distinguishing between popular wine consumers and those who prefer finer wines or wines that are well-known as Quality Wines Produced in Determined Regions (QWPDR).

Although Origin Denominations are very useful to differentiate superior quality wines from ordinary consumption wines, the classification alone is not enough to provide a real competitive advantage in the international marketplace, especially if the product is not effectively promoted using a targeted marketing strategy. The ability of a producer to provide effective communication and promotion actions plays a strategic role in international trade, but yet this is often neglected, or not executed using sufficient financial resources (Carbone, 2003).

This paper will elaborate on and estimate an econometric model which will explain the size of QWPDR trade flows from Italy to its main importing countries using the "Gravity Model" approach. Both the results obtained and the model itself are useful for forecasting potential trends in the exportation of high quality Italian wines, taking into consideration some macro-variables, such as wine production, GDP, population, agreements on trades, etc.

In particular, this model illustrates the possibility of identifying the main growing markets where all participants in the wine supply-chain, such as private wineries, joint-ventures, regional and national agencies, and producers' associations, can unite to concentrate product communication and promotional efforts.

Moreover, the model allows a quantitative evaluation of the effects that EU enlargement and growing international trade liberalization can have on export performances of Italian high quality wine.

Finally, this work represents one of the first attempts to assess the empirical validity of the "Gravity Model" with respect to a specific product category and its international trade.

The remainder of this paper is structured as follows: Section 2 provides a general overview of Italian quality wine exports during recent years; Section 3 discusses the theoretical framework of the Gravity Model; Section 4 examines a specific extended version of the Gravity Model; Section 5 discusses the estimation results; and Section 6 presents considerations and conclusions.

2. General Overview of High Quality Italian Wine Exports

During the last decade, the value (at constant prices) of Italian wine exports has increased significantly, as illustrated in **Graph 1**. Nevertheless, in 2003 there was a considerable reduction in exports, followed by only moderate growth in 2004 and 2005. With respect to Italian QWPDR exports, the trend resembles the one for the general category except for the period after 2003. During that period exports dropped and they have not returned to previously registered levels.

Furthermore, the last decade has seen a modification of the composition of Italian wine exports: in 1995 high quality wine exports represented almost 40 percent of total wine exports and by 2001 they accounted for 57 percent of the mix. Since 2002 the proportion of high quality wine in total exports has declined.

With regard to the international marketplace, Italy exports its quality wine to almost all countries in the world (**Table 1**); however, 8 countries account for 80 percent of Italy's total high quality wine exports (the USA, Germany, the United Kingdom, Switzerland, Canada, Japan, Denmark and Austria).

With respect to the European markets, Germany imports approximately 23 percent of Italian QWPDR exports; the United Kingdom and Switzerland import, respectively, 9 percent and 8 percent of Italian QWPDR exports. During the past few years, these European importing partners have registered a reduction of their demand for high quality imported wine, but the new country additions to the EU compensated for this reduction. The exportation of Italian high quality wine to these new EU members primarily involved Latvia, Malta, Slovak Republic and Slovenia. Recently, the Russian Federation and Ukraine have become more important markets.

During the past few years, the importation rate for Italian wine by North America has also increased. In particular, the USA leads the imports of Italian high quality wines at a rate of about 26 percent, while Canada also continues to increase its demand.

In Central and South America we observe very heterogeneous trends: Argentina, Brazil, the Dominican Republic, Ecuador, Guatemala and Peru have been reducing their imports of Italian high quality wines, while Colombia, Mexico and Venezuela have been increasing their demand.

Moreover, the most dynamic of the Asian partners, China and India, have registered astonishing growth of Italian high quality wine imports in recent years. On the other hand, Japan, which has historically been Italy's sixth largest importer of high quality wines, has curtailed its consumption.

3. *Theoretical Framework of the Gravity Model*

Many economists believe that the Gravity Model is a very powerful tool for international trade analysis. Timbergen (1962) and Pöyhönen (1963) were the first to propose the idea, and later it was extended by several other researchers. After these decisive contributions, the Gravity Model was used in many empirical studies for bilateral trade analysis (Prentice et al., 1998) and for the estimation of the impact of a variety of policy issues relating to, for example, free trade blocs (Martinez-Zarzoso et al., 2003), multilateral commercial agreements (Rose, 2002), migration and tourism flows (Karemera et al., 2000), and foreign direct investment (Brenton et al., 1999).

The basic concept of the Gravity Model for trade analysis borrows the gravity equation from physics: the volume of trade between two countries is proportional to their economic "mass" and inversely proportional to their respective distance.

The analytical relation of the basic Gravity Model is expressed as follows :

$$(1) \quad F_{ij} = G \frac{M_i^\alpha M_j^\beta}{D_{ij}^\gamma}$$

where, F_{ij} is the export flow from origin country i to destination country j , usually measured by its economic value; M_i and M_j are the economic size of the two countries, usually Gross Domestic Product (GDP) is considered; D_{ij} is the distance between the two countries, measured as physical distance between their first cities; G is a constant that depends on the units used to measure the other variables.

The multiplicative nature of the gravity equation means that it is possible to take natural logarithms and obtain a linear relationship between the log of trade flows and the log of economy sizes and distances as follows:

$$(2) \quad \ln F_{ij} = \alpha_0 + \alpha \ln M_i + \beta \ln M_j - \gamma \ln D_{ij} + \varepsilon_{ij}$$

This equation is estimated by the Ordinary Least Square (OLS), therefore it is assumed that the error term ε_{ij} is normally distributed.

Linnemann (1966) was the first to include several additional variables to the basic Gravity Model, obtaining what has been successively called the "Augmented Gravity Model". In fact, empirical estimations may add other variables like population, income per capita,

exchange rates, and dummy variables for the presence of common language, colonial links or commercial agreements among the trading countries (Deardorff, 1995; Head, 2003).

At the empirical level, the Gravity Model gives very robust estimates and provides a good fit to the observed data. In fact, most of the estimations for bilateral trade volumes with respect to GDP, distance and other explanatory variables, have given values for the determination index (R^2) ranging between 0.65 and 0.95, depending upon the specification of the equation (Harrigan, 2001).

Despite the success of the empirical analysis of trade patterns, the Gravity Model was extensively described as a theoretical orphan. However, in the last decade several authors have worked on reconciling international trade theories with the Gravity Model specification. Starting from the work of Anderson (1979), it has been shown that the formulation of the Gravity Model can be derived from different theoretical models such as Ricardian models, Hecksher-Olin (H-O) models and Increasing Returns to Scale (IRS) models of the New Trade Theory (Serlenga et al., 2004). As highlighted by Davis (2000), it is remarkable that in a short period of time, the Gravity Model has switched from being a theoretical orphan to a model for which many people were claiming its maternity.

It is also important to underscore that the empirical success of the Gravity Model has come without much consideration of its econometric properties. However, several authors have recently argued that the application of the basic Gravity Model can sometimes provide biased results of its estimates because of heterogeneous relationships between trading countries (Matyas, 1997; Cheng, 1999; Wall, 2000; Glick and Rose, 2001). This heterogeneity can be related to historical, cultural, ethnic, political or geographical factors that simultaneously explain the trade volume between countries in pairs, although these factors are often difficult to observe and quantify. Because of this, according to the authors, it is possible to control these factors by introducing the so-called “country-pair fixed effects” into the gravity equation in order to capture the unobserved heterogeneity. The Gravity Model with country-pair fixed effects assumes the following analytical form :

$$(3) \ln F_{ij} = \alpha_0 + \alpha_{ij} + \alpha \ln M_i + \beta \ln M_j - \gamma \ln D_{ij} + \varepsilon_{ij}$$

Note that the intercept has two parts: one common to all country pairs (α_0) and one specific for each country pair (α_{ij}). This is a classical regression model that can be estimated using the Least Square Estimator, and includes a Dummy Variable for each of the country pairs (LSDV). The fixed-effects introduction is a result of ignorance; in fact, as there is still no concrete idea as to the variables responsible for this heterogeneity, each country pair is differentiated by its own dummy variable which is able to capture the uniqueness within the pairs (Cheng et al., 2005).

In many studies, the Gravity Model estimation is made using panel data. These are sets formed by repeated observations of the same cross-sectional units over time. The use of panel data provides several advantages such as more variability in the data-set and the possibility of identifying the effects of time-varying variables (e.g. progressive reduction of trade barriers) (Kennedy, 2003). More precisely, the use of panel data allows for the incorporation into the Gravity Model of another type of fixed effects, namely “year-specific fixed effects”, as indicated by the following notation:

$$(4) \ln F_{ijt} = \alpha_0 + \alpha_{ij} + \alpha_t + \alpha \ln M_{it} + \beta \ln M_{jt} - \gamma \ln D_{ij} + \varepsilon_{ijt}$$

Note that, in this last case, the intercept has three parts: one common to all years and country pairs (α_0); one specific to each country pair and common to all years (α_{ij}); and one specific to each year and common to all country pairs (α_t). This regression model is able to capture the relationship between relevant variables over time, as well as to identify the overall business cycle through the proper selection of dummy variables (t) for annual variations in trade flows.

4. **Extended Version of the Gravity Model for the Analysis of Italian High Quality Wine Exports**

In this work, the value of the exportation for high quality wine from Italy to its main partner countries is explained through an extended form of the Gravity Model using fixed effects. Among all the models tested, the one that exhibits the best outcome is the following:

$$(5) \ln \text{Exp}_{jt} = \alpha_0 + \alpha_j + \alpha_t + \alpha \ln \text{QwProd}_{it} + \beta \ln \text{PcGDP}_{jt} + \gamma \text{EU} + \delta \text{EUAN} + \varepsilon_{jt}$$

Where:

Exp_{jt} = value of QWPDR exports from Italy to country j in the year t , expressed in Euro at constant prices;

α_0 = constant;

α_j = specific “country-effect” for country j ;

α_t = specific “year-effect” for year t ;

QwProd_{it} = Italian QWPDR production in the year t , expressed in hectoliters;

PcGDP_{jt} = per capita GDP of importing country j in the year t , expressed in U.S. dollars at constant prices;

EU = dummy variable that assumes the value of 1 if the country j is member of European Union in the year t , 0 otherwise;

EUAN = dummy variable that assumes the value of 1 if the country j has started EU Accession Negotiations in the year t , 0 otherwise;

ε_{jt} = error term related to the observation with the country j and the year t .

This regression model has been estimated by Ordinary Least Squares, and includes a Dummy Variable for each partner country and each year (LSDV).

The classic Gravity Model uses total GDP as a proxy for output capacity of the exporting country. Nevertheless, while total GDP is appropriate for studies using aggregated export data, in the case of a specific agro-food product such as quality wine, this variable would overestimate the country’s output capacity. For this reason, the physical production of the specific good analyzed (or alternatively its monetary value) was considered as the most suitable proxy of the output capacity for the exporting country, which in this case is Italy. The parameter of this variable is expected to be positive because it is expected that the higher the quality wine production, the higher its exportation volume, especially in the case of Italy where production of all wine exceeds total internal consumption.

At the same time, the income effect for the importing countries is considered by including total GDP in the standard Gravity Model. However, the countries that import high quality wine from Italy have substantial differences in terms of the size of their economies, living costs and income per capita. Therefore, GDP per capita has been included in this model as it is a stronger variable for explaining the income effect in importing countries. Using GDP per capita, we expect a positive parameter since the higher a country’s income, the higher their demand for a higher quality of wine.

In this empirical model, the distance between Italy and each importing country has been omitted because of difficulties concerning the proper measure of the economic distance that would have encompassed transportation and communication costs (Cheng, 2005). The most common method to measure the distance is to consider the geographical distance between the capitals of the partner countries. In this way, it is implicitly assumed that overland transport costs are the same as those for overseas, and that all overland/overseas distances are equal in cost. Moreover, it is assumed that the capital cities, or any other single point in a country, are an appropriate proxy for the economic center. This might be acceptable for small countries with one major city, but is not an accurate measure for large countries such as the United States, Canada, Russia or China, which have a large number of major cities that are very distant from each other. On the other hand, the model with specific “country-effects” eliminates the need to include the distance variable.

As it was discussed in the introduction, one of the objectives of this work is to estimate the effects of regional integration considering the exporting performances of Italian high quality wine. The

most common method to estimate the effects of regional integration in a Gravity Model is to include dummy variables for each integration regime during the sample period (see, for example, Cheng, 2005). In this empirical model two dummy variables were included to estimate the regional integration effects: one related to the EU member countries (EU) and another related to some Central and Eastern European countries (Cyprus, Estonia, Hungary, Poland, the Czech Republic, Slovenia, Bulgaria, Latvia, Lithuania, Malta, Romania and Slovakia). These countries started in the EU Accession Negotiations (EUAN) during the sample period. As is widely known, there are no customs barriers within the countries of the European Union but instead there is a common customs tariff applied to imports from non-EU countries. However, some Central and Eastern European countries have started EU Accession Negotiations which would involve a progressive reduction (up to a cancellation) of customs barriers to all EU imports.

Finally, it is important to note that in this empirical model the intercept has three parts: one common to all years and country pairs (α_0); one specific to each country pair and common to all years (α_j); and one specific to each year and common to all country pairs (α_t). In particular, year-effects (one for each year) can be considered as indicators of globalization that capture export variations over time independently from other explanatory variables included in the model.

The data-set for this analysis has 605 observations over a period of 11 years (1995–2005). There are 55 countries included in the analysis and they encompass the largest importers of QWPDR from Italy. The volume of Italian high quality wine exported to these countries in 2005 accounted for more than 92 percent of the total.

Data on Italian QWPDR exports (dependent variable) was extracted from the database of the Italian Institute of Statistics (ISTAT). Exports are expressed in thousands of Euros at current prices. This data was deflated using Consumer Price Indexes (CPI) given by ISTAT. Data for Italian QWPDR production was also obtained from the ISTAT database in thousands of hectoliters. Finally, data for “per capita GDP” was obtained from the World Economic Outlook Database of International Monetary Fund and is expressed in current U.S. dollars which were deflated using Consumer Price Indexes (CPI) from the U.S. Bureau of Labor Statistics.

5. Estimation Results

Estimation results for Equation 5 are reported in **Table 2** that includes the most important performance indicators for the empirical model.

In particular, it is important to highlight that the F-statistic is 1,073.52 with a p-value that is less than 0.01, which means a good overall significance of the model, while the R-squared measure is 0.968, which indicates an almost perfect fit to the observed data.

The size of Italian QWPDR production is a variable with a significant effect (at 1%) on Italian quality wine exports and its coefficient is positive, as expected. Considering the logarithmic form of the equation, this coefficient can be read directly as elasticity. Therefore, a coefficient slightly higher than one (1.08) can be interpreted that an increase or a decrease in Italian quality wine production will lead, respectively, to a proportional increase or decrease in Italian quality wine exports. This can be explained by taking into account that consumption of high quality wine in Italy represents only a small share of Italy’s internal production, thus a production variation generates directly proportional effects on exports. This has two important implications: first, Italy shows an export-oriented nature regarding the analyzed good and, second, there is a real possibility that a strong increase in Italian quality wine production could be absorbed by the international market. In other words, Italy should increase the proportion of high quality wine in total production because there are favourable conditions in place which would increase exportation. In fact, although Italy exports high quality wine to more than fifty countries, a large share of these flows go to just a few large trading partners (the five largest importers absorb about 70 percent of Italian quality wine exports). On the other hand, the production of Italian high quality wine could easily be increased, from a production perspective. This is due to the fact that a large share of Italian wine production, especially in the southern

regions, belongs to the “table wine” category, despite the existence of favourable factors (land, climate, know-how, institutional context, etc.) which would allow for the production of a higher quality wine. Nevertheless, a step forward on the production front must not be done without commensurate marketing and promotional activities. In order to expand its exportation of high quality wine, Italy must take into account the increasing competition in the international arena, and concentrate its communication and promotional efforts in the countries which indicate favourable market conditions. At the same time it must protect its existing market share in its main importing countries, notwithstanding the absence of immediate or future expansion possibilities.

GDP per capita in importing countries also has a significant effect (level of 1%) on quality wine imports from Italy. This variable is a measure of demand in the importing countries and its effect is positive. More precisely, a one percent increase in per capita GDP in a given importing country could have as a consequence an increase of 1.6 percent in the value of quality wine imports from Italy, if other variables remain constant. Therefore, according to these results, the value of Italian quality wine exports is income elastic. On the other hand, income elasticity greater than one is predictable for a processed good such as quality wine, and this could be explained considering that the international market is larger if a bigger amount of product is available. Consequently, if Italian producers of high quality wine intend to expand their exportations, it is natural to look to those countries where income growth is constant and solid. It is also important to observe that any decrease in income for the trade partners, in other words an economic recession, would have serious negative consequences on the volume of Italian quality wine exports. Looking at **Table 3**, that shows the IMF estimates for annual percent change of GDP per capita, it is interesting to highlight that, among countries with the highest income growth rates, there are three very populous countries, China, Russia and India, where expansion possibilities for Italian quality wine exports are very attractive. Currently these countries import less than 1% of total exports of Italian high quality wine. However, this share could increase exponentially if Italian exporters succeed in penetrating these markets and in consolidating their presence. At the same time, it is important to highlight that the main countries importing Italian high quality wine (the United States, Germany, the United Kingdom, Switzerland, Canada, Japan and almost all western European countries) show a moderate but stable income growth (ranging between about 1 and 2 percent) and therefore it would be strategic to advertise, defend and consolidate Italian market shares against any possible aggressions by the new wine producing countries.

During the period considered, the European Union has passed an historical enlargement: on 1 May 2004, ten new countries of Central and Eastern Europe (Cyprus, the Czech Republic, Estonia, Latvia, Lithuania, Hungary, Poland, Slovenia, Slovakia and Malta) have joined the fifteen existing member States: Austria, Belgium, Luxemburg, Denmark, Finland, France, Germany, Greece, Ireland, Italy, Netherlands, Portugal, Spain, Sweden and United Kingdom. The EU dummy variable included in the model has a positive and statistically significant coefficient (at 1%). More precisely, the model suggests an increase of 136 percent ($e^{0.859} - 1 = 1.36$) on Italian quality wine exports towards EU countries with respect to non-EU countries, *ceteris paribus*. This is easily understandable if it is taken into account that there are no customs barriers within EU countries and, that these countries are also physically closer to Italy.

Before their EU adhesion, some Central and Eastern European countries had started EU Accession Negotiations to consider a progressive reduction of customs barriers on EU imports, including those from Italy. More precisely, EU Accession Negotiations began on 31 March 1998 with the six best-prepared countries (Cyprus, Estonia, Hungary, Poland, the Czech Republic and Slovenia) and on 15 February 2000 were expanded to include all other candidate countries (Bulgaria, Latvia, Lithuania, Malta, Romania and Slovakia). The coefficient of EUAN dummy variable is positive and statistically significant (a little over 1%). Furthermore, the model shows an increase of 36 percent ($e^{0.304} - 1 = 0.36$) of the

exports of Italian high quality wine towards all the Central and Eastern European countries that have started EU Accession Negotiations, if all conditions remain the same. In addition, it is interesting to note that all new EU members and, in particular, the Baltic Republics (Latvia, Estonia, Lithuania) show high income growth rates (ranging between about 4 and 9 percent). Therefore, these countries represent very interesting, and as yet untapped, markets. With respect to New World competitors, the exporters of Italian quality wine could gain extra profit from the EU enlargement due to any cancellation of customs barriers.

The analysis of year-specific fixed effects shows an increase of the exportation volume of Italian high quality wine over time which is independent with respect to the variations of all the other variables. More precisely, the year-specific effects are positive and significant for the years included in the period of 1997–2003 and they show a regular increase over time with the exception of 2003 which shows a considerable decline. Note that, for comparison, the year dummies are measured relative to 1995, which has been omitted. Between 1995 and 2002, the export of Italian high quality wine increased by 86 percent ($e^{0.62} - 1 = 0.86$) independently with respect to the variations of all the other variables. This could be considered as the “globalization effect”, taking into account that most of the WTO agreements are the result of the Uruguay Round Negotiations signed at the Marrakesh ministerial meeting in April 1994. However, the high rate of Italian quality wine export growth could also be derived from other factors, such as the increase in international demand as it relates to a change in consumer preference. The drop in 2003 could probably be explained by the introduction of the Euro currency and its rapid strengthening with respect to other major international currencies, in particular the U.S. dollar, which resulted in unfavourable softening of Italian exports.

Finally, looking at the results for country-specific fixed effects in **Table 4**, it is possible to observe that all fixed effects are positive and statistically significant at one percent except for Slovenia, which shows an effect non statistically different from zero. Examining **Table 5**, it is possible to verify that some of the countries with the highest fixed effects are very populous countries such as China, India, United States, Brazil, Russia, Mexico and Japan, so in these countries the larger Italian quality wine exports can be related to the high number of consumers. Other countries with high fixed effects are geographically close to Italy and are also some of the most important Italian trade partners, such as Germany, the United Kingdom and Switzerland. Other countries such as Kenya, the Philippines, Canada and Thailand are very distant and not very populous countries, but they have high fixed effects probably likely due to their consumers having a particular preference for Italian high quality wine. On the other hand, some of the countries with the lowest fixed effects are very small countries such as Cyprus, Slovakia, United Arab Emirates, Israel, Latvia and Singapore, so in these countries the slighter Italian quality wine exports can be related with the low number of consumers. Other countries with low fixed effects such as Portugal, Greece, Hungary, New Zealand and Spain are wine producing countries and their consumers probably like more domestic quality wine.

6. Conclusions and Final remarks

In this work it has been shown that the Gravity Model is a very useful analytical tool even when trade analysis is conducted on a specific product. In particular, this model which has been optimally adapted for these specific research purposes, is able to explain with great accuracy the size of trade flows using easily disposable data. Moreover, the Gravity Model may also be used to forecast potential trends in trade flows and to estimate the impact of a variety of policy issues.

Examining the results of the analysis of exports of Italian high quality wine some points can be highlighted.

The production of Italian high quality wine should be increased because there are advantageous opportunities in international markets. Considering that the exportation of this specific product is income elastic, as shown by the empirical model, Italian producers should diversify their targeted export markets/countries taking into account their income growth. In other words, the research results indicate that producers exporting their wine should focus on reducing the dispersion of their profits by choosing a diversified portfolio that takes into account the income growth of each country/area. In this way, the portfolio should focus on countries with high income growth rates, in order to take advantage of the income growth effect on exports. However, it should also include countries with moderate but stable income growth rates in order to maintain market share. The aforementioned approach should reduce the risk of a negative impact on the demand of high income growth countries, given that these economies could be less stable in the long run.

Finally, it is possible to evaluate both the effects of regional integration and the impact of the international trade liberalization on the exporting performance of Italian high quality wine.

According to the model, the enlargement of the EU presents a great opportunity for the exporters of high quality Italian wine. In fact, there is a high probability that these Italian exporters could penetrate the Central and Eastern European markets which are rapidly growing. In this way they would exploit a significant commercial advantage related to the absence of customs barriers, even if it is also important to strengthen their own presence in these markets before the eventual and greater trade liberalization which would effectively reduce this advantage.

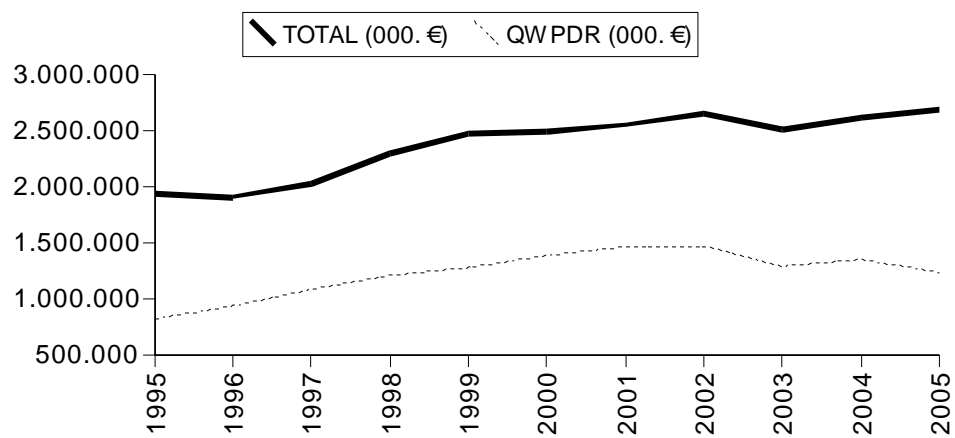
At the same time, considering the possible connection to WTO agreements signed at the end of Uruguay Round Negotiations, we can observe that these agreements have positively influenced the exportation of high quality Italian wine. Therefore, it is desirable that the negotiations on agriculture in the Doha Development Agenda Round are rapidly concluded with an agreement. Obviously, this evaluation refers exclusively to the effects of a strong liberalization of the international trade on the performance of the exports of high quality Italian wine and not other products.

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Graph 1. Italian wine export trends from 1995 to 2005 (at constant prices)



(Source: ISTAT)

Table 1. Italian QWPDR exports towards main importing countries

Countries	Value*	Share	Countries	Value*	Share
USA	337,181	26.14%	China	1,104	0.09%
Germany	297,417	23.06%	New Zealand	914	0.07%
United Kingdom	114,135	8.85%	United Arab Emirates	909	0.07%
Switzerland	103,050	7.99%	Thailand	876	0.07%
Canada	76,516	5.93%	Israel	713	0.06%
Japan	46,267	3.59%	Latvia	625	0.05%
Denmark	33,054	2.56%	Venezuela	618	0.05%
Austria	27,356	2.12%	Estonia	492	0.04%
Belgium - Lux	23,046	1.59%	Costa Rica	489	0.04%
Netherlands	20,464	1.45%	Hungary	472	0.04%
France	18,703	1.45%	Cyprus	464	0.04%
Sweden	17,270	1.34%	Malaysia	413	0.03%
Norway	11,264	0.87%	Lithuania	376	0.03%
Russian Fed.	7,262	0.56%	Philippines	371	0.03%
Ireland	6,352	0.49%	India	355	0.03%
Brazil	5,289	0.41%	Dominican Republic	317	0.02%
Finland	4,980	0.39%	South Africa	251	0.02%
Spain	2,914	0.23%	Colombia	250	0.02%
Australia	2,777	0.22%	Ukraine	246	0.02%
Poland	2,709	0.21%	Portugal	246	0.02%
South Korea	2,111	0.16%	Romania	211	0.02%
Hong Kong	1,974	0.15%	Slovak Republic	194	0.02%
Czech Republic	1,782	0.14%	Kenya	167	0.01%
Singapore	1,668	0.13%	World	128,990,436	100.00%
Mexico	1,526	0.12%	<i>UE(15)</i>	566,845	43.94%
Malta	1,262	0.10%	<i>UE(25)</i>	575,354	44.60%
Greece	1,151	0.09%	<i>North America</i>	413,698	32.07%

* The value is expressed in thousands of Euros at constant prices (mean from 2003 to 2005) (Source: ISTAT)

Table 2. Regression results (country-specific fixed effects are omitted)

Variable	Coefficient	Std Error	T-Statistic	p-value	Significant
Constant	-2.8320	1.1356	-2.4940	0.01293	**
ln_QwProd	1.0824	0.4410	2.4547	0.01442	**
ln_PcGDP	1.6058	0.1798	8.9316	<0.00001	***
EU	0.8591	0.1666	5.1571	<0.00001	***
EUAN	0.3044	0.1232	2.4703	0.01381	**
Year-specific effects					
1996	0.0853	0.1109	0.7689	0.44226	
1997	0.1528	0.0862	1.7719	0.07698	*
1998	0.2565	0.0738	3.4740	0.00055	***
1999	0.2976	0.0801	3.7156	0.00022	***
2000	0.4964	0.0820	6.0566	<0.00001	***
2001	0.6025	0.0838	7.1899	<0.00001	***
2002	0.6209	0.0890	6.9766	<0.00001	***
2003	0.2555	0.0883	2.8954	0.00394	***
2004	0.1459	0.0937	1.5569	0.12008	
2005	0.1327	0.0823	1.3549	0.24512	

Dependent Variable = \ln_Exp_{it}

Number of observations = 605

F-Statistic (67, 537) = 1,073.52 (p-value < 0.00001)

$R^2 = 0.971897$

Adjusted $R^2 = 0.968391$

Log-likelihood = -302.692

Significant: *** at 1% ; ** at 5% ; * at 10%

Table 3. Annual percent change of Per capita GDP*

<i>Countries</i>	<i>2005</i>	<i>2006</i>	<i>2007</i>	<i>Countries</i>	<i>2005</i>	<i>2006</i>	<i>2007</i>
China	9.6	9.5	9.5	Jamaica	0.9	2.3	2.6
§ Latvia	10.9	11.6	9.4	Brazil	0.8	2.2	2.5
§ Estonia	10.1	9.8	8.3	Spain	2.8	3.0	2.5
§ Slovak Republic	6.1	6.5	7.0	Jordan	4.5	3.4	2.4
Russia	7.0	6.9	6.9	Finland	2.8	3.3	2.3
§ Lithuania	8.1	7.2	6.9	Colombia	3.5	3.0	2.3
§ Bulgaria	6.3	6.4	6.8	\$ United Kingdom	1.2	2.2	2.2
§ Romania	4.4	5.9	5.9	Australia	1.3	1.8	2.2
India	7.2	6.7	5.6	Norway	2.0	1.7	2.2
Argentina	8.0	6.8	4.8	Israel	3.0	1.9	2.2
§ Czech Republic	5.9	5.9	4.7	\$ Japan	2.6	2.7	2.1
Hong Kong	6.4	5.1	4.6	\$ Austria	1.4	2.6	2.1
§ Poland	3.5	5.1	4.5	\$ Denmark	3.0	2.4	2.1
Ireland	3.3	4.4	4.2	\$ Canada	2.0	2.2	2.0
Malaysia	3.2	3.7	4.0	Belgium	1.5	2.7	2.0
Thailand	4.4	3.4	4.0	Mexico	1.5	2.5	2.0
§ Slovenia	3.6	4.2	3.8	\$ United States	2.3	2.5	1.9
§ Hungary	4.3	4.7	3.7	Ecuador	3.3	3.0	1.8
Ukraine	3.4	5.8	3.6	Sweden	2.3	3.6	1.8
Peru	4.9	4.5	3.5	France	0.6	1.8	1.8
Dominican Rep.	7.7	4.0	3.5	\$ Switzerland	1.7	2.9	1.7
Greece	3.7	3.7	3.5	Venezuela	7.2	5.4	1.6
Korea	3.5	4.2	3.4	Portugal	0.3	1.1	1.4
Kenya	3.7	3.6	3.4	Guatemala	0.6	1.5	1.4
Philippines	3.0	2.9	3.3	Netherlands	1.3	2.6	1.2
South Africa	3.9	3.0	3.0	\$ Germany	0.9	2.0	1.2
Luxembourg	3.6	3.1	2.9	§ Malta	1.8	0.9	1.0
§ Cyprus	3.7	2.6	2.9	Italy	-1.0	1.1	1.0
Costa Rica	4.0	4.7	2.8	New Zealand	1.3	0.3	0.5
Singapore	3.7	5.1	2.7	United Arab Emirates	0.8	3.6	-1.7

* Data for years 2006 and 2007 are IMF estimates

§ = New member states of European Union

\$ = Main importing countries of Italian quality wine

(Source: World Economic Outlook Database of International Monetary Fund)

Table 4. Regression results (country-specific fixed effects)

Countries	Fixed effects	Std Error	T-Statistic	p-value	Significant
Argentina	2.1227	0.3400	6.2429	<0.00001	***
Australia	2.9739	0.2863	10.3859	<0.00001	***
Austria	3.8581	0.2126	18.1481	<0.00001	***
Belgium-Luxembourg	2.9838	0.2553	11.6861	<0.00001	***
Brazil	6.7128	0.3167	21.1973	<0.00001	***
Canada	5.7184	0.2588	22.0972	<0.00001	***
China	6.0576	0.5024	12.0571	<0.00001	***
Colombia	3.8812	0.3777	10.2760	<0.00001	***
Costa Rica	3.4879	0.3105	11.2323	<0.00001	***
Cyprus	0.9056	0.1960	4.6203	<0.00001	***
Czech Rep.	2.8922	0.2183	13.2518	<0.00001	***
Denmark	3.5209	0.2376	14.8202	<0.00001	***
Dominican Rep.	4.6414	0.3919	11.8422	<0.00001	***
Ecuador	3.2333	0.4074	7.9361	<0.00001	***
Estonia	2.2039	0.2597	8.4878	<0.00001	***
Finland	2.2294	0.2130	10.4670	<0.00001	***
France	3.6118	0.2021	17.8741	<0.00001	***
Germany	6.3913	0.2104	30.3775	<0.00001	***
Greece	1.5149	0.1616	9.3732	<0.00001	***
Guatemala	3.8514	0.4124	9.3385	<0.00001	***
Hong Kong	2.1890	0.2741	7.9849	<0.00001	***
Hungary	1.7646	0.2542	6.9419	<0.00001	***
India	5.4767	0.6659	8.2247	<0.00001	***
Ireland	2.1093	0.2195	9.6109	<0.00001	***
Israel	1.5755	0.3146	5.0082	<0.00001	***
Jamaica	2.8917	0.3558	8.1276	<0.00001	***
Japan	4.8962	0.3213	15.2404	<0.00001	***
Kenya	6.1438	0.6221	9.8768	<0.00001	***
Latvia	1.8710	0.4206	4.4481	0.00001	***
Lithuania	2.6393	0.3317	7.9573	<0.00001	***
Malaysia	3.2262	0.3114	10.3611	<0.00001	***
Malta	2.4494	0.2215	11.0560	<0.00001	***
Mexico	4.2231	0.2725	15.4960	<0.00001	***
Netherlands	3.5789	0.2127	16.8226	<0.00001	***
New Zealand	2.0537	0.2447	8.3930	<0.00001	***
Norway	2.8663	0.3343	8.5744	<0.00001	***
Peru	3.4877	0.3793	9.1957	<0.00001	***
Philippines	5.7582	0.4956	11.6184	<0.00001	***
Poland	4.2278	0.2608	16.2138	<0.00001	***
Portugal	0.0000				
Russia	6.2919	0.3668	17.1526	<0.00001	***
Singapore	2.0868	0.2610	7.9952	<0.00001	***
Slovak Rep.	0.9694	0.2987	3.2448	0.00125	***
Slovenia	0.0083	0.2438	0.0340	0.97290	
South Africa	3.6344	0.3290	11.0475	<0.00001	***
South Korea	2.7615	0.2713	10.1769	<0.00001	***
Spain	2.1990	0.1998	11.0083	<0.00001	***
Sweden	3.2740	0.2247	14.5676	<0.00001	***
Switzerland	5.3786	0.3199	16.8144	<0.00001	***
Thailand	5.0654	0.3771	13.4322	<0.00001	***
Ukraine	4.8920	0.5258	9.3038	<0.00001	***
United Arab Emirates	1.2367	0.2781	4.4471	0.00001	***
United Kingdom	5.3947	0.2123	25.4065	<0.00001	***
United States	6.7005	0.2981	22.4758	<0.00001	***
Venezuela	4.3123	0.3005	14.3505	<0.00001	***

Significant: *** at 1% ; ** at 5% ; * at 10%

Table 5. Country-specific fixed effects and population*

<i>Countries</i>	<i>Fixed effects</i>	<i>Population</i>	<i>Countries</i>	<i>Fixed effects</i>	<i>Population</i>
Brazil	6.7128	184,18	Ecuador	3.2333	13,22
United States	6.7005	296,56	Malaysia	3.2262	25,95
Germany	6.3913	82,46	Belgium-Lux	2.9838	10,86
Russia	6.2919	142,70	Australia	2.9739	20,40
Kenya	6.1438	33,45	Czech Rep.	2.8922	10,23
China	6.0576	1.307,56	Jamaica	2.8917	2,66
Philippines	5.7582	84,24	Norway	2.8663	4,61
Canada	5.7184	32,23	South Korea	2.7615	48,29
India	5.4767	1.094,25	Lithuania	2.6393	3,43
United Kingdom	5.3947	60,22	Malta	2.4494	0,40
Switzerland	5.3786	7,27	Finland	2.2294	5,23
Thailand	5.0654	65,11	Estonia	2.2039	1,35
Japan	4.8962	127,74	Spain	2.1990	41,38
Ukraine	4.8920	46,93	Hong Kong	2.1890	6,97
Dominican Rep.	4.6414	8,53	Argentina	2.1227	37,83
Venezuela	4.3123	26,43	Ireland	2.1093	4,13
Poland	4.2278	38,16	Singapore	2.0868	4,35
Mexico	4.2231	105,30	New Zealand	2.0537	4,10
Colombia	3.8812	46,04	Latvia	1.8710	2,31
Austria	3.8581	8,23	Hungary	1.7646	10,10
Guatemala	3.8514	13,72	Israel	1.5755	6,75
South Africa	3.6344	46,89	Greece	1.5149	11,10
France	3.6118	62,70	United Arab Emirates	1.2367	4,68
Netherlands	3.5789	16,31	Slovak Rep.	0.9694	5,41
Denmark	3.5209	5,41	Cyprus	0.9056	0,83
Costa Rica	3.4879	4,33	Slovenia	0.0083	2,00
Peru	3.4877	27,95	Portugal	0.0000	10,52
Sweden	3.2740	9,04			

* Population is expressed in Millions of habitants

(Source: World Economic Outlook Database of International Monetary Fund, year 2005)

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International traveling and trade: further evidence for the case of Spanish wine based on fractional VAR specifications

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Summary

This paper deals with the relationship between international travelling and trade. For this purpose we focus on a particular case study: the connection between the Spanish wine exports to Germany and the German travellers to Spain. Unlike previous studies we use a methodology based on fractional vector autoregressive models, which permits us to compute the impulse responses in a similar way as in the standard VAR case. The results show that the orders of integration of the two series are constrained between 0 and 1, being higher for the arrivals series than for the exports. The impulse response analysis reveals that an increase in travelling produces a positive initial impact on trade though it tends to disappear in the long run.

KEYWORDS: International trade, Multivariate models, Fractional VAR, Tourism.

1. Introduction

International trade of good and services has been shown to be influenced by many factors of either push or pull character. While no mainstream microeconomic model has yet been developed to establish theoretically the link between trade and tourism, a host of empirical work has emerged which shows that there may in fact be a connection between the flow of goods and people. Many studies attempt to test the hypothesis that movements of people can contribute to generate exports, but they may also stimulate imports. Tourism is thought to be able to promote cross-border exports by initiating entrepreneurial activities as a result of learning about new business opportunities while travelling. At the same time, demand for new products to be consumed back home may be created as a consequence of learning about them during foreign travel.

Easton (1998) analysed whether Canadian total exports are complementary or substitutive to tourist arrivals, using pooled data regressions. He finds "some evidence of substitution of Canadian exports for tourist excursions to Canada" (p. 542) by showing that when the relative price of exports goes up, the number of tourists visiting Canada increases. Kulendran and Wilson (2000) analysed the direction of causality between different travel and (aggregate) trade categories for Australia and its four main trading partners. Their results show that travel Granger causes international trade in some cases and vice versa in others. Shan and Wilson (2001) replicate this latter approach and also find two-way Granger causality using aggregate data for China. Aradhyula and Tronstad (2003) used a simultaneous bivariate qualitative choice model to show that cross-border business trips have a significant and positive effect on US agribusinesses' propensity to trade. Fischer (2004) explored the connection between aggregate imports and imports of individual products and bilateral tourist flows, using an error correction model. His results show that trade-tourism elasticities are consistently higher for individual products. Fischer and Gil-Alana (2007) quantified for the first time the length of the effect of tourism on international trade, using the case of German imports of Spanish wine. Depending on the wine type, the effect was estimated to last between 3 and 11 months, and on average 5.5 months.

What emerges from all these studies is that the existence, the direction, the strength (magnitude) and the length of the effect which tourism may have on international trade seems to depend on the analysed countries and products, and on the estimation technique used. Even if a range of results is now available, further empirical evidence is still useful in order to obtain a more complete and robust understanding of the actual nature of the relationship between international tourism and trade.

The aim of this study is therefore to expand existing knowledge on the travel-trade relationship for food products by generating further empirical evidence, based on recently developed fractional VAR regression models. The analysis is more empirical than theoretical in the sense that it is attempted to test econometrically the hypothesis of a potentially existing relationship between travelling and exports. The used approach is not grounded in microeconomic supply or demand theory since no output, income or price data are taken into account in the econometric specification of the model. However, VAR models are generally accepted as theory-free methods for estimating economic relationships, thus being a legitimate alternative to the identification restrictions in structural models (Sims, 1980). Thus, we focus exclusively on the relationship between the exports of Spanish wines to Germany and the number of German tourists travelling to Spain on a monthly basis. This analysis differs from our earlier paper (Fischer and Gil-Alana, 2007) in so far as a longer period of investigation, export instead of import data and a different econometric modelling approach is used.

The structure of this article is as follows. First, for the two series under consideration, we produce univariate results based on fractional integration models. This approach is more flexible than others usually employed in the literature since it allows us to consider the cases of stationarity $I(0)$ and nonstationarity $I(1)$ as particular cases of our approach. Then, an innovative bivariate fractionally integrated model is used, i.e., we estimate jointly the orders of integration of the two series, and then analyse the cross impulse response functions. In other words, the effect of a shock in one variable over the other across time is computed. Here, we implicitly assume that the direction is uni-directional in the sense that we believe that travelling has an influence on exports and not the reverse case. The main innovation is that we allow fractional values for the orders of integration while standard methods suppose that they are either 0 or 1. In the fifth section, the obtained results are compared to similar ones from other studies, before some conclusions are drawn. The appendices contain the technical details of the paper. Appendix A presents the functional form of the test statistic for testing fractional integration in a multivariate context. Appendix B refers to the fractional VAR model, specified for the bivariate case, and the subsequent sub-sections in that appendix describe the restriction required to the identification of the system for the two cases of white noise and autocorrelated disturbances.

2. *Econometric methodology*

This section is based on econometric grounds and we describe the techniques employed in the empirical work in Section 4. A crucial point when modelling univariate (or multivariate) time series is to correctly determine the order(s) of integration. In other words, in order to make statistical inference, the series are required to be stationary $I(0)$. If they are not, a standard approach is to take first differences based on the assumption that the series are then nonstationary $I(1)$. However, these two approaches ($I(0)$ and $I(1)$) may be too restrictive in the sense that many series may present a behaviour that is far from these two cases. In particular, the series may present a degree of dependence across time that is higher than the one described by the $I(0)$ models (e.g., the exponential degree associated to the AR specifications) but smaller than the one obtained through the $I(1)$ case. In such cases fractional differencing may be a viable approach.

For the purpose of the present paper we define an I(0) process as a covariance stationary process with spectral density function that is positive and finite. In this context, we say that a given raw time series $\{x_t, t = 0, 1, \dots\}$ is I(d) if:

$$(1 - L)^d x_t = u_t, \quad t = 1, 2, \dots, \quad (1)$$

$$x_t = 0, \quad t \leq 0,$$

where u_t is I(0) and where L means the lag operator ($Lx_t = x_{t-1}$).¹ Note that the polynomial above can be expressed in terms of its Binomial expansion, such that for all real d,

$$(1 - L)^d = \sum_{j=0}^{\infty} \binom{d}{j} (-1)^j L^j = 1 - dL + \frac{d(d-1)}{2} L^2 - \dots$$

The literature has usually stressed the cases of $d = 0$ and 1, however, d can be any real number. If $d = 0$ in (1), $x_t = u_t$, and a ‘weakly autocorrelated’ (e.g. AR) x_t is allowed for. However, if $d > 0$, x_t is said to be a long memory process, also called ‘strongly autocorrelated’, so-named because of the strong association between observations widely separated in time, and, as d increases beyond 0.5 and through 1, x_t can be viewed as becoming “more nonstationary”, in the sense, for example, that the variance of partial sums increases in magnitude.² These processes were introduced by Granger (1980, 1981), Granger and Joyeux (1980) and Hosking (1981), (though earlier work by Adenstedt, 1974, and Taquq, 1975 shows an awareness of its representation), and were theoretically justified in terms of aggregation of ARMA processes with randomly varying coefficients by Robinson (1978), Granger (1980). If d belongs to the interval (0, 0.5) x_t is covariance stationary, but both the autocorrelations and the response of a variable to a shock take much longer time to disappear than in a standard ($d = 0$) stationary case. If $d \in [0.5, 1)$ the series is no longer covariance stationary but is still mean reverting, with the effect of the shocks dying away in the long run. Thus, the fractional differencing parameter d plays a crucial role for our understanding of the economy and the macro dynamics. Examples of applications of fractional integration in economic time series are among others the papers of Diebold and Rudebusch (1989), Baillie and Bollerslev (1994) and Gil-Alana and Robinson (1997).³

In this section we present a novel approach that permits us to consider a structural fractional VAR model from its reduced form and then obtain the impulse response functions. We derive a simple method in a multivariate fractional integration framework, which lets the data determine simultaneously the response of one variable over the other(s). This method presents some advantages with respect to previous approaches. First, the fractional integration approach allows to discern the order of integration of a given variable without the econometrician to choose between zero or one. The order of integration may be zero, a fraction of one, one or it could be even above one. Second, this approach is agnostic with respect to the order of integration of the variables before including them in a vector autoregressive (VAR) framework. As a result, pre-tests of the orders of integration of the variables are not required. Third, there is no disagreement between the responses of the variables in levels or in first differences as the responses in first differences are exactly the same as those implied by the variables in levels by construction.

The starting point is the following structural model:

¹ The condition $x_t = 0, t \leq 0$ is required for the Type II definition of fractional integration. For an alternative definition (Type I) see Marinucci and Robinson (1999).

² Models with d ranging between -0.5 and 0 are short memory and have been addressed as anti-persistent by Mandelbrot (1977), because the spectral density function is dominated by high frequency components.

³ See also Baillie (1996) for a complete review of I(d) processes.

$$AD y_t = u_t, \quad t = 1, 2, \dots \quad (2)$$

$$u_t = G u_{t-1} + v_t, \quad t = 1, 2, \dots, \quad (3)$$

where A is a (nxn) matrix of parameters; D is an (nxn) diagonal matrix of form:

$$\begin{pmatrix} (1-L)^{d_1} & 0 & 0 \\ 0 & \dots & 0 \\ 0 & 0 & (1-L)^{d_n} \end{pmatrix},$$

where d_1, d_2, \dots, d_n can be real values; y_t is a (nx1) vector of the observable variables; u_t is a (nx1) vector, which is assumed to be $I(0)$; G is another (nxn) matrix of parameters, and v_t is a (nx1) structural error vector with zero mean and diagonal variance-covariance matrix V. Substituting (2) into (3), we obtain

$$AD y_t = GAD y_{t-1} + v_t, \quad t = 1, 2, \dots \quad (4)$$

implying that

$$D y_t = A^{-1} G A D y_{t-1} + A^{-1} v_t, \quad t = 1, 2, \dots \quad (5)$$

Using now the lag-operator (i.e. $Ly_t = y_{t-1}$):

$$[I - A^{-1} G A L] D y_t = A^{-1} v_t, \quad t = 1, 2, \dots,$$

we get

$$y_t = D^{-1} [I - A^{-1} G A L]^{-1} A^{-1} v_t, \quad t = 1, 2, \dots, \quad (6)$$

which is the structural $MA(\infty)$ representation of y_t .

In a multivariate system the number of procedures for fractional integration is very limited. Gil-Alana (2003a,b) proposed an extension of the univariate tests of Robinson (1994) in the frequency domain, while Nielsen (2005) developed time domain versions of Gil-Alana's tests. These methods allow us to estimate a reduced-form model of form:

$$D y_t = \varepsilon_t, \quad t = 1, 2, \dots \quad (7)$$

$$\varepsilon_t = F \varepsilon_{t-1} + w_t, \quad t = 1, 2, \dots, \quad (8)$$

where ε_t is a (nx1) vector of the d-differenced variables; F is a (nxn) matrix of parameters, and w_t is an $I(0)$ vector with variance-covariance matrix W. Substituting now (7) into (8),

$$D y_t = F D y_{t-1} + w_t, \quad t = 1, 2, \dots, \quad (9)$$

implying that

$$[I - F L] D y_t = w_t, \quad t = 1, 2, \dots,$$

and then

$$y_t = D^{-1} [I - F L]^{-1} w_t, \quad t = 1, 2, \dots, \quad (10)$$

which is the reduced-form $MA(\infty)$ representation of y_t .

Note that the structural model in (6) has $2n^2 + 2n$ parameters to estimate: n corresponding to the fractional differencing parameters in D; $2n^2$ of the two matrices A and G; and the n variances in V. On the other hand, the reduced-form $MA(\infty)$ representation in (10) contains $n^2 + n(n+1)/2$ parameters: the n d-parameters in D; n^2 in F, and $n(n+1)/2$ parameters of the variance-covariance matrix W. Therefore, in order to identify the system we need to impose $(n/2)(n+1)$ restrictions in the structural model. N restrictions can be obtained by imposing a 1-unit variance in the variance-covariance matrix of v_t in (3), V. However, $(n^2 - n)/2$ restrictions will still be required. Here, there are two possibilities: one is to impose triangularity in the A matrix in (2) – this would imply that the contemporaneous and the

future effects of some of the variables on the others will be zero, which may be a relatively strong assumption in some cases. The second approach uses the Blanchard and Quah (1989) decomposition, which implies that in the long run some variables have no effect on the others.

3. *The data*

We look at the relationship between trade and tourism by focussing on the interdependencies between the exports of Spanish wines to Germany and the number of German travellers to Spain.

The raw data were obtained from two different Eurostat databases. First, exports of Spanish wine (without sparkling wine) and of sparkling wine to Germany are taken from COMEXT "EU trade since 1995 by CN6" database. The arrivals of Germans in Spanish collective accommodation establishments are obtained from the "TOUR_OCC_NINRMW = Nights spent by non-residents – world geographical breakdown – monthly data" database.

4. *The empirical work*

The first thing we do in this section is to model individually the two series, which are the total number of arrivals of Germany in Spanish collective accommodation establishments, and the total Spanish wine exports (including sparkling wine) to Germany, monthly, from 1995M1 to 2006M7.

INSERT FIGURE 1 ABOUT HERE

A visual inspection at the series (in Figure 1) clearly shows that the two series present a seasonal component, which is changing over time. Dealing with seasonality is a matter that is still controversial. Deterministic approaches based on seasonal dummy variables are discouraged in this case in view of the changing seasonal patterns. A standard approach here is to perform a test of seasonal unit roots against the alternative of stochastic stationary behaviour. The most commonly-used method when dealing with monthly data is the one proposed by Beaulieu and Miron (1993), which is basically an extension of the Hylleberg, Engle, Granger and Yoo (HEGY, 1990) method to the monthly case. A drawback of this approach is that it is restricted to the case of I(1) and I(0) specifications and thus, it does not take into account fractional alternatives. Therefore, we also perform an alternative method (Robinson, 1994) that is nested in the fractional seasonal model of the form:

$$(1 - L^{12})^d y_t = u_t, \quad t = 1, 2, \dots$$

where the (seasonal) unit root corresponds to the case of $d = 1$.⁴ Though we do not report the results in the paper, we perform both Beaulieu and Miron (1993) and Robinson (1994) approaches, and we found in both cases strong evidence of unit roots with respect to the two series. Thus, since the two series are based on logarithm transformations, in what follows we work with the monthly growth rate series, which is just the monthly first differences of the log-transformed data.

INSERT FIGURE 2 ABOUT HERE

Figure 2 displays the two monthly differenced log-transformed series with their corresponding correlograms and periodograms. It is observed that the two series may now present a stationary behaviour.

⁴ See Gil-Alana and Robinson (2001) and Gil-Alana (2002, 2005) for descriptions of seasonal fractional models.

4.1 Univariate results

First we examine individually each series to check if they are truly stationary I(0). Here we employ a simple version of Robinson's (1994) univariate tests, which is based on the model,

$$(1 - L)^d y_t = u_t, \quad t = 1, 2, \dots \quad (11)$$

with I(0) ut. This method consists of testing the null hypothesis of

$$H_o : d = d_o, \quad (12)$$

in (11) for any real value do. Thus, the unit root null hypothesis corresponds to

$$H_o : d = 1, \quad (13)$$

while $d = 0$ corresponds to the stationary I(0) case. This method has some advantages compared with other more classic approaches of testing unit roots (Dickey and Fuller, 1979; Phillips and Perron, 1988; or any of its recent developments, Elliot et al., 1996; Ng and Perron, 2001, etc.). The most obvious one is clearly the fact that the latter approaches are too restrictive in relation with the order of integration since only I(0) and I(1) specifications are taken into account. Moreover, these methods are based on autoregressive (AR) alternatives, which in the simplest form, can be expressed as:

$$(1 - \rho L) y_t = u_t, \quad (14)$$

testing the null of:

$$H_o : \rho = 1, \quad (15)$$

in (14), and leading to a non-standard limit distribution, unlike what happens in Robinson, (1994) where the limit distribution is standard normal. Fractional and AR departures from (13) and (15) have very different long run implications. In (11), y_t is nonstationary but non-explosive for all $d \geq 0.5$. As d increases beyond 0.5 and through 1, y_t can be viewed as becoming "more nonstationary", but it does so gradually, unlike in case of (15) around (14). The dramatic long-run change in (14) around $\rho = 1$ has the attractive implication that rejection of (15) can be interpreted as evidence of either stationarity or explosivity. However, rejection of the null does not necessarily warrant acceptance of any particular alternative and they can be consistent against many of the numerous other types of departure (Robinson, 1993). On the other hand, the approach employed here applies equally to any real null hypothesized value of d and the same standard, null and local limit distribution theory obtains. This is also in sharp contrast to asymptotic theory for statistics directed against AR alternatives, where, for example, different null theory obtains for I(2) than for I(1) processes.

We use Robinson's (1994) approach, testing H_o (12) in model (11) for d_o -values from -1 to 2 with 0.01 increments. Table 1 presents the values of d_o where H_o (12) cannot be rejected at the 5% level, for the two series assuming that u_t in (11) is first white noise, and then allowing for some type of weak dependence structure, in particular, AR(1) and Bloomfield-type disturbances.⁵ Moreover, we also permit the inclusion of an intercept and/or a linear time trend, and thus, we report the results for the three cases of no regressors, an intercept and an intercept with a linear trend.

INSERT TABLE 1 ABOUT HERE

⁵ The Bloomfield (1973) model is a non-parametric approach of modelling the I(0) disturbances that produces autocorrelations decaying exponential as in the AR(MA) case.

Starting with the arrivals, the first thing we observe in Table 1 is that the two null hypotheses of $d = 0$ and $d = 1$ are both rejected in practically all cases, and the non-rejection values of d are constrained between these two values. We also display in the table the value of d producing the lowest statistic (in absolute value). That value should be an approximation to the maximum likelihood estimate of d since Robinson's (1994) method is based on the Whittle function, which is an approximation to the likelihood function. We observe that d is equal to 0.54 in case of white noise disturbances, and it is slightly higher for autocorrelated u_t . However, a very different picture is obtained for the export series. Thus, if u_t is white noise, d seems to be slightly above 0, and if autocorrelation is permitted, the null of $I(0)$ stationarity cannot be rejected. Thus, it seems clear that the arrivals present a stronger degree of association across time and thus, a higher degree of persistency than the corresponding export series.

The results presented so far may be biased because of the presence of a structural break in the data. (See, again Figure 2). Granger and Hyung (1999), Gouriéroux and Jasiak (2001), Diebold and Inoue (2001) and others showed that $I(d)$ models and structural change are issues which are highly connected. Thus, we also perform another recent procedure (Gil-Alana, 2007) that permits us to estimate the fractional differencing parameters and the coefficients associated to the linear trend, along with the time of the structural break in a model given by:

$$y_t = \alpha_1 + \beta_1 t + x_t; \quad (1-L)^{d_1} x_t = u_t, \quad t = 1, \dots, T_b \quad (16)$$

$$y_t = \alpha_2 + \beta_2 t + x_t; \quad (1-L)^{d_2} x_t = u_t, \quad t = T_b + 1, \dots, T, \quad (17)$$

where the α 's and the β 's are the coefficients corresponding to the intercept and the linear trend; d_1 and d_2 may be real values, u_t is again $I(0)$ and T_b is the time of the break that is supposed to be unknown. Note that the model in (16) and (17) can also be written as:

$$(1-L)^{d_1} y_t = \alpha_1 \tilde{1}_t(d_1) + \beta_1 \tilde{t}_t(d_1) + u_t, \quad t = 1, \dots, T_b, \quad (18)$$

$$(1-L)^{d_2} y_t = \alpha_2 \tilde{1}_t(d_2) + \beta_2 \tilde{t}_t(d_2) + u_t, \quad t = T_b + 1, \dots, T, \quad (19)$$

where $\tilde{1}_t(d_i) = (1-L)^{d_i} 1$, and $\tilde{t}_t(d_i) = (1-L)^{d_i} t$, $i = 1, 2$.

The procedure employed here is based on the least square principle and is similar to the one proposed by Bai and Perron (1998) for the case of stationary $I(0)$ processes. First we choose a grid for the values of the fractionally differencing parameters d_1 and d_2 , for example, $d_{i0} = 0, 0.01, 0.02, \dots, 1$, $i = 1, 2$. Then, for a given partition $\{T_b\}$ and given initial d_1, d_2 -values, $(d_{10}^{(1)}, d_{20}^{(1)})$, we estimate the α 's and the β 's by minimizing the sum of squared residuals,

$$\min \sum_{t=1}^{T_b} \left[(1-L)^{d_{10}^{(1)}} y_t - \alpha_1 \tilde{1}_t(d_{10}^{(1)}) - \beta_1 \tilde{t}_t(d_{10}^{(1)}) \right]^2 +$$

w.r.t. $\{\alpha_1, \alpha_2, \beta_1, \beta_2\}$

$$\sum_{t=T_b+1}^T \left[(1-L)^{d_{20}^{(1)}} y_t - \alpha_2 \tilde{1}_t(d_{20}^{(1)}) - \beta_2 \tilde{t}_t(d_{20}^{(1)}) \right]^2$$

Let $\hat{\alpha}(T_b; d_{10}^{(1)}, d_{20}^{(1)})$ and $\hat{\beta}(T_b; d_{10}^{(1)}, d_{20}^{(1)})$ denote the resulting estimates for partition $\{T_b\}$ and initial values $d_{10}^{(1)}$ and $d_{20}^{(1)}$. Substituting these estimated values on the objective

function, we have $RSS(T_b; \mathbf{d}_{10}^{(1)}, \mathbf{d}_{20}^{(1)})$, and minimizing this expression across all values of \mathbf{d}_{10} and \mathbf{d}_{20} in the grid we obtain $RSS(T_b) = \arg \min_{\{i,j\}} RSS(T_b; \mathbf{d}_{10}^{(i)}, \mathbf{d}_{20}^{(j)})$. Then, the estimated break date, \hat{T}_k , is such that $\hat{T}_k = \arg \min_{i=1,\dots,m} RSS(T_i)$, where the minimization is taken over all partitions T_1, T_2, \dots, T_m , such that $T_i - T_{i-1} \geq |\epsilon T|$. Then, the regression parameter estimates are the associated least-squares estimates of the estimated k -partition, i.e., $\hat{\alpha}_i = \hat{\alpha}_i(\{\hat{T}_k\})$, $\hat{\beta}_i = \hat{\beta}_i(\{\hat{T}_k\})$, and their corresponding differencing parameters are $\hat{d}_i = \hat{d}_i(\{\hat{T}_k\})$, for $i = 1$ and 2 . Several Monte Carlo experiments conducted in Gil-Alana (2007) show that this procedure performs relatively well even with small samples. This procedure can be easily extended to the case of multiple breaks. However, for the validity of the type of long-memory (fractional integration) model we use in this application it is necessary that the data span a sufficiently long period of time to detect the dependence across time of the observations; given the sample size of the series employed here, the inclusion of two or more breaks would result in relatively short sub-samples, therefore invalidating the analysis based on fractional integration.

INSERT TABLE 2 ABOUT HERE

The results based on the above approach are displayed in Table 2. Starting with the arrivals, we observe that the break date takes place at 2001M1, which is surprisingly a few months earlier than the September 11th attack in the U.S., and this happens for the two cases of white noise and AR(1) disturbances. If u_t is white noise, the orders of integration are 0.58 and 0.21 respectively for the first and second sub-samples. If u_t is AR(1) the orders of integration are slightly higher in the two sub-samples though again decreasing after the time break. If we concentrate now on the exports we observe that the break date occurs two months later than in the previous case (2001M3) and the orders of integration are 0.26 and -0.04 with uncorrelated errors and 0.31 and 0.02 with AR(1) disturbances.

The finding of the break in the arrivals at 2001M1 may be explained by the fact that during 2000 the German economy slowed down significantly after the bursting of the technology bubble at the end of 1999. Thus, from the beginning of 2001 there was a significant decrease in German international travel activities, in particular to Spain, the most important travel destination of Germans (Provincial Tourist Board of the Costa del Sol, 2003).

In sum, the results presented so far indicate that the two series display different orders of integration, independently of the inclusion or not of a structural break. In what follows we consider a bivariate set-up that solves the potential problems of unbalanced orders of integration in standard time series regression frameworks as is the case in the present work.

4.2 Multivariate results

In this section we look at the multivariate model. This is important if we want to determine the effect of structural shocks on the dynamic path of travelling and export trade variables. The bivariate model is estimated following the procedure in Gil-Alana (2003a). This method is briefly described in Appendix A and present two main advantages. First, it is an extension of the univariate tests of Robinson (1994) to the multivariate case and thus, similarly to the univariate case, we do not need to impose a priori any assumption about the order of integration of the series as is the case with standard VAR models. Second, with respect to the univariate case the orders of integration are estimated more efficiently since it makes use of additional information from the cross dependencies between the variables.

We estimate the orders of integration from the reduced form model (7), which, in this bivariate case, becomes:

$$\begin{pmatrix} (1-L)^{d1} & 0 \\ 0 & (1-L)^{d2} \end{pmatrix} \begin{pmatrix} y_{1,t} \\ y_{2,t} \end{pmatrix} = \begin{pmatrix} \varepsilon_{1,t} \\ \varepsilon_{2,t} \end{pmatrix}, \quad t = 1, 2, \dots \quad (20)$$

where $y_{1,t}$ refers to the arrivals monthly growth series and $y_{2,t}$ is the monthly growth rate of exports, and test the null hypothesis:

$$H_0: \mathbf{d} \equiv (d_1, d_2)^T = (d_{10}, d_{20})^T \equiv \mathbf{d}_0, \quad (21)$$

in (20) for (d_{10}, d_{20}) -values from -1 to 2, with 0.01 increments, with $\varepsilon_t = (\varepsilon_{1,t}, \varepsilon_{2,t})^T$ assumed to be first a white noise vector process, and later a VAR(1) specification. In order to avoid the inclusion of deterministic terms in (20) both series are mean-subtracted before the implementation of the procedure.

INSERT FIGURES 3 AND 4 ABOUT HERE

Figures 3 and 4 display the region of (d_{10}, d_{20}) -values where the null hypothesis (21) cannot be rejected at the 5% level, letting the residuals to follow first (in Figure 3) a white noise vector process, and, in Figure 4, a stationary VAR(1) specification. Starting with the white noise model, we observe that the results are completely in line with the univariate ones. Thus, d_1 , the order of integration of the number of arrivals is constrained between 0.5 and 0.7, while d_2 , the order of integration of the export series is strictly above 0, widely ranging between 0.05 and 0.45. If we permit a VAR specification on the differenced series, the values of d_1 range between 0.5 and 1.2, while those of d_2 are constrained between -0.1 and 0.3.

Table 4 identifies the estimates of the orders of integration of the two series, which are the values of d_1 and d_2 producing the lowest statistics in the multivariate procedure. We observe that if it is white noise, the values are 0.54 and 0.18 respectively for the arrivals and exports. Imposing a VAR(1) specification, the values become 0.70 and 0.04.

INSERT TABLE 4 ABOUT HERE

The next step in our analysis is to report the associated impulse response function of exports to a shock in the travelling series. For this purpose we employ the identification strategy described in Section 2, which, for the bivariate case is fully presented in Appendix B.

INSERT TABLE 5 ABOUT HERE

Table 5 displays the cross impulse responses of the effect of 1-unit shock in the growth rate of travelling on the growth rate of exports according to the two specifications described above, that is, the one based on white noise and the VAR(1) model. We observe that according to the white noise specification, an increase in travelling produces a negative initial impact though it becomes positive for the following period and then, start decreasing fast. On the other hand, if we employ the VAR(1) specification, which seems to be a much more realistic assumption, the initial impact is positive and then decreases at a lower rate than in the previous case of white noise disturbances. One drawback of our study is that we do not derive the confidence bands associated with the impulse response functions. Confidence intervals are typically derived through bootstrapping or Monte Carlo simulations from the error terms given the distribution of the parameters in the model. However, though we do not provide any evidence based on confidence intervals, the fact that the coefficients associated to the fractional VAR model were all statistically significant suggests that the latter parameterization should provide a more realistic picture of the relationship between the two variables, implying that travelling produces a positive effect

on exports at least for the case of the Spanish wine exports to Germany with respect to the German travellers to Spain.

5. Comparison of results to other studies

Our results imply that, for the more realistic case of the VAR(1), in the event of a shock in travelling almost 10% of its effect on exports remains in the following period, though then decreases to 2.76%, 0.79%, 0.33% etc. (see Table 5). Overall, the total effect sums up to 14.7% over the tracked 20 months. However, 90% of this total effect is already realised after four months, and 95% of it after 9 months. These results seem to be in line with those obtained by Fischer and Gil-Alana (2007) who find (using long memory regressions and very similar monthly growth rate data) that the tourism-trade effect lasts two months (in the case of white noise disturbances) and 9 months in the case of Bloomfield ($p = 1$) disturbances.

6. Concluding comments

In this article we have examined the relationship between international trade and travelling. For this purpose we have focussed on a particular case study, analyzing the connections between the exports of Spanish wines to Germany with the total number of German travellers to Spain. We have employed a methodology based on fractional vector autoregressive models, which is more general than the standard VAR approach in the sense that we do not restrict the series to be $I(0)$ or $I(1)$ but $I(d)$ for any real value d . Starting from a structural model we have derived the conditions to identify the parameters from the reduced form model, which is basically a generalization of the standard $I(0)/I(1)$ VAR case. The impulse response functions are then immediately obtained.

The series under analysis were the exports of Spanish wine to Germany and the total number of arrivals of Germans to Spain, monthly, from 1995M1 to 2006M7, both in logarithm form. Due to the nonstationary seasonal nature observed in the two series, first seasonal differences were adopted, working then with the monthly growth rates. The univariate work showed that the two series display different orders of integration. Thus, the arrivals present an order of integration which is constrained between 0.5 and 1, while the degree of integration of exports is slightly above 0. The multivariate work confirms that result and the impulse response analysis suggests that a positive shock in the arrivals tends to increase the exports to a certain level, decreasing then slowly the effect in the long run.

The obtained results are in line with earlier studies and thus add to the literature dealing with the tourism-trade relationship. While econometric findings in themselves cannot incontestably prove that a positive relationship between international travel activities and resulting trade flows exists in reality, the increasing empirical results clearly suggest that the existence of such a link may not be unlikely, at least for some products and in some countries. Further work in this field now needs to aim at establishing a theoretical economic framework, which can contribute to explain the existence of the tourism-trade phenomenon.

Appendix A

A simple version of the procedure proposed in Gil-Alana (2003a,b) consists of testing the null hypothesis:

$$H_0: d \equiv (d_1, d_2, \dots, d_n)^T = (d_{1o}, d_{2o}, \dots, d_{no})^T \equiv d_o, \quad (A1)$$

for any real vector d_o , in the model given by (7) where ε_t is supposed to be an I(0) vector process with spectral density function $F(\lambda)$ that is positive definite. Thus ε_t may be white noise but it also allows us to include VAR structures. To allow for some degree of generality, let us suppose that ε_t in (7) is generated by a parametric model of form:

$$\varepsilon_t = \sum_{j=0}^{\infty} A_j(\tau) w_{t-j}, \quad t = 1, 2, \dots, \quad (A2)$$

where w_t is white noise and W is the unknown variance-covariance matrix of w_t . The spectral density matrix of ε_t is then

$$f(\lambda; \tau) = \frac{1}{2\pi} w(\lambda; \tau) W w(\lambda; \tau)^* \quad (A3)$$

$$w(\lambda; \tau) = \sum_{j=0}^{\infty} A_j(\tau) e^{i\lambda j},$$

where w^* means the complex-conjugate transpose of w . A number of conditions are required on A and f_ε when deriving the test statistic; their practical implications being that though ε_t is capable of exhibiting a much stronger degree of autocorrelation than multiple ARMA processes, its spectral density matrix must be finite, with eigenvalues bounded and bounded away from zero. In Gil-Alana (2003a) it is shown that a Lagrange Multiplier (LM) test of H_0 (A1) in (7) takes the form:

$$\tilde{S} = T \tilde{b}^T \left[\tilde{C} - \tilde{D}^T \tilde{E}^{-1} \tilde{D} \right]^{-1} \tilde{b}, \quad (A4)$$

where T is the sample size and

$$\begin{aligned} \tilde{b} &= \frac{-1}{T} \sum_{r=1}^{T-1} \psi(\lambda_r) \text{tr} \left(I_\varepsilon(\lambda_r) \tilde{f}(\lambda_r; \tilde{\tau}) \right); \quad \tilde{C} = \frac{4}{T} \sum_{r=1}^{T-1} \psi(\lambda_r) \psi(\lambda_r)^T; \\ \tilde{D}^T &= \frac{-1}{T} \sum_{r=1}^{T-1} \psi(\lambda_r) \left[\text{tr} \left(\tilde{f}^{-1}(\lambda_r; \tilde{\tau}) \frac{\partial \tilde{f}(\lambda_r; \tilde{\tau})}{\partial \tau_1} \right); \dots; \text{tr} \left(\tilde{f}^{-1}(\lambda_r; \tilde{\tau}) \frac{\partial \tilde{f}(\lambda_r; \tilde{\tau})}{\partial \tau_q} \right) \right]; \end{aligned}$$

$$\tilde{E}_{uv} = \frac{1}{2T} \sum_{r=1}^{T-1} \text{tr} \left(\tilde{f}^{-1}(\lambda_r; \tilde{\tau}) \frac{\partial \tilde{f}(\lambda_r; \tilde{\tau})}{\partial \tau_u} \tilde{f}^{-1}(\lambda_r; \tilde{\tau}) \frac{\partial \tilde{f}(\lambda_r; \tilde{\tau})}{\partial \tau_v} \right),$$

where $I_\varepsilon(\lambda_r)$ is a matrix with $(u,v)^{\text{th}}$ element:

$$\begin{aligned} I_{uv}(\lambda_r) &= W_u(\lambda_r) \overline{W_v}(\lambda_r); \quad W_u(\lambda_r) = \frac{1}{\sqrt{2\pi T}} \sum_{t=1}^T \tilde{\varepsilon}_{ut} e^{i\lambda_r t}, \\ \tilde{\varepsilon} &= \begin{pmatrix} \tilde{\varepsilon}_{1t} \\ \dots \\ \tilde{\varepsilon}_{nt} \end{pmatrix} = \begin{pmatrix} (1-L)^{d_{1o}} & \dots & \dots \\ \dots & \dots & \dots \\ \dots & \dots & (1-L)^{d_{no}} \end{pmatrix} \begin{pmatrix} y_{1t} \\ \dots \\ y_{nt} \end{pmatrix}, \end{aligned}$$

where the line over W denotes complex conjugate, and \tilde{f} is the spectral density matrix of $\tilde{\varepsilon}$:

$$\tilde{f}(\lambda; \tau) = \frac{1}{2\pi} \tilde{w}(\lambda; \tau) \tilde{W} \tilde{w}(\lambda; \tau)^*$$

with

$$\tilde{w}(\lambda; \tau) = \sum_{j=0}^{\infty} A_j(\tau) \tilde{\varepsilon}^{i\lambda j} \quad \text{and} \quad \tilde{W} = \frac{1}{T} \sum_{t=1}^T \tilde{\varepsilon}_t \tilde{\varepsilon}_t^T.$$

Finally,

$$\tilde{\tau} = \arg \min_{\tau \in T^*} \left(\frac{T}{2} \log \det \tilde{f}(\lambda_r; \tau) + \frac{1}{2} \sum_{r=1}^{T-1} \text{tr} \left(\tilde{f}^{-1}(\lambda_r; \tau) I_{\varepsilon}(\lambda_r) \right) \right),$$

where T^* is a compact subset of q -dimensional Euclidean space. Extending the conditions in Robinson (1994), Gil-Alana (2003a) shows that:

$$\tilde{S} \rightarrow_d \chi_n^2 \quad \text{as } T \rightarrow \infty. \quad (\text{A5})$$

Appendix B

We consider the following structural bivariate model:

$$\begin{pmatrix} a & b \\ c & d \end{pmatrix} \begin{pmatrix} (1-L)^{d1} & 0 \\ 0 & (1-L)^{d2} \end{pmatrix} \begin{pmatrix} y_{1,t} \\ y_{2,t} \end{pmatrix} = \begin{pmatrix} u_{1,t} \\ u_{2,t} \end{pmatrix}, \quad t = 1, 2, \dots, \quad (\text{B1})$$

where, initially, $u_{1,t}$ and $u_{2,t}$ are assumed to be serially uncorrelated, mutually orthogonal structural disturbances, whose variances are normalized to unity. Note that this model can be expressed as:

$$\begin{pmatrix} (1-L)^{d1} y_{1,t} \\ (1-L)^{d2} y_{2,t} \end{pmatrix} = \begin{pmatrix} \frac{d}{ad-bc} u_{1,t} - \frac{b}{ad-bc} u_{2,t} \\ \frac{-c}{ad-bc} u_{1,t} + \frac{a}{ad-bc} u_{2,t} \end{pmatrix}, \quad t = 1, 2, \dots \quad (\text{B2})$$

Considering now the transformed disturbances:

$$u_{1,t}^* = \frac{1}{ad-bc} (d u_{1,t} - b u_{2,t}) \quad \text{and} \quad u_{2,t}^* = \frac{1}{ad-bc} (a u_{2,t} - c u_{1,t}), \quad (\text{B3})$$

and using the Binomial expansions in the fractional differencing polynomials in the left-hand-side of (B1), we obtain

$$y_{1,t} = \sum_{j=0}^{\infty} \psi_j^{(1)} u_{1,t-j}^* \quad \text{and} \quad y_{2,t} = \sum_{j=0}^{\infty} \psi_j^{(2)} u_{2,t-j}^*, \quad (\text{B4})$$

$$\psi_j^{(i)} = \frac{\Gamma(j+d_i)}{\Gamma(j+1) \Gamma(d_i)}, \quad i = 1, 2,$$

where $\Gamma(x)$ stands for the Gamma function and d_i , $i = 1, 2$ are the orders of integration of the two series. Substituting (B3) into (B4):

$$\begin{aligned}
y_{1,t} &= \sum_{j=0}^{\infty} \phi_j^{(1,1)} u_{1,t-j} + \sum_{j=0}^{\infty} \phi_j^{(1,2)} u_{2,t-j}; \\
y_{2,t} &= \sum_{j=0}^{\infty} \phi_j^{(2,1)} u_{1,t-j} + \sum_{j=0}^{\infty} \phi_j^{(2,2)} u_{2,t-j},
\end{aligned} \tag{B5}$$

where the impulse response coefficients are:

$$\phi_j^{(1,1)} = \frac{d \psi_j^{(1)}}{ad-bc}; \quad \phi_j^{(1,2)} = \frac{-b \psi_j^{(1)}}{ad-bc}; \quad \phi_j^{(2,1)} = \frac{-c \psi_j^{(2)}}{ad-bc}; \quad \phi_j^{(2,2)} = \frac{a \psi_j^{(2)}}{ad-bc}. \tag{B6}$$

Appendix B.1: Identification in a pure vector fractional model

From the reduced-form system:

$$\begin{pmatrix} (1-L)^{d_1} & 0 \\ 0 & (1-L)^{d_2} \end{pmatrix} \begin{pmatrix} y_{1,t} \\ y_{2,t} \end{pmatrix} = \begin{pmatrix} \varepsilon_{1,t} \\ \varepsilon_{2,t} \end{pmatrix}, \quad t = 1, 2, \dots, \tag{B7}$$

we can obtain the estimates of d_1 and d_2 under the assumption that ε_t is a white noise vector process. Using now (B2) and (B7):

$$\begin{aligned}
\varepsilon_{1,t} &= \frac{d}{ad-bc} u_{1,t} - \frac{b}{ad-bc} u_{2,t}, & \text{and} \\
\varepsilon_{2,t} &= \frac{-c}{ad-bc} u_{1,t} + \frac{a}{ad-bc} u_{2,t},
\end{aligned}$$

implying that

$$\sigma_{11}^{\varepsilon} = \frac{1}{(ad-bc)^2} (d^2 \sigma_{11}^u + b^2 \sigma_{22}^u - 2bd \sigma_{12}^u), \tag{B8}$$

$$\sigma_{22}^{\varepsilon} = \frac{1}{(ad-bc)^2} (c^2 \sigma_{11}^u + a^2 \sigma_{22}^u - 2ac \sigma_{12}^u), \tag{B9}$$

$$\sigma_{12}^{\varepsilon} = \frac{1}{(ad-bc)^2} ((ad+bc) \sigma_{12}^u - dc \sigma_{11}^u - ab \sigma_{22}^u). \tag{B10}$$

Note that in this context we have three equations (B8-B10) for seven unknowns ($a, b, c, d, \sigma_{11}^u, \sigma_{12}^u$ and σ_{22}^u), but using the restrictions imposed on the variance-covariance matrix of u_t ($\sigma_{12}^u = 0$ and $\sigma_{11}^u = \sigma_{22}^u = 1$), the system given by (B8) – (B10) reduces to:

$$\begin{aligned}
\sigma_{11}^{\varepsilon} &= \frac{1}{(ad-bc)^2} (d^2 + b^2), & \sigma_{22}^{\varepsilon} &= \frac{1}{(ad-bc)^2} (a^2 + c^2), \\
\sigma_{12}^{\varepsilon} &= \frac{-1}{(ad-bc)^2} (dc + ab).
\end{aligned}$$

The new system of equations is still not identified, as there are only three equations for four unknowns. One possibility is to assume that one of the coefficients (a, b, c or d) is

equal to 0. For example, $b = 0$ implies, according to (B6), that a structural shock to y_{2t} (u_{2t}) has no effect on y_{1t} neither contemporaneously nor in the long run. Similarly, if $c = 0$, a shock to y_{1t} will have no effect on y_{2t} . This is a plausible assumption in some cases. Alternatively, (Blanchard and Quah, 1989) we can impose the restriction:

$$\sum_{j=0}^{\infty} \phi_j^{(1,2)} = 0 \quad , \quad \text{or} \quad \sum_{j=0}^{\infty} \phi_j^{(2,1)} = 0. \quad (\text{B11})$$

Combining the previous expression with (B11) the system is now completely identified and the impulse response functions can easily be obtained.

Appendix B.2: A (2x1) vector fractionally autoregressive model

Here, we extend the structural model (B1) to the case of weak parametric autocorrelation in u_t . In particular, we consider the case of a VAR(1) system for u_t . Thus, the structural model is now (B1) with

$$\begin{pmatrix} u_{1,t} \\ u_{2,t} \end{pmatrix} = \begin{pmatrix} \phi_{11} & \phi_{12} \\ \phi_{21} & \phi_{22} \end{pmatrix} \begin{pmatrix} u_{1,t-1} \\ u_{2,t-1} \end{pmatrix} + \begin{pmatrix} v_{1,t} \\ v_{2,t} \end{pmatrix}, \quad t = 1, 2, \dots, \quad (\text{B12})$$

where $v_{1,t}$ and $v_{2,t}$ are serially uncorrelated and mutually orthogonal with unit variance (i.e., $\sigma_{11}^v = \sigma_{22}^v = 1$ and $\sigma_{12}^v = 0$) and with all the roots lying outside the unit circle. First, we describe the impulse response functions. Assuming that u_t is stationary, (B12) can be written as:

$$\begin{pmatrix} u_{1,t} \\ u_{2,t} \end{pmatrix} = \begin{pmatrix} C_{11}(L) & C_{12}(L) \\ C_{21}(L) & C_{22}(L) \end{pmatrix} \begin{pmatrix} v_{1,t} \\ v_{2,t} \end{pmatrix}, \quad t = 1, 2, \dots, \quad (\text{B13})$$

where $C_{ij}(L)$, $i, j = 1, 2$ are polynomials of infinite order in L . From (B2) and (B13):

$$\begin{pmatrix} (1-L)^{d_1} y_{1,t} \\ (1-L)^{d_2} y_{2,t} \end{pmatrix} = \frac{1}{ad-bc} \begin{pmatrix} d & -b \\ -c & a \end{pmatrix} \begin{pmatrix} C_{11}(L)v_{1,t} + C_{12}(L)v_{2,t} \\ C_{21}(L)v_{1,t} + C_{22}(L)v_{2,t} \end{pmatrix} = \frac{1}{ad-bc} \begin{pmatrix} dC_{11}(L)v_{1,t} + dC_{12}(L)v_{2,t} - bC_{21}(L)v_{1,t} - bC_{22}(L)v_{2,t} \\ -cC_{11}(L)v_{1,t} - cC_{12}(L)v_{2,t} + aC_{21}(L)v_{1,t} + aC_{22}(L)v_{2,t} \end{pmatrix} = \begin{pmatrix} w_{1,t} \\ w_{2,t} \end{pmatrix} \quad (\text{B14})$$

Hence, the model becomes:

$$\begin{pmatrix} (1-L)^{d_1} y_{1,t} \\ (1-L)^{d_2} y_{2,t} \end{pmatrix} = \begin{pmatrix} w_{1,t} \\ w_{2,t} \end{pmatrix}, \quad t = 1, 2, \dots, \quad \text{implying that}$$

$$y_{1,t} = \sum_{j=0}^{\infty} \psi_j^{(1)} w_{1,t-j} \quad \text{and} \quad y_{2,t} = \sum_{j=0}^{\infty} \psi_j^{(2)} w_{2,t-j}. \quad (\text{B15})$$

Substituting now w_t from (B14) into (B15) we obtain

$$y_{1,t} = \sum_{j=0}^{\infty} \rho_j^{(1,1)} v_{1,t-j} + \sum_{j=0}^{\infty} \rho_j^{(1,2)} v_{2,t-j}, \quad (\text{B16})$$

$$y_{2,t} = \sum_{j=0}^{\infty} \rho_j^{(2,1)} v_{1,t-j} + \sum_{j=0}^{\infty} \rho_j^{(2,2)} v_{2,t-j}, \quad (\text{B17})$$

where the impulse response functions are:

$$\begin{aligned} \rho_j^{(1,1)} &= \psi_j^{(1)} \frac{(dC_{11}(L) - bC_{21}(L))}{ad - bc}, \\ \rho_j^{(1,2)} &= \psi_j^{(1)} \frac{(dC_{12}(L) - bC_{22}(L))}{ad - bc}, \end{aligned} \quad (\text{B18})$$

$$\begin{aligned} \rho_j^{(2,1)} &= \psi_j^{(2)} \frac{(-cC_{11}(L) + aC_{21}(L))}{ad - bc}, \\ \rho_j^{(2,2)} &= \psi_j^{(2)} \frac{(-cC_{12}(L) + aC_{22}(L))}{ad - bc}. \end{aligned} \quad (\text{B19})$$

Appendix B.3: Identification in a VAR fractional model

The reduced-form model is now (B7) with

$$\begin{pmatrix} \varepsilon_{1,t} \\ \varepsilon_{2,t} \end{pmatrix} = \begin{pmatrix} \xi_{11} & \xi_{12} \\ \xi_{21} & \xi_{22} \end{pmatrix} \begin{pmatrix} \varepsilon_{1,t-1} \\ \varepsilon_{2,t-1} \end{pmatrix} + \begin{pmatrix} w_{1,t} \\ w_{2,t} \end{pmatrix}, \quad t = 1, 2, \dots, \quad (\text{B20})$$

and using again any of the parametric procedures for vector fractional integration we can obtain estimates of d_1 and d_2 , ξ_{11} , ξ_{12} , ξ_{21} and ξ_{22} , along with the coefficients of the variance-covariance matrix of w_t , i.e., σ_{11}^w , σ_{12}^w and σ_{22}^w .

Identification follows here the same lines as in the previous case, noting that

$$\begin{pmatrix} w_{1,t} \\ w_{2,t} \end{pmatrix} = \begin{pmatrix} a & b \\ c & d \end{pmatrix}^{-1} \begin{pmatrix} v_{1,t} \\ v_{2,t} \end{pmatrix},$$

implying three equations of the same form as in the white noise case, and that

$$\begin{pmatrix} \xi_{11} & \xi_{12} \\ \xi_{21} & \xi_{22} \end{pmatrix} = \begin{pmatrix} a & b \\ c & d \end{pmatrix}^{-1} \begin{pmatrix} \phi_{11} & \phi_{12} \\ \phi_{21} & \phi_{22} \end{pmatrix} \begin{pmatrix} a & b \\ c & d \end{pmatrix}.$$

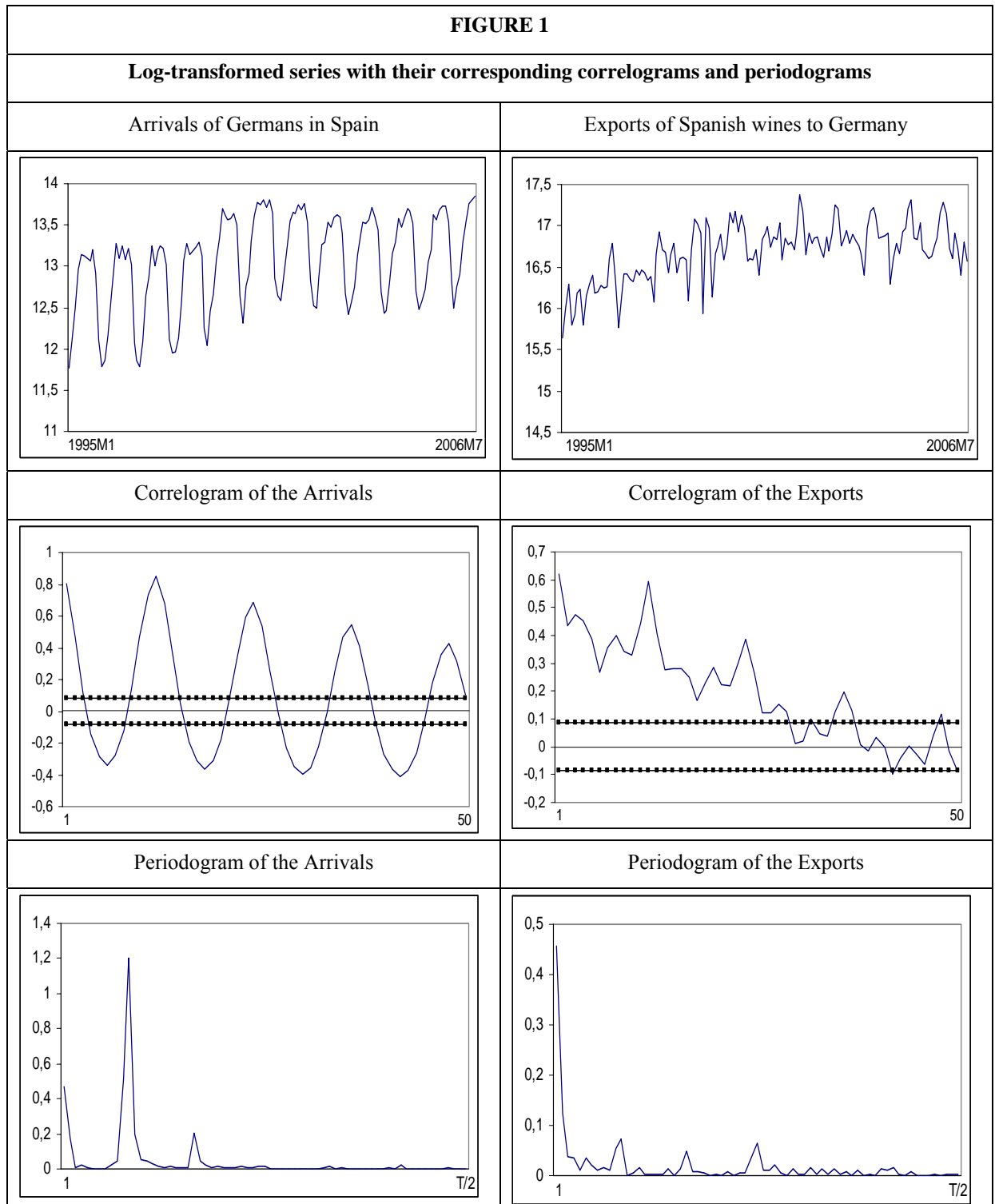
Thus, we add four equations with four unknowns, so the same restrictions as in the previous case apply here.

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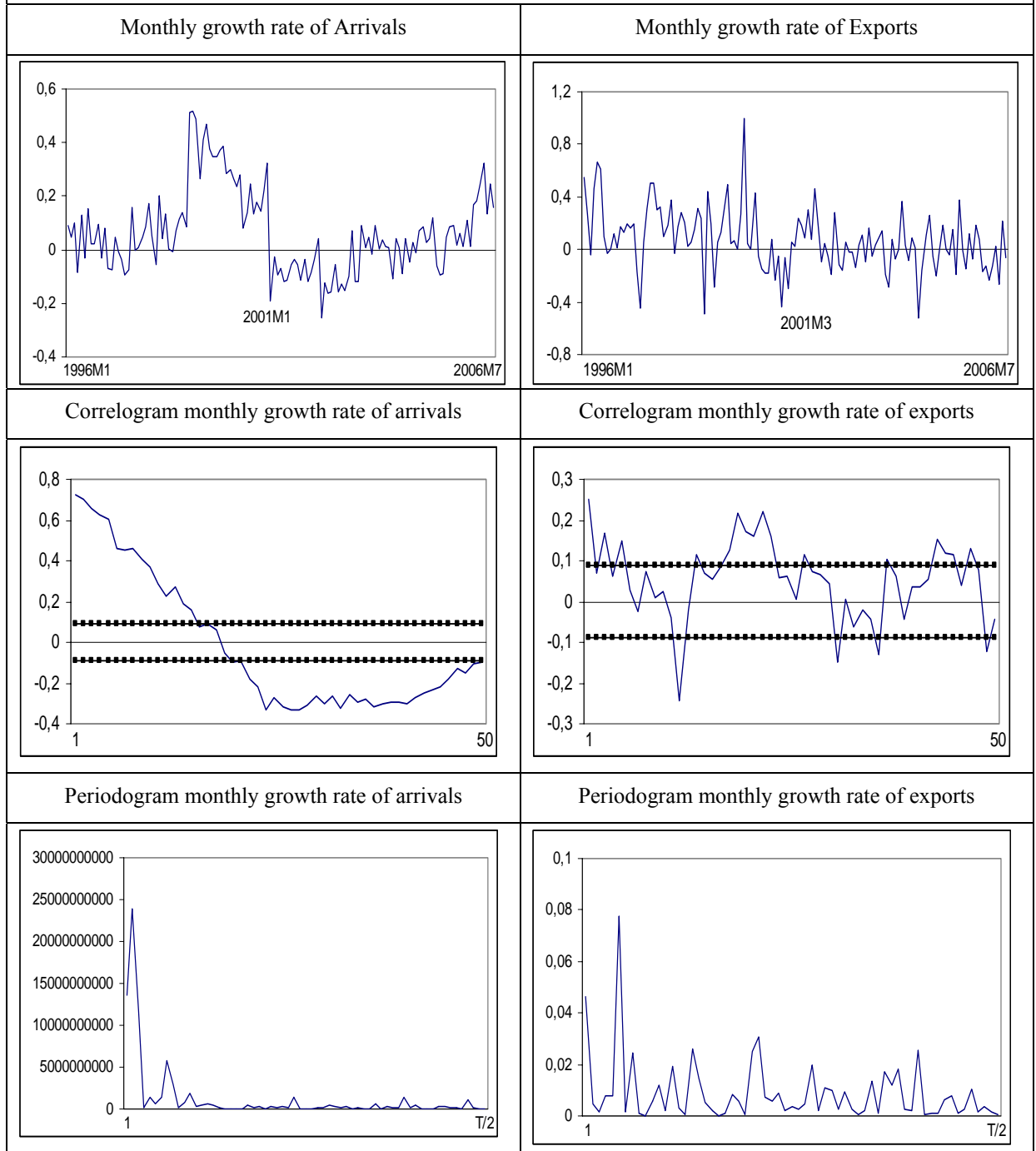
Tables and Figures



The large sample standard error under the null hypothesis of no autocorrelation is $1/\sqrt{T}$ or roughly 0.08 for the series used in this application. The periodograms are computed based on the discrete frequencies $\lambda_j = 2\pi j/T$.

FIGURE 2

Monthly growth rate series with their corresponding correlograms and periodograms



The large sample standard error under the null hypothesis of no autocorrelation is $1/\sqrt{T}$ or roughly 0.08 for the series used in this application. The periodograms are computed based on the discrete frequencies $\lambda_j = 2\pi j/T$.

TABLE 1			
Testing the order of integration in the univariate time series			
ARRIVALS	No regressors	An intercept	A linear time trend
White noise	[0.47 (0.54) 0.63]	[0.47 (0.54) 0.63]	[0.47 (0.54) 0.64]
AR (1)	[0.62 (0.73) 0.87]	[0.61 (0.72) 0.87]	[0.61 (0.72) 0.87]
Bloomfield (1)	[0.65 (0.80) 1.03]	[0.64 (0.80) 1.02]	[0.64 (0.80) 1.02]
EXPORTS	No regressors	An intercept	A linear time trend
White noise	[0.09 (0.19) 0.33]	[0.09 (0.18) 0.31]	[-0.07 (0.08) 0.27]
AR (1)	[-0.14 (0.06) 0.30]	[-0.14 (0.06) 0.27]	[-0.12 (0.02) 0.12]
Bloomfield (1)	[-0.06 (0.10) 0.33]	[-0.04 (0.08) 0.27]	[-0.09 (0.03) 0.13]

TABLE 2							
Estimates of the fractional differencing parameters with a single structural break							
ARRIVALS	T_b	First sub-sample			Second sub-sample		
		d_1	α_1	β_1	d_2	α_2	B_2
White noise	2001M1	0.58	0.0150 (0.168)	0.00016 (0.051)	0.21	-0.3972 (-5.319)	0.00408 (5.213)
AR (1)	2001M1	0.65	-0.0168 (-0.127)	0.0042 (1.198)	0.43	-0.5371 (-5.279)	0.00534 (4.947)
EXPORTS	T_b	First sub-sample			Second sub-sample		
		d_1	α_1	β_1	d_2	α_2	B_2
White noise	2001M3	0.26	0.2720 (2.132)	-0.0074 (-2.189)	-0.04	0.2017 (2.066)	-0.0021 (-2.116)
AR (1)	2001M3	0.31	0.2428 (1.918)	-0.0049 (-1.920)	0.02	0.2276 (2.028)	-0.0074 (-1.943)

t-values in parenthesis.

FIGURE 3

(d_1, d_2) -values where H_0 cannot be rejected at the 5% level for white noise u_t .

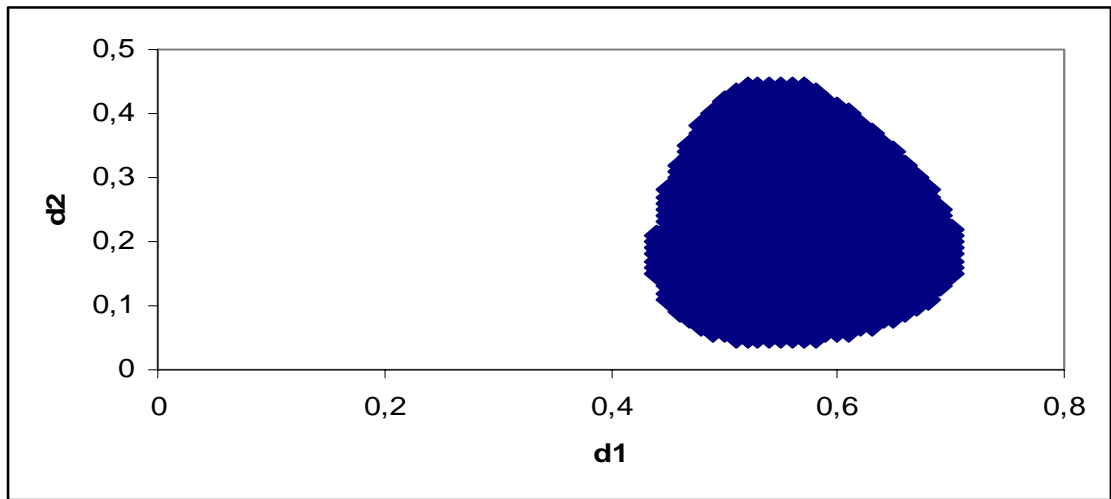


FIGURE 4

(d_1, d_2) -values where H_0 cannot be rejected at the 5% level for VAR(1) u_t .

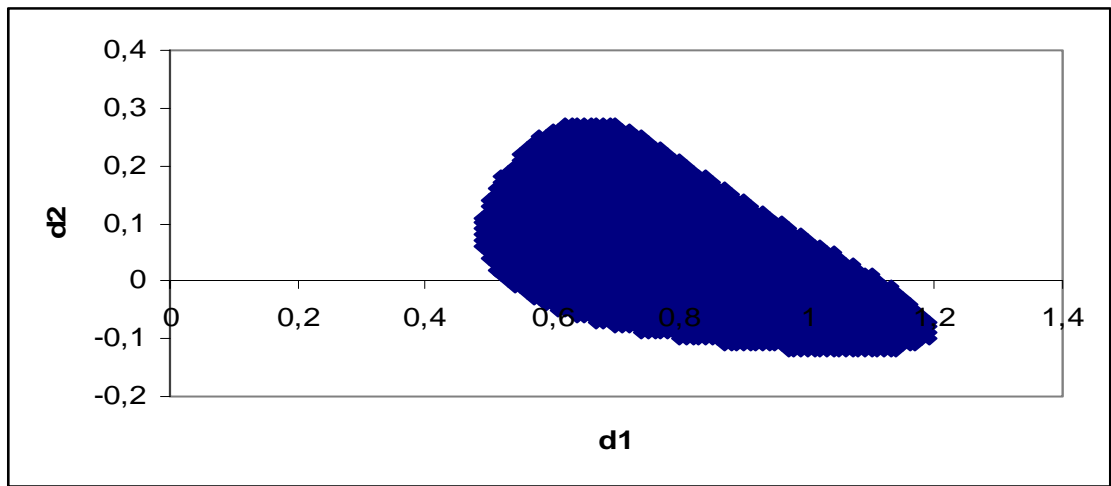


TABLE 4		
Estimates of the orders of integration in a multivariate framework		
Disturbances / Order of Int.	d_1 (Arrivals)	d_2 (Exports)
White noise	0.54	0.18
VAR (1)	0.70	0.04

TABLE 5		
Cross impulse responses of travelling on exports		
Time periods	White noise	VAR (1)
1	-0.0248	0.0979
2	0.0204	0.0276
3	0.0018	0.0079
4	0.0007	0.0033
5	0.0004	0.0018
6	0.0002	0.0013
7	0.0002	0.0010
8	0.0001	0.0009
9	0.0001	0.0007
10	0.0001	0.0007
11	0.0001	0.0006
12	0.0001	0.0005
13	0.0000	0.0005
14	0.0000	0.0005
15	0.0000	0.0004
16	0.0000	0.0004
17	0.0000	0.0004
18	0.0000	0.0004
19	0.0000	0.0003
20	0.0000	0.0003

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Competitiveness of Turkey's Organic Exports in the European Union Market

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Summary

Turkey's exports of organically produced agricultural products have been rapidly growing particularly in response to increasing demand in the European Union countries. Common view and findings of the research on organic trade in Turkey confirms that European market is expanding.

A lacking component of the existing research on Turkey's organic exports is that none of the studies focused on modeling the export market for organic products which would enable to make forecasts as well as to make analysis for policy implications. Another missing component of the stream of studies on trade of Turkish organic commodities is the lack of understanding of the present situation of the competitiveness of Turkish exports in the European Union market. The study therefore focuses on estimating an econometric export demand function for organic products and exploring the competitiveness and export performance of Turkish exports as well as understanding the components of export performance. An effort to estimate an econometric export demand model for Turkey's organic exports and revealing sources of export performance and competitiveness is what makes the present study a unique one.

The project has three major objectives and thus seeks to produce three outputs: *The first objective is to estimate an export demand model for Turkish organic products in the European Union market.* It is therefore possible to estimate price and income elasticities of demand as well as to make projections. *The second objective is to explore Turkey's export competitiveness in organic products in the European Union market.* In order to fulfill this objective, we will estimate indices to measure Turkey's competitiveness. *The third objective is to investigate export competitiveness and determine the components of export performance.* Through constant market share analysis, we seek to determine the key factors underlying the growth of Turkey's organic exports.

The study reveals that export demand for the Turkish organic products are growing and sensitive to price and income changes in target countries. Turkey has a clear comparative advantage against the rival EU countries in selected products. Competitiveness is particularly due to relative prices, thus does not indicate a sustainable competitiveness due to lack of added value in the export items.

KEY WORDS: Organic Agriculture, Turkish Agriculture, Export Demand, Competitiveness, Turkish Organic Exports

Introduction

Studies on the economics of organic agriculture in Turkey have started in early 1990s. The studies cover topics such as differences in production costs (Akgüngör, 1996); domestic market demand (Akgüngör, et.al, 1999; Koç et.al., 2001) and export (Gündüz, 2001).

The common finding of the studies is that organic agriculture in Turkey has grown rapidly both in terms of production and exports. The studies point out that Turkey has a comparative advantage in export markets both with respect to product variety and product quality. There has not been a systematic study on how Turkey's organic exports are sensitive to changes in relative prices and consumers' disposable income. A sound export policy should take into consideration of how prices and income changes affect export competitiveness. Existing research emphasizes the growing potential of Turkish organic exports yet does not look into estimating the parameters of demand for organic food imports of the EU countries of Turkish origin.

Another missing component of the existing research is that they do not analyze the level of competitiveness of Turkey's exports against its major rivals and whether and how have

competitiveness changed over time. Existing studies also miss the analysis of determining the major determinants of export growth.

Objectives

The aim of the study is to estimate an econometric export demand function for organic products and explore competitiveness and export performance of Turkish organic exports to the European Union market.

The paper has three major objectives:

- The first objective is to estimate an econometric export demand model for Turkish organic products in the European Union market. This objective aims to reveal price and income elasticities of demand as well as to make export forecasts.
- The second objective is to understand Turkey's export competitiveness of organic products in the European Union market.
- The third objective is to uncover the components of export performance.

Methodology

1. Method in estimating price and income elasticity estimates: Price and income elasticity estimates are determined through estimating an econometric export demand model for Turkey's organic product exports to the EU market. We also use Linear Approximation (LA) / Almost Ideal Demand System (AIDS) model is a convenient tool to estimate organic products' price and income elasticities (Deaton and Muellbauer). Details regarding econometric model and LA/AIDS model are explained in relevant sections as presented below.
2. Method in estimating export competitiveness of Turkey's organic products in the EU market against its major competitors: To explore the export competitiveness of Turkey's organic products in the EU market, we use competitiveness indices such as revealed comparative advantage index and comparative export performance index. Details regarding indices are explained in relevant sections as presented below.
3. Method in estimating the sources of export performance: Constant market share analysis seeks to reveal the sources of existing export performance. The constant market share analysis developed by Tysznski (1951) and further developed by Leamer ve Stern (1970) Richardson (1971) explores whether the growth in exports are due to export performance or the country's export competitiveness.

Data

In estimating the export demand function and LA/AIDS model, we use export data that is compiled by the Aegean Region Exporters' union and published by Turkey's Ministry of Turkey's Agricultural and Rural Affairs. Systematic data collection on organic exports has started in 1999. The data set on organic food exports therefore covers the period of 1999-2005. The income and population series of the EU countries were obtained from International Financial Statistics. Consumer price index series to convert dollar values into constant prices are from US Bureau Labor Statistics for the CPI for Urban Consumers (1984-86). All data covers annual observations for the 1999-2004 period.

In estimating export competitiveness and constant market share analysis, we need data for world organic food exports as well as organic exports of individual countries. The indices require incoming and outgoing export flows for Turkey and selected rival countries in four target countries. Since Eurostat database does not include organic trade flows, and no other data set were complete and sufficient enough to do the computations, we proxy conventional products in place of organic external trade flow. We therefore use Eurostat external trade data set (Comext) without being able to distinguish across organic and conventional food exports.

Process of Product and Target Country Selection

In selecting the highest percentage of organic products in total organic exports, we determine products with higher than 10% of organic exports. The products with exports shares over 10% for the 1998-2004 period are, raisins, dried figs, dried apricots and hazelnuts. These four products make up 77.7% and 59.7% of total organic product exports in 1999 and 2004, respectively.

The demand model is estimated for the 4 EU target countries with highest shares in Turkey's total organic exports to the EU. Germany, Netherlands, France and United Kingdom are the four countries with highest shares in Turkey's total organic exports (60-70% over the years).

Results

1. Export Demand Function for Turkey's Export into the EU Market

1.1. Demand Function

To understand the effect of price and income changes on Turkey's organic food exports in target markets, we estimate an econometric demand function for Turkey's organic food. The estimated demand function is actually an import demand function for Turkish organic foods in the target EU countries. The function enables us to explore how relative prices affect Turkey originated organic imports as well as to be able to make predictions on market share of Turkish imports on total organic imports.

A demand function for the aggregate EU market is not a practical option since the number of observations on prices and quantities imported (exported from Turkey) do not cover a long time span (data is limited to annual organic food export data for the 1998-2004 period). In order to avoid the problem regarding degrees of freedom, we construct two sets of panel data. The first data set covers four target countries that Turkey has the highest import share (Germany, Netherlands, France and Great Britain). The second data set covers four product groups (raisins, dried figs, dried apricots and hazelnuts).

The econometric demand function is presented below for selected products and countries.

$$X_{it}^d = \alpha_i^d + \gamma_1 P_{it} + \gamma_2 P_{it}^w + \gamma_3 X_t^{AB} + Y_t^{AB} + \varepsilon_t$$

Where,

X_{it}^d = export demand for product i (quantity) at time t.

P_{it} = Real export price of product i at time t.

P_{it}^w = Real world price of product i at time t.

X_t^{AB} = Total demand of the EU for Turkish exports (quantity demanded) at time t.

Y_t^{AB} = Disposable income in the EU target countries at time t.

The above equation can be estimated in one stage under the assumption that the price is exogenous. In order to find out whether there is a problem of simultaneity; we use the test developed by Hausman and explore whether Turkey's export price is independent of quantity exported. In order to proceed, an instrument for the price variable is developed using the supply equation as presented below.

$$P_{it} = \alpha_i^s + \beta_1 X_{it}^s + \beta_2 E_t + \beta_3 P_t^{dom} + \beta_4 DC_t + \beta_5 Y_t^{dom} + \beta_6 PC_t + u_{it}$$

Where,

P_{it} = Real export price of product i at time t.

X_{it}^s = Export supply for product i at time t.

E_t = Real exchange rate at time t.

P_t^{dom} = CPI in Turkey at time t.

DC_t = Export incentives

Y_{dom}^t = Quantity produced in the domestic market

PC_t = Production cost

The demand function is estimated through two different sets of panel data. The dependent variable of the first set of panel data has the quantity exported (quantity imported by the EU target countries) of four products. The second set of panel data has the quantity exported (quantity imported by the EU target countries) by the four target countries.

The first set of panel data estimates the import demand function for the four selected products (organic raisins; organic apricots, organic figs and organic hazelnuts). The dependent variable is per capita imports of product i from the selected target countries (kg/population). Here, i denotes organic raisins; organic apricots, organic figs and organic hazelnuts. The independent variables of the model are price and income variables. The price variable measures the ratio of the export price of product i to country j to the world price of product i. The income variable measures the per capita purchasing power parity of consumers in target country j.

The second set of panel data estimates the import demand function of the four selected countries (Germany, Netherlands, France and United Kingdom). The dependent variable is Turkey's aggregate export of four products to target country j. The independent variables of the model are price and income as defined above.

1.2. LA/AIDS Model

In addition to the estimates derived from the export demand function we use LA/AIDS model to predict price and income elasticities within a closed system of demand equations for organic products. The model consists of the consumers' budget shares of the products, product prices and consumers' disposable income:

$$w_i = \alpha_i + \sum_j \gamma_{ij} \log p_j + \beta_i \log(x/P)$$

Where w_i is the budget share of the i th good, x is the total consumption expenditure, p_j is the price of the j th good and P is the Stone's approximation of the price index specified as below:

$$\log P = \alpha_0 + \sum_i \alpha_i \log P_i + 1/2 \sum_j \sum_k \gamma_{jk} \log p_j \log p_k$$

The model has the following restrictions:

$$\sum_{i=1}^n \alpha_i = 1$$

$$\sum_{i=1}^n \gamma_{ij} = 0$$

$$\sum_{i=1}^n \beta_i = 0$$

$$\sum_j \gamma_{ij} = 0$$

$$\gamma_{ij} = \gamma_{ji}$$

Under the above restrictions, the AIDS equation is a demand system. The price and income elasticities are defined as below following Gren ve Alston (1990 and 1991):

Expenditure elasticity:

$$\varepsilon_i = \left(1 + \frac{\beta_i}{w_i} \right)$$

Price elasticity:

$$\varepsilon_{ij} = \delta_{ij} + \frac{\gamma_{ij}}{w_i} + \frac{\beta_i w_j}{w_i}$$

Using the LA/AIDS model, we get income and price elasticities of Turkey's exports of organic products to the four importing EU countries, under the assumption that the consumer expenditure for the organic products can be modeled independent of the consumers' other expenditures.

1.3. Model Estimation and Findings

The coefficient estimates of the demand function and LA/AIDS model are presented below.

1.4.1. Demand Function Estimates

As explained above, the demand functions are estimated for Turkey's four largest organic exports (raisins, dried figs, dried apricots and hazelnuts) and largest EU importing countries for Turkey's organic exports (Germany, Netherlands, France and United Kingdom). Export demand equation is estimated for the aggregate of the four products as well as the aggregate for the four countries. The demand functions are specified as below:

$$PCQ_{jit} = \alpha_0 + \alpha_1 PR_{jit} + \alpha_2 YR_{jit} + u_t$$

Where,

t : time (t = 1998 , ..., 2004)

j : countries (j = Germany, Netherlands, France and United Kingdom)

i : products (i = raisins, dried figs, dried apricots and hazelnuts)

PCQ_{jit} : per capita exports of good i to country j in year t (Kg.)

PR_{jit} : relative export price of good I in country j in year t (US\$/Kg)

YR_{jit} : Per capita real income of country j in year t according to purchasing power parity (US \$).

Relative export prices (PR_{jit}) is determined by the ratio of price series (export value (\$) divided by quantity exported (kg)) and world price of the product. Since organic product price series does not exist, we use conventional product export price as a proxy for organic food. Since it is expected that price series of the organic products and conventional products are correlated, such proxy is considered to be the second best for using the organic price series.

The exogeneity of the price variable is tested by the test developed by Hausman. The Hausman test suggests endogeneity so a two stage least squares methods is used to estimate the demand equation.

The demand function is estimated under two different specifications. The first specification includes the aggregate of four product imports by the selected countries. Country demand functions are thus estimated. The second specification includes the aggregate of four countries for the four products. Product demand functions are estimated using two sets of panel data for the 1998-2004 period. Since the fixed effect model is a more efficient estimator than the random effect model, we estimate the fixed effect panel model. The cross section heterogeneity problem is corrected by the method developed by White.

- Product Demand Functions

The product demand function estimates are presented in Table 1.

(Table 1)

The results indicate that per capita real income variable is positive and significant as expected. Similarly, the relative price variables on all products except for dried figs are negative and significant. The high value of the per capita income variable is particularly related to the fact that the organic products that are covered in the study are considered to be luxury products, thus suggesting high income elasticities. The products that are most sensitive to price changes are raisins and hazelnuts.

- Organic Product Demand for Countries

The country import demand functions are estimated and results are presented in Table 2:

(Table 2)

All four countries have negative price coefficients and positive income coefficients. All variables are statistically significant except for per capita and price variable in Netherlands and per capita income variable of France.

1.4.2. LA/AIDS Model

The LA/AIDS model is specified as below:

$$w_i = \alpha_i + \sum_j \gamma_{ij} \log p_j + \beta_i \log(x/P)$$

(i = raisins, dried figs, dried apricots and hazelnuts)

(j = Germany, Netherlands, France and United Kingdom)

The demand system under the LA/AIDS model covers five products. Those are, raisins, dried figs, dried apricots, hazelnuts and all other products. The assumption is that the consumer expenditure for organic products in selected countries can be modeled independent of all other products and expenditures. The budget shares of the products in selected countries are presented in Table 3.

(Table 3)

The elasticities are estimated using the coefficients estimated by the LA/AIDS model as explained above. The elasticity estimates are summarized in Table 4.

(Table 4)

The main diagonal of Table 4 indicates own price elasticities of the products where the off diagonal elements are cross price elasticities. The last column can be interpreted as income elasticities for the products. All coefficients of the price expenditure estimates are lower than 1 as expected and except for the price elasticity of raisins, all have negative values that is consistent with economic theory. The findings regarding cross price elasticity estimates suggest that the sign of the coefficients are negative and that the products are not considered to be substitutes.

Per capita expenditure elasticities of the products are positive as expected by the economic theory. This indicates that real per capita income increases would cause higher demand for the organic products. Here, the income elasticity of dried apricots is 1,24 (elastic); income elasticity of raisin is 1,03 (unitary elastic); income elasticity of dried figs and hazelnuts are 0,51 and 0.33 (inelastic).

Consequently, a relative increase in per capita income of Germany, France, Netherlands and United Kingdom would cause a larger increase in per capita consumption of dried apricots and a smaller increase in per capita consumption of dried figs and hazelnuts.

3. Export Competitiveness of Turkish Organic Products

Export competitiveness indices that are used in the context of the research are “revealed comparative advantage index” and “comparative export performance index”. The indices are calculated for the 1999-2005 period using European Commission Intra and Extra Trade (COMEXT) database.

3.1. Revealed Comparative Advantage (RCA) Index

The revealed comparative advantage index explores whether the country has a comparative advantage over the rival countries. The formula of the RCA index is presented below:

$$RCA = \ln \left\{ \frac{(X_i^B)}{(X^B)} / \frac{(X_i^A)}{(X^A)} \right\}$$

Here,

X_i^B = Turkey's export of product i to the EU market.

X^B = Turkey's total exports to the EU market.

X_i^A = Rival countries' export of product i to the EU market.

X^A = Rival countries' total exports to the EU market.

The positive index values indicate a comparative advantage.

3.2. Comparative Export Performance (CPA) Index

The index is presented below. A value greater than 100 indicates a comparative advantage

$$CPA = (X_{it} / X_t) / (X_{iw} / X_w) \times 100$$

Here,

X_{it} = Turkey's export of product i (Exports to the world and exports to the EU)

X_t = Turkey's total exports (Exports to the world and exports to the EU)

X_{iw} = World (and EU) exports of product i

X_w = World (and EU) total exports

3.3. Constant Market Share Analysis

The CMS equation is specified below:

$$\Delta q = \sum_i \sum_j s_{ij}^0 \Delta Q_{ij} + \sum_i \sum_j Q_{ij}^0 \Delta s_{ij} + \sum_i \sum_j \Delta s_{ij} \Delta Q_{ij}$$

Where,

q = target country's organic exports (value)

s_{ij} = Turkey's export market share of product i (selected four products) in country j (selected four countries)

Q_{ij} = Total imports of market j

Δ = annual change

0 = base year

The first term of the above equation represents "structural effect", second term represents "competitiveness effect" and the third term represents "secondary effect (combination of both effects)" (Chen and Duan, 2001).. Structural effect represents export growth due to total growth in the EU market. Competitiveness effect represents export growth due to Turkey's export competitiveness. The secondary effect represents combination of both the structural and competitiveness effect.

3.4. Selection of Rival Countries in Target Markets

To determine Turkey's export competitiveness in the EU market, there is a need to know the rival countries in selected target EU countries. In determining rival EU countries, we select the ones whose export shares are larger than 20% for the selected products in selected target countries during the 1999-2004 period.

The analysis is done for two distinct markets: intra and extra EU markets. Countries whose export shares are larger than 20% separately for the intra and extra EU market are selected. Table 5 summarizes the distribution of value of selected products imported for the selected countries. As the import value figures in Table 5 indicates, the vast majority of exports are made from the extra EU countries.

(Table 5)

Turkey has the highest share of imports of the selected four products in selected target markets. However, small as they are, the EU member countries whose export shares in intra-EU trade are higher than 20% are presented in Table 6.

(Table 6)

3.5. Findings

- Revealed Comparative Advantage (RCA) Index

Tables 7, 8, 9 and 10 summarize the RCA index for selected rival countries and products.

All rival countries have comparative advantage over Turkey when exports of selected four products are compared with the total of four (RCA 1). When exports of selected four products are compared with the total exports of fruits and vegetables, RCA 2 reveals that Turkey has a comparative advantage over the rival countries. Similar results prevail with respect to dried apricots, dried figs and hazelnuts. The results are consistent with the fact that Turkey's majority of fruit and vegetable exports consist of the selected four products, thus representing traditional export items and less variety in fruit and vegetable exports. When fruit and vegetable sector exports as a whole are taken into consideration, Turkey has a clear comparative advantage over the competing countries with respect to raisins, dried figs, dried apricots and hazelnuts.

(Table 7)

(Table 8)

(Table 9)

(Table 10)

- Turkey's Export Performance (CEP index)

The findings from the CEP index are consistent with the findings from the RCA index. Turkey has a clear comparative advantage in the EU market in selected four products against rival EU member countries.

(Table 11)

(Table 12)

(Table 13)

(Table 14)

Turkey's export competitiveness of raisins is high against rival EU countries. The country in close performance with Turkey is Greece. Yet Greece has lower values of CEP index indicating that Turkey has a clear comparative advantage with respect to prices and market share in the EU market against its closest rivals.

Above findings indices indicate that Turkey has comparative advantage over the rival EU exporting countries. The section below seeks to explore the source of export competitiveness.

- Constant Market Share Analysis (CMS)

Constant market share analysis is used to explore the factors that affect a country's export performance. The analysis assumes three factors to explain the reason why a country exports grow faster than world exports: The first reason is related to the growth of the export market relative to the world export growth (structural effect). The second reason is improvements in competitiveness of the exporting country (competitiveness effect). The third reason is a combined effect of competitiveness and structure. Table 15 and 16 summarizes the results of CMS analysis. The CMS analysis reveal that all of Turkey's

export growth in the selected four products is due to the growth of the EU 25 market. Turkey's comparative advantage is not due to increase in its competitiveness but is related to the gradual growth of EU export market.

(Table 15)

(Table 16)

4. Final Remarks

The findings show that Turkey's exports of organic products to the EU market are growing however is limited to traditional export items (dried products) over the years. The growth in exports is particularly due to relative prices. Had Turkey's prices become relatively higher than the rival countries, it is quite likely that Turkey would lose its market share.

Except for hazelnuts and dried figs, the expenditure elasticity of selected products (raisins, dried figs and apricots) are higher than unity thus suggesting that consumers tend to demand more when their incomes increase. The CMS analysis show that competitiveness is particularly due to relative prices thus does not indicate a sustainable competitiveness due to lack of added value in the export items.

Although the paper reveals evidence of cost competitiveness, it cannot compare the conditions of Turkey and the rival EU countries for sustained competitiveness. Sustainability in competitiveness depends on the political, legal and macroeconomic foundations as well as microeconomic conditions for prosperity, such as company operating practices and strategies, quality of inputs, infrastructure and institutions. Competitiveness must therefore shift from comparative advantage (low cost labor or natural resources) to competitive advantage due to more productive and distinctive products and processes. The focus of further research should consider exploring the conditions for sustainable competitiveness with respect to microeconomic foundations of productivity and investigate the sophistication of the environment within which the firms in respective countries compete.

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Table 1 – Import Demand Coefficients for Selected Organic Products

Coefficient	<i>Raisins</i>	<i>Dried Apricots</i>	<i>Dried Figs</i>	<i>Hazelnuts</i>
Relative price (t statistic)	-3.83190 (-4.506503)	-0.51582 (-1.706358)	1.49839 (1.000027)	-1.72648 (-2.812257)
Real Per Capita Income (t statistic)	12.189510 (6.092963)	8.61162 (7.164771)	12.77593 (2.933813)	5.86772 (2.246187)

Table 2 – Organic Import Demand Coefficients for Selected Countries

Coefficient	Countries			
	Germany	Netherlands	France	United Kingdom
Relative price (t statistic)	-0.439526 (-2.471176)	-0.209861 (-0.989804)	-0.665028 (-4.806804)	-0.832126 (-4.454662)
Real Per Capita Income (t statistic)	1.672867 (0.903075)	5.879414 (0.461628)	9.178942 (10.23006)	5.798229 (2.996906)

Table 3: Budget Shares of the Target Countries (%)

Germany						
	Raisins	Dried Figs	Dried Apricots	Hazelnuts	Other Organic Products	Total
1998	14.8	16.0	15.3	30.7	23.2	100
1999	13.6	19.3	11.6	23.0	32.5	100
2000	17.7	10.7	15.6	25.1	30.8	100
2001	18.3	9.9	15.3	23.4	33.1	100
2002	18.8	12.5	19.0	12.4	37.3	100
2003	24.4	11.7	17.0	16.4	30.5	100
2004	17.9	16.6	14.0	22.4	29.2	100
France						
	Raisins	Dried Figs	Dried Apricots	Hazelnuts	Other Organic Products	Total
1998	20.40	13.00	25.80	9.90	30.90	100
1999	12.80	7.90	14.80	12.90	51.60	100
2000	17.30	13.70	22.80	21.50	24.60	100
2001	21.40	11.00	26.00	22.40	19.30	100
2002	16.50	19.70	36.10	14.20	13.40	100
2003	23.50	15.40	31.50	14.10	15.60	100
2004	19.60	28.60	20.70	16.40	14.80	100
Netherlands						
	Raisins	Dried Figs	Dried Apricots	Hazelnuts	Other Organic Products	Total
1998	36.60	9.60	3.70	21.20	28.90	100
1999	26.40	5.30	3.10	12.70	52.40	100
2000	28.40	3.40	7.00	12.60	48.60	100
2001	26.60	2.80	7.90	22.00	40.70	100
2002	28.20	1.20	4.50	18.50	47.60	100
2003	18.50	4.30	0.20	10.90	66.00	100
2004	14.20	5.60	5.10	13.80	61.40	100
United Kingdom						
	Raisins	Dried Figs	Dried Apricots	Hazelnuts	Other Organic Products	Total
1998	23.40	19.10	5.30	11.20	41.10	100
1999	28.00	26.80	5.60	4.70	34.90	100
2000	40.20	17.90	6.10	4.70	31.00	100
2001	31.70	20.30	1.70	3.60	42.70	100
2002	33.00	22.70	8.60	4.80	31.00	100
2003	24.10	35.60	7.40	7.90	25.00	100
2004	27.00	29.80	6.90	5.70	30.70	100

Table 4: Price and Expenditure Elasticity Estimates

Product	Price elasticity 1	Price elasticity 2	Price elasticity 3	Price elasticity 4	Price elasticity 5	Expenditure elasticities
1. Raisin	0,322376	-0,565286	-0,03903	-0,71081	0,198181	1,030152
2. Dried Apricot	-0,18686	-0,785876	0,492266	0,49808	-0,20693	1,244081
3. Dried Fig	-0,64962	0,5945413	-0,61122	-0,29826	-0,46101	0,513532
4. Hazelnut	0,917386	-0,426732	0,108115	-0,88962	-0,61329	0,326822
5. Diğer Ekolojik ürünler	-1,1529	0,2344764	-0,22388	0,41458	-0,70931	1,292636

Table 5: Distribution of EU Imports of Hazelnuts, Dried Figs, Raisins and Dried Apricots Across Intra and Extra EU Countries

	1999		2005	
	Intra E	Extra EU	Intra E	Extra EU
<i>Product: Hazelnuts</i>				
Target Market: France	19,421	40,167	27,273	20,261
Target Market: Netherlands	3,859	8,183	5,423	15,713
Target Market: Germany	43,708	210,123	90,769	160,797
Target Market: United Kingdom	446	9,126	4,343	11,079
<i>Product: Dried Figs</i>				
Target Market: France	1,157	12,855	1,151	16,506
Target Market: Netherlands	139	3,513	338	3,998
Target Market: Germany	3,409	14,318	3,069	14,687
Target Market: United Kingdom	1,257	3,769	3,358	2,889
<i>Product: Raisins</i>				
Target Market: France	8,230	18,907	5,619	23,395
Target Market: Netherlands	11,364	38,653	6,651	36,466
Target Market: Germany	16,624	56,403	11,285	59,833
Target Market: United Kingdom	33,747	111,164	23,309	105,391
<i>Product: Dried Apricots</i>				
Target Market: France	755	14,163	650	18,447
Target Market: Netherlands	1,288	5,431	334	54,457
Target Market: Germany	1,524	12,521	3,513	15,235
Target Market: United Kingdom	3,527	16,773	7,471	18,231

Table 6: Rival Country Selection

Target country/Product	Hazelnut		Dried Figs		Raisins		Dried Apricots	
	Rival Countries (Intra EU) ¹	Rival Countries (Extra EU) ²	Rival Countries (Intra EU) ¹	Rival Countries (Extra EU) ²	Rival Countries (Intra EU) ¹	Rival Countries (Extra EU) ²	Rival Countries (Intra EU) ¹	Rival Countries (Extra EU) ²
France	Italy (%64)	Turkey (%98)	Netherlands (%29)	Turkey (%99)	Greece (%38)	Turkey (%59)	Netherlands (%30)	Turkey (%99)
	Spain (%20)		Italy (%22)		Belgium (%33)	S. Africa	Germany (%42)	
			Germany (%35)				Belgium (%43)	
Netherlands	Germany (%72)	Turkey (%88)	Germany (%87)	Turkey (%99)	Greece (%75)	Turkey (%68)	France (%37)	Turkey (%90)
	United Kingdom (%26)		Italy (%26)			USA	Germany (%35)	
							United Kingdom (%49)	
Germany	Italy (%76)	Turkey (%81)	France (%22)	Turkey (%99)	Netherlands (%26)	Turkey (%67)	France (%64)	Turkey (%95)
			Netherlands (%53)		Greece (%52)		Netherlands (%45)	
			Austria (%41)		Belgium (%33)			
United Kingdom	Italy (%76)	Turkey (%99)	France (%63)	Turkey (%96)	Greece (%87)	Turkey (%61)	France (%89)	Turkey (%97)
			Netherlands (%28)			ABD		

¹ Figures in parentheses represent export share of intra EU countries within the total intra EU exports.

² Figures in parentheses represent export share of extra EU countries within the total extra EU exports

In exports of hazelnuts, dried figs, dried apricots and raisins, Turkey's rival EU member countries are Germany, Belgium, France, Netherlands, Spain, Italy and Greece. The competitiveness indices are obtained for these rival EU member countries.

Table 7: Turkey's Export Competitiveness of Raisins Against Rival Countries (RCA Index)

Years	Greece	Netherlands	Belgium
Four products*			
1999	-1.280	-0.841	-1.082
2000	-1.102	-0.731	-1.011
2001	-1.383	-0.725	-1.172
2002	-1.280	-0.518	-0.884
2003	-1.110	-0.481	-0.735
2004	-1.129	-0.555	-0.691
2005	-1.394	-0.348	-1.137
Sector**			
1999	0.513	3.272	3.557
2000	0.886	3.376	3.293
2001	0.839	3.230	3.366
2002	0.941	3.265	3.476
2003	0.936	3.443	3.447
2004	0.928	3.540	3.518
2005	0.787	3.688	3.481

***RCA 1**= (The ratio of Turkey's dried apricot exports to the EU 25 and Turkey's total exports of the four products to the EU 25)/(The ratio of rival countries' dried apricot exports to the EU 25 and the rival countries' total exports of the four products to the EU 25)

** **RCA 2**= (The ratio of Turkey's dried apricot exports to the EU 25 and Turkey's total sectoral export to the EU 25)/(The ratio of rival countries' dried apricot exports to the EU 25 and the rival countries' total sectoral export to EU 25)

Note: For the definition of the "sector", see Comext code 08.

Table 8: Turkey's Export Competitiveness of Dried Apricots Against Rival Countries (RCA Index)

Years	Rival Countries				
	Netherlands	Germany	Belgium	France	United Kingdom
Four products*					
1999	0.060	0.296	0.999	-1.669	-0.672
2000	-0.058	0.056	0.981	-1.762	-0.947
2001	-0.123	-0.345	1.109	-1.890	-1.505
2002	0.009	-0.148	1.019	-1.348	-1.214
2003	0.057	0.391	0.272	-1.115	-0.956
2004	0.222	0.002	0.571	-1.139	-0.530
2005	-0.151	-0.359	0.788	-1.411	-0.526
Sector**					
1999	4.173	2.803	5.638	2.374	2.104
2000	4.048	2.769	5.285	2.172	2.213
2001	3.831	2.769	5.646	2.002	1.482
2002	3.791	3.004	5.378	2.504	1.939
2003	3.981	3.213	4.454	2.409	1.915
2004	4.317	2.752	4.780	2.344	2.342
2005	3.886	2.492	5.406	1.779	2.437

***RCA 1**= (The ratio of Turkey's dried apricot exports to the EU 25 and Turkey's total exports of the four products to the EU 25)/(The ratio of rival countries' dried apricot exports to the EU 25 and the rival countries' total exports of the four products to the EU 25)

** **RCA 2**= (The ratio of Turkey's dried apricot exports to the EU 25 and Turkey's total sectoral export to the EU 25)/(The ratio of rival countries' dried apricot exports to the EU 25 and the rival countries' total sectoral export to EU 25)

Note: For the definition of the "sector", see Comext code 08.

Table 9: Turkey's Export Competitiveness of Dried Figs Against Rival Countries (RCA Index)

Years	Rival Countries				
	Netherlands	Italy	Germany	France	Austria
Four Products*					
1999	-0.472	2.740	0.218	-0.884	-0.835
2000	-0.206	2.504	-0.016	-0.706	1.648
2001	-0.586	1.641	-0.183	-1.062	-0.156
2002	-0.345	3.026	-0.314	-0.644	-0.063
2003	-0.251	3.242	-0.234	-0.292	-0.812
2004	0.182	2.224	-0.359	-0.748	-1.044
2005	-0.109	1.784	-0.407	-0.520	-1.125
Sector**					
1999	3.641	5.853	2.725	3.159	3.045
2000	3.900	5.935	2.697	3.229	3.424
2001	3.369	5.241	2.932	2.830	2.485
2002	3.437	5.963	2.838	3.208	3.617
2003	3.672	5.952	2.588	3.233	2.698
2004	4.277	4.952	2.391	2.735	2.315
2005	3.927	4.704	2.444	2.670	2.140

***RCA 1**= (The ratio of Turkey's dried fig exports to the EU 25 and Turkey's total exports of the four products to the EU 25)/(The ratio of rival countries' dried fig exports to the EU 25 and the rival countries' total exports of the four products to the EU 25)

** **RCA 2**= (The ratio of Turkey's dried fig exports to the EU 25 and Turkey's total sectoral export to the EU 25)/(The ratio of rival countries' dried fig exports to the EU 25 and the rival countries' total sectoral export to EU 25)

Note: For the definition of the "sector", see Comext code 08.

Table 10: Turkey's Export Competitiveness of Hazelnuts against Rival Countries (RCA Index)

	Rival Countries			
Years	Italy	Spain	Germany	England
Four Products*				
1999	-0.515	-0.411	-0.143	0.578
2000	-0.525	-0.473	-0.076	1.292
2001	-0.359	-0.178	0.173	2.378
2002	-0.570	-0.379	0.174	2.091
2003	-0.672	-0.452	-0.067	0.791
2004	-0.634	-0.483	0.113	1.100
2005	-0.452	-0.407	0.062	1.152
Sector **				
1999	2.597	4.615	2.363	3.354
2000	2.905	4.267	2.637	4.452
2001	3.241	5.182	3.288	5.365
2002	2.367	5.098	3.327	5.243
2003	2.037	4.961	2.754	3.662
2004	2.094	4.625	2.863	3.972
2005	2.468	3.893	2.913	4.115

***RCA 1**= (The ratio of Turkey's hazelnut exports to the EU 25 and Turkey's total exports of the four products to the EU 25)/(The ratio of rival countries' hazelnut exports to the EU 25 and the rival countries' total exports of the four products to the EU 25)

** **RCA 2**= (The ratio of Turkey's hazelnut exports to the EU 25 and Turkey's total sectoral export to the EU 25)/(The ratio of rival countries' hazelnut exports to the EU 25 and the rival countries' total sectoral export to EU 25)

Note: For the definition of the "sector", see Comext code 08.

Table 11: Turkey's Export Competitiveness of Raisins Against Rival Countries (CEP Index)

Years	Greece	Netherlands	Belgium	Turkey
Four Products*				
1999	219.7	142.9	181.2	155.4
2000	217.5	149.6	196.2	182.8
2001	213.8	114.9	175.6	176.8
2002	270.0	130.9	185.6	189.0
2003	266.3	145.4	185.9	182.9
2004	270.6	156.5	178.2	197.1
2005	329.5	120.7	257.1	214.4
Sector**				
1999	1182.8	75.0	56.4	1976.6
2000	1044.3	86.6	94.1	2533.4
2001	1018.3	93.3	81.4	2357.1
2002	1228.8	120.3	97.4	3148.5
2003	1311.0	106.8	106.3	3341.4
2004	1260.2	92.5	94.6	3188.6
2005	1320.2	72.5	89.3	2898.9

***CEP 1**= (The ratio of Turkey's raisin exports to the EU 25 and Turkey's total exports of the four products to the EU 25)/(The ratio of EU 25 raisin exports and EU 25 total exports of the four products)

** **CEP 2**= (The ratio of Turkey's raisin exports to the EU 25 and Turkey's total sectoral exports to the EU 25)/(The ratio of EU 25 raisin exports and EU 25 total sectoral exports)

Note: For the definition of the "sector", see Comext code 08.

Table 12: Turkey's Export Competitiveness of Dried Apricots Against Rival Countries (CEP Index)

Years	Netherlands	Germany	Belgium	France	United Kingdom	Turkey
Four products*						
1999	131.24	103.64	51.34	739.74	272.91	139.40
2000	122.36	109.09	43.28	672.38	297.55	115.42
2001	86.13	107.56	25.13	503.78	342.93	76.14
2002	122.08	142.81	44.45	474.09	414.56	123.14
2003	131.96	94.45	106.46	426.19	363.35	139.71
2004	108.61	135.34	76.65	423.63	230.47	135.61
2005	116.80	143.91	45.71	411.83	170.08	100.48
Sector**						
1999	65.32	257.07	15.10	394.86	517.16	4,240.45
2000	67.22	241.66	19.52	438.72	421.43	3,851.79
2001	66.55	192.52	10.84	414.46	697.10	3,069.67
2002	106.88	234.75	21.86	387.25	681.56	4,736.11
2003	91.21	196.49	56.81	438.97	719.67	4,884.60
2004	59.71	285.39	37.56	429.50	430.34	4,474.77
2005	66.43	267.70	14.53	545.94	282.80	3,234.90

***CEP 1**= (The ratio of Turkey's dried apricot exports to the EU 25 and Turkey's total exports of the four products to the EU 25)/(The ratio of EU 25 dried apricot exports and EU 25 total exports of the four products)

** **CEP 2**= (The ratio of Turkey's dried apricot exports to the EU 25 and Turkey's total sectoral exports to the EU 25)/(The ratio of EU 25 dried apricot exports and EU 25 total sectoral exports)

Note: For the definition of the "sector", see Comext code 08.

Table 13: Turkey's Export Competitiveness of Dried Figs Against Rival Countries (CEP Index)

Years	Netherlands	Italy	Germany	France	Austris	Turkey
Four products*						
1999	150.00	6.04	75.26	226.58	215.86	93.61
2000	109.59	7.29	90.55	180.52	17.16	89.15
2001	99.40	10.72	66.45	160.04	64.64	55.33
2002	124.97	4.29	121.13	168.43	94.25	88.47
2003	128.30	3.90	126.08	133.56	224.66	99.79
2004	80.20	10.41	137.87	203.35	273.44	96.25
2005	111.67	16.82	150.36	168.39	308.22	100.09
Sector**						
1999	74.66	8.18	186.69	120.94	135.54	2,847.53
2000	60.21	7.87	200.58	117.78	96.93	2,974.96
2001	76.81	11.81	118.93	131.67	185.97	2,230.80
2002	109.42	8.75	199.11	137.58	91.45	3,402.64
2003	88.69	9.08	262.28	137.57	235.02	3,488.90
2004	44.09	22.44	290.73	206.17	313.64	3,176.14
2005	63.52	29.18	279.70	223.23	379.15	3,222.45

***CEP 1**= (The ratio of Turkey's dried fig exports to the EU 25 and Turkey's total exports of the four products to the EU 25)/(The ratio of EU 25 dried fig exports and EU 25 total exports of the four products)

** **CEP 2**= (The ratio of Turkey's dried fig exports to the EU 25 and Turkey's total sectoral exports to the EU 25)/(The ratio of EU 25 dried fig exports and EU 25 total sectoral exports)

Note: For the definition of the "sector", see Comext code 08.

Table 14: Turkey's Export Competitiveness of Hazelnuts Against Rival Countries (CEP Index)

Years	Italy	Spain	Germany	United Kingdom	Turkey
Four products*					
1999	209.67	188.96	144.56	70.29	125.27
2000	199.26	189.12	127.11	32.36	117.83
2001	220.65	184.13	129.59	14.30	154.12
2002	194.18	160.37	92.27	13.57	109.80
2003	187.84	150.85	102.66	43.52	95.96
2004	180.80	155.47	85.68	31.94	95.91
2005	163.49	156.24	97.76	32.88	104.01
Sector**					
1999	283.78	37.73	358.58	133.19	3,810.50
2000	215.18	55.17	281.58	45.84	3,932.08
2001	243.08	34.91	231.96	29.06	6,213.53
2002	395.78	25.80	151.68	22.31	4,223.02
2003	437.38	23.51	213.57	86.19	3,355.13
2004	389.83	31.03	180.68	59.63	3,164.73
2005	283.71	68.27	181.85	54.67	3,348.61

***CEP 1**= (The ratio of Turkey's dried fig exports to the EU 25 and Turkey's total exports of the four products to the EU 25)/(The ratio of EU 25 dried fig exports and EU 25 total exports of the four products)

** **CEP 2**= (The ratio of Turkey's dried fig exports to the EU 25 and Turkey's total sectoral exports to the EU 25)/(The ratio of EU 25 dried fig exports and EU 25 total sectoral exports)

Note: For the definition of the "sector", see Comext code 08.

Table 15: Turkey's Export Share of Four Products in the EU 25 Export Market

Product	Year	Turkey's exports of four products to the EU 25 Market	EU 25's total imports of the four products	Turkey's Market Share in the EU 25 Market	Change in Turkey's Market Share	Change in the value of EU 25 imports from Turkey
Raisins	1999	164.096,27	384.245,79	0,43	0,03	1.388,66
	2005	176.014,88	385.634,45	0,46		
Dried Apricots	1999	57.863,37	71.644,05	0,81	-0,04	28.209,42
	2005	77.096,07	99.853,47	0,77		
Dried Figs	1999	53.873,66	66.875,91	0,81	-0,06	17.693,48
	2005	63.283,43	84.569,39	0,75		
Hazelnuts	1999	375.602,81	493.820,24	0,76	-0,15	309.800,34
	2005	494.011,19	803.620,58	0,61		

Table 16: Sources of Export Competitiveness of Turkey in EU 25 Market (CMS Analysis)

	Değer	% pay
Change in Total Exports (total of four products)	158.969,46	100,00
Structural Effect	273.265,96	171,90
Competitive Effect	-67128,8	-42,23
Secondary Effect	-47167,7	-29,67

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The challenge of the international organic certification: a new opportunity for agricultural trading?

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Summary

The successful literature about gravitational models stresses that bilateral trade flows among countries is influenced by GDP factors and transaction costs. In other words the mass of bilateral trade would be related to the typical demand-supply factors which explain the quantity of traded goods in perfect competition models and a wide series of variables which express transaction costs whose role is strongly highlighted by institutional economists. If compared to the previous literature our paper shows a twofold novelty. First it is the first attempt to analyse the bilateral trade of specific agricultural goods for Italy by a cross country and panel analysis and second it provides an original specification for transaction costs. In particular, we assume that the level of organic certification standards harmonisation between Italy and extra-European countries could represent a good “proxy” for the cultural, political and social affinity in bilateral trading. Interestingly we find that the absence of specific import harmonisation rules between Italy and other extra-European countries decreases the level of bilateral trade for all the agricultural produce. A plausible explanation could be that harmonisation of organic standards is a signal of low transaction costs. In this context for a specific country the awareness of a high harmonisation level of organic standards towards another region could represent affinity in the trading activities for the whole agricultural produce. The policy agenda about the harmonisation of the agricultural standards should be tackled in the context of a more complex agenda concerning the affinity of political, cultural and social practices among different regions in the agricultural and in all the other economic sectors.

KEYWORDS: Food trade, gravitational models, harmonisation, organic agriculture, Italy

1. Introduction

Traditional gravitational models point out that the magnitude of import and export among countries strongly depends on the distance among regions and on the size of the involved economies (Bergstrand, 1985; Evenett and Keller, 1998). The shorter the distance and the greater the GDP, the more trade will occur. However recent literature outlines that gravitational models could be suitable also to investigate the role of transaction costs in affecting trading. The concept of transaction costs is crucial in the New Institutional Economics questioning the general findings deriving from neoclassical theories (Williamson, 2000). Williamson explains that transaction costs derive from contact, negotiation and control activities corresponding to the different stages of the transaction. The contact cost is related to the search of the transaction partner. The negotiation cost are those beard for the correct and unambiguous writing of the contract and finally the control costs are those expressing the activities devoted to control the implementation of the contract from the partner. Though a wide literature focussed on the investigation of transaction costs, only a few contributions provided reliable monetary estimations (Wallis and North 1986). Gravitational models are suitable for extensions capturing the impact of transaction costs for trading. Whereas Frankel and Rose (2002) study the impact of a

common currency in the mass of bilateral flows, den Butter and Mosch (2003) find that trust has a statistically significant impact on the trading mass.

Our paper provides a contribution to this debate in the specific field of the agricultural sector. Starting from gravitational models we assume that trading of agricultural produce is affected by the same factors identified by the previous literature as the distance among regions and the size of the economy. As first step we will test these assumptions for the specific agricultural sector for Italy by a cross country analysis in 2003 and by a panel analysis in the lapse of time 1997 – 2003.

As second step we will introduce a new set of variables representing more sophisticated transaction costs in bilateral trading for Italy other than the physical distance. A first criterion is to discriminate European and extra-European countries. A very intuitive concept suggests that countries included in the European Union could represent lower transaction costs in the bilateral trade with Italy because of the common currency, harmonised rules, common habits and traditions. The novelty of this paper is that we introduce a criterion in order to identify areas showing lower transaction costs for non European Union countries.

Recently wide scientific debate regarded the growth of organic farming aimed at minimizing the negative externalities of farming on the environment and on social justice. Many researchers agree on the fact that production and consumption of organic food is driven by ethical and social values (Seyfang, 2006). The pursue of organic practices is guaranteed by certification activities driven by professional inspectors. An important pitfall of this procedure is that organic standards are different in each country. Our assumption is that the extent of the differences among certification standards represent a good proxy of the differences in the “affinity” in the agricultural sector among countries.

Given this background our paper will answer the following research question. Assuming that differences represent lower transaction costs, how much do these transaction costs affect the trade of agricultural produce?

We think that this paper could provide an interesting and original message. Harmonisation of certification standards cannot be considered an isolated activity. Policy makers should work to harmonize (without eliminating) cultural and habits differences sector among countries. This harmonisation could represent an impulse for integration of certification standards but also for trust in the relationships among regions driving a wider mass of trading and growth for all the agricultural produce. In the section 1 we will briefly introduce the model and we will explain the data source. In the section 2 we will show the results. Finally the conclusions.

2. Model set up

The gravitational model is characterised by a very simple and intuitive notion. The mass of bilateral trade among regions would be influenced by the typical factors influencing the trading of goods in a perfect competition market such as demand and supply factors and by transaction costs. The typical transaction costs which are expressed by the literature are transport costs (which are usually represented by the distance among regions). The conceptual model can be expressed by an equation as follows:

$$(1) T_{ij} = A * (Y_i Y_j / D_{ij})$$

Where

T_{ij} = bilateral trade
 A = constant of proportionality
 $Y_{i,j}$ = the GDP for countries i and j
 D_{ij} = physical distance between the country i and the country j .

T_{ij} expresses the mass of bilateral trade among countries i and j , $Y_{i,j}$ represents the economic size of countries i and j and in particular the supply side factors. In other words the basic assumption is that more countries produce GDP and more is the trading attraction. Previous literature generally also identifies demand side factors. The willingness to buy trading goods is usually expressed by the level of GDP per capita between two countries.

On the basis of the previous comments a more accurate expression interprets the equation (1) by a Cobb Douglas as follows:

$$(2) PX_{ij} = A^1 (Y_i * Y_j)^{\beta_1} ((Y_i / L_i) * (Y_j / L_j))^{\beta_2} * (D_{ij})^{\beta_3}$$

Where P is the price, L is the level of population and X is the trading mass. $(Y_i * Y_j)$ and (Y_i / L_i) factors mean that the supply and demand factors are expressed as the interaction of economic size indicators for the involved countries. To make the previous equation suitable for an econometric analysis we should consider the following model:

$$(3) \log V_{ij} = \alpha^1 + \beta_1 \log(Y_i * Y_j) + \beta_2 \log((Y_i / L_i) * (Y_j / L_j)) + \beta_3 \log(D_{ij}) + \varepsilon_{ij}$$

where V_{ij} is the monetary value of the agricultural trading mass (import + export), ε_{ij} is the usual normal stochastic error and \log is the natural logarithm. Of course being the values expressed in natural logarithms, each coefficient should be interpreted as elasticity. We will label this model as the *Basic Gravitational Model* (BGM) that we will use to apply the gravitational model for the agricultural international trading in Italy by a cross country and a panel analysis. Empirical studies focussing on the specific topic of the agricultural produce are not wide-spread in the previous literature (Sevela, 2002; Dascal *et al.*, 2002) and our specific case study for Italy is quite original.

The second step will be to introduce a more sophisticated set of variables expressing transaction costs in the trading of agricultural produce. A first transaction costs variable distinguishes between European and extra-European countries. Currency dummies or variables expressing law/political transaction costs are variables which typically express transaction costs which strongly affect each sector of the economic activity. In this context we will consider a dummy variable as follows:

4) DEU = 1 if the trading partner is an EU member and 0 if it is not.

It is a very intuitive assumption. The underlying hypothesis is that the agricultural trading between Italy and another European countries will be facilitated because of the absence of transaction costs deriving from factors such as borders, currency exchange costs and trust relationships. Of course if we applied the same analysis to the other European Union partners this dummy variable would express the same value for each country.

Moreover we introduce a more specific dummy variable which identifies partners with lower transaction costs among extra-European regions. Our aim is to identify a variable that could express the degree of cultural, social and political "affinity" among countries about agricultural practices. To reach our goal we focus on the specific sector of organic food. Our assumption is that the trust factor in the organic sector among trading partners shows

an even more important role than in the whole agricultural sector. For this reason policies implemented by countries in order to facilitate the import procedures of organic food from other regions could represent a concrete and interesting signal showing affinity between countries in the agricultural habits and practices. If this assumption is true a high level of organic standards harmonisation among regions should indicate both a high level of trust and a lower level of transaction costs among trading countries. This will determine a higher level of bilateral trade. The important consequence of this assumption is that the “hot” issue concerning the harmonisation of organic standards should be assessed in a more general context involving the cultural and social affinity among countries in the international marketing. In line with this strand of research we introduce a dummy variable as follows:

5) DEO = 1 if the trading partner can enjoy a privileged organic export procedure in Italy on the basis of the European laws¹ and DEO = 0 if it is not.

This description of this dummy variable needs a further comment. As the reader can notice our implicit assumption is that if Italy allows a third country simplified import procedures both the import and export mass between these countries will increase. We should specify that this dummy variable does not properly represent equivalency between Italy and other regions. As expressed by IFOAM (2004) the issue of standards equivalence cannot be safely assessed on the basis of unambiguous criteria. For this reason the meaning of this dummy variable is the perception of equivalence rather than a strict and objective interpretation of equivalence in organic standards. Moreover this dummy variable captures lower transaction costs in trading concerning both all the economic sectors and the specific agricultural sector. The fact that Italy grants equivalency to a third country expresses affinity in the bilateral relations concerning laws, culture, politics affecting the industrial, services and primary sectors and affinity in the specific agricultural practices or food quality standards. For this reason we assume this dummy variable as a good proxy of lower transaction costs affecting more generally economy or the specific agricultural sector.

Now that we have clarified the meaning of our dummy variables we can set up our Adjusted Basic Gravitational Model (*ABGM*) as follows:

6)

$$\log V_{ij} = \alpha + \beta_1 \log(Y_i * Y_j) + \beta_2 \log((Y_i / L_i) * (Y_j / L_j)) + \beta_3 \log(D_{ij}) + \beta_4 DEU + \beta_5 DEO + \varepsilon_{ij}$$

Data are extracted from different sources. Data about V are extrapolated from the FAOSTAT core dataset. Data about GDP are taken from the International Monetary Fund Dataset. Data about the distance among regions are extracted from the Frenkel and Rose’s (2002) dataset. The analysis is driven by a 130 cross country (2003) and a balanced panel (122 countries, 1997 – 2003) dataset. Data about GDP and V in the panel data are expressed in real terms. Next section shows the results.

3. Results

The analysis is driven by the E-Views Software. First we present results for the cross country analysis with the *BGM* model.

¹ The European Law 2092/91 recognises for some non European countries equivalency in organic standards. Actually 8 countries benefit from this law: Australia, Argentina, Costa Rica, Hungary, New Zealand, Czech Republic, Switzerland and Israel. Hungary and Czech Republic in the lapse of time 1997-2003, which is the period of interest of our analysis, had not joined the European union. Equivalency concerns both standards and conformity assessment.

TABLE 1 ABOUT HERE

From the basic model we get interesting information.. The distance (D) and the interaction variable concerning GDP ($PROD Y$) show significant coefficients. As we said before, coefficients should be interpreted as elasticities, so a 1% increase of D and $PROD Y$ respectively generate a 0.81% decrease and a 0.79% increase of bilateral trading V . The interaction variable expressing GDP per capita ($PROD YPC$) is statistically insignificant (5% significance level). Though in Frenkel and Rose (2002) this variable is statistically significant in other works we find similar results (Sohn and Yoon, 2001; den Butter and Mosch 2003). The model is satisfactorily performing if we consider a 0.73 value of the adjusted R^2 index. Both the significant coefficients associated to D and $PROD Y$ show the expected signs highlighted by the previous published literature about gravitational models. If we consider the more complete ABGM model, results are again rather encouraging. As the reader can notice from the table 2 the ABGM model confirms the results we obtained in the table 1 and mainly both dummy variables DEU and DEO are significant. Moreover both dummy variables are associated to coefficients showing a strong positive impact.

TABLE 2 ABOUT HERE

This result would suggest that bilateral trade of agricultural produce is more strongly addressed towards EU countries and towards extra-EU countries if they enjoy a privileged export procedure of organic produce in Italy. The fact that those countries can benefit from privileged export procedures could be the signal that Italy recognises those countries as affine in trading and this would stimulate bilateral trade flows. The reader should notice that the coefficients associated to the two dummy variables show similar coefficients values. A Wald Test confirms that these two coefficients are not statistically different (see Appendix 1, Table 5). Interestingly, these results would suggest that transaction costs in countries where Italy recognises equivalency in organic standards would be as low as in European countries. The performance of the model expressed by the R^2 index (0.75) is not strongly higher than in the BGM model (0.73). However the omitted variable/redundancy F-tests (Annex 1, table 6) show that the introduction of the two dummy DEU and DEO variables is statistically significant (see Appendix 1 table 2). Moreover the low increase of the R^2 index could be explained by the fact that countries included in the European Union and organic standards equivalency groups represent only a small sub-sample. For this reason DEU and DEO would be significant but they would not explain a high portion of the model variance.

Results are robust to normality tests (Jarque-Bera) and misspecification tests (Ramsey test)². We only find heteroscedasticity (Appendix 1, Table 7), but adjusting the estimation procedure to correct heteroscedasticity, we do not find particular results differences in the significance of the coefficients. The value of each coefficient by a White correction does not vary.

TABLE 3 ABOUT HERE

The panel data analysis does not significantly change our conclusions. We set up an ABGM model by a introducing time period effects as in Frenkel and Rose (2002). An F test confirms that fixed time period effects are not redundant in the ABGM model. As second step we run an Hausmann test to choose between the fixed effects and the random effects

² See the table 3, Appendix 1.

model. Results suggest that the random effects framework is the most appropriate model set up (Appendix 1, Table 8). The suitability of the random effects approach shows that the explanatory variables are not correlated with idiosyncratic errors and that they represent exogenous variables. However results from the Hausmann test do not represent conclusive and unambiguous proof of this finding.

As the reader can see from the table 4 results are similar to those concerning the cross country analysis . The panel analysis confirms the sign and the significance of our previous estimations³. Interestingly again, coefficients associated to the dummy variables *DEU* and *DEO* are not statistically different by a F-test (see Appendix 1, Table 8). From these results we have more robust evidence that the magnitude of the impact of equivalency in importing procedures is comparable to the one deriving from the inclusion to the European Union. We deem that this result could be of great interest for policy makers and who are interested in developing and expanding international trading in agricultural produce.

TABLE 4 ABOUT HERE

4. Conclusions

In this paper we focus on the application of the empirical gravitational for bilateral trade flows between Italy and other world countries by a cross country and a panel analysis for agricultural produce. Whereas the traditional variables designed by the previous literature to explain the mass of trade are significant and the statistically robustness of the model is quite reliable for this specific case study the novelty of our paper is that we introduce a variable explaining the perception of affinity in trading between Italy and other non European Union Countries. The crucial concept of our paper is that we analyse the impact of the country 's acknowledgement of equivalence among organic standards on the whole mass of trading of agricultural produce (imports plus exports). Our intuition is that if a country specifically recognises equivalence in organic standards the whole agricultural produce trading would benefit. This intuition is confirmed by empirical results for the Italian case. Equivalency in organic standards and the acknowledgement of common conformity assessment mechanisms could represent the signal of lower transaction costs in bilateral trading. The important policy implication of our contribution is that "unilateral" equivalence in organic standards could be considered as expression of the awareness for a country of a more general cultural, social and political affinity in trading of agricultural produce. Policy maker aimed at reducing (without of course eliminating) contrasts and different habits in the international relationships would work also for more harmonised organic standards and for more intense trading relationships.

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³ Intercept and time effects are not reported.

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Tables

Table 1. Cross country analysis. 2003. BGM model.

Dependent Variable: V
Method: Least Squares

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-19.01587	3.210352	-5.923296	0.0000
PROD Y	0.799991	0.062435	12.81313	0.0000
PROD YPC	0.038697	0.086343	0.448174	0.6548
D	-0.811694	0.150553	-5.391419	0.0000
R-squared	0.735473	Mean dependent var	16.70109	
Adjusted R-squared	0.729174	S.D. dependent var	2.563739	

Table 2. Cross country analysis. 2003. ABGM model.

Dependent Variable: V
 Method: Least Squares

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-17.28720	3.171807	-5.450270	0.0000
PROD Y	0.769765	0.061588	12.49870	0.0000
PROD YPC	-0.059669	0.090318	-0.660649	0.5101
D	-0.634896	0.164173	-3.867234	0.0002
DEU	1.192956	0.499297	2.389272	0.0184
DEO	1.276640	0.508601	2.510100	0.0134
R-squared	0.754018	Mean dependent var	16.70109	
Adjusted R-squared	0.744100	S.D. dependent var	2.563739	

Table 3. Cross section analysis. 2003. ABGM model.

Dependent Variable: V
 Method: Least Squares
 White Heteroskedasticity-Consistent Standard Errors & Covariance

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-17.28720	2.926786	-5.906549	0.0000
PROD Y	0.769765	0.056822	13.54704	0.0000
PROD YPC	-0.059669	0.091811	-0.649908	0.5170
D	-0.634896	0.143805	-4.414964	0.0000
DEU	1.192956	0.317079	3.762329	0.0003
DEO	1.276640	0.403152	3.166648	0.0019
R-squared	0.754018	Mean dependent var	16.70109	
Adjusted R-squared	0.744100	S.D. dependent var	2.563739	

Table 4. Panel analysis. 1997 - 2003. ABGM model.

Dependent Variable: V

Method: Panel EGLS (Period random effects)

Variable	Coefficient	Std. Error	t-Statistic	Prob.
PROD Y	0.752168	0.025800	29.15408	0.0000
PROD YPC	-0.012072	0.033845	-0.356678	0.7214
D	-0.647331	0.068491	-9.451336	0.0000
DEU	1.057688	0.204495	5.172195	0.0000
DEO	0.843219	0.240815	3.501520	0.0005

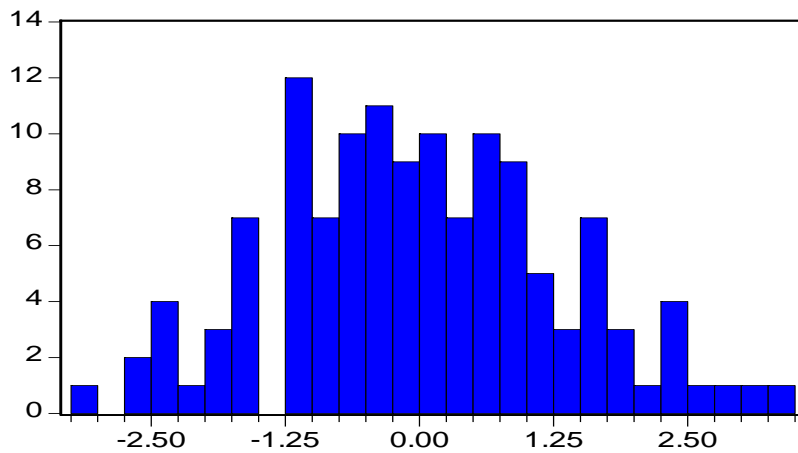
Table 5. Wald test on the dummy coefficients restriction $\beta_4 = \beta_5$.

Test Statistic	Value	df	Probability
F-statistic	0.019285	(1, 124)	0.8898
Chi-square	0.019285	1	0.8896

Table 6. Redundant variables, omitted variables tests: DEU, DEO.

Redundant Variables: DEU, DEO			
F-statistic	4.674517	Prob. F(2,124)	0.011035
Log likelihood ratio	9.449497	Prob. Chi-Square(2)	0.008873
Omitted Variables: DEU, DEO			
F-statistic	4.674517	Prob. F(2,124)	0.011035
Log likelihood ratio	9.449497	Prob. Chi-Square(2)	0.008873

Table 7. Jarque Bera test, Ramsey's test, White test for heteroschedasticity.



Series: Residuals	
Sample 1	130
Observations	130
Mean	3.24e-15
Median	-0.051177
Maximum	3.467888
Minimum	-3.101374
Std. Dev.	1.318588
Skewness	0.157219
Kurtosis	2.774908
Jarque-Bera	0.809992
Probability	0.666979

Ramsey RESET Test:

F-statistic	1.125750	Prob. F(2,124)	0.327701
Log likelihood ratio	2.339271	Prob. Chi-Square(2)	0.310480

White Heteroskedasticity Test:

F-statistic	2.324100	Prob. F(9,120)	0.018977
Obs*R-squared	19.29646	Prob. Chi-Square(9)	0.022787

Table 8. Redundant fixed effects test, Hausmann test and Wald test on the dummy coefficients restriction $\beta_4 = \beta_5$.

Redundant Fixed Effects Tests			
Test period fixed effects			
Effects Test	Statistic	d.f.	Prob.
Period F	11.245565	(6,842)	0.0000
Period Chi-square	65.831211	6	0.0000
Hausmann Test Summary			
Chi-Sq. Statistic	Chi-Sq. d.f.	Prob.	
Period random	3.000930	5	0.6998
Wald Test:			
Test Statistic	Value	df	Probabilità
F-statistic	0.653326	(1, 848)	0.4192
Chi-square	0.653326	1	0.4189

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Organic Consumers: A Demographic Portrayal of Organic Vegetable Consumption within the United States

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Summary

The organic market sector is one of the fastest growing food sectors in the United States with growth rates in organic food sales averaging 18% per year between 1998 and 2005. The largest segment within the organic market is fresh produce, comprising 36% of retail sales in 2005. To date, no published studies utilize consumer purchase information to understand which demographic factors influence the purchase of organic vegetables. This analysis focuses on aggregate vegetable purchases, along with the top three organic vegetables procured by consumers in the 2004 AC Nielsen Homescan panel dataset: pre-packaged salads, carrots, and spinach. We approach our research questions in two phases. First, the probability a consumer purchases organic vegetables is estimated in a logistic model framework. Second, a Heckman two-stage model is utilized to depict the relationship of organic vegetable expenditures as a ratio of total household vegetable expenditures. Throughout both rounds of analysis, race, education level and household income consistently influence the odds of purchasing organic vegetables.

Introduction

Organic is the fastest growing food sector in the United States, with growth rates in retail sales averaging 18% per year between 1998 and 2005. Currently organic sales comprise 2.5% or \$13.8 billion of the \$550 billion food industry within the United States (NBJ, 2006).² The largest segment within the organic market is fresh produce, comprising 36% of retail sales in 2005. Organic fresh produce is an important category because it is considered a 'gateway' product, meaning consumers often enter the organic market by first purchasing organic produce and widening their sector purchases from there (Hartman, 2001). Sales of organic produce are expected to grow at an average rate of 7.7% between 2006 and 2010 (NBJ, 2006).

Growth in organic food sales is fueled both by growing consumer demand for organic food and greater accessibility in retail outlets. Consumer demand for variety, convenience and quality for fresh produce – both organic and conventional – has exploded. As a result, new varieties have been introduced, and retailers now offer many organic fresh produce items year-round. Similar to the conventional produce sector, growing consumer demand for convenient products has translated to booming sales of organic pre-cut produce, and in turn, more packaged and branded products are available. Conventional supermarkets have noticed the growing popularity of organic products, and have added organic fruits and vegetables to their shelves. These retail trends – i.e., increased marketing of organic products through conventional supermarkets and large retail outlets in addition to the

¹ The views expressed here are those of the authors, and may not be attributed to the Economic Research Service or the U.S. Department of Agriculture.

² Organic is defined as products not grown, or processed with prohibited substances and are produced/regulated by the USDA National Organic Program (United States Department of Agriculture, 2002).

traditional venues of specialty stores – have made organic produce accessible to more consumers.

As the organic market grows, one may speculate about what kinds of consumers are buying organic food, and in this case, organic fresh vegetables. Understanding the demographic factors that influence the likelihood that a consumer will purchase organic vegetables or the demographic factors that influence the share of household income spent on organic vegetables can help guide retail markets in gaining a better understanding of the most profitable customer bases to market organic products.

To date, most characterizations of organic consumers result from industry studies, with the most notable conducted by the Hartman Group. Results of their recent surveys indicate that half of those who frequently buy organic food have incomes below \$50,000, and that African-Americans, Asian-Americans and Hispanics use more organic products than the general population (Howie, 2004.) In 2004, 42% of organic consumers had incomes below \$40,000 (Barry, 2004.) The most recent Hartman study (2006) indicates that Asians and Hispanics were the ethnic groups (when considering Asians, Hispanics, Whites, and Blacks) most likely to have purchased organic products in the previous three months, while core consumers (defined by the Hartman Group as consumers committed to an organic lifestyle) were most likely to be Hispanic and African-American (Baxter, 2006.)

Consumer surveys provide insight into consumer behavior; however more reliable information about preferences can be obtained by examining consumer purchases, which reflect what people actually do versus what they say they do. To date, no published studies utilize consumer purchase information to understand the demographic factors that influence the purchase of organic fresh produce. This paper is one of the first efforts to use purchase data to characterize organic consumers. We rely on AC Nielsen Homescan data, which has demographic information and food purchase information for a national panel of 41,000 households for the year 2004. The AC Nielsen Homescan panel is a nationwide panel of households that scanned their food purchases (from all retail outlets) at home. Data includes detailed product characteristics, quantity and expenditures for each food item purchased by each household. For the purpose of organic research, the Homescan data provide the richest information currently available because it captures the purchasing patterns for each household, including both sales in conventional and natural product channels, as well as provides demographic information about each household in the panel.

This analysis focuses on aggregate organic vegetable purchases, along with the top three organic vegetables purchased by consumers in the Homescan panel dataset: pre-packaged salads, carrots, and spinach. We approach our research questions in two phases. We first model the odds of a consumer purchasing organic vegetables relative to purchasing conventional vegetables in a logistic model framework. We next model the share of organic vegetables by relying on the Heckman two-stage model, since we argue that consumers make two related decisions: consumers first decide whether to buy organic, and once this decision is made, they next decide how much of their budget to devote to organic vegetables.

The paper proceeds as follows. We first review the related literature, and next describe the dataset and methodology. The econometric models and results are portrayed, followed by the conclusion.

Background

Several studies have attempted to portray organic consumers through willingness to pay surveys or by collecting purchase and demographic information from shoppers (usually the researchers spend one day at a store collecting data). Many of these studies suggest that the typical organic household is a younger household in which females do the shopping, and that smaller and higher income households are the most likely purchasers of organic produce (Govindasamy and Italia, 1990) and organic apples (Loureiro, McCluskey, and

Mittlehammer, 2001). Households knowledgeable about alternative agriculture are more likely to purchase organic produce (Govindasamy and Italia, 1990) and those concerned about the environment are more likely to purchase organic apples (Loureiro, McCluskey, and Mittlehammer, 2001). Those concerned about food safety are more likely to buy organic produce (Govindasamy and Italia, 1990) and organic apples (Loureiro, McCluskey, and Mittlehammer, 2001). Those who enjoy trying new products are more likely to purchase organic produce (Govindasamy and Italia, 1990). Households with children under 18 are more likely to purchase organic produce (Thompson and Kidwell, 1998) and organic apples (Loureiro, McCluskey, and Mittlehammer, 2001). Consumers with children are willing to pay less for organic potatoes (Loureiro and Hine, 2001) and more likely than other households to purchase organic apples (Loureiro, McCluskey, and Mittlehammer, 2001).

Willingness to pay surveys provide insight into consumer behavior, and for many economic issues, are an excellent way to proceed. However, more reliable information about preferences can be obtained by examining consumer purchases, which reflect what people actually do versus what they say they do. The first studies making headway in this direction made use of Information Resources (IRI) scanner data, which contained purchase information from select conventional grocery stores in different regions of the country. These studies focused on calculating how quantity demanded responds to changes in organic and conventional prices. Frozen organic vegetables, organic milk, and organic baby food all exhibited high price elasticity of demand, meaning that the quantity purchased responds greatly to price changes (Glaser and Thompson 2000; Thompson and Glaser 2001). For some frozen vegetables, there was little crossover between purchases of organic and conventional products, so that changes in prices of either commodity had no significant impact on quantities purchased (Glaser and Thompson 1999). For other products (milk and baby food), the conventional and organic products are substitutes, so that increases in the price of the conventional product result in consumers' purchasing a greater quantity of the organic products (Glaser and Thompson 2000; Thompson and Glaser 2001).

Data Description

This paper relies on the 2004 ACNielsen Homescan dataset, unique in that it records household grocery purchases from a wide variety of retail outlets, along with household demographic information for 41,000 households. Every time a household purchased groceries, they scanned their purchases into the Homescan database by using an ACNielsen scanner kept in their home. The design of the ACNielsen dataset constrained the analysis to pre-packaged organic items, that is, those with UPC codes. Random weight produce purchases were not identifiable as organic in the dataset, since ACNielsen does not distinguish between organic and conventional products for random weight items. One possible way to incorporate the random weight purchases would have been to sort through the data to identify which random weight products were organic, but this would have introduced a significant amount of error.

From the full dataset, we selected 38,947 households that purchased prepackaged vegetables during 2004. Several datasets were created: one aggregated organic and conventional purchases (on a dollar basis) of all prepackaged vegetables, which as 33,004 households. The other three datasets consist of purchase data for pre-packaged salads (26,227 households), carrots (26,424 households) and spinach (6,384 households), the top three purchased organic vegetable categories within the Nielson Homescan dataset.³ In the

³ Pre-made salad mixes comprised 43% of organic vegetable purchases, while carrots and spinach made up 22.5% and 3.3% of purchases. It should be noted fresh lettuce was actually the third highest category for organic vegetable purchases (7%). However, this

aggregate dataset, we defined an organic household as one that made at least one organic vegetable purchase during 2004. In the salad, carrot and spinach datasets, an organic household was defined as a household that made at least one purchase of organic salads, carrots or spinach, respectively, within the year. Future work will examine differences between frequent and occasional purchasers of organic vegetables, salad, carrots and spinach.

ACNielsen reports demographic information (education level, age, racial composition, presence of children under six years of age) for both the female and the male head of household. Based on the assumption that females make the majority of grocery purchases within a household, we defined the head of household as the woman if a female was present in the household; otherwise, the male was considered the head of household.

The education, race, and age variables reflect those of the head of household. Head of household education level is broken into four categories: high school graduate or less education, some college education, college degree, and post college education. Age of the head of household is grouped into three categories of less than thirty, between 30 and 49 and greater than 49. Race of the head of household is defined as Caucasian, African American, Asian, Hispanic, and other.

Households are grouped into two categories: those with and without children less than six years old. ACNielsen classifies household income into categories, ranging from a low of under \$5,000 a year to a high of over \$100,000 per year. This analysis uses the midpoint of each range, with \$2,500 as the lowest income. For the top income category, income above \$100,000 a year, we used 167,252, which is the national weighted average of income above 100,000, based on the Census. For each respective dataset, we created a dummy variable denoting whether a household bought organic carrots, organic lettuce, organic spinach, or within the aggregated dataset, vegetables in general.

The final variable created is organic share, which accounts for the share of household vegetable expenditures devoted to organic vegetables. Organic shares were calculated by taking household expenditures spent on organic vegetables and dividing the value by total household expenditures on vegetables (summed organic and conventional vegetables). This procedure was also done for the spinach, salad and carrot datasets individually by taking expenditures for each vegetable category and dividing them by total vegetable expenditures.

The data set is a stratified random sample. The sample was selected based on both demographic and geographic targets. Stratification was done to ensure that the sample matches the U.S. Census. The household was the primary sampling unit and there was no intentional clustering. The weight assigned to each household reflects the demographic distribution within strata. All analysis relies on both the projection factor (ACNielsen sample weights) and strata to estimate proportions, means, and standard errors.

Methodology

Two sets of analysis were conducted. The first examines which demographic factors influence the probability a household will purchase organic vegetables (both aggregate and individual categories); we use a logistic model to analyze this question. The second examines the two stage decision process: do I purchase organic vegetables? If so, what share of vegetable expenditures do I devote to organic vegetables? In this case, we use the Heckman two-stage model to understand which demographic factors influence the share of household expenditures spent on organic vegetables.

The first stage of the Heckman model is a probit model, called the selection equation, which examines the household's choice to buy organic vegetables as a function of different

category was arguably closely related to pre-made salads and spinach was used as a replacement category.

demographic factors. The first stage produces the inverse mills ratio, which accounts for the selection bias (ie, the decision to participate in the organic market.) In the second stage of the Heckman model, demographic variables were regressed on the share of organic vegetables purchased and the inverse mills ratio. In the second stage, called the outcome equation, only the group that buys organic is included in the least squares regression. The inverse mills ratio is necessary because the estimators from the least squares model are consistent but the standard errors are not; the procedure passes along a correction factor from the first stage to the second stage to use in finding consistent estimates of the standard error; see Greene (1993) for more detailed explanation.

In all models estimated, we rely on Stata's survey component to incorporate ACNielsen's weights and strata. The use of the weights adjusts the data so that the estimates represent the U.S. population. Use of the strata provides efficient estimates by adjusting the standard errors.

Results

Logistic Model

For ease of interpretation, we opted to use logistic regressions with reported odds ratios. The estimated coefficients reflect the odds that a consumer with a characteristic (such as having a child under 6) will buy organic, relative to the odds of not buying organic. The logistic model is represented by:

$$1. Pr\{\text{household purchases organic}\}=f(\text{race, children under six, age, education, income})$$

The dependent variable is the binary organic household variable (1=purchased organic and 0 = did not purchase organic). Race is captured in five dummy variables, representing Caucasian, Asian, African-American, Other, and Hispanic, with the largest category, Caucasian, omitted from the regression. The presence of a child under six is represented by a dummy variable. Age of the head of household is comprised of three groups, less than 30, 30-49 years, and 50 and older. Age less than 30 was omitted. Education of the head of the household has four categories, high school education or less, attended college, graduated college, and post graduate work, with high school education or less dropped. Household income is a continuous variable, as explained earlier.

Logistic models were estimated, first using the aggregated vegetable dataset, and then the salad, carrot and spinach datasets.⁴ Within the aggregate vegetable dataset race, education and household income were statistically significant at the five percent level. African Americans were .64 times less likely than Caucasians to purchase organic vegetables. Increases in education levels of consumers consistently increased the odds of purchasing organic vegetables, when compared to consumer with a high school education or less. Consumers with some college education were 29% more likely to purchase organic produce, while consumers who graduated college, or had post college education were 53% and 80% more likely to purchase organic vegetables than those with a high school education or less. The interpretation of the impact of income on the odds of buying organic vegetables, relative to buying conventional vegetables, is different because income is a continuous variable. In this case, the estimated coefficient is 1.00002. Thus, when income increases by 1 unit, the odds of buying organic vegetable is 1.0002; this change is small, but significant.

Logistic results for the salad and carrot datasets were similar to the aggregate vegetable results. Like the aggregate vegetable dataset race (specifically African American),

⁴ Comprehensive result tables for all regressions can be found in Appendix A.

education level and household income were all statistically significant. However, age was also a statistically significant factor, a result that varied from the aggregate dataset. Statistically significant results for salads and carrots are listed below.⁵

Table 1: Estimated odd ratios for Packaged Salad and Carrot Logit Models

Variable	Packaged Salad: Odds Ratio (SE)	Carrots: Odds Ratio (SE)
African American	0.76 (0.07)	0.70 (0.09)
Some College	1.47 (0.11)	1.38 (0.11)
Graduated College	1.93 (0.15)	1.56 (0.11)
Post College Degree	2.47 (0.24)	1.66 (0.18)
Household Income	1.00 (0.00)	1.00 (0.00)
Age: 30-49	0.69 (0.91)	0.73 (0.11)

Consistent with the aggregate dataset, African American consumers are less likely to consume organic salads and vegetables than Caucasian consumers. As education levels increase, consumers are more likely to purchase organic salads and carrots, when compared to those who have a high school education or less. Similarly, as household income increases, so does the likelihood of purchasing organic salads and carrots. Interestingly, consumers between the ages of 30 and 49 are 0.69 times less likely to purchase salads and 0.73 less likely to purchase carrots than consumers that are younger than 30.

Logistic results for the spinach dataset varied greatly from the other datasets. Race, presence of children under six years, and household income were the only statistically significant variables. Asian Americans were 0.14 times less likely to purchase organic spinach than Caucasian consumers. Conversely, consumers with children under the age of six were 96% more likely to purchase organic spinach than households with children under the age of six. Similar to the other datasets, as household income increases so does the probability of purchasing organic spinach.

The general picture presented by the logistic analysis is that education level, some races, and household income demographics affect the odds that consumers will purchase organic vegetables, relative to conventional vegetables, in general and broken down into produce sectors.

Another way of interpreting the logistic results is to calculate the predicted probabilities of buying organic vegetables, relative to buying conventional vegetables.⁶ This can be done under a variety of scenarios. These results are preliminary, and are intended to give a flavor of how the probability of buying organic vegetables varies as certain demographic factors changed. The predicted probabilities are based on average income of the aggregate vegetable sample.⁷ Presented are the predicted probabilities for Caucasian households under different assumptions about age and head of household education level, and presence of children under the age of 6 in the households. Predicted probabilities increased under all scenarios as the education level of the head of household rose. Households without children had a higher predicted probability of purchasing organic vegetables.

⁵ Coefficients are statistically significant at the 5% level. Note that these tests indicate difference from the odds ratio being equal to 1.

⁶ Predicted probabilities are a conversion of the estimated odds ratio coefficients from a logistic model into relative probabilities.

⁷ The average income for the aggregate vegetable dataset is \$59,940.

Table 2: Predicted probability of buying organic vegetables, relative to buying conventional vegetables, for Caucasian households at average income

Scenario	Predicted Pr{organic}
kids, 30-49, some college	0.07
kids, 30-49, grad college	0.24
kids, 30-49, grad school	0.40
no kids, 30-49, some college	0.11
no kids, 30-49, grad college	0.28
no kids, 30-49, grad school	0.44
kids, over 50, some college	0.16
kids, over 50, grad college	0.33
kids, over 50, grad school	0.49
no kids, over 50, some college	0.20
no kids, over 50, grad college	0.37
no kids, over 50, grad school	0.53

Heckman Two-Stage Model

The second question we addressed is what demographics influence the share of household expenditures spent on organic vegetables. The Heckman two-stage model was estimated using the same four datasets. In the first stage, a probit model was estimated, using the following demographic variables. Then a linear regression was estimated using the following variables, as well as the inverse mills ratio (λ).

2.

$$\begin{aligned} orgshare = & \alpha + \beta_1 Race_{Asian} + \beta_2 Race_{Black} + \beta_3 Race_{Hisp} + \beta_4 Race_{Other} + \\ & \beta_5 childlt6 + \beta_6 Age_{30-49} + \beta_7 Age_{>50} + \beta_8 Edu_{Some\ College} + \beta_9 Edu_{College\ College} + \\ & \beta_{10} Edu_{Post\ College} + \beta_{11} Income + \lambda \end{aligned}$$

The linear regression results for the aggregate dataset reported a R^2 value of 0.28. All variables except Asian race, Hispanic race, and other race were statistically significant at the five percent level. Shares spent on organic vegetables are expected to decrease by 0.008 with African American consumers, decrease by 0.004 for households with children under six years of age, decrease by 0.008 and 0.007 for consumers that are in age groups 30-49 and greater than 50. Conversely, consumers with higher education levels will consistently increase their frequency of purchases of organic vegetables. Lastly, as consumer incomes increase, the share spent on organic vegetables increases slightly. We'll revisit the interpretation of these coefficients in the next version; these interpretations do not incorporate the cross equation marginal effects. However, the initial results are fairly consistent with the logit results presented earlier for the aggregate vegetable dataset.

When the linear model was run on the individual vegetable categories, the R^2 values were significantly stronger and few variables were statistically insignificant, suggesting that the model fits the disaggregated data better than the aggregated data. This preliminary finding warrants a closer look, which will be part of the next version of the paper. For the salad dataset, R^2 was 0.47 and only Hispanic race and African American race were insignificant at the five percent level. The education and household income variables all increase shares as education levels and incomes increased. Shares decreased with children

under six, and if consumers were African American. The only deviance from the aggregate regression was shares spent on salads increase slightly with Asian consumers.

The carrots dataset reported a R^2 value of 0.54 and only Asian race was statistically insignificant. The results were consistently the same as the salads and aggregate datasets where shares spent on organic carrots decrease with each race category, age category and with the presence of children under six. Shares increase with increases in education levels and incomes. In the spinach dataset, the R^2 was the highest of all datasets at 0.65 and all variables were statistically significant at the five percent level. Again, shares spent on organic spinach decreased with each race, age and children under six categories, and rose with increases in education and household incomes.

Final Remarks

Using 2004 AC Nielsen Homescan data, we analyzed which demographic factors influenced the odds of consumers purchasing organic vegetables, along with the odds of purchasing organic pre-packaged salads, carrots and spinach. We also analyzed once households decided to purchase organic vegetables, which demographics influenced the share of household vegetable expenditures spent on organic vegetables (both in the aggregate vegetable and individual carrot, salad and spinach datasets). Logit models were used for the first round of analysis and the Heckman two-step model was utilized for the second share calculating stage.

Throughout all stages of analysis, consumer's education level, and household income were the most consistent variables that impact the odds of purchasing organic products. These same demographics statistically affect the share of vegetable expenditures spent on organic vegetables. These results vary with the previous consumer survey results from Barry, and Hartman, which reflected minorities, and lower income consumers purchased organic products. However, these results hold consistent to the generally held stereotype that organic consumers are wealthy, well educated Caucasians.

As organic markets continue to grow, understanding the demographic factors that influence the probability a consumer will purchase organic vegetables or the demographic factors that influence the share of household income spent on organic vegetables can help guide retail markets in gaining a better understanding of the most profitable customer bases to market organic products. This is especially important since organic vegetables, and organic produce in general, is considered a gateway product that introduces consumers to organic products. If a consumer tries organic vegetables, they are likely to continue expanding their consumption of other organic products.

From these preliminary results, Caucasians that are well educated with higher incomes are the most likely market sector to focus marketing organic vegetables to. However, these results also provide an understanding of demographic gaps that are missing from the organic vegetable consumer profile, such as African Americans. Next steps in this paper will be to address some technical issues regarding interpretation of the Heckman coefficients, and fine-tuning the econometric analysis. Further research should explore why African Americans, and other minorities are less likely to purchase organic vegetables, which may provide insight into ways to target marketing of organic vegetables towards this undeveloped, large market segment.

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Appendix A

Table 3: Logit Analysis Results

Variable	Aggregate: Odds Ratio (SE)	Salad: Odds Ratio (SE)	Carrots: Odds Ratio (SE)	Spinach: Odds Ratio (SE)
Hispanic	1.12 (0.13)	1.16 (0.18)	0.97 (0.17)	0.74 (0.33)
Black	0.64* (0.04)	0.76* (0.07)	0.7* (0.09)	0.88 (0.26)
Asian	0.83 (0.1)	1.1 (0.17)	0.89 (0.18)	0.14* (0.06)
Other	0.93 (0.07)	1.05 (0.11)	0.88 (0.11)	0.68 (0.22)
Child < 6	0.96 (0.07)	0.88 (0.09)	0.89 (0.1)	1.69* (0.42)
Age: 30-49	0.83 (0.08)	0.69* (0.1)	0.73* (0.11)	0.49* (0.17)
Age: 50 >	0.91 (0.09)	0.76 (0.11)	0.77 (0.12)	0.56 (0.21)
Some College	1.29* (0.06)	1.47* (0.11)	1.38* (0.11)	1.28 (0.26)
College Grad	1.53* (0.08)	1.93* (0.15)	1.56* (0.13)	1.3 (0.28)
Post College	1.8* (0.12)	2.46* (0.24)	1.66* (0.18)	1.86* (0.42)
HH Income	1.00* (0.00)	1.00* (0.00)	1.00* (0.00)	1.00* (0.00)

*Denotes significance at the 5% level.

Table 4: Heckman Model: Probit Results

Variable	Aggregate: Odds Ratio (SE)	Salad: Odds Ratio (SE)	Carrots: Odds Ratio (SE)	Spinach: Odds Ratio (SE)
Hispanic	0.07 (0.04)	0.08 (0.08)	-0.02 (0.09)	-0.17 (0.2)
Black	-0.24* (0.06)	-0.14* (0.05)	-0.17* (0.06)	-0.05 (0.14)
Asian	-0.11 (0.07)	0.06 (0.08)	-0.07 (0.1)	-0.86* (0.22)
Other	-0.05 (0.04)	0.01 (0.06)	-0.06 (0.06)	-0.17 (0.15)
Child < 6	-0.02 (0.04)	-0.06 (0.05)	-0.06 (0.05)	0.26* (0.12)
Age: 30-49	-0.1 (0.06)	-0.19* (0.07)	-0.16* (0.08)	-0.36* (0.18)
Age: 50 >	-0.05 (0.06)	-0.14* (0.08)	-0.13 (0.08)	-0.3 (0.19)
Some College	0.14* (0.03)	0.19* (0.04)	0.16* (0.04)	0.11 (0.09)
College Grad	0.24* (0.03)	0.34* (0.04)	0.22* (0.04)	0.12 (0.1)
Post College	0.34* (0.04)	0.48* (0.05)	0.26* (0.05)	0.3* (0.11)
HH Income	2.66e-07* (2.66e-07)	4.15e-06* (3.29e-07)	1.29e-06* (3.67e-07)	1.99e-06* (6.99e-07)

*Denotes significance at the 5% level.

Table 5: Heckman Model: OLS Results

Variable	Aggregate: Coefficients (SE)	Salad: Coefficients (SE)	Carrots: Coefficients (SE)	Spinach: Coefficients (SE)
Hispanic	0.002 (0.002)	0.007 (0.005)	-0.008* (0.004)	-0.064* (0.01)
Black	-0.01* (0.001)	-0.021* (0.002)	-0.019* (0.003)	-0.015* (0.005)
Asian	0.003 (0.003)	0.029* (0.007)	-0.011 (0.007)	-0.219* (0.014)
Other	-0.001 (0.001)	0.002 (0.003)	-0.008* (0.003)	-0.048* (0.008)
Child < 6	-0.004* (0.001)	-0.009* (0.003)	-0.014* (0.002)	0.083* (0.01)
Age: 30-49	-0.008* (0.002)	-0.035* (0.005)	-0.028* (0.004)	-0.103* (0.022)
Age: 50 >	-0.01* (0.002)	-0.026* (0.005)	-0.021* (0.004)	-0.08* (0.021)
Some College	0.007* (0.001)	0.026* (0.002)	-0.033* (0.002)	0.029* (0.005)
College Grad	0.016* (0.001)	0.053* (0.003)	0.044* (0.002)	0.034* (0.005)
Post College	0.02* (0.002)	0.071* (0.005)	0.05* (0.003)	0.088* (0.01)
HH Income	5.28e-08* (1.10e-08)	4.87e-07* (2.97e-08)	1.87e-07* (2.21e-08)	6.88e-07* (6.31e-08)
Mills Ratio (λ)	0.09* (0.002)	0.533* (0.013)	0.761* (0.006)	1.611* (0.027)

*Denotes significance at the 5% level.

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Does taste beat food safety? Evidence from the “Pêra Rocha” case in Portugal

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Summary

Until recently, fresh fruits such as pears were provided to markets as generic products. However, these products are now differentiated by cultivars, origins and appearances, as well as by companies' production and processing methods. Therefore, we observe a lot of denominations of origin, retailers' and private labels in order to signal the differentiation to the consumers, who are often willing to pay large price premiums for products with specific attributes.

Indeed the value consumers put on fruits depends on the degree of product-information that are available to them and this information derives mainly from tasting and from the label of the products. In this paper, we used an experimental auction to investigate how quality attributes information affects consumers' willingness to pay for different types of pears, particularly choosing the Portuguese "Rocha" pear variety. The BDM auction mechanism was combined with sensory analyses in order to develop an integrated approach to evaluate product attributes.

The main results show that information on the products' characteristics related to food safety instantly influences consumers' willingness to pay. However, it appears that sensory intrinsic attributes related to taste finally beats the guarantee of food safety in driving the buying behaviour.

KEYWORDS: Experimental auction, Willingness to pay, Quality signals, Food safety, Fruits.

1. Introduction

The European fruit and vegetable sector has experienced important changes during the last years. Producers have had to meet the challenges of global competition within the European market and of the strong concentration process in retailing. Consequently, these products are now differentiated by cultivars, origins and appearances, as well as by companies' production and processing methods. Therefore, we observe a lot of denominations of origin, retailer labels or private brands in order to signal the differentiation to the consumers who are often willing to pay large price premiums for products with specific attributes.

In this paper, we use a protocol based on an experimental auction in order to improve the understanding of how different attributes of fruits can interact and affect consumers' willingness-to-pay (WTP). Taking the example of the pear industry in Portugal, we apply this protocol to both non-certified and certified products. For this last category of products, our aim is to show the role of two kinds of “labels” in order to transmit the information on attributes to consumers: (i) a collective label with a denomination of origin (namely the “Rocha do Oeste” pear) and (ii) a premium retail label (namely the well known “Fileira Qualidade Carrefour”, Carrefour's Quality Lines). The main result we obtain is that “food safety” is an important issue for these certifications, but it cannot outperform sensory attributes, because consumers are not ready to compromise on taste.

The purpose of our experiment is to improve the assessment of the relative influences of different attributes on the consumers' WTP for a product. Following the typology of Nelson (1970), and Darby and Karny (1973), our aim is to compare the relative influences of search attributes (which are directly observable, like "appearance" of pears for example), experience attributes ("taste" for example, which is usually unknown before consumption) and credence attributes (for example "food safety", which cannot be evaluated directly by consumers).

Following Caswell *et al.* (2002), the three main attributes of "appearance", "taste", and "food safety" that we consider in our experiment are "intrinsic" attributes, related to the physical characteristics of the product. However, in the food area, there are a lot of extrinsic cues which are searchable and closely related to the marketing and differentiation strategies of the producers. According to Caswell *et al.* (1992) and Grunert (2005) information in the form of labels could contribute to the comprehensiveness and accuracy of consumers' evaluation of search, experience and credence attributes.

In the case of credence attributes, extrinsic cues have an important role to inform the consumers who can "believe" or "give credence" to the signals without being able directly to test or verify the credence quality itself. Then, consumers have a tendency to rely on simple indicators such as brand name, retailer reputation, and labelling in their evaluations. For example, an eco-label is a credible label that identifies environmentally preferable products based on an environmental impact assessment of the product compared to other products in the same category. Consumers are generally unable to measure quality attributes such as the impact of production practices on environment but they may make inferences about these attributes from extrinsic quality indicators and cues as brand names.

In this context, research on country-of-origin effects has established that consumers may use origin information as a quality cue (Stefani *et al.*, 2006). Certification of origin can also carry information on health and safety issues, namely if they certify the so-called "Integrated Pest Management". In this way, certification of origin can act as a private brand in order to differentiate products by enlarging product attractiveness, assuring the consumer simultaneously on more than one attribute. This is the reason why we compare the effectiveness of a certification of origin to a retailer's label in their respective abilities to carry information on a selection of attributes in the pear sector. We show however that both labels neglect a very important certification which is rarely used in the fruit sector, namely a ripeness certification ("fully ripe" for example) which could provide a taste guarantee to consumers.

The paper is organized as follows. The next section presents the reasons for using the WTP approach to measure consumer preferences. Then we describe the experimental design and present empirical findings, specifically the results in terms of WTP. The concluding section discusses implications of the empirical findings.

2. Background on WTP for quality attributes

Recent studies find that consumers are willing to pay for different quality attributes and for information about them. The WTP approach is, therefore, concerned with measuring *ex ante* valuations, that is, valuations at the moment choices are made. Researchers measure WTP also from actual market transactions, and from a variety of stated and revealed preferences methods.

A common feature in WTP studies is the use of various types of contingent valuation methodologies to elicit WTP, including surveys, choice experiments (conjoint analysis), and experimental markets.

Stated preferences studies like stated choice surveys use new or non-existent product attributes and asked consumers to make choices in a sequence of choices scenarios. The values of different attributes are estimated by varying the product attributes between the choice scenarios.

Studies that measure consumer preferences in terms of their WTP for different attributes and that are based on real choices and costs are denominated revealed preference methods. Experimental markets (EM) are well-known category of revealed preference methods that are characterised by the use of real economic incentives. Methods with this feature are called incentive-compatible methods for eliciting willingness to pay (Alfnes *et al.*, 2006).

EM give the opportunity to control the type and timing of information provided to participants and observe changes in bidding behaviour (Shogren *et al.*, 1999). A lot of research studies have used EM to assess consumers' WTP for different quality attributes. Examples of EM studies that evaluate search quality attributes are the research of Melton *et al.* (1996) that analysed WTP for fresh pork shops and concluded that attributes like appearance affect WTP. Also, the study of Lange *et al.* (2002) that used EM to reveal the WTP for Champagnes presented with different external information. Recently, Lund *et al.* (2006) analysed the monetary value consumers put on freshness of apples and they used EM. Others researchers have measured monetary values of experience quality attributes. Lusk *et al.* (2001) used an experimental auction to investigate how variance in beef tenderness affects consumers' valuations. As well, Umberger, *et al.* (2004) used an experimental auction to determine consumer WTP for beef flavour.

Experimental markets have become an increasingly popular tool for evaluating consumer preferences for credence attributes since the nineties (Fox *et al.*, 1995; Hayes *et al.*, 1995; Rozan *et al.*, 2004; Hobbs *et al.*, 2006). Credence quality attributes, like food safety have been valued using the revealed preference approach. Food safety can be treated as a dimension of quality (Hooker *et al.*, 1995) where safety attributes are categorised as a subset of quality attributes that including foodborne pathogens, heavy metals, pesticide residues, food additives and veterinary residues. Measuring WTP for safety attributes has been an important issue in agricultural economics and the different food safety attributes have led to an important range of WTP analysis.

In early empirical studies on food safety, WTP was frequently valued by means of contingent valuation (CV) surveys. Some of them have focused on risk reductions from pesticides in food (Buzby *et al.*, 1998), others on risk reduction from pathogen like *Salmonella* (Henson, 1996). However, Shogren (1993) argued that survey methods like CV are not a real market discipline because they don't create an environment conducting to accurate and reliable responses. Also, a few authors considered that CV of food safety overcomes the information problem by providing objective assessments of health risk.

Others researchers employed choice experiment to calculate WTP for several food safety attributes. Enneking (2004) used this method to analyse the impact of food safety label applied to brand products. He concluded that WTP estimates vary considerably across food labels and quality labelling influences consumer choice behaviour. Also, Alfnes *et al.* (2003) used a choice experiment to analyse Norwegian consumers' preferences for domestic, imported and hormone-treated beef.

Due to the concern over the "hypothetical nature" of the stated preferences approaches, research conducted more recently has used experimental economics procedures to elicit WTP for food safety attributes. This technique has been applied to a number of different food safety attributes including reductions in pesticides risk (Roosen *et al.*, 1998; Rozan *et al.*, 2004), pathogen risk (Hayes *et al.*, 1995), and in the use of food irradiation (Shogren *et al.* 1999).

Advantages and limitations of EM in valuing food safety attributes have been discussed in the literature. Buzby *et al.* (1998) used three different techniques to evaluate the costs of foodborne illness and the benefits to society of a safer food supply. They presented a case study for each technique: CV surveys on pesticide residues, EM for a chicken sandwich with risk of contamination and one expenditure-based technique such as the cost-of-illness approach. They argued that valuation with controlled environment offers advantages like consider consumers' budget constraints, revelation of truthful values by the use of a reveal-mechanism and minimization of selection bias by recruiting for a "generic consumer

study". Enneking (2004) criticised experimental auctions and CV studies, because he considered that these approaches pick out the food safety attributes as a central survey theme. He argued that consumers' attention is concentrated on this product feature, resulting in an over-representation compared with real market behaviour, where food safety is only one of several attributes.

In this paper, we argue that consumers can and do make tradeoffs between different quality attributes. Following, Grunert (2005), we consider that the importance of different attributes to consumers could change over time. According to him, sooner or later it is possible that credence attributes could lose out to experience attributes. He points out that taste and healthiness have the same importance before consumption, but it may change after consumption. Consumer could give a different importance to taste because it has now been experienced, while healthiness is still intangible and information-based.

Research in experimental markets as the work of Melton *et al.* (1996) suggested that measure consumer preferences for any fresh food based on appearance without tasting is unrealistic. With the same point of view, Hobbs *et al.* (2006) used an experimental auction to evaluate WTP for two different kinds of meat with different quality assurances. The results show that consumers make tradeoffs between taste and production methods attributes, and they suggest that consumers are unlikely to compromise eating experience.

3. Objectives

We used an experimental auction to investigate how quality attributes information affects consumers' willingness to pay for different types of pears, particularly choosing the Portuguese "Rocha" pear cultivar. As in Melton *et al.* (1996), Roosen *et al.* (1998), Umberger *et al.* (2004) and Hoobs *et al.* (2006), our experiment features simultaneous valuation of multiple attributes of quality (taste, appearance, food safety and labels), where quality is defined as a multi-dimensional vector of these attributes. Participants faced the problem of evaluating four different modalities of "Rocha" pear.

4. Data and methodology

In our experiment, the elicitation method used was the BDM mechanism (Becker-DeGroot-Marschak, 1964), also known as lottery mechanism. The BDM mechanism has been used in different research beginning with the analysis of the preference reversal phenomenon and risk preferences. Recently, it was used to evaluate quality differentiated products (Lusk *et al.*, 2001) and to elicit willingness to pay for GMO-free products (Noussair *et al.*, 2004). The BDM mechanism is theoretically equivalent to a second-price sealed-bid auction (Vickrey auction). In both cases, the dominant strategy is to bid one's private value because bids are separated from market price. Like Vickrey auction, the BDM mechanism provides incentives to participants to truthfully reveal their preferences.

The BDM mechanism was combined with sensory evaluation in order to develop an integrated approach able to evaluate extrinsic as well as intrinsic product attributes, and possible interactions between them. Sensory techniques were also used to make sure that pears were very similar within each alternative.

4.1 Experimental Subjects

The experiment took place in the district of Oeiras, near Lisbon, in Portugal. Oeiras has a population of about 170,000 and is located in a predominantly urban area.

Seventy-four participants were recruited from the general population of these location and three groups were selected. One group was recruited using the specific protocol describe by Lange *et al.* (2002), that consists of random choices of phone numbers in the district where the study was performed (Oeiras). This group was a representative random panel of the Oeiras population. The two other groups were selected using a random sample from the

different professional's categories of employees of the National Agrarian Station (research institute) and the city council of Oeiras. The participants of the first group didn't have agrarian knowledge and the participants of the other group had information about agronomic science.

For the three groups, individuals contacted by phone were selected if they ate at least 3 pears per week, regularly participated in their food purchasing, and if they ate "Rocha" pears. Consumers' information obtained by a questionnaire answered by phone also gave us details about socio-economic characteristics of the participants, pears characteristics selection at the moment of purchase and places of purchase. Table 1 presents summary statistics for the socio-demographic variables describing the three groups.

Participants took part in one of eight sessions, and the number of participants in each session varied from five to fourteen people. No compensation was offered for participation, but subjects were given 2 euros before they start bidding and were told they could keep the money if they did not spend it.

Note that recruitment without compensation is likely to increase selection bias, but, since, opportunity costs vary across individuals, it is possible that uniform compensation may differentially impact subjects' revealed values. Buzby *et al.* (1998) reported a significant positive effect on revealed values for reduction in *Salmonella* risk when a \$3 participation payment was made to student subjects whose opportunity costs were likely near zero.

[Insert Table 1]

4.2 Products

The "Rocha" pear is produced exclusively in Portugal, the greater part of the fruit grows in the Central West Coast (accounting for 90% of the national production), although its production extends towards the central interior. This fruit is very familiar to Portuguese people and widely consumed on a weekly or daily basis. The "Pêra Rocha do Oeste" is a Protected Designation of Origin (PDO) since 1993. Among the 14 Portuguese PDO/PGI fresh fruits, the PDO "Pêra Rocha do Oeste" is the most important and the exportation markets are its principal destination (Fragata *et al.*, 2007). The largest importer of "Rocha" pear is the United Kingdom (41%), followed by France (17%), Brazil (14%), Ireland (9%), the Netherlands (7%) and the Russian Federation (4%). This pear has developed a good reception from the big chain retailers, as its shelf life and resistance to handling are superior to "Williams", the main competing pear cultivar during the summer (Silva *et al.*, 2005).

Four modalities/types of "Rocha" pear were chosen for this experiment, selected for their differences in intrinsic attributes and extrinsic quality cues. One generic "Rocha" pear without signal of quality (P1), a pear with a premium retailer label (P2) and two pears with the Protected Designation of Origin (P3 and P4) with two levels of maturities, controlled by a sugar contents measurement (°Brix). The means °Brix of the four modalities were: 14° for P1; 13° for P2 and P3; 11° for P4 (see Table 2). The selection of homogenous subsets of pears within each category was done with assistance from post-harvest scientists at INIAP with training in sensory analysis and product characterization (sugar contents, texture and assessed colour of the pears).

4.3 Experimental procedure

Sessions were run in a classroom located in the formation center of INIAP. Participants sat in individual tables organised in four rows of four tables. All sessions were held in the week of 6 to 12 November 2006. At this time several categories of "Rocha" are available on the market.

Prior to conducting the experiment for the "Rocha" pear, care was taken to make sure all participants were familiar with the experimental procedure and understood it. In addition to describing each part of the experience and the respective steps, participants were given

examples of how the BDM mechanism works. The preference revelation property was emphasized by explaining why it was in a participant's best interest to bid his true valuation in the BDM mechanism. Participants then gained first-hand experience with the BDM mechanism by participating in a non-hypothetical market with small pears (a pear size not evaluated in our experimental market). Once this familiarisation had taken place, the experiment with the "Rocha" pear was conducted.

The experiment consisted in an evaluation phase followed by a selling phase. During the evaluation phase, participants had to evaluate different alternatives of "Rocha" pear in four different information conditions. In each information situation, participants could evaluate the four modalities simultaneously and had to complete a small questionnaire indicating, for each alternative pear, whether they want to buy 1 kilo of this pear and if "yes" at what maximum price. Questionnaires were collected at the end of each information step in order to prevent subjects from reconsidering their evaluations from one information situation to the other.

The evaluation stage of the experiment consisted of four steps: (i) blind tasting of the four modalities pears, ii) visual and tactile examination, iii) additional information, iv) tasting with all the information.

At the beginning of the first step, situation 1 (S1), participants received a sample of each of the four alternative pears for tasting. Each modality was identified with a letter and besides the fact that they were "Rocha" pears, no other indication was given. Clear plastic cups containing pear slices were given to participants – each cup containing three slices of one modality. For each alternative, participants had to indicate their buying intention and maximum price as explained previously.

- In situation 2 (S2), one fruit of each of the four modalities was given to each participant. Three modalities were identified with a personalized retailer/producer label: P2 with a label "Fileira Qualidade Carrefour" (FQC), and P3 and P4 with a label "Rocha do Oeste" (RO). The participants could only make a visual and tactile inspection of the products and examine the labels, but were not allowed to taste the pears. They had enough time to evaluate each of the alternative pear carefully before completing the questionnaire.

- In situation 3 (S3), some information was given about quality assurance, origin and food safety for each fruit. Before the information was issued individually to participants, they were asked to answer a few questions to check their prior beliefs about those quality attributes: (1) Do you know if this type of pear has quality assurance? (2) Do you know if this label assures specific origin? (3) Do you know if this pear has food safety assurance? The experimenter provided oral comments about the interpretation of the questions and additional information about agricultural integrated production practices were given. Responses were collected by means of a matrix questionnaire in table form. Participants had three alternative answers: "yes", "no" and "don't know". After they answered, they were given another table form with the same questions and the right answers. After considering the information provided, participants had to evaluate the same four alternative pears.

Finally, in situation 4 (S4), participants were given a knife and asked to taste the pears before given a new evaluation accounting for all the information about each of the four alternative pears.

During the last phase of the experiment, each participant selected one situation at random (by choosing one card among sixteen), and then drew one token from a box containing 30 tokens with price ranging from €0,20 to €2,00. If the bid the participant submitted in one situation was higher than the price on the token he drew, the participant had to buy 1 kilo of "Rocha" pear at the price appearing on the token. If his bid was less he had no opportunity to buy. At the end of the session participants could ask to check the bag containing the tokens.

5. Results

5.1 Results for each information situation

From the seventy-four participants who evaluated 4 alternative pears in 4 information situations, we collected a total of 1184 prices. Figure 1 shows the distribution of these prices. Refusals to buy result in 177 zero prices (14.9% of the total). Given that no participant systematically refused to buy (out of 16 evaluations, the maximum number of refusals to buy is 8, and the median is 2), we can interpret these refusals as zero WTP for specific characteristics. Strictly positive WTP are distributed almost normally, around a mean of €0.88 and a median of €0.9. Compared to market prices, the WTP distribution seems to be slightly shifted to the left, but nevertheless a majority of positive WTP are within the range of market prices (from €0.68 to €1.5).

Figure 2 splits the distribution of prices according to pears (rows) and information situations (columns). From this figure, we can see that the distributions of prices for pear P4 (last row) are characterized by a lot of zero WTP in all the information situations, and in particular in situation S1 when tasting was the only way to evaluate the pears.

[Insert Figure 1,2]

Looking at mean WTP by pear and information situation makes interpretation easier. Figure 3 displays the mean WTP for each pear (including refusal to buy, counted as zero) with the corresponding 95% confidence interval.

Under blind tasting condition (situation S1), the generic “Rocha” pear P1 obtains a mean WTP of €0.91, significantly higher than those of all other pears, which actually have a lower sugar rate (controlled by a sugar contents measurement, see Table 2). The mean of prices proposed for pear P1 is greater than the mean prices for pears P2, P3 (+ €0.14 and + €0.13, respectively, with $P < 0.005$ in both cases) and P4 (+ €0.46, $P < 0.0001$). Moreover, after blind tasting, participants are also willing to pay significantly more for pears P2 and P3 than for pear P4 (+ €0.32 and + €0.33 respectively, $P < 0.0001$). As prices proposed for pears P2 and P3 (with identical sugar rate) do not differ significantly, the hierarchy of prices appears to be the same as the hierarchy of sugar rates. So we can conclude that participants are sensitive to variations in sensory characteristics, and adjust their WTP accordingly.

In situation S2, participants could evaluate the pears by visual inspection and examination of the stickers on pears P2, P3 and P4. Mean WTP differences show no impact of quality labels. Mean WTP are not different for pears P1, P2 and P3 though P1 has no label, and P2 has a different label from P3. Moreover, WTP for P4 is significantly lower than WTP for P3 (- €0.29, $P < 0.0001$) though they both have the same label. The main visible difference between P4 and the other pears is colour, P4 being greener than the other three. This difference in colour is taken as an evidence of unripeness by participants. It should be noted that there was no direct correspondence between situation S1 and S2: pears were identified by different codes, were not presented necessarily in the same order, and participants received only peeled slices in situation S1 and the entire fruit in situation S2. Once again, this result points out the importance of fruits’ maturity in the consumer choices.

The sequel of the experiment shows that the limited knowledge of consumers on integrated pest management is largely responsible for their relative lack of responsiveness to fruit labelling. To control for a priori beliefs of participants at this stage of the experiment, we asked them to complete a short questionnaire. For each pear, they had to answer three questions: about guarantee of quality, guarantee of origin, and food safety guarantee (associated with integrated pest management). Table 3 shows the distribution of responses for each pear and each guarantee. Right answers are written in bold characters, and percentages showing that only a minority of consumers are well informed about one of the

guarantees given by the labels are underscored. Data from Table 3 highlight the fact that participants are strongly under informed on the guarantee of higher food safety standards given by labels. Indeed, from the column "Guarantee of Food Safety" of Table 3, we can see that a minority (less than 50%) consider that these labels take into account integrated pest management. Moreover, only 8.2% of participants know that generic "Rocha" pear doesn't have a specific guarantee of food safety (i.e. a higher standard compared to the public regulations).

After having completed the questionnaire, participants were given the right answers and asked to perform another evaluation of the four pears. As a result of this new evaluation, pear P1 obtains a much lower WTP than pears P2 and P3 (- €0.36, $P < 0.0001$). The control of participants' knowledge before this evaluation allowed a good estimation of the effect of an information about the food safety guarantee brought by the labels. It highlights the increase in labels' reputation that more communication could bring. Nevertheless, the fact that in this situation, informed participants did not value pear P4 very much compared to P2 and P3 (- €0.30, $P < 0.0001$), raises the question of the trade-off between food safety guarantee and sensory quality.

Situation S4 brings some answer to this question. When fully informed on labels and after tasting of all the pears, participants finally value the pears according to their sensory characteristics rather than their labels. WTP for pear P4 remains significant lower than WTP for P1, P2 and P3, (- €0.25, - €0.27, - €0.35 respectively, $P = 0.0001$ or less). Moreover, WTP for pears P1, P2 and P3 are not significantly different. This could mean that the better taste of pear P1 compensates for the absence of specific guarantee on sanitary risks.

[Insert Table 2 and Figure 3]

5.2 Effects of information on WTP

The results obtained for each information situation show a complex pattern of relationships between taste and food safety in consumers' evaluation. Note that the greatest WTP obtained across all situations (€0.91) are for pear P1 in situation S1 and for pears P2 and P3 in situation S3.

In the first case, consumers revealed their WTP after blind tasting without any information regarding origin or production practices. As could have been expected, participants enjoy the sweetest pear. More surprising is the fact that a WTP of €0.91 is significantly higher than those obtained in situations closer to actual purchase conditions, that is when participants could only see the fruits and their quality labels. This lead to the idea that pear producers could certainly increase the market price of ripe fruits if they were able to certify a "Fully Ripe" characteristic to consumers.

In the second case, participants revealed their WTP without tasting the pears, but after having been informed of production practices and the associated guarantees. Again, this situation is far from a natural buying situation (taking into account the lack of knowledge of consumers on the real significance of the labels). Because the guarantee of food safety is insufficiently conveyed by the labels in situation 2, we can estimate the difference in WTP between a safe pear and an unsafe one. The absence of sanitary guarantees explains the decrease of the WTP for pear P1, since the WTP for pear P1 is €0.30 less in situation 3 than situation 2 ($P < 0.0001$). Note that information on integrated pest management increases the WTP for pear P2 (+ €0.10, $P = 0.0003$) and pear P3 (+ €0.07, $P = 0.05$). Moreover, it appears that the guarantee of origin (or the absence of guarantee of origin in the case of the retail label) has no specific effects compared to the food safety guarantees.

In order to evaluate the respective weights of taste and food safety attributes, we need to better understand the evolution of the WTP for each pear during the experiment. Figure 4 shows the mean WTP trends for each pear and each information situation. The WTP for

pear P1 starts from €0.91 in situation S1 and decreases to €0.86 in situation S2. When consumers are informed on the absence of safety guarantee, in situation S3, the mean WTP for P1 decreases dramatically to €0.56. The trend is reversed when participants can taste again the pears in situation S4, and the WTP then grows from €0.55 to €0.78 ($P < 0.0001$). Participants value the pear taste strongly, despite the absence of food safety guarantees. The WTP for the others pears show similar trends according to the information provided to participants. It seems that the reference to a label (“Rocha do Oeste” or “Fileira Qualidade Carrefour”) improves the WTP after the blind tasting. However, this result is significant only for pear P4, which WTP increases of €0.11 from situation 1 to situation 2 ($P = 0.02$). When participants have all the information about safety guarantees attached to the labels, they increase their WTP in a much clearer way. Indeed, comparing situations S1 and S3, we observe that the WTP increases by €0.15 ($P = 0.0004$) for pear P2, €0.13 ($P = 0.008$) for P3 and €0.17 ($P = 0.001$) for P4. Contrary to pear P1, the average WTP for P2, P3 and P4 decrease in situation S4. These results support the idea that participants put more weight on “taste” than on “food safety”.

[Insert Figure 4]

6. *Final remarks*

This research is a first contribution towards reducing the information gap in the pear market. The experiment’s results reveal that consumers are willing to pay significantly more for fully ripe pears, and for better quality assurances related to on-farm production methods, such as the absence of pesticides. These results have important implications for firms strategies regarding production, commercialization and signaling of product quality to consumers.

However, our results reveal no statistically significant difference between the WTP for Denomination of Origin and the WTP for retailers’ high premium labels, suggesting that the guarantee of origin is not very crucial for consumers. It seems that, in addition to marketing and promotion efforts, these labels should improve the signaling of credence attributes to consumers. They should do so, not because the WTP is higher for goods produced with less pesticides, insecticides, etc., but because the absence of these guarantees could lead to an important decrease of the WTP. Indeed, our results support the idea of a negative effect of the absence of information (i.e, non safe production) previously highlighted by Fox et al. (2002). In this sense, a signaling like the one given by "organic products" could be a good assurance for the future of producers’ income.

However, the results of this study suggest that "taste beats food safety", because even when consumers are well informed about safer products, they finally prefer to choose and enjoy the tasty alternative. This result is of great practical importance, because a large number of standards, labels and quality signals establish no link between the different attributes of the products and their methods of production. For example, in France, the logo "Label Rouge" signals sensory quality, but does not guarantee the origin of the product or the way it has been produced (organic or environmental friendly production for example). Unlike the “Label Rouge”, the "Appellation d’Origine Contrôlée" guarantees the origin and is very well known, but this label does not give any guarantees regarding sensory quality or environmental aspects. In the same way, the label "Agriculture Biologique", signaling organic products, accounts for the environment and gives some guarantees about food safety, but does not guarantee a high level of sensory quality. Therefore in France, contrary to Portugal where, for example, the “Rocha do Oeste” is a multipurpose label, none of the well known signals of quality take into account the necessity of a simultaneous certification of attributes which is asked for by consumers. This is the reason why the premium retail labels (like the one of “Carrefour” we studied in this paper) are expanding (see Bazoche et al., 2005).

The next step of this research should be to apply our methodology across a wider cross section of the European population, both geographically and socially. Hence, future research should explore the diversity of possible tradeoffs between food safety and sensory pleasure. This point is of particular importance in the fruit sector given that most of economic problems of this sector arise from the difficulty to offer a ripeness guarantee to consumers.

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Tables

Table 1. Profile of participants (N=74)

Group	Characteristic	Option	Percentage
City Council n=24	Gender	Female	79.2
		Male	20.8
	Age (years)	16-34	45.8
35-59		54.2	
60-76		0.0	
Oeiras n=21	Gender	Female	47.8
		Male	52.2
	Age (years)	16-34	8.7
35-59		34.8	
60-76		56.5	
EAN n=29	Gender	Female	66.7
		Male	33.3
	Age (years)	16-34	11.1
35-59		85.2	
60-76		3.7	

Table 2. Characteristics of the tested pears

Code	Designation	Quality signal	Appearance (colour)	Sugar rate (°Brix ²)	IPM ³	Market price ⁴ (€)
P1	Pêra Rocha generic	no	yellow	14	no	[0.68; 0.89]
P2	Pêra Rocha "Carrefour's Quality Line"	Premium label	yellow	13	yes	[1.02; 1.23]
P3	Pêra Rocha do Oeste	PDO ¹	yellow	13	yes	[1.10; 1.50]
P4	Pêra Rocha do Oeste	PDO ¹	green	11	yes	[1.10; 1.50]

¹ PDO: Protected Denomination of Origin

² Brix degrees are roughly equivalent to the percentage of sugar present in the pear

³ IPM: Integrated Pest Management

⁴ Source for price: <http://www.gppaa.min-agricultura.pt/cot/2006/iVeg.html>, Week 6-12/11/2006; Pêra*Rocha*SE*65-70mm; (I): DOP and (II): Generic (price*36%)

Table 3. A priori knowledge on guarantees on pears

	Guarantee of quality			Guarantee of origin			Guarantee of safety		
	Yes	No	Don't know	Yes	No	Don't know	Yes	No	Don't know
P1 Pêra Rocha Generic	41.9%	16.2%	41.9%	58.9%	1.4%	39.7%	20.5%	8.2%	71.2%
P2 Pêra Rocha "Carrefour's Quality Line"	51.4%	21.6%	27.0%	41.1%	15.1%	43.8%	49.3%	2.7%	47.9%
P3 Pêra Rocha do Oeste	74.0%	6.8%	19.2%	89.2%	0.0%	10.8%	47.9%	2.7%	49.3%
P4 Pêra Rocha do Oeste ("green")	57.5%	17.8%	24.7%	86.5%	2.7%	10.8%	43.8%	4.1%	52.1%

Graphs and Diagrams

Figure 1. Distribution of WTP for all pears and information situations

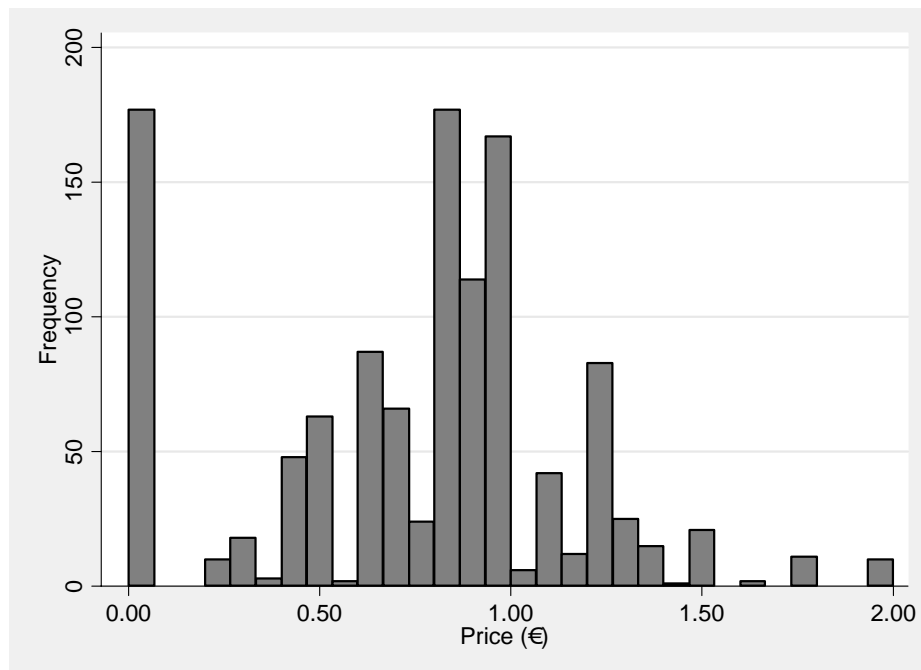


Figure 2. Distribution of WTP for each pear in each information situation

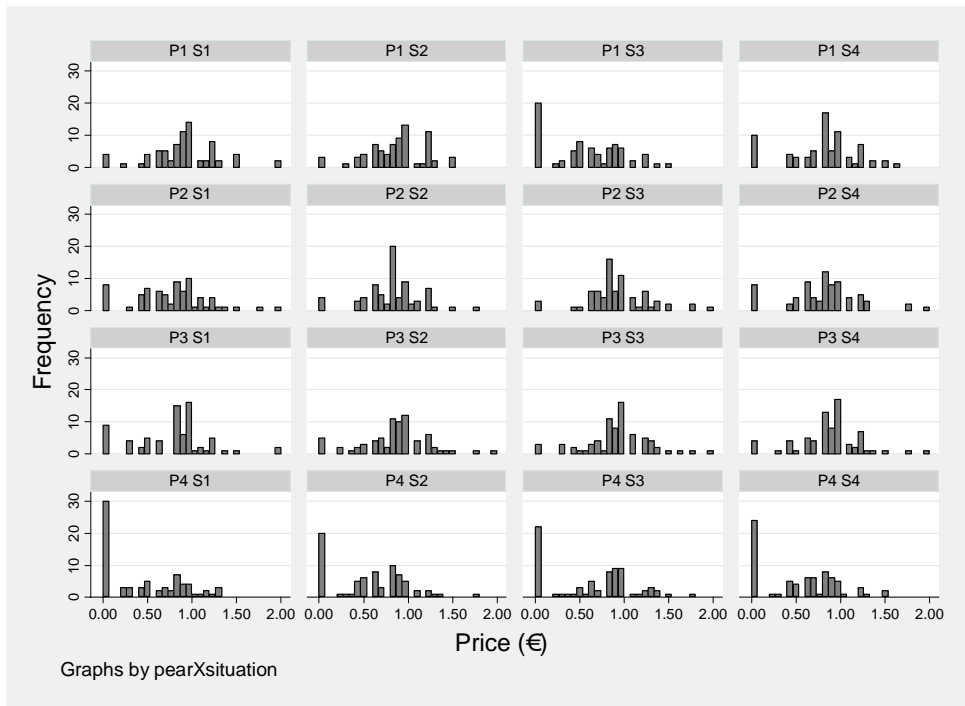


Figure 3. Confidence intervals (95%) of mean WTP for each pear in each information situation

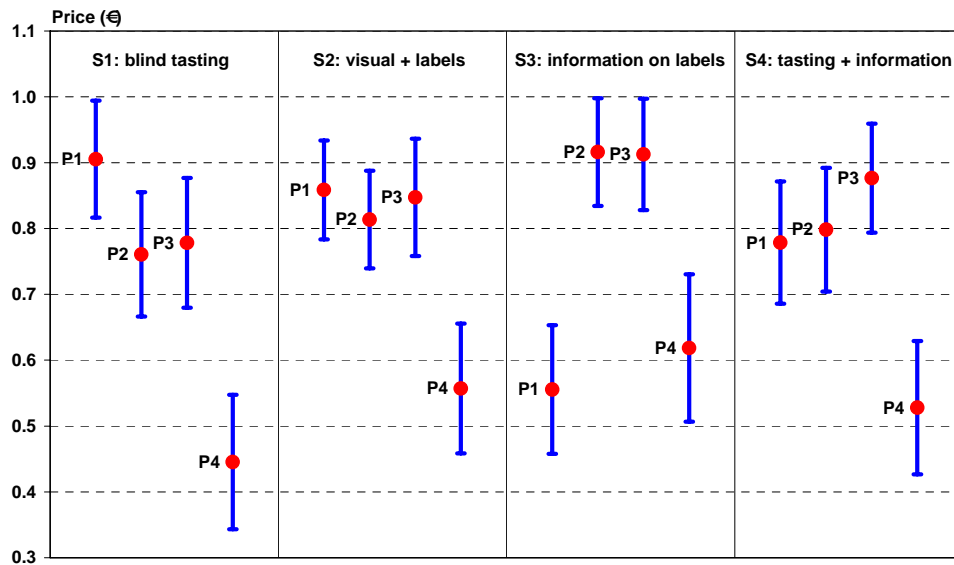
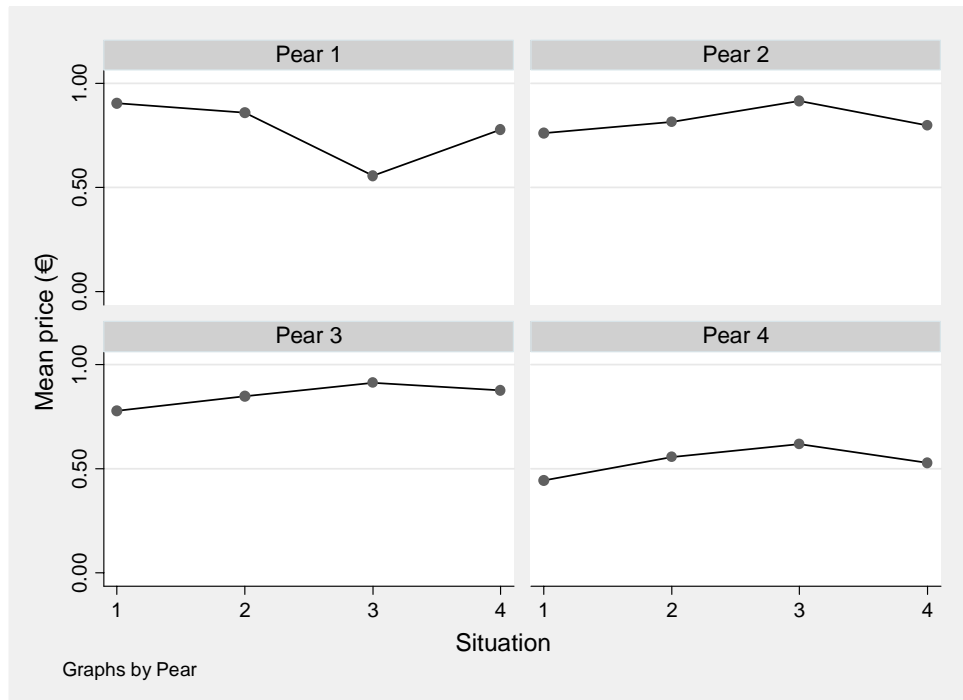


Figure 4. Trends in mean WTP according to the information situation for each pear



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Consumer Willingness to pay for Organic Food in Urban Turkey

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Summary

The objective of the paper is to present the preliminary results of the survey project whose aim is to explore the Turkish consumer's perceptions regarding food safety and the tradeoff they make between chemical residues and cosmetic quality in fresh fruit and vegetable marketing chain. Previous research in Turkey contends that Turkey's organic food exports are growing and that there is a small but growing domestic market. A lacking component of the prevailing studies is that none of the studies have focused on the cosmetic quality component of organic products. Another aspect that is missing in the previous studies is that it is not possible to make inferences for the Turkish urban consumers due to designs in sampling and population definition. The aim of the project will be fulfilled by estimating a representative sample of Turkish urban consumer's willingness to pay for reduced chemical residues in food and the tradeoff they make between cosmetic quality and food safety. The data is obtained through consumer focus group studies and consumer surveys with a representative sample of Turkish urban population.

Higher income and educated individuals show more interest and have more knowledge regarding organic products. The choice for organic products is due to consumer perception that organic products have higher nutritional value and carry low health risk. It is also found that consumers do not perceive that organic products have higher prices than conventional counterparts. Consumer willingness to pay for products with organic labels and certified products is up to 36%, thus representing a strong demand potential for organic products in Turkey's urban markets.

KEYWORDS: Organic fruits and vegetables, consumer preferences, willingness to pay, perceived risk

1. Introduction

Turkey's organic production started with demand from the European Union countries in 1984-1985. The first production and exports were limited with traditional agricultural export items of Turkey: raisins and dried figs. Organic exports started with simply 8 items particularly after the 1980s both the number of organic products and volume of exports started to increase. Turkey's export for organically produced agricultural products has been rapidly growing mostly in response to increasing demand in the European Union countries. Common view and findings of the research on organic trade in Turkey confirms that European market is expanding. With respect to the distribution of organic production exports across product groups, more than half of the value is attributed to Turkey's traditional crops: hazelnuts, raisins, dried figs and dried apricots. The share of these four products in total organic exports is 80% in 1998, however due to increase in the number of various other product groups in export value; the share has dropped to 60% in 2004. However, it is clear that traditional product groups have a central importance in Turkey's organic food production and exports.

2. Background

Domestic consumption of organic products is still at its very early stages. After 1999, specialized stores started selling organic products particularly in centers such as İzmir, Adana, Antalya, Kuşadası, Bodrum. Organic demand has started to grow with several supermarkets starting to include such products in their selection. Akgüngör, Miran and Abay demonstrate that Turkish consumers are willing to pay up to 10% premium to avoid health risks due to pesticides and thus for products with organic labels (Akgüngör, Miran and Abay, 2001). Several other studies have pointed out interest and demand for products with organic labels (Koç, Akyıl, Ertürk and Kandemir, 2002). The market however is still in very weak. Organic products, produced in 0,14% of total arable land has a sales volume of 3 million (including what is being sold as labeled “natural”; products which are not certified organic). Considering certified organic products, the market share of labeled products are less than 1% (Turkish Ecological Agricultural Association). However, it is estimated that the annual growth rate of the supermarket sold of organic products are growing at a rate of 50% (Wiler and Yuseffi, 2005).

3. Objectives

The objective of the study is to explore consumer attitudes towards organic products and their willingness to pay. In doing so, the project also aims to:

- Analyse consumers’ attitudes towards organic foods,
- Determine the factors that influence the decision to buy,
- Consumer willingness to pay for products that are labeled as organic.

4. Data and methods

The data is compiled through a questionnaire collected from a random sample of 202 consumers in Istanbul and Izmir. Personal interviews were performed in February 2007 via a structured questionnaire with the household member who performs most of the food shopping. The questionnaire was constructed through extensive pre-testing of each particular question via personal interviews with the consumers. The interviewed individuals were asked to state their interpretations of a series of suggested questions.

The fieldwork was conducted in cooperation of a professional marketing research firm. To ensure close collaboration with the researchers and the research firm, the research team played an active role throughout the fieldwork. The research team, along with the field directors and field supervisors of the professional research firm, held training sessions with the field workers regarding the survey questions and the sampling scheme.¹ The supervisors asked the respondents about the length and the quality of the interview and several demographic questions. Following validation, the completed questionnaires were checked for the quality of data.

5. Results

5.1. Sample Profile

The sample is made up of a total of 202 individuals whose main socio-economic characteristics are shown in Table 1.

(Table 1)

¹ Details regarding the random sampling scheme can be obtained from the authors.

The majority of the sample is women (75%). The average age is 36. It is expected that the majority of the sample would consist of women since the survey intended to find individuals who do most of the food shopping. Average education is 8.7 years; most of whom are middle school graduates. The average annual income if the household is 9271 €. The average household size is 3.29 persons

5.2. Organic Product Awareness and Individual Characteristics

Tables 2 and 3 show that cross tabulations across organic product awareness and age does not reveal a statistically significant relationship. However, education and income are significant determinants of organic product awareness of the sample.

(Table 2)

(Table 3)

5.7. Consumer Preferences of Organic and Non-Organic Alternatives

This part considers consumers' decision making process when making purchases and evaluating organic and non organic alternatives. To understand such process, we use the analytic hierarchy process to uncover consumer preferences (AHP). AHP is a mathematical decision making technique that allows consideration of both qualitative and quantitative aspects of decisions. It reduces complex decisions to a series of one-on-one comparisons, then synthesizes the results (Mc Caffrey, 2005). In exploring consumer preferences for organic food purchases, we consider that consumer has "quality", "price", "knowledge on how the product is produced (certified)" and "health risk". Under quality, the consumer considers attributes such as "cosmetic quality", "nutritional value", "hygiene" and "taste", all of which leads the consumer to make a decision to purchase organic and non organic alternatives.

The following results in Table 4 present consumer's choices of organic and non organic alternatives using the above criteria. The consumer is asked to indicate the relative importance of the attribute for organic and non-organic alternative; giving % score for each alternative to sum up to 100. The results are presented below:

(Table 4)

Consumers rank organic products higher than non organic products when they consider the cosmetic quality of the product. The percentage score that the consumers give to organic product with respect to cosmetic quality is 0.728, while the percentage score for non organic products are 0.235. Similarly, with respect to nutritional value, hygiene and taste, consumers always rank organic alternatives over non organic alternatives.

When the quality sub criteria (cosmetic quality, nutritional value, hygiene and taste) are evaluated together, the consumers rank nutritional value over the other three attributes (0,357). Their ranking for hygiene comes second; taste comes third and cosmetic quality the last. The results indicate that consumers value health-related attributes such as nutritional value and hygiene over cosmetic and taste related attributes (Table 5).

5.8. Variables that Determine Consumer Awareness of Organic Products

Organic awareness is measured within two steps. First consumers were asked whether they have heard of the term “organic product”. If answered yes, they were given alternative definitions which one of them has the correct answer. Those consumers who choose the correct answer are considered to be “aware” with respect to organic food. Probit model is used to estimate the variables that determine awareness. The result of the probit model is presented in Table 6.

(Table 6)

The probit model suggests that age, education, income levels positively affect organic awareness. The results indicate that there is an indication that consumers have an educated awareness towards organic products. The people that know about organic production are high income, older and educated individuals. All other variables such as gender, household size, employment status does not affect consumers’ awareness of organic products. The results indicate that domestic marketing of organic food calls for informing young people and lower income groups of the presence and benefits of organic products.

5.9. Consumer willingness to Pay

Consumer willingness to pay for organic products is elicited using a contingent valuation survey. Scenarios regarding prices and organic and non organic alternatives were presented to the consumers.

The survey was designed to simulate consumers’ tomato purchasing behavior for their respective households under alternative prices and scenarios about pesticide residues. Under scenario 1, the consumers were not given any information about pesticide residues in tomatoes (present case). Under scenario 2, the consumers were provided with a label that guarantees that the tomatoes were tested and certified that they do not contain pesticide residues harmful to human health. The price under scenario 2 was above the price under scenario 1. The consumers were informed that the prices of all other fruits and vegetables were at their prevailing levels and none of them were under sale. The sample was divided into 4 sub samples. Each sub sample received different sets of prices. The two sets of prices for 4 sub samples and the number of individuals in each sub sample are given in Table 7.

(Table 7)

Under scenario 1, the survey asks the individuals to state the amount of tomatoes that they would buy at given prices. The individuals were read and shown a statement indicating that “Assume that over stack of the tomatoes that you usually buy, there is a label that says: ‘These tomatoes are organic and they are tested and certified that there are no pesticide residues that are harmful for human well-being’ and these tomatoes are sold at (price under scenario 2) Turkish Liras (T.L.)/kg.”. The individuals were asked whether they would buy tomatoes under the prevailing price and scenario. If so, the individuals were then asked to state the amount of tomatoes that they would buy.

Demand for tomatoes is estimated using OLS model and Tobit model. (Table 8). Since the dependent variable includes “zero” values as well as non negative values, we use Tobit model to estimate consumer willingness to pay (for details regarding willingness to pay estimates and theoretical background, see Akgüngör, Miran and Abay, 2001).

The model suggests that all variables other than income affect tomato demand. All the variable coefficients are as expected by the theory. The organic dummy variable is positive and significant as expected since it represents a demand shift due to presence or an organic label.

(Table 8)

The willingness to pay for organic labels is calculated using the coefficient estimates (for the derivation of willingness to pay, see Akgüngör, Miran and Abay, 2001).

$$WTP = -b_2X_2 / b_1$$

$$WTP = -152.457 * 0.5 / -93.649 = 0.81398 \text{ YTL/kg}$$

Since the average price of non organic product is 2.248 and consumer willingness to pay is 0.81 TL, the consumers' are willing to pay up to 36% price premium.

6. Final remarks

The study on urban consumers' preferences and willingness to pay for organic foods reveal that educated and high income individuals have increased interest on organic product purchases. The choice for organic products is due to consumer perception that organic products have higher nutritional value and carry low health risk. It is also found that consumers do not perceive that organic products have higher prices than conventional counterparts. Consumer willingness to pay for products with organic labels and certified products is up to 36%. This represents a potential demand for organic products in Turkey's urban markets.

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Appendix:

The Variables Used in the Econometric Model

Variables	Variable description
PRICE	Price of organic and non organic tomatoes
INCOME	Household income
ORGANIC	Dummy variable that takes the value of 1 if the product is organic and 0 if the product is non organic
HOUSEHOLD	Household size
AGE	Respondent's age
EDUCATION	Respondent's education level
MARITAL	Marital status
KID_18	Children under the age 18
KID_3	Children under the age 3
KID3_6	Children between ages 3 and 6
KID7_14	Children between ages 7 and 14
KID15_17	Children between ages 15-18
RISK	Perceived risk
GENDER	Respondent's gender (male=1)
SOCIAL SECURITY	Have social security? (yes=1)
EMPLOYED	Are currently employed? (yes=1)

Tables

Table 1. Socio-economic characteristics of the survey sample

Sex	Frequency	Percent		
Men	51	25.2		
Women	151	74.8		
Total	202	100.0		
Marial Status	Frequency	Percent		
Married	138	68.3		
Single	49	24.3		
Spouse Deceased	11	5.4		
Divorced	4	2.0		
Total	202	100.0		
Age Groups	Frequency	Percent	Mean	Std Deviation
18-30 years old	84	41.6	25.3	3.54
31-40 years old	58	28.7	35.9	2.71
40-50 years old	41	20.3	45.3	3.27
51 + years old	19	9.4	63.4	7.31
Total	202	100.0	36.0	12.26
Education	Frequency	Percent	Mean	Std Deviation
Literate	6	3.0	.33	0.58
Elementary	63	31.2	5.02	0.13
Primary	27	13.4	8.22	0.58
High School	89	44.1	11.10	0.43
University	17	8.4	15.18	0.53
Total	202	100.0	8.97	3.42
Income level of household	Frequency	Percent	Mean	Std Deviation
<3600 €	24	12.7	2897.5	488.11
3601-6000 €	46	24.3	4641.5	569.80
6001-9000 €	35	18.5	6988.3	749.23
9001-12000 €	28	14.8	9918.0	517.45
12001-15000 €	28	14.8	13091.3	123.92
15001 + €	28	14.8	20726.0	5207.32
Total (no answer: 13 individuals)	189	100.0	9271.1	6109.19
Profession*	Frequency	Percent		
Civil Servant	27	13.8		
Wage earner	67	34.4		
Self employed	57	29.2		
Pensioner	37	19		
Other	7	3.6		
Total (no answer: 7 individuals)	195	100.0		

* Profession of the household member who brings home the majority of income

Table 2. Organic Product Awareness and Education

Question: Have you ever heard of the term “organic product”?

	Literate (no school)	Elementary	Primary	Secondary	University	Total
	frequency	% frequency	%frequency	%frequency	% frequency	%frequency
Yes	2 33.3	31 49.2	14 51.9	70 78.7	15 88.2	132 65.3
No	4 66.7	32 50.8	13 48.1	19 21.3	2 11.8	70 34.7
Total	6 100.0	63 100.0	27 100.0	89 100.0	17 100.0	202 100.0

(Pearson Chi-Square value = 23.025, Asymp. Sig. (2-sided) =.000)

Table 3. Organic Product Awareness and Income

Question: Have you ever heard of the term “organic product”?

	<3600 €	3601-6000 €	6001-9000 €	9001-12000 €	12001-15000 €	15001 + €	Total*
	frequency	% frequency	% frequency	% frequency	% frequency	% frequency	% frequency
Yes	9 37.5	27 58.7	23 65.7	20 71.4	20 71.4	22 78.6	121 64.0
No	15 62.5	19 41.3	12 34.3	8 28.6	8 28.6	6 21.4	68 36.0
Total	24 100.0	46 100.0	35 100.0	28 100.0	28 100.0	28 100.0	189 100.0

*13 individuals did not give information regarding their incomes.
(Pearson Chi-Square value = 11.846, Asymp. Sig. (2-sided) =.037)

Table 4. Consumers' Ranking of Organic and Non Organic Attributes (% rank)

Attributes	Min.	Mean.	Max.	S.Deviation
Cosmetic Quality				
Organic	0.000	0.728	1.000	.187
Non organic	0.000	0.272	1.000	.187
Nutritional value				
Organic	0.000	0.756	1.000	0.179
Non organic	0.000	0.244	1.000	0.179
Hygiene				
Organic	0.000	0.771	1.000	0.175
Non organic	0.000	0.229	1.000	0.175
Taste				
Organic	0.000	0.782	1.000	0.171
Non organic	0.000	0.218	1.000	0.171
Price				
Organic	0.000	0.717	1.000	0.202
Non organic	0.000	0.283	1.000	0.202
Knowledge on how product is produced				
Organic	0.000	0.756	1.000	0.177
Non organic	0.000	0.244	1.000	0.177
Health Risk				
Organic	0.000	0.770	1.000	0.182
Non organic	0.000	0.230	1.000	0.182

Table 5. Ranking According to Attributes According to Quality

Sub-criteria	Min.	Mean	Maks.	Std. Deviation
Cosmetic quality	0.017	0.066	0.455	0.065
Nutritional value	0.092	0.357	0.700	0.131
Hygiene	0.068	0.339	0.690	0.128
Taste	0.034	0.238	0.707	0.110

Table 6: Probit Estimates

Independent variable: 0 or 1; 0 if the consumer is not aware of organic products; 1 if the consumer is aware of organic products.

<i>Variable</i>	<i>Coefficient (Std. Error)</i>
Const	-2.88529 (0.909194)
GENDER	-0.15575 (0.288237)
INCOME	0.000094** (0.000041)
SOCIAL SECURITY	-0.00027 (0.000982)
HOUSEHOLD	0.036135 (0.089108)
AGE	0.03141* (0.009738)
EDUCATION	0.251021** (0.112703)
MARITAL	0.179853 (0.158871)
EMPLOYED	0.000265 (0.000983)
LR chi ² (8)	26.07*
Adjusted R ²	0.12

* Significant at $\alpha=0.01$ **Significant at $\alpha=0.05$ ***Significant at $\alpha=0.10$
Variables are defined in the appendix.

Table 7: Pairs of Tomato Prices for the Four Subsamples

	Non-Organic Tomato Price (TL/kg): Scenerio 1	Organic Tomato Price (TL/kg): (Scenario 2)
Group 1	1.5	3
Group 2	2	3.5
Group 3	2.5	4
Group 4	3	5

Table 8: Estimates of Econometric Demand Model for Tomatoes

Dependent variable: Per capita tomato consumption

<i>Variable</i>	<i>OLS</i>	<i>Tobit</i>
	<i>Coefficient</i> <i>(Std. Error)</i>	<i>Coefficient</i> <i>(Std. Error)</i>
Const	2030.36* (127.493)	2065.62* 132.317
PRICE	-80.321** (34.8239)	-93.649** 39.9661
ORGANIC	128.138*** (77.9308)	152.457*** 86.7605
RISK	-0.000364961* (0.000108195)	-0.000476429* 0.0001308
HOUSEHOLD	-348.445* (22.4974)	-361.744* 19.5787
INCOME	0.0294255 (0.0320445)	0.0443676 0.0439617
F-statistic (5, 368)	54.7072*	
Adjusted R ²	0.42	

* Significant at $\alpha=0.01$ **Significant at $\alpha=0.05$ ***Significant at $\alpha=0.10$

Note

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What does the 'New Quality' mean in view of Polish dairy cooperatives?

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Summary

This paper investigates the relationship between the chosen quality strategy and the vertical co-ordination mechanism of a focal company by using new institutional economics, as well as strategic management approaches. The theoretical findings are tested using evidence from 19 of the largest Polish dairy cooperatives, surveyed in spring 2006. The results show that all co-ops recognise the changing market requirements and are treating food quality as more than plain food safety and the ability to continuously reproduce an *ex ante* defined set of attributes. However, compared to investor-owned dairies, co-ops are disadvantaged in quality-based competition due to their lower flexibility and access to financial and qualified human resources. To overcome this intense competition, co-ops modify their production profile, which leads to market segmentation. Moreover, the choice of quality strategy is an economic activity, guided by the co-op's profit expectations within the selected market. The chosen quality strategy determines the design of the vertical co-ordination mechanism. Thus, the higher the requirements for the final product, the further quality management systems go beyond a firm's boundaries, and the higher is the intensity of the relationships between the intermediary stages in the dairy chain.

KEYWORDS: network theory, relationship management, quality management, cooperatives, Poland

1. Introduction

In countries where food is no longer scarce, questions of food security are becoming less important. Instead, issues addressing food safety and quality are gaining in importance. Thus, in most developed countries, food quality has been used as a means of differentiating food products (branded products versus non-branded products) whereas food safety has become a competitive necessity. However, due to food scares such as the BSE- and FMD-crises, or more recently, the "rotten meat" scandal in Germany, food safety issues connected with firm boundaries that overlap vertical interactions hold differentiating potential. Hanf/Hanf (2005) considered the most striking consequence of these dramatic food scares the fact that politicians, consumers, producers and suppliers all assess food quality as no longer the matter of a single firm. Instead, the whole food chain has to work together in order to deliver the "new quality". Since food-borne hazards know no geographical boundaries, food safety standards have become a ubiquitous phenomenon that nationally and globally influences agri-food markets. Additionally, as products become more differentiated, commodity requirements are becoming more demanding, which leads to higher and more specific quality demands. Thus, in order to meet the demanded new quality, food processors and retailers have to re-design their food chains in such a way that these standards are adhered to every step of the way; thus, the co-ordination mechanism of the existing food chain must be altered. Spot market transactions, which are unable to properly co-ordinate the exchange of trust attributes, are substituted by transactions in vertically co-ordinated chain organisations. Such higher co-ordinated chain organisations are either hybrids or vertically integrated firms. For the agri-food business, there is

evidence that the majority of these chain systems is organised as vertical networks, i.e., supply chain networks (SCN).

In transition countries or new member states, quality management concepts might still be an emerging field and might be used as a differentiating instrument: Through EU-accession, the structure of those markets has shifted towards more globalisation and competition based on quality and price differences, rather than just price. On the one hand, the minimum quality standards of the EU set a bottom line that forces low-quality producers to raise their quality or drop out of the market. On the other hand, private standards such as the “International Food Standard” (IFS), and Standards of the “British Retail Consortium” (BRC), as well as industry-wide standardisation systems like the family of ISO standards are diffusing to those markets from Western countries. Concurrently, the new EU member states are seeing changing consumer demand – in terms of incomes and concerns over product standards. The changing environment in those markets, including both mandatory and voluntary standards, and ongoing restructuring processes at all stages in the food chain, may cause unique developments as far as quality management is concerned.

The aim of this paper is to identify the quality perception of the Polish operators in the dairy market and to find out which influence the chosen quality strategy exerts on the vertical co-ordination mechanism. In the first part of the paper, we present a brief review of the relevant theories. Since the Polish dairy market is dominated by co-operatives, we additionally review the general co-operative literature. The literature suggest that due to their complex governance structures co-ops may face significant hold-ups affecting quality control and management. Following the theoretical discussion, the second portion of the paper details the relevance of quality management thoughts for the Polish dairy cooperatives.

2. *Theoretical considerations*

What does the ‘new quality’ mean?

There were several severe food crises in the years prior to the BSE- and FMD- crises in the winter of 2000/01, e.g. the Coke-scandal in Belgium, the BSE-crisis in the UK, and the wine-scandal in Austria and Germany. However, the crisis in the winter of 2000/01 can be regarded as the straw that broke the camel’s back (Hanf/Hanf 2005). The growing concerns of consumers, producers and governments worldwide have influenced the political debate on food safety. In the European Union (EU) a variety of new standards have been set in order to ensure the demanded minimum level of food quality. The result of these developments is that legal quality requirements are becoming more stringent and comprehensive (i.e., covering more safety attributes), and food policy is becoming increasingly integrated across various sectors (Ugland/Veggeland, 2006).

With increasing knowledge and perception of risk, consumer demand for safety and a willingness to pay for it increases (Antle, 2001). At the same time, as incomes rise, consumers demand even more quality, including, besides safety, such attributes as nutritional value, product diversity and tightness of product specification. Providing credence attributes is becoming an integral and ubiquitous issue for business operators. Indeed, trust-based attributes are expanding and include, besides food safety and nutritional properties, different contextual product properties related to certain public goods or values, such as environmental justice or cultural (traditional) values, etc. (Allaire, 2004). Consumers are, however, not able or willing to intensively and fully ascertain the credence characteristics of food products. Thus, they look for signals to facilitate their buying decisions, e.g. a well-known brand or a certificate of quality, thereby motivating the participants of the food chain to take the appropriate measures and to meet the ‘new quality’ demand (Hanf/Pieniadz, 2006).

Through the expansion and deepening integration of the EU, the quality-based competition among business operators has intensified. On the one hand, the minimum quality standards of the EU force low-quality producers to raise their quality or drop out of the market (Hockmann/Pieniadz, 2006). On the other hand, the increasing demand for quality signals especially allows supermarkets and manufacturers of branded products to benefit from imposing voluntary, private quality and safety standards, some of which are even more stringent than similar governmental regulations. Hence, the use of private voluntary standards across food categories has been increasing in both long-standing EU members, as well as in transition countries (Swinnen, 2006; Spencer/Reardon, 2005). Fulponi (2006) argues that private standards will become even more prominent in upcoming years as we observe increased market concentration and buying power in the retail sector, as well as its integration with financial markets. Unnevehr et al. (1999) assert that since food safety and quality can be successfully managed using private standards, their diffusion will henceforth even reduce the need for direct legal regulations. Thus, in order to meet the demanded new quality, food processors and retailers will have to enact additional mechanisms and re-design their food chains to induce the incentive-compatible behaviour of upstream business operators. Hanf/Hanf (2005) concluded that these demands on quality lead to the conceptualisation of chain quality management concepts by combining these 'new quality' demands with general chain management concepts.

Verticalisation and chain quality management

Food supply chains can be characterised as pyramidal-hierarchical networks. Such networks have a strategic character, with the focal company being the core element. The focal company is the centralised decision-making unit and may be either the manufacturer or retailer (Jarillo 1988). Thus, the focal company determines the decisions of all network members, including the choice of measures to ensure the achievement of the super-ordinate network aims (Wildemann 1997). Efficiency gains, higher profits, and cost reductions are important reasons for building such networks – which can be called supply chain networks – with food quality being regarded as one of the most important. Allaire (2004) mentioned the “quality turn” as a main reason for the tendencies towards verticalisation in food chains worldwide. The consultancy KPMG (2000) characterises verticalisation as the building of vertically coordinated systems resulting in changing markets for ‘fast moving consumer goods’ (FMCG). Thus, vertically coordinated systems are understood as the exchange of goods not primarily conducted by market transactions. In other words, verticalisation means intensifying vertical relationships, which can take different forms of bilateral commitment between partnering firms based on implicit and explicit contracts. Generally, we can distinguish between two partnering types: strategic and operational partnering:

Strategic partnering is defined as an “on-going, long-term, inter-firm relationship for achieving strategic goals, which deliver value to customers and profitability to partners” (Mentzer et al., 2000, p.550). The aim of strategic partnering is to improve or entirely alter a company’s competitive position through developing new products and technologies and by creating new markets (Webster 1992). Additionally, strategic partnering should also include exclusivity and non-imitability (Mentzer et al., 2000). Operational partnering is defined as a “needed, short-term relationship for obtaining parity with competitors” (ibid. p.550). Thus, an operational partnering strategy seeks to improve operational efficiency and effectiveness, especially by reducing transaction costs. Such orientation involves shorter time spans and less organisational resources. Therefore, operational partnership is much easier to implement (and also to reverse) than strategic partnership. In addition to such aspects of aligning interests, chain management has to consider aspects of coordination (Gulati et al., 2005). In their framework on chain management Hanf/Dautzenberg (2006) combined these considerations with the thought that networks consist of different levels,

namely firm, dyadic, and network levels. They point out that these three aspects have to be mirrored in the collective strategy¹ of a supply chain network.

Thus, if quality is the leading idea or strategy to be coordinated along the SCN, all members must share a homogeneous understanding of quality management, which provides the preconditions for the emergence of a collective strategy, and thus collective actions that address the chosen strategy. In this case, we expect a correlation between the chosen quality strategy and the design of the partnership. Therefore, the following assumption can be made in order to test it empirically in the second part of the study:

If a firm chooses a pure cost leadership strategy, we expect that this firm will produce products that solely meet the minimum quality requirements (EU/ governmental regulations). In this case, we expect that vertical exchange will take place by arm's-length transactions, meaning that vertical co-ordination is more or less done via the (spot) market. Thus, it will be sufficient for a cost-optimising firm to develop operational partnerships in both upstream and downstream stages. If a firm chooses the opposite strategy of product differentiation and quality attributes (especially trust elements) are chosen as the means of differentiation, we expect the firm to develop more sophisticated relationships. Yet we expect that the differentiated firms are more likely to develop strategic partnerships. In this case, vertical co-ordination can be regarded as highly cooperative or even vertically integrated.

Quality problems in co-operatives

In the previous section we argued that food quality is no longer the matter of a single firm, but instead the whole food chain has to work together in order to deliver the 'new quality'. However, Hanf/Schweickert (2003) as well as Hanf/Kühl (2005) mention that due to their organisational form, co-operatives face problems integrating themselves in supply chain networks. A major reason for this are the co-op's internal institutions governing the behavior of the co-op's members and affecting the co-op's ability to manage the quality of its products. Arguments for this are the following: In the context of increasing vertically co-ordinated agri-food systems, Sykuta/Cook (2001) showed that at the producer level, the most practical co-ordination mechanism is contracting. Because of their very own property rights structure, producer co-ops have some advantage compared to investor-owned firms. However, in addition to these benefits, they also face some problems. By using a property rights approach, Cook (1995) pointed out five general sets of problems: Free Riding Problems, Horizon Problems, Portfolio Problems, Control Problems and Influence Cost Problems. As Cook (1995) showed, these sets of problems constrict the various types of co-operatives (Sapiro I-Nourse II) differently. Combining a principal-agent approach with the concepts of opportunistic behaviour, conflicts of interest, asymmetric information and stochastic conditions, Eilers/Hanf (1999) show that it is not clear who is the principal and who is the agent, i.e., both the co-operatives and the members can be principals and agents. For this reason, neither leadership mechanisms nor selective terms of delivery can be enforced by the co-operatives, i.e., the members can deliver all the commodities which alternative dealers do not accept. Co-operatives that are to accept these commodities face the problem of adverse selection. Additionally, Fulton/Giannakas (2001) show that the cross-subsidisation and member heterogeneity in large centralised, multipurpose co-ops may lead to substantial financial pressures for the co-operative because members of such co-operatives do not see a strong connection between the success of the co-op and their own business. Furthermore, Karantininis/Zago (2001) showed, by applying a game theory model, that instead of selling their commodities to open co-ops, farmers would rather sell

¹ In general, collective strategies are defined as systematic approaches by collaborating organisations that are jointly developed and implemented (Astley/Fombrun 1983, Astley 1984, Bresser 1988, Bresser/Harl 1986, Carney 1987, Edström et al., 1984, Sjurts 2000).

them to investor-owned firms if they had the choice. Fulton (1995) concludes that if markets disappear as a result of an increased vertical co-ordination, co-operatives may also begin to disappear. Hendrikse/Bijman (2002) share this assessment if investment on the side of the processor or retailer becomes more important for the total chain value than the investments by the farmers. In an empirical survey, Schramm et al. (2006) evaluated German dairy co-ops' brands. Using institutional economic and behaviour approaches, they showed the strengths and weaknesses of co-ops' branding strategies. Even though they were able to locate different factors exerting influence on branding strategies, quality issues were of major importance – negatively as well as positively. Besides these disadvantages, Briscoe/Ward (2006) name some managerial advantages of co-ops, as far as small and medium-sized co-ops are considered; These include better communications with farmers, staff flexibility, easier (more efficient) control, hands-on management, greater motivation, and identification.

3. Quality management in Polish co-ops

Even though unbranded and branded products co-exist in the Polish dairy product market, an increase in market share of branded (higher quality) products is becoming evident. However, the majority of the branded products are produced by large companies. Particularly in the retailer sector, large (foreign-owned) retail chains are gaining market share. For these chains, it is typical to proliferate the food assortments, meaning that their suppliers are forced to produce more differentiated products. For the producing sector in Poland, it can be said that a consolidation is taking place; however, over 300 dairies still exist. The majority of these dairies are producer co-operatives with milk processing being their prime economic activity. Because of this, we have chosen co-ops as the unit of empirical investigation.

We surveyed 19 of the 22 largest Polish dairy cooperatives in February and March 2006. Roughly equal numbers of semi-structured interviews were conducted across the various hierarchical levels in the co-ops, including chief executive officers, quality managers, and supervisors in the marketing and supply departments. The sequence of the questioned representatives was the same for each co-op. The interviews were conducted by telephone and lasted between 20 and 40 minutes per respondent.² This technique made particular sense in view of the above-mentioned research questions: On the one hand, chain quality management as well as networks concern activities and processes that are challenging to quantify and may even be ambiguous or misunderstood. On the other hand, the topics are particularly sensitive in emerging markets. Moreover, in those markets there might be some unique and relevant developments which have to be first recognised, while giving the respondents some freedom to explore our general views. In the following, we elaborate on the relevance of the previously considered quality management thoughts based on the surveyed cooperatives.

General comments on dairy co-ops

Despite the fact that organisational capabilities in Polish agriculture remain relatively low, producers' cooperatives continue to be a significant part of Polish dairy processing. To some degree all cooperatives draw on the long history of cooperative thinking. Most of them were grounded in the 1920s and 1960s. According to the statements of the interviewed persons, cooperative values are coming increasingly under pressure. The challenges of maintaining a coherent socio-economic environment have been amplified by

² Additionally, some major investor-owned dairies were interviewed as well. In this case, only the quality managers were asked for their analytic expertise, allowing relative statements regarding various quality management issues in co-ops and investor-owned firms.

ongoing liberalisation, globalisation and standardisation, all of which change trade patterns for agricultural and food commodities and influence production costs and commodity prices. Similarly, the continuing expansion and deepening integration of the European Union, as well as the current reforms of the common market organisation for milk and milk products are redefining the challenges for operators in the European dairy market. Thus, for milk processors that decide to stay in the market, the issue is whether or not to adapt the current business strategy to the changing operating environment. The success of an enterprise not only depends on its ability to reconfigure the production system (technology, management) within the firm and improve the quality of inputs, but also to redesign its food chains, so as to efficiently produce the demanded quality and variety of milk products. In this context, co-ops face additional organisational problems that hamper their flexibility to make the needed adjustments. The complexity rises since the co-ops must meet the interest of their members while also satisfying the consumer. The member-driven orientation makes co-ops fundamentally different from investor-owned corporations in that they are compelled to look for quite stable markets, since they are not able to compete with more flexible and strictly profit-oriented private enterprises.

The interviews showed that on the one hand, all co-ops recognise the changing market requirements (demanded new quality) and understand quality to be an important action parameter for reaching the needs and wants of the consumers. This indicates that even for the Polish co-ops, food quality is more than plain food safety and the ability to continuously reproduce an *ex ante* defined set of attributes. On the other hand, the co-ops are also aware of the strong competition on the product (consumer) market and of being confronted by multiple problems with regard to their 'inherent characteristics'. One of the largest constraints seems to be the conflict between the co-ops' status (co-operative principles) and economic goals: For most of the investigated co-ops, 'success' means the degree to which the enterprise has achieved the targeted goals. Since co-ops target different social and economic goals and the decisions are made mostly on a consensus-driven basis, there are plenty of potential conflicts of interest and hold-ups in the decision-making process. For example, with regard to the quality issue, there are significant inherent frictions when selecting small dairy producers—members that deliver low quality raw materials. The co-ops feel, generally, to be disadvantaged by the organisational and management structure, as well as by the limited financial and qualified human resources that would significantly improve both the process and product quality. Some co-ops also mentioned restricted access to foreign capital and know-how as being their main competitive disadvantage in quality improvement. Indeed, investor-owned firms with foreign investments benefit from having better access to approved business concepts and quality assurance systems, as well as capital from the main company. In interviews, the representatives of the two firms with FDI mentioned that they had not noticed any additional costs regarding implementation of higher quality standards in the plant. The implementation of QMS was monitored by representatives of the main company, and the staff in the domestic sub-company was well advised and supported by special training with regard to quality issues. One of the co-op leaders mentioned that "the domestic dairies with FDI have just to copy the approved business concept and educate their staff on the costs of the mother company, whereas the co-ops have to be very 'innovative' while meeting the current market challenges and dealing with co-op specific constraints". The 'innovative' thinking refers, however, to finding a creative solution under the given circumstances, while imitating the marketing strategies of private and prospering companies.

The above-mentioned considerations reveal that the lack of investment is one of the crucial hurdles for those investigated co-ops that wish to adopt additional quality improvement instruments. Surveyed co-op representatives reported being sceptical regarding the benefits of the quality assurance systems prior to their implementation. In some cases, these doubts had postponed the decision to adopt. Once introduced (i.e., HACCAP prior to EU accession) the co-ops acknowledged many advantages, i.e., less variation in quality outputs,

better harmonisation of operational sequences, and less variability of staff skills while managing the quality.

Further, co-ops recognise some advantages as far as the relationship with their suppliers are considered: Producers tend to trust a cooperative more than (foreign) investor-owned companies. The surveyed representatives pointed out that a farmer is typically risk-averse and seeks stable, trust-based relationships and social acceptance, both of which he can enjoy as a member of a co-op. In most cases, these utilities outweigh pecuniary disadvantages, since most of the co-ops bid lower prices for raw milk. Additionally, their support as 'service providers' enables them to supply some services to the farmers independent of the government or other private services. Besides information transfers between the co-op and the farmers (consulting, choice of production techniques), co-ops offer their members credits or access to credits for investments in the growth and specialisation of the farms. These instruments increase producer loyalty and assure, at least, continuous access to raw materials. However, co-ops still face multiple conflicts when selecting quality suppliers (supplier=member). The organisational 'stickiness' in the selection process of quality producers impedes the manufacturing process and quality output and compels the co-ops to target markets for lower quality. Nevertheless, the co-ops strive to adjust to the market requirements and utilise various instruments to induce the incentive-compatible behaviour of upstream business operators. For example, co-ops use quality-dependent payment schemes to remunerate better raw milk quality. Additional provisions exist as well, including a price premium for extraordinary quality (super extra) and direct delivery for farms either approved by the veterinary bureau or which possess certain breeds of milk cows. All co-operatives pay a price premium on membership. Thus, payment schemes differ greatly between dairies. However, in all pricing mechanisms, the price increases as compliance with quality requirements set by the purchaser increases. Co-op representatives mentioned that the EU quality regulations have an immense 'educative' influence on the farmers with regard to quality improvements. On the other side, mandatory regulations take away a co-op's ability to select (passive selection). The co-ops expect some competitive advantages at the procurement stage due to the better 'access' to their local communities, in the middle-term.

Proposition: Cooperatives are disadvantaged in quality-based competition due to their lower flexibility and limited access to financial and qualified human resources. Thus, they are often imitators or choose generally stable markets for their proliferation.

Proposition: Cooperatives have some advantages over private firms at the procurement stage in the mid-term, owing to their local communities' attachment, and their potential of being a 'service provider' that enables them to supply services independent of the government or other private services.

The co-ops solution: How to be competitive

First Level: Market segmentation

Economies of scale have become a factor of considerable importance in the milk sector and have affected all stages and legal forms of enterprises in Europe. The (largest) Polish co-ops recognise the challenge and strive to expand in the milk market by applying various growth strategies. The most common strategy is internal growth via entering new (export) markets and market penetration with regard to FMCG such as UHT-milk. Moreover, well performing co-ops expand through mergers and acquisitions which, besides rapidly increasing revenue, allow them to utilise economies of scope, e.g. the transfer of capital, technology and know-how within the company, as well as synergies of using common brand names. We observe that all investigated co-ops modify their production profile, which leads to a kind of market segmentation and mitigates direct rivalry among firms. Basically, they move toward specialisation on either the white or yellow production line, or

they extend their production, offering highly diversified goods of both lines. The interviews indicate that firms use both cost-leadership, and to different degrees, product differentiation strategies. Product differentiation is important to all investigated co-ops, as they recognise the need to make products more attractive to the target market. However, differentiation takes various forms, from a simple modification to an existing product (a new flavour of yoghurt) to creating a new branded product in which factors other than price are taken into account by consumers (market segmentation).

Proposition: To overcome the intensive competition, co-ops modify their production profile, which leads to market segmentation.

Second Level: Choice of quality strategy:

The heterogeneity of the co-ops is even greater when comparing the chosen quality strategies. Co-ops which take the role of the focal firm in a dairy chain especially act to escape from price competition by setting themselves apart and bringing quality to a differentiating parameter. Investments in brand, reputation and reduction of information asymmetry about product quality (social marketing, TV spots, food exhibitions, etc.) are becoming a priority for this group. All of those co-ops use intensive ISO quality standards. Some of them also implemented voluntary ISO standards on environmental management and possess an adequate certificate integrating both systems, whereas the remaining manufacturers of branded products intend to implement them in the near future. The respondents of those co-ops stressed that the main incentive for implementing the voluntary environmental standards was to demonstrate their environmental concerns, and hence to increase their reputation and brand loyalty. Several dairies in those group additionally address region-specific credence attributes, such as cultural and traditional values of the area where the co-op is located, and social justice while stressing the importance of product purchase for employment in rural areas. In most cases this strategy leads to a kind of 'local patriotism' among consumers, as far as the purchase of the regional milk products is concerned. To stabilise their market shares and to protect their independence, the co-ops with a strong brand reject producing and selling their products under a private retailer's label. This premium-quality strategy, however, usually concerns the largest of the investigated co-ops, and thus seems to be a minority when all Polish co-ops are considered. On the other 'end' of the investigated firms are co-ops that utilise a strong cost-orientation for their competitive advantage. Cost leadership is achieved by economies of scale, thus producing basic products and improving the efficiency of all business operations is a priority for this group. In those groups there are usually no dominant standard-setting purchaser, thus the dairies have some freedom in their choice of quality strategies and measures to guarantee the effectiveness of the chosen strategy. Accordingly, those co-ops offer their products at the cheapest price (price leadership) while meeting just the minimum quality as demanded by the obligatory regulations. The representatives of those co-ops argued that there is so far no need to change this strategy, since there is still a profound group of low income consumers who demand their products, and hence enable attractive profits. Because the firms do not possess a strong brand, they use voluntary public quality certifications and labels to signal quality, such as "Q" (quality) and "Eco" (ecological), developed and assigned by the Polish Centre for Testing and Certification (PCBC). Some standards promote national food products of high and reliable quality, such as the "Try Fine Food" standards (PDZ) designed by the Polish Ministry of Agriculture and Rural Development. Representatives of the co-ops mentioned however, that they recognised that their products are currently threatened by the plurality of signs, which can sometimes even increase the uncertainty among consumers.

Between those two above-mentioned groups there are co-ops that are strongly dependent on direct purchasers. Usually these co-ops have no brand (or not a strong one) and regard the dominant purchaser as the standard-setting entities; they then adjust their quality strategy and management to the respective requirements.

If the focal company is a manufacturer requiring tightly-specified industrial products, the co-op has to adjust quality assurance systems to the specific requirements (i.e., unique chemical or physical parameters). Quality signals and voluntary quality systems seem to be irrelevant to those co-ops. Some FDI use the possibility of intra-industry trade based on the co-ops' supply, since the co-ops have better access to the local milk suppliers. On the other hand, the co-ops benefit from the financial support of the focal firm, while carrying out relation-specific investments. Joint investments first concerned quality improvements at the procurement stage, and then the adoption of new processing technologies. The adherence to specific requirements is ensured by close business-to-business (B2B) relations, including some knowledge-sharing routines and enhanced monitoring. Additionally, in such direct relationships, the threat of direct and strong sanctions (losing the focal purchaser) limits opportunistic behaviour and facilitates cooperative adaptation by the co-op. At the same time, the high intensity of unexpected controls and enhanced monitoring suggests that the focal firm either does not trust the partner or must steadily improve the knowledge about its capability, as well as the correctness of the process.

If a dairy sells its products to a retail chain and the retailer then sells them as proprietary private label products, the implementation of retailer-specific schemes will be required. Thus, the processors are voluntarily obligated to implement standards for auditing retailer-branded food products, such as IFS and BRC. Interestingly, the retailers are satisfied if those concepts are running but they do not need to be certified, which seems to be specific for an emerging market. In this case, the quality standards are used to coordinate pooled interdependencies. We found that focal firms prefer control-based relationships rather than trust-based ones to govern partnership behaviours and the maintenance of their specific requirements. In particular, retailers with strong bargaining power apply restrictive control mechanisms, even if the running quality concepts are certified. Adjustment to the retailer-specific requirements involves investment in specialised resources, which increases the co-ops' dependence on retailers. However, because IFS and BRC are widely used standards, the co-ops have formal access to alternative institutional customers on the national or international markets.

Proposition: Co-ops follow different quality strategies within the chosen production profile. Adoption of higher quality standards is an economic activity, guided by the co-op's profit expectations.

Third Level: Verticalisation:

The chosen quality strategy influences the vertical coordination mechanism along the dairy chain. In the next step we investigate the linkages between quality performance and the design and intensity of vertical relationships with the upstream and downstream stages by examining four groups identified in our data set. The main findings illustrates Scheme 1. The scheme was developed by type of dairy cooperative based on the chosen quality strategy and the dominant purchaser. The dominant purchaser was, in most cases, the focal and hence standard-setting unit exercising chain quality management. Thus, even if a co-op delivers its products to different purchasers, the dominant one determines the co-op's quality performance, and hence the design of the relationships with the upstream stages (suppliers). If a co-op is a manufacturer of branded products, it takes the position of a focal company itself. Producing and delivering quality products requires implementation of superior (or at least higher than average) quality management systems. However, we found some differences even between the quality producers.

④ Manufacturers of branded products have recognised that they must actively create their own distribution opportunities. For all channels – retail, wholesale, and export – they use medium- and long-term contracts which contain all sorts of details that address product quality matters. Thus, the co-ops control, to some extent, quality measurements that are external to the firm. However, despite reciprocal information exchange and ongoing negotiations, these relationships still have an operational character (\leftrightarrow). However, the co-

ops increasingly use partnering mechanisms that are more strategic in nature, so marketing information such as point-of-sale data is exchanged. The co-marketing is particularly intensive in partnerships with retail chains, because it is based on ongoing negotiations and adjustments addressing sales strategies, promotions, and pricing behaviour (\leftrightarrow). Typically, this leads to complex reciprocal interdependencies, which demand well-defined organisational principles and a certain level of management skills to govern the relationships. Such relation-specific systems seem to be unique for an individual chain of branded products manufacturer.

Interaction at the procurement stage can also be described as intensive, especially with the larger and specialised farmers (\leftrightarrow). Using incentives to upgrade the quality of raw milk, the co-ops exert a firm boundary for the overlapping quality scheme. Some of the actions result from the implementation of ISO quality standards, which require quality objectives to be included in the quality policy and to be leveraged to upstream stages. Additionally, the co-ops provide intensive consulting assistance and herd management for their members. One co-op even provided business angles as an alternative know-how source (technology transfer) as early as at the beginning of the 1990s. Overall, we think that in this case, we can speak not only from a chain quality concept; instead, it is a strategic one.

②&③ When the focal company is either a manufacturer or branded retailer, we found that purchasers prefer control-based relationships rather than trust-based ones to govern partnership behaviours and the maintenance of their specific requirements (\rightarrow). In particular, retailers with strong bargaining power apply restrictive control mechanisms, even if the running quality concepts are certified. Adjustment to the retailer-specific requirements involves investment in specialised resources, which increases the co-ops' dependence on the retailers. However, because IFS and BRC are widely-used standards, the co-ops have formal access to alternative institutional customers on the national or international markets. Contracts and managerial discretion are used to meet sequential interdependencies, with the contracts containing specifics on quality and payment. As long as these specifics are met, the duration is prolonged. Additionally, we found some reciprocal interdependencies among the partners in B2B relationships between the co-ops and the industrial purchaser. Overall, the relationships between the focal companies and the dairies is very intense. Therefore, this type of partnering is more strategic than operational. Regarding the relationship between co-ops and their members, we found that co-ops encourage growth strategies through intensive consulting assistance, which aims to select larger farms (\rightarrow), hence, they use economies of scale. Overall, we conclude that supply chain networks are established and chain quality management is exercised. However, even though the partnering can be described as more strategic in nature, there is a lack of a collective quality strategy. Thus, we would classify the paradigm as an operational chain quality management. Because more and more retailers are bringing their proprietary private label products on the market, there is increasing price competition among the products. For the concerned co-ops, this means that they face strong pressure on the costs, which precludes resource allocation to more sophisticated quality management systems.

① Because of the strong cost orientation of the basic product producers, it is not surprising that those processors apply mandatory standards and schemes and restrict their relationships with suppliers to the basic commitments and principals as regulated in the cooperatives' statute (\rightarrow). Nevertheless, the co-ops' relationships seem to be better developed at the procurement stage than at the distribution stage. We could identify operational partnerships between the co-ops and their milk suppliers and some dyadic actions addressing the chosen quality strategy at this stage, but there is still a missing recognition of similar interests and initiatives to explore operational advantages in relationships with their institutional customers. Further development of retailers and wholesalers with strong bargaining power will force the dairies either to join their SCN or take the role of a focal company and strengthen their brand. Independent of that, the dairy must first create its supply chain network and develop a chain quality management.

Proposition: The challenge of the focal firm is to choose the quality approach that best fits the overall network's aims as well as its performance.

Proposition: The chosen quality strategy determines the design of the vertical co-ordination mechanism. The higher the requirements of the final product, the further quality management systems go beyond a firm's boundaries and the higher is the intensity of the relationships between the intermediary stages in the dairy chain.

4. Final remarks

Food today is perceived as a complex bundle of characteristics, with an increasing level of importance placed on credence attributes relating to product and methods of production (e.g. environmental friendliness). Food processors and retailers must re-design their food chains in such a way that all stages of the food chain are involved to meet the demanded 'new quality'. Therefore, the coordination mechanism of the existing food chain has to be altered, because spot market transactions are unable to properly coordinate the exchange of credence attributes; they must be substituted by transactions in vertically coordinated chain organisations. Such chain organisations are either hybrids or vertically integrated firms. For the agro-food business, there is evidence that the majority of these chain systems are organised as vertical networks i.e., supply chain networks. Chain management must incorporate the relationships and interdependencies of the member firms, as well as problems arising at the firm level, the dyadic level, and the network level. Applying these thoughts on quality issues, it becomes evident that we have to differentiate between operative chain quality management and strategic chain quality management.

The example of Polish dairy co-operatives provides new insights into quality management issues faced by cooperatives. First, our findings indicate that activities related to quality improvements are generally aligned with current market opportunities for optimal enterprise performance. On the one hand, co-ops recognise that they must deliver safe and reliable food and differentiate their products, at least in a partial way, to make them more attractive to the consumer. This indicates that even for the co-ops, food quality is more than plain food safety and the ability to continuously reproduce an *ex ante* defined set of attributes. On the other hand, co-ops face various problems, the largest of them being the conflict between the co-ops' principles and economic goals and limited financial and qualified human resources that would significantly improve both process and product quality. The co-ops' specific problems compel them to modify their production profile and usually to tap markets for basic products, since they are hardly able to compete with more flexible and strictly profit-oriented private enterprises on markets for high-value added products. However, our study reveals that there are some exceptions to this general observation, especially when examining the co-ops' chosen quality strategy and the design of the quality management systems.

Overall, we conclude that in most cases, supply chain networks are established and chain quality management is exercised. However, this is only the case if there is a focal actor that influences its network structure. The results show that retail chains and industrial purchasers with foreign investment and strong bargaining power usually take the position of the focal firm in the SCN. In those cases, strategic partnering between the individual chain stages dominates. However, because there is a lack of a collective quality strategy overlapping all actors, quality management initiatives are still operational in this case. There are still some Polish co-operative dairies that are not embedded in any SCN. These concern processors of non-branded goods or those with weak brands that sell their products to purchasers without a focal position. Because there is no powerful focal firm in the chain, no managerial discretion can be exerted and no chain quality management concepts can be installed. Thus, we could only identify operational partnerships between the co-ops and their milk suppliers and some dyadic actions addressing the chosen quality strategy at the procurement stage. In contrast, at the distribution stage we observed that the partners do not

share homogenous interests regarding quality issues; there is even a lack of dyadic initiatives aimed at exploring the operational advantages of the cooperation. Our empirical results show profound diversity regarding quality management approaches in the Polish milk supply chains. However, one thing is clear: The chosen quality strategy determines the design of the vertical coordination mechanism. Thus, the higher the product requirements, the further quality management systems go beyond a firm's boundaries and the stronger is the shift from operational towards strategic quality management.

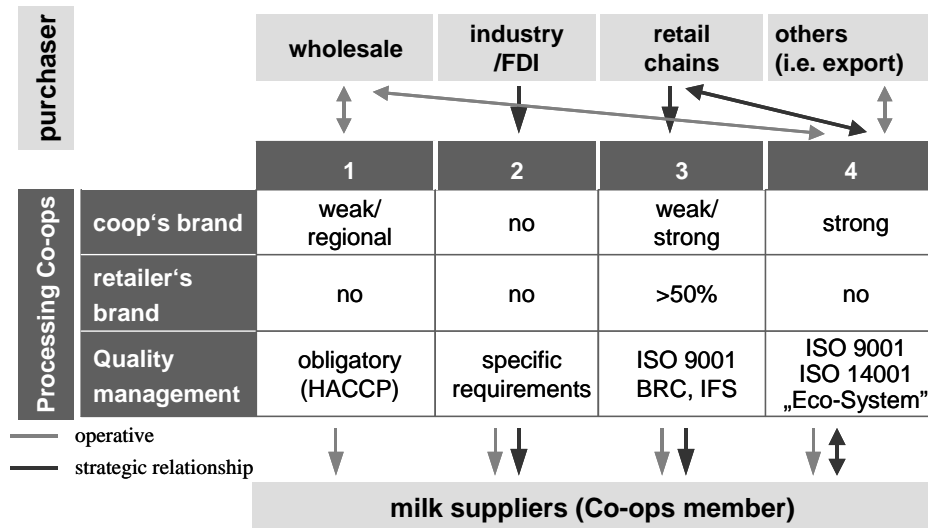
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Diagram

Scheme 1: Typology of Polish dairy chains: Linkages between the chosen quality strategy and the design of the relationships between a cooperative and its upstream and downstream stages.



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Indirect Effects of Eco-labelling of agricultural products on Natural Resources

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Summary

The implementation of eco-labelling schemes for agricultural and food products may represent an opportunity to enhance production technologies compatible with the sustainable economic approach. The paper presents an attempt to design a comprehensive methodological framework in which the consumer behaviour change is the driving force for redirecting the market, the production, and the international trade. This approach focuses on the specification of the most relevant variables necessary to implement a simplified, but comprehensive analysis, from which it is possible to proceed to a broad estimate of the changes in terms of consumption patterns, revenue distribution, import and export, and natural resources consumption.

On a theoretical basis, the framework highlights that the most relevant conservation effect on natural resources, occurs when the eco-labelling schemes are enforced by two countries, under a market regime of free trade. On the contrary, if only one country adopts the schemes, then the effect is negligible.

KEYWORDS: environmental labelling, natural resources conservation, international trade

1. Introduction

The setting and enforcement of policy measures aimed at natural resource conservation represent a controversial matter since, in the one hand, it is necessary in order to pursue a sustainable economic development by encouraging free trade and fair competition but, on the other hand, the lacking of environmental regulations may negatively affect the future availability of resources, with severe consequences on the wealth for future generations. Among the most common environmental policy measures, the concern of WTO member countries has been focused on the setting of environmental standards and the implementation of environmental certification schemes. Both of them may be used to serve for protectionist purposes, although the mechanisms by which they interfere with production, trade, and consumption are quite different.

Since the 1990s environmental certification has been pointed out as an instrument to support sustainable production methods (Stevens et al., 1998). Eco-labels, in particular, have received great attention in the WTO (WTO, 1999): a voluntary eco-label scheme is present in almost all countries of the world except Australia, Africa and Brazil (Environmental Protection Agency, 1998). Most eco-labels schemes are promoted through a direct initiative of governmental bodies (e.g. the EU eco-label, the US EPA Energy Star) and often the schemes include environmental prescriptions related to environmentally-friendly production methods.

The use of these schemes for food products often implies the imposition of the environmental concerns of importing countries in matter of production methods, to their trading partners, with considerable effects on trade and welfare (Greaker, 2006).

However, we claim that the most relevant issue is to demonstrate whether eco-labelling schemes are effective in order to achieve the preservation of natural resources. In this regard, the literature is still lacking of methodologies and models useful to evaluate the effectiveness of these sort of environmental certification on natural resources preservation,

in order to estimate who gets losses and benefit, within an international economic framework.

The domain of environmental certification is wide, but in this paper we refer in particular to agricultural products, because of the growing world-wide consumer interest in “environment-friendly” food, drink, and natural fibre, and the role that eco-labels may play in rewarding good environmental performance for these production sectors.

In this paper we propose a methodological framework for the investigation and the analysis of the effects of the environmental certification, developed within the neoclassical paradigm, in which we model the interaction of the changes in the demand (consumer demand theory), and the comparative advantage between two countries (Heckscher-Ohlin model). We investigate the effects of the certification under three different scenarios: autarky, free trade with certification adopted by one country, and free trade with certification adopted by both countries.

Our hypothesis is that the consumer concern in environmental protection represents the driving force to increase the market share of certified goods, and also causing the emergence of a premium price, in contrast with the standard goods.

The structure of the paper is described as follows. In the next section we briefly describe the background and the state of the art related to the environmental certification and eco-labelling. In the third section, we describe the methodological framework for developing an economic model. We follow the neoclassical theory, in order to model the direct and indirect effects of the certification to consumers, natural resources stock, and income distribution. The last section concludes the paper.

2. Background of Eco-Labelling schemes

An eco-label is a tag placed on a product that certifies that it is produced through an environmentally-friendly process. Such tags let consumers make informed choices about what they are buying, so that, if a consumer is concerned with the environment, he can support responsible food production. In essence, eco-label is a device conceived to enhance the market efficiency, aimed at solving the problem of asymmetric information, in order to differentiate a good with different level of environmental quality, for which consumers are willing to pay a premium price. A few years ago, the EU has enacted a specific regulation on this matter (Reg.(EC) 880/92), that has been revised more recently with Reg.(EC) 1980/2000, clearly states which products are eligible for the eco-label award scheme, and the basic rules. At the present, the regulation excludes food, drink, pharmaceutical and some categories of medical devices.

However, there are some examples of eco-label schemes applied to fishery products, where the adoption of traditional catching techniques are dangerous for some species (e.g. dolphins are accidentally killed during the tuna fish catching). Recently, the EU has launched the debate in this regard¹.

Another example is provided by the forest certification, where companies are requested to demonstrate their sense of responsibility, for adopting good management practices. Third parties certification bodies are providing labels to forest products derived from well-managed forests (Toshiaki et al., 2006). The area of certified forests worldwide amounts to 241 million ha, equivalent to 6.2% of the world's forests (Kraxner and Rametsteiner, 2005). The reason for which eco-labelling represents a controversial issue during the negotiation process within the WTO partners relies on the fact that importing countries enforcing mandatory eco-labelling schemes, may insist that foreign exporters meet the same labelling

¹ Communication from the Commission to the Council, the European Parliament and the European Economic and Social Committee, launching a debate on a Community approach towards eco-labelling schemes for fisheries products, (COM(05) 275), on July 2005.

requirements, and therefore it might be used as a sort of technical trade barrier (OECD 2003; WTO, 2002).

In fact, the WTO states the principle that similar products are treated equally, irrespective of the country of origin, while the concept of eco-labelling is to differentiate the good made by an environmentally friendly technology, having higher quality for which consumers concerned with the environment are willing to pay a premium price.

On the contrary, several members of the Doha Ministerial Conference agreed on voluntary, participatory, market-based and transparent environmental labelling schemes, as efficient economic instruments to allow consumers to discriminate environmentally friendly products from other products (WTO, 2003).

The most important issue from an economic perspective relies on the fact whether eco-labelling schemes are effective in the preservation of the environment, or not. In fact, the literature referring to this matter is relatively scarce. In particular, we found the study of Melser and Robertson (Melser and Robertson, 2005), in which analyze the environmental effects of eco-labelling by focusing on the externality problem coexistent with the production process of a good. Another study on the effects and relevance of eco-label schemes on the consumer choice has been carried out by Grolleau and Caswell (Grolleau and Caswell, 2005). In their analysis, they focus on the importance of the product labelling, as a mean to convey to consumers the additional quality embedded in a green good, and from which they expect to get an additional utility.

However, in both cases, the analysis is mainly focused on the consumption side, while there is no particular emphasis on the effects on the trade flow of goods among international partners.

On the contrary in the study of Greaker (Greaker, 2006) eco-labels are analyzed, in comparison with environmental standard, in a partial trade model with one domestic firm and one foreign firm. His results suggest that "...may be optimal for the domestic government to introduce an eco-label and get both firms to adopt the label, instead of setting an environmental standard".

3. Methodological framework

The approach we challenge in this paper is based on the assumption that eco-labelling schemes are able to increase the awareness and the responsibility of consumer consumption, such that they are able to affect producer choice. It is a typical *marketing oriented* perspective, where the firm strategy depends on the revealed preferences, tastes, and needs of the consumers.

3.1. Effects of the certification on the demand

Under the classical assumption of consumer theory, the set of affordable alternatives is just the set of the bundles that satisfy the consumer's budget constraint. Considering the possible consumption bundles or consumption set, in which x_1 is the quantity of a conventional food product and x_2 is the quantity of all other goods he wants to consume, if we know the price of goods (p_1, p_2) and the fixed budget available to a consumer m , the problem of preference maximization can be expressed as:

$$\text{Max}_{x_1, x_2} U(x_1, x_2)$$

subject to:

$$p_1 x_1 + p_2 x_2 = m$$

This constrained maximization problem can be solved using the Lagrangian:

$$L = U(x_1, x_2) - \lambda(p_1 x_1 + p_2 x_2 - m)$$

where λ is the Lagrange multiplier.

Differentiating the Lagrangian with respect to x_1 , x_2 and λ , putting the first order conditions, necessary for an interior maximum, we can obtain the implication:

$$\frac{\partial U / \partial x_1}{\partial U / \partial x_2} = \frac{p_1}{p_2}$$

Therefore, the maximization implies that the marginal utility of the two goods is equal to the economic rate of substitution between them. This means that the consumer wants to find the point on his budget line that achieves highest utility, and satisfy the tangency condition that the slope of the indifference curve equals the slope of the budget line.

If these conditions are satisfied we find the utility-maximization point and have the optimal choice of two goods (x_1^* , x_2^*) that satisfied the budget constraint.

Suppose a country wish to introduce an environmental certification on food product to obtain a reduction of use of natural resource. The certification have a direct impact on x_1 , in that we can distinguish a market shared between the certificated product αx_1 , and the non certificated product $(1-\alpha)x_1$, where α is the market share.

The certification cause a variation of p_1 and, after the certification on good x_1 , the consumer's budget constraint becomes:

$$\alpha x_1(p_1 + t) + (1 - \alpha)x_1 p_1 + p_2 x_2 = m$$

So, the problem of preference maximization became:

$$\text{Max}_{x_1, x_2} U(x_1, x_2)$$

subject to:

$$\alpha x_1(p_1 + t) + (1 - \alpha)x_1 p_1 + p_2 x_2 = m$$

In this new condition the optimal choice of two goods is (x_1^{**} , x_2^{**}), and the level of utility that consumers can achieve will depend on value of α and t , where t represents the increase of price derived from certification and α the penetration of certificated goods in the country and reflects consumer heterogeneity (Greaker, 2006). If consumers give more importance to personal taste rather than to environmental quality of production, the demand function is horizontally dominated, if environmental quality of production is more important than personal taste the demand function is vertically dominated (Neven and Thisse, 1990).

Another important aspect to analyze is consumers' perception of quality: the information for intrinsic attributes may be search (if the consumer can learn about the quality level prior to purchase), experience (after purchase) or credence (not at all). The adoption of an environmental certification can change a credence characteristic into a search characteristic and can reduce the asymmetric information between producers and consumers (Caswell et al., 2002). So certification became an external intervention to allow consumers to choose products that correspond to their preference and honest producers to signal their products. So the consumers' utility from consuming an eco-labelled product is determined by its environmental characteristics and t represents his willingness to pay a price premium for an eco-label-ed good.

3.2. Effects of the certification on the supply

We suppose a supply function for each good based on a classic Cobb-Douglas production function, considering two basic factors: a bundle of generic production factors (F), and natural resources (E).

According to the Heckscher-Ohlin model, we assume that both countries adopt the same technology, but they differ in terms of resources' endowment:

Therefore, the supply for any good in each country is given by:

$$S = a F^f E^e$$

In the case of environmental certification, we suppose a change in the production technology, such that the productivity of environmental resources increases, despite of the productivity of the generic production factor:

$$S_{x1}' = a_{x1} F_{x1}^{f-\varepsilon} E_{x1}^{e+\varepsilon}$$

If we assume that the environmental certification is not compulsory, we suppose that some firms will differentiate their products, in order to respond to consumer's preferences. Therefore, in our simplified market model, we will consider three goods:

- the standard x_1 , with supply function

$$S_{x1} = a_{x1} F_{x1} E_{x1}$$

- the ecolabelled x_1 , and the other good (x_2), with supply function

$$S_{x1}' = a'_{x1} F_{x1}^{f-\varepsilon} E_{x1}^{e+\varepsilon}$$

- the other good, with supply function

$$S_{x2} = a_{x2} F_{x2}^{f''} E_{x2}^{e''}$$

The overall supply for the good x_1 is provided by a mix of the standard and eco-label goods, such that:

$$S_{x1} = \alpha S_{x1} + (1-\alpha) S_{x1}'$$

where α is the share of the market hold by the eco-labelled good.

We need also to consider that production process involves also the remuneration of production factors, supposing the existence of an efficient market, either for the generic production factor, and for natural resources. We also consider that these remunerations correspond to the budget available for consumption, that is:

$$m = rF + vE$$

with r and v representing, respectively, the price for the purchase of the generic production factor and the natural resource.

The introduction of an environmental certification, causing a change of a certain technology, toward another more respectful of the environment, at least for one good, will cause some effects in terms of a) consumption and production patterns (the ratio between x_1 and x_2), b) the budget available for consumption, and c) the distribution of income.

3.3. Situation with autarky

In the case of autarky, the consumption of each good (D) cannot be higher than the domestic supply (S) and, therefore, at the equilibrium, there will be the case such that:

$$D = S$$

The effect of the enforcement of the certification on the demand of two ordinary goods, is similar to that of introducing a tax t on the good x_1 , causing a reduction of the quantity of good x_1 , and also the reduction of the quantity of good x_2 .

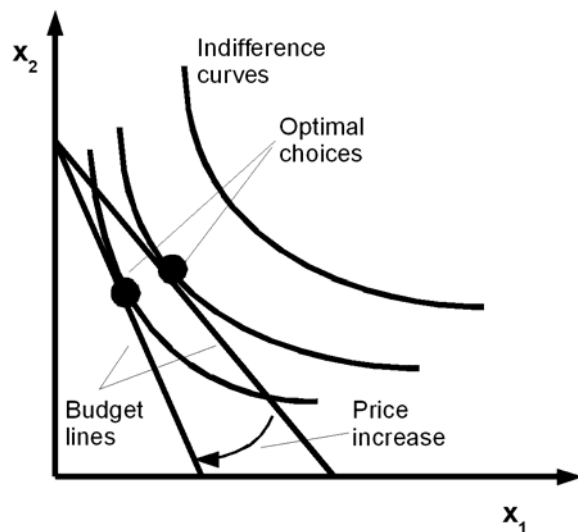


Figure 1 – Effect of price increase in the demand of an ordinary good

The ratio between x_1 and x_2 changes according to the elasticity of consumption in respect to the consumer revenue (ϵ_R). If $\epsilon_{Rx1} > \epsilon_{Rx2}$, then consumption of x_1 will be reduced more than the reduction of x_2 , therefore the ratio x_1/x_2 will decrease². On the contrary, if $\epsilon_{Rx1} < \epsilon_{Rx2}$, then the demand of x_1 will lower to a less extent than x_2 , causing the increase of the ratio x_1/x_2 .

In regards to the effects on revenue distribution and on the indirect demand of inputs, we consider the effects caused on x_1 and x_2 . In the case of x_2 , since the price is unchanged, but the quantity decreases, producers always will lose, therefore there will be a reduction of income, more relevant for owner of the generic production factor, relatively to owner of natural resources. Moreover, there is a more evident reduction in the use of the generic factor, relatively to natural resources.

On the contrary, when we analyze the effects on x_1 , we need to consider the elasticity in respect to its own price (ϵ_{px1}). If $\epsilon_{px1} > 1$, then the effect of the price increase consequent to the certification is offset by the loss for lower consumption. Consequently, producers will lose and, relatively, owner of the natural resources will lose more than the owner of F . In contrast, if $\epsilon_{px1} < 1$, then producers of x_1 will get a higher revenue and, relatively, the remuneration of natural resources, in respect of the remuneration for F . There will be a lower pressure on the natural resource, due to the change of a more *green* technology.

3.4. Situation with free trade

The first difference relies in the fact that consumption of each good (D) may differ from the domestic supply (S), due to import and export flows of goods. Consequently, we define two equations, corresponding to each country:

$$D = S + \text{Imp} - \text{Exp}$$

According to the Heckscher-Ohlin model, one country exports the good in which it has a comparative advantage, since it uses the factor that is relatively more abundant. On the contrary, the same country is better off from importing the good which uses the factor that is relatively more scarce (Basevi et al, 2001; Krugman and Obstfeld, 2003). In our case, we suppose that the Home is more endowed in F, in respect of E, while the Foreign is more endowed in E, in respect of F:

² In this analysis we do not consider Giffen goods.

$$\frac{F^H}{E^H} < \frac{F^F}{E^F}$$

This implies that the Home imports food (x1) from the Foreign, which requires relatively more natural resources, while it exports the other good (x2), which uses more of F. Similarly, the Heckscher-Ohlin model states that trade causes a change in the relative prices of the two goods in the two countries, tend to converge into the relative world price:

$$\frac{P_{x1}^H}{P_{x2}^H} = \frac{P_{x1}^F}{P_{x2}^F} \equiv \frac{P_{x1}^W}{P_{x2}^W}$$

As follows, we discuss about the consequences of the environmental certification on both countries, either in the case only one country, or both countries may adopt the certification. The analysis is referred to the effect on the equilibrium.

Case a1) Certification adopted only by the Home

The adoption of a more green technology implies an increase of production costs for x1 that, if compensated adequately by the premium price (t), may still represent an opportunity for product diversification, allowing the firm to be more competitive in respect to other firms. Therefore, to a certain extent, the market in the Home is characterized by two differentiated goods x1, of which the certified good is produced domestically, and exchanged in the domestic market, at price $px1+t$, while the ordinary good is either produced domestically, or imported, at price $px1$.

If we assume that the supply of certified good is sufficient to satisfy the domestic consumption, and the premium price is sufficient to cover the additional costs for certification, the mechanism may work as a policy measure for protect from the foreign competitors.

The overall effect might be a reduction of the import flow from the Foreign, despite the existence of the premium price, that may be perceived only by domestic producers.

In this case, in the Home we may observe similar effects as in the case of autarky, while in the Foreign there should not be any relevant effect, as the relative prices between the two goods in the both countries remain basically unchanged, as well as import and export flows.

Case b) Certification in both countries

In this case, it is expected a more relevant effect, in that also producers in Foreign may pursue the achievement of the premium price t, under the condition that it is sufficient to offset the additional cost for the certification. Therefore, in this case, the relative price between the two goods increases in Home, determining an increase of trade from Foreign to Home. However, since the higher price corresponds to the certified product, this implies that in Foreign there is an increase of produce from the green technology. Natural resources will be preserved, but the overall production of the good x1 will be lower, in part due to the increased export to Home, and in part because of the technological change. Consequently, the price for good x1 may increase, to a certain extent, although consumer in Foreign may not be willing to pay for the certification. The price increase for the good x1 may cause a relevant reduction of the purchasing power of the other good (x2), with consequent reduction of imports from Home. In general, effects of the certification in Foreign are similar to the analysis in the case of autarky, and even more amplified, since the good x1 holds a relevant importance either in the demand and the production mix.

4. Concluding remarks

The theoretical analysis has proved that the enforcement of voluntary, participatory, market-based environmental labelling schemes may be potentially efficient economic instruments in order to preserve natural resources. The effectiveness of this measure

depends on the market share of certified products, in comparison with other goods, the elasticity of demand to consumer revenue, and the market situation. In the case of free trade and under the hypothesis that certification scheme is implemented by only one country, the effects are limited to that country, similarly to the impacts in the case of autarky. However, most relevant impacts are expected when both countries agree to enforce voluntary certification schemes.

The implementation of eco-labelling schemes represents a moderate approach, in contrast with other economic instruments. In this regard, they should be preferred, as they cause lower market distortion effects, while consumers concern towards environment may represent the real driving force for the pursuing of a more sustainable development.

However, for the achievement of the preservation of natural resources, a combination of several policy measures may be preferred, in order to face to the complexity of this matter, such as:

- economic measures, such as the introduction of environmental tax, to internalize the externalities originated as a co-product, or the payment of financial incentives, aimed at promoting cleaner production technologies;
- regulatory measures, consisting in the enforcement of rigid environmental standards, indicating the minimum necessary requirements that producers have to comply, in order to enter the world market;
- institutional mechanisms, based on the principle that polluters may establish contracts with those who detain the property rights of natural resources (approach based on the Coase theory).

The integrated use of these policy measures should take into account of the type of the potential environmental damage, but also should consider that enforcing a too rigid environmental regulation may interfere with the market mechanism, causing market failures, and the emergence of economic inefficiencies.

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The roles of geographical indications on the internationalisation process of agri - food products

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Summary

The purpose of this paper is to analyse the roles Geographical Indications (PDO and PGI) can play in the internationalisation process of some small-medium scale agri - food products from Tuscany (Italy).

The analysis of the selected case studies highlighted among the driving motivations of firms for the use of PDO/PGIs on international markets both defensive roles (in particular for the function of defending from abuses in using geographical name), and offending roles against competitors (as in the case of product differentiation or exclusive right of benefiting from the reputation of origin). Besides, there is also a strictly commercial role in terms of giving an answer to the explicit request of certifications from customers.

PDOs and PGIs can represent an internationalisation tool, although their effectiveness depends on several factors that rely on the characteristics of the product, of the production system (rate of fragmentation, organisation, role of collective organisations...) and of the firms in particular, as well as on the characteristics of the destination market.

KEYWORDS: Quality Food Products (QFPs), PDO and PGI, Small and Medium Enterprises (SMEs), Marketing strategies.

1. Introduction

The success of the market of Origin Products¹ is due to their suitability in responding to consumers' needs in terms of genuinity and authenticity in front of food massification, thus rediscovering old cultural traditions; this success pointed out the usefulness of agrifood product's territorial origin highlighted in the label to become a strategic tool for differentiation.

The EEC Reg. 2081/92 (recently substituted by EC Reg. 510/2006) arranged this strategic tool through the introduction of the Protected Denomination of Origin (PDO) and Protected Geographical Indication (PGI), two quality signs aiming at pointing out the link between the production process of an agri - food product and its territorial origin.

The use of suitable marketing strategies for PDOs and PGIs is an issue which has recently been faced by economic literature. Up to now, there is no much evidence on the effects the application and use of PDO and PGI may have on the internationalisation of agri -food firms. Due to the fact that firms producing PDOs and PGIs are mainly Small and Medium Enterprises (SMEs), often marketing strategies are difficult to implement, both in terms of costs and supply availability to orientate consumer's demand.

¹ We define as Origin Products all those products fitting the TRIPS definition for Geographical Indications, apart from the fact that they are labelled/designated by (and hence exchanged on markets with) a geographical indication or not. The use of a geographical indication to indicate an OP is in fact a step in the process of valorisation of the product and it is a result of the behaviour of the actors (local and non local). For further information on OPs and GIs in the world, both from economic and normative point of view, see the Siner - GI project results (www.origin-food.org).

The aim of this paper is that of verifying the roles PDOs and PGIs play in the internationalisation process of agri - food firms: when and why do firms use PDO-PGI for selling their products on the international market? Are they satisfied? Are PDO-PGI a valuable tool for helping firms in their internationalization process? At what conditions?

The paper starts from an analysis of the literary background regarding the role of origin products in international markets (par.2), focusing on the specific contribution of PDO/PGI products (par.3). After having identified the driving motivations leading firms to the use of PDOs and their subsequent satisfaction (par.4), and given a short description of the case studies examined (par.5), the paper puts in evidence the results of a specific survey carried out on the factors of success and limits of the use of PDOs and PGIs in internationalisation, both at an aggregate level (par.6), at product-type level (par.7) and at single firms level (par.8). The paper ends with some concluding remarks (par.9).

2. Origin products in international markets

The saturation of the national market and the growth of consumers' purchasing power in some emergent countries represent important triggers for the penetration of new markets for Quality Foods Products (QFPs). Among QFPs, Origin Products (OPs) are a segment of particular interest, due to their special qualities deriving from the strong link with the territory they originate from.

The globalisation of consumers' preferences and new technologies in production, communication and information give also to agri - food firms producing OPs new opportunities to internationalise themselves (Galizzi, 1990; Mellano, 2000).

Internationalisation of agri - food firms can be seen from two different (but strictly interrelated) points of view. The first one is internationalisation of all production processes, which can be pursued through the creation of new firms on foreign markets (namely 100 percent ownership of company overseas by start - up or acquisition, participation to capital of foreign companies through investments like Foreign Direct Investment, or less invasive forms of participating in global markets as partnerships or joint - ventures) or more simply through delocalisation of one or more phases of the production process (Galavotti, 2005). On the other side, there is internationalisation of commercial channels, which is nowadays more and more interrelated to the production process: this relation depends on targets and kind of investment (many investments are made in order to increase penetration of foreign markets, firstly penetrated through export activities).

However, agri - food firms need suitable tools in order to take the opportunity offered by internationalisation: these tools are capabilities to invest both in physical factors, as new production factories and, above all, in non-physical factors as know-how, organisational and managing capabilities which permit the innovation and valorisation of the product (Galizzi, 1995).

Internationalisation of commercial channels is the most relevant aspect of the internationalisation process for agri - food firms producing OPs: in most cases they implement traditional production processes using local raw materials and local know-how; hence the internationalisation of the production process is in most cases impossible unless abandoning the basis of specificity of the OPs, consequently firms have to orientate their internationalisation process on commercial channels and markets, rather than on the production process.

In addition, firms producing OPs are mainly Small and Medium Enterprises (SMEs) and this often does not allow the implementation of "traditional" marketing strategies both in terms of costs and of a sufficient supply of the product to orientate the consumer's demand. Difficulties met by SMEs producing OPs in penetrating new long - distance markets are often due to inadequate marketing and production strategies. According to Albisu (2002), many firms belonging to an OP supply chain tend to be more product oriented than market oriented and, even if pride of the product and loyalty to the traditional production

techniques may generate highly valuable product qualities, it is not a guarantee for a successful sales strategy. The success of promotion of OPs depends on careful implementation of effective marketing strategies, for consumers use a variety of signifiers to identify origin and authenticity, such as the place of purchase and/or consumption, physical attributes, and mechanisms that communicate heritage (Rangnekar, 2004).

In particular, selling Origin Products on international markets can rise problems in highlighting the link with the territory and in recognition of meaning of “traditional” and “typical” terms: consumers have different cultural backgrounds and ideas of which characteristics give “typicality” to agri – food products (use of local raw materials? Production process in a certain area? Historical production process? And how old a process has to be in order to define it “historical”?)

Other problems can be determined by cases of misleadings and frauds of OPs. Nomisma, together with INDICOD, has recently published a report (Nomisma, 2005) on the usurpation and misuses of the names of Italian OPs, taking in exam the imitations of pasta, wine, cheese and other Italian food products on the USA market, and trying to estimate the (large) economic damage resulting from non-Italian made products which imitate and/or catch Italy’s notoriety.

3. *Expected contribution of GIs on internationalisation of OPs*

Internationalisation of commercial channels and markets implies more complex transactions and consequently requires, coupled with strategies to increase consumers awareness on quality of food products, more information on traded products, in order to face informative problems and asymmetries as different typology of consumers, different food safety regulations and distribution practices. In this sense penetration of international markets requires the use of quality signs both as minimum standard in transactions and differentiation/valorisation tools (Marette, Crespi and Schiavina, 1999) in particular for those agri -food products which are characterised by a specific quality (Ménard, 1996; Barjolle et al, 1998).

In addition, the differentiation of consumption patterns and the growing demand of information lead agri-food firms to look for a competitiveness based on quality issues (in its wide meaning); this, coupled to the need of acquiring and managing control over a more globalised production process and supply-chain, is pushing for regulating supply-chains through severe and often private-own, public and international minimum quality standards (ISO 9001, EurepGAP, IFS, BRC, etc.).

The rise of quality standards risks to cut off Origin Products, producers and countries which are not sufficiently equipped (structures, know-how, support services, etc.).

It is argued that as large retailers take interest in local and regional food (acting on evidence of increasing consumer interest), they invoke certification schemes and standards that allow them to retain control. Consequently, globalisation tends to act as a promoter of Geographical Indication regulation and recognition schemes (Belletti and Marescotti, 2006).

The EEC Reg. 2081/92 (recently substituted by EC Reg. 510/2006) created the Protected Designation of Origin (PDO) and the Protected Geographical Indication (PGI), two quality signs aiming at pointing out the link between the production process of an agri - food product and its territorial origin and guaranteeing protection against misleading uses of the geographical name.

The new EC Reg. 510/2006 offers PDOs and PGIs for signalling and differentiate QFPs linked to the territory, “In view of the wide variety of products marketed and the abundance of product information provided, the consumer should, in order to be able to make the best choices, be given clear and succinct information regarding the product origin ” (EC Reg. 510/2006, 4th “whereas”).

Both PDO and PGI share the same normative system and procedures for the application, and give the same guarantees to consumers, and the same rights to producers, but differences between these two signs depend on how closely the quality specificities of the products are linked to the geographical area of which they bear the name. The Protected Designation of Origin (PDO) is meant for those products which show an objective and very close link between their features and the area of which they bear the name (including human and natural factors, such as climate, soil quality and local know – how); the Protected Geographical Indication (PGI) also designates products linked to the area of which they bear the name but with a more flexible objective link.

PDOs and PGIs include both the so-called niche commodities, which are produced on a small scale in very limited areas where the interaction between the variety or species and the environment gives particular qualities to the product, up to large scale products. However, although the contribution of registered foods to Italian agri - food economy is far from marginal (it is estimated - wine excluded - about 7.2% of the agricultural added value) with a turnover of over 3,1 billion euro at production and 8,6 billion euro at consumption (INDICOD - Nomisma, 2005), firms producing PDOs and PGIs in Italy are mainly Small and Medium Enterprises (SMEs).

Most studies have been dedicated to analyse PDOs and PGIs effects on producers, on consumers' behaviour, on supply chain, while recently their impact on local development, rural development and environment has arisen among new research targets. However, the use of suitable marketing strategies for PDOs and PGIs is an issue which has recently been treated by economic literature and up to now there is no much evidence on the effects the application and use of PDO and PGI may have on the internationalisation of agri – food products.

Agri - food firms are registering a growing interest in PDOs and PGIs and have great expectations on the positive effects they can exert on international markets. Some studies (Belletti, 2001, Anania et al., 2004, Pacciani et al. 2003) underline the fact that PDO and PGI labels may act as a “key” to open modern market and/or long distance commercial channels (for example, export channels): in fact, amongst potential effects that PDO and PGI labels may have on markets there are “the market-cleaning effect”, thus the exclusion of non-authentic origin products, the creation process of reputation and visibility for labelled products, the access to modern and/or long commercial channels (especially those which show higher informative gaps). In particular, due to the complexity of OPs systems, the presence of a PDO or a PGI in the market can exert a “reassurance” effect on consumers and customers, out of territory the of production (Tregear et al., 2004): this effect derives both from an independent and qualified third party guarantee (Anania and Nisticò, 1999) and from the Code of practices, which establishes shared minimum standards (among producers), creates references and reduces information costs, minimizing moral hazard (Akerlof, 1970). In this way, these shared minimum standards allow more compatibility between supply chain actors and ease the access to new markets and new commercial channels (Belletti, 2001): in this sense PDOs and PGIs can become an important competitive lever for agri-food firms which want to penetrate new long-distance markets. In fact, the opening of international markets and trade leads to both a growing demand of information from consumers, and to the use of “halo country effects” (for reputed geographical names) by sellers (Porretta, 1992; Belletti and Marescotti, 2006).

Some difficulties for agri - food SMEs to enter new markets can be determined by transaction costs (Coase, 1937; Williamson, 1975), such as bureaucratic costs associated with managing and coordinating the supply chain, opportunity cost of time used to communicate with farmers and coordinate them, costs for testing potential suppliers/buyers (on the side of trade) (Hayes, 2000), and information and research costs on the side of consumers: in this sense the use of PDO or PGI helps to identify subjects and products attributes, reducing transaction costs both from trade side and the consumers one.

The presence of the Code of Practices, in addition, helps agri – food firms to codify management procedures and increases internal coordination between phases of the supply chain: this can ease implementation of internationalisation strategies either in terms of producers' improved confidence toward management functions (planning, organising, leading and controlling), or collective marketing initiatives on foreign markets due to the collective dimension of PDO and PGI, often amplified by the presence of collective organisations as Consortia (Canada and Vazquez, 2005).

However, the internationalisation phenomenon does not have to be considered only a penetration process of new or long – distance markets. For agri – food firms internationalisation also means integrating at global level both markets and economies, through different ways (Nomisma, 2005; Zucchella and Maccarini, 1999; CNEL 1992). For example, the consumption of OPs is strictly linked to tourism, in particular to the eno - gastronomic tourism which in Italy is obtaining an increasing success (wine/olive oil/cheese routes), and to the more general re - discovery of the values of rurality, within a typical urban, middle-class trend: this permits SMEs producing PDOs and PGIs to build up networks (like Wine and Flavour Routes) and create synergies with other sectors, like tourism and handicraft. In order to create networks PDOs and PGIs, SMEs have to rediscover the collective dimension of their system, joining to Consortia and Associations, which are, in most cases, a key figure for application and management of the PDO or PGI and for promoting activities.

4. Objectives, data and methodology

The purpose of this paper is to analyse the impact of Protected Designations of Origin (PDO) and Protected Geographical Indications (PGI) on the internationalisation process of some small-medium scale agri - food products from Tuscany (Italy) which have already borne the European geographical protection.

Our focus is on the different functions PDOs and PGIs are able to absolve, by exploring them on the specific context of international trade and analysing their impact from the production perspective.

Specifically, the main objectives are:

- to determine which are general motivations of agri - food firms for using PDOs and PGIs, with special reference to foreign markets;
- to assess the level of utilisation of the denominations by the firms and the incidence of exports of PDOs and PGIs on total firms' turnover;
- to characterise the marketing channels mostly used;
- to verify the level of satisfaction of the firms using the denominations also in relation to the motivations they had;
- to identify the role of collective organisations managing the denomination (Consortia in particular).

In order to reach these objectives, we carried out a case study analysis focused on the firms and the collective organisations involved in the internationalisation strategies. Due to the diversity of involved firms in terms of dimensions, interests in internationalisation, attended foreign markets and commercial channels, reached export data and role of collective organisation as Consortia, a diversity of results was expected in order to describe the impact of using PDOs or PGIs in the internationalisation process.

This paper bases its analysis on four case-studies (Olio Toscano PGI, Olio Chianti Classico PDO, Pecorino Toscano PDO and Prosciutto Toscano PDO) which have been selected from a wider survey carried out in Tuscany in the years 2005 - 2006 on some OPs of the region. Each case study analyses the production system of the agri - food product, starting from the characterisation of the product, going into the structure, functioning and evolution of the supply chain, with special regard to the description of its enterprises, their organisation, problems and main commercial channels. Considering the purpose of the paper a special

attention has been paid to the role of exports and in particular to the use of the geographical indications on international markets.

Selected products are representative of main Tuscan exports of agri - food products labelled as PDOs and PGIs. The choice has also been addressed to products that bear a well - known denomination (Toscana and Chianti) and have therefore a particular appeal to foreign markets.

As far as selection of firms is concerned, we chose all the firms which are charged of the decision of using the PDO-PGI sign (bottlers for extra-virgin olive-oils, cheesemakers for Pecorino Toscano PDO, and seasoners for Prosciutto Toscano PDO); all these firms produce and then export PDO and PGI products. In the case of production systems with a high number of export - oriented producers, we identified the firms to involve in the survey through a *critical case sampling* methodology, in order to reach a good coverage of the typology of firms involved in the supply chain. The chosen actors are those who represent a key-element for the understanding of the matters covered by the study or have a particular capacity of influencing the development of the internationalisation process. Therefore, our aim was not so much to build a statistically representative sample, as to maximise information on a specific subject.

We adopted mainly open qualitative interviews, a choice motivated by the fact that our goal was not so much to gather quantitative information as to understand the motivations and satisfaction level of producers using PDOs or PGIs in their internationalisation processes, as much as characterising the problems and opportunities of the different marketing channels and the role of collective organisations. As far as more quantitative aspects are concerned, we also collected data either from each selected firm, or Consortia's representatives in order to gain an overview on the main trends of PDO and PGI products in terms of production volumes, PDO/PGI total firms' turnover and foreign sales.

The tool we used for interviewing producers was a semi-structured questionnaire in way to get information related to each of the main research objectives. The questions we proposed were partly open ones, especially in the case of more qualitative aspects of the survey, while remaining questions were multiple choice. We interviewed a total number of 16 firms belonging to 4 selected production systems: Olio Toscano PGI, Olio Chianti Classico PDO, Pecorino Toscano PDO and Prosciutto Toscano PDO.

In addition, the representatives of all Consortia were interviewed in depth, due to the fact that the action of such institutions has a strong impact on associated firms, especially for small and very small enterprises which generally cannot bear the burden of international marketing on their own resources, experiences, capabilities and management skills.

5. The case study analysis: description of the production systems

The aim of this paragraph is to give a short description of the main features of the selected production systems, in terms of typology of firms involved in the process, marketing channels used by firms, role of collective organisations, and level of internationalisation. Particular attention is given to the certified (PDO-PGI) product, which is often a minor part of the total amount of the production of the firms involved in the production process, depending on the structure and strategies of the firms, on marketing channels used, on the "strength" of the PDO-PGI itself in collecting consumers and customers attention.

A special focus is also given to the level of internationalisation of firms, that is still limited in average and very diversified between different products and even within the same production system.

5.1 The Tuscan extra – virgin Olive Oil PGI

The “Toscano” (Tuscan) extra-virgin olive oil is a product which enjoys great, longstanding "renown" in Italy and also internationally. The PGI was obtained in 1998, in particular in order to face problems of misleading of the renown name “Tuscan” for olive oil.

The production system is very articulated, managed by a variety of professional and non-professional actors (olive growers, olive mills, olive pickers, merchants, both small and industrialised mixing and bottling firms) and characterised by a very strong fragmentation (in 2002/03, 2.500 tons was certified, produced by 9.900 olive growers, 244 olive-oil mills and 258 bottlers).

The production is directed toward heterogeneous marketing channels, from very short (direct sale by the olive growers) to long channels (large bottling firms selling to supermarket chains). More than 60% of the total PGI production is sold through large retailers, followed by intermediates and wholesalers, while only just 4% of the production is distributed through direct channels (direct sale to final consumers). Internationally, the main channels used in order to export olio Toscano PGI are buyers of foreign Large Retailer and middle-men, as foreign importers and/or national exporters (most firms exports through this channel) even if direct sales to foreign consumers are growing in importance.

Tuscan extra-virgin olive oil PGI is the most export oriented product among Italian recognised PDOs and PGIs. In 2003, its sales relied on foreign markets for more than 66% of all production volume (Nomisma, 2005), gaining during the last five years an increasing importance in terms of quantity and value coming from international trades. Main foreign markets for Tuscan olive oil are non - European countries, in particular the most important market is represented by United States which accounts for more than 60% of the total exported volume of protected product, (which amounts 13.413 q in 2006, for a value of more than 16,500,000 euros, thus the 65% of total production value).

Within the supply-chain, owing also to the fragmentation of the production system, the role of the Consortium (Consorzio di tutela dell’Olio di Oliva toscano) is particularly relevant for the services offered to the members, which represent all the Olio Toscano PGI producers.

5.2. The Chianti Classico extra - virgin olive oil PDO

The Chianti Classico extra virgin Olive Oil is a new denomination, that obtained the PDO in the year 2000, but enjoying the high reputation of a geographical name well known for the production of wine.

The first phase of the production structure (olive growing) is very fragmented among many farms, most of them run by the owner’s family. Some farms are medium – sized, but olive oil production is not the principal activity (which is generally wine production, but also saffron and lavender production in some cases), hence the degree of specialisation is very low.

The PDO Chianti Classico Olive Oil supply chain counts 258 olive growers (119 of them are also olive millers and bottlers), 30 olive mills and 100 bottlers, often organised in form of cooperative. In 2006, the Consortium of Chianti Classico olive oil associated all previously described categories of producers.

Producers do not certify all the olive oil production as PDO, partly on the basis of the channels on which the product is sold and therefore to the signalling necessities. In average, the percentage of certified production is about 20% of the local production of olive oil.

Main commercial channels on foreign markets are the direct sale through agritourist farms owned by olive oil producers and through import wholesalers. As for the markets of destination, 65% of the total exported Chianti Classico olive oil PDO goes to the EU foreign markets (Germany, France, England, Austria and Belgium), while 35% of the exported product is destined to the U.S.A., Canada, Switzerland, Vietnam and Norway.

The Chianti Classico PDO internationalisation strategies had already been adopted by producers before they gained the recognition of PDO protection: in fact most farms were already present on foreign markets with their olive oil, principally thanks to wine Chianti Classico sales, which have consolidated commercial channels and a very high renown for a quite long time.

5.3. The Pecorino Toscano PDO

The Pecorino Toscano is a typical sheep cheese produced in a wide geographical area which includes the whole Tuscany, part of Umbria and Lazio. It has a defined and structured production process which gives a significant mass of product marketed on structured commercial channels.

Before obtaining the PDO, the Pecorino Toscano was protected (since 1954) with a national protection system of local production called Denomination of Origin (D.O.). Therefore, this sheep cheese has been considered as a product needing a protection against misuses and frauds for a long time. For the existence of different typologies of pecorino (sheep) cheese traditionally produced in Tuscany and hence sold as “Tuscan pecorino cheese”, a mark which could include and protect all these heterogeneous products was needed. Therefore, after the D.O. protection, producers applied for the European recognition of protection of the geographical indication, obtaining the PDO in 1996.

The Pecorino Toscano PDO is produced by non - specialized dairy factories, which also produce other kinds of cheese. However, the particularity of the Pecorino is the raw material (milk) coming only from sheep breeding in the PDO area. In Pecorino Toscano PDO cheese production system, some of the actors of the supply chain are associated to a Consortium, whose activities concern technical assistance to the members, recording and management of the data related to the milk and dairy production and of the marketing phase of the Pecorino Toscano PDO, including promotional activities.

The commercial channels for the Pecorino Toscano PDO cheese on foreign markets are various, mainly indirect selling through wholesalers and direct selling to tourists, even if a high percentage of the product is sold to buyers of Large Retailers.

The Pecorino Toscano PDO cheese sold on foreign markets is about 17% of the total PDO production in quantity and it is destined for the 81% to EU countries (England, France, Germany, Sweden, Austria, Spain, Greece, Denmark, Belgium and Finland) and the rest is sold to U.S.A., Canada, Australia, Japan, China, Switzerland and Luxemburg.

5.4. The Prosciutto Toscano PDO

The “Prosciutto Toscano PDO” is a raw ham made only by pigs belonging to specific races, reared in a determined area (Tuscany and other Italian regions included in the area of rearing recognised for PDOs Prosciutto di Parma and S. Daniele), and with dry salting process which can only be carried out in Tuscany.

The product has a link with tradition and geographic area of Tuscany basically due to the seasoning, which involves specific know-how in order to manage the process. The relative low presence of pig breeding in the area of Tuscany and the relative higher costs of raw materials answering standards established in the Code of Rules constitute a limit to producers to increase volumes of PDO production.

The production system of PDO Prosciutto Toscano includes 25 producers who are variously involved in the production process: butchering, sectioning and seasoning. They join PDO production to other kind of products (salami, sausages, fresh meat, etc.), often similar to the marked one (for example ham obtained by non Italian pigs). All producers but one using the PDO have joined the Consortium since it was born in 1990 in order to protect the origin product from unfair national and foreign competitors, which have started to directly threat the Tuscan ham selling inexpensive similar products made of “unknown”

pork. After the request for the recognition of Italian denomination of origin, the Consortium applied for EU PDO, gaining it in 1996.

PDO Prosciutto Toscano is one of the growing leaders of the Italian ham market, after the most popular PDOs Prosciutto di Parma and S. Daniele. However, on the national market the PDO Prosciutto Toscano seems not to suffer the direct competition of other Italian raw hams because, given its particular features, it has its own positioning on the market. Nevertheless, many synonyms or imitations of the PDO product on the market strongly mislead the consumer, both on local and foreign markets.

Almost all PDO ham production is sold on national and local markets, either because these markets better know Tuscan ham characteristics and attributes, or because firms do not reach sufficient volume of certified product in order to sell it overseas: this implies low importance of exports in terms on impact on the turnover of the Prosciutto Toscano PDO system.

The firms which go overseas are very few in number, generally the biggest ones, thus those with a range of production from 50,000 to 150,000 PDO hams per year. The PDO Tuscan ham registers an average rate of export incidence on total PDO production of 4% of value and 6% of quantity. Moreover, exports of PDO on total firms' turnover have a lower impact than other firms' products sold overseas. Prosciutto Toscano PDO firms mainly export their product through importers-exporters, while the direct channel is less important for these firms because they belong to more industrialised sector which is generally out of tourist routes.

6. The use of PDO/PGI on international markets: motivations and satisfaction

The analysis of the roles PDO/PGIs play in international markets has moved from the determination of the motivations producers have in the use of PDOs and PGIs both on the national and the international market.

The literature analysis (see par. 2 and 3) together with previous research carried out by the authors allowed us to identify some key functions attributable to PDO and PGIs on the market. The functions have been identified as follows:

- The defence of the geographical name of protected products against misuses and abuses (phenomenon largely present for most OPs from Tuscany);
- Answering to specific customers' requests (middle-men, importers-exporters, buyers for foreign large based retailers, etc);
- Gaining higher premium price than non PDOs or PGIs similar products;
- Increasing firms' turnover on the same international commercial channels;
- Facilitating the opening of new commercial channels and or regional markets (especially in the case of foreign large based retailer);
- Steadying commercial relations and reducing uncertainty on the trade and final markets regard to volumes and/or prices of exchanged PDO and PGI products;
- Benefiting from collective product promotion thanks to the presence of a collective organisation in charge of organising, defending and promoting represented PDO or PGI production system;
- Offering more guarantees to final consumers (traceability of the product and its production process);
- The differentiation of protected products on foreign attended markets;
- Benefiting from renown and reputation of geographical name of origin of protected PDO and PGI product.

Main PDOs and PGIs functions supposed as driving forces are quite diversified. Due to firms characteristics, features of denominations and target markets conditions, selected functions cover either defensive roles (defending the protected product from abuses in

using geographical name), or offending roles against competitors of protected product (product differentiation, exclusive right of benefiting of reputation of origin), as well as they can affect commercial aspects of trading PDOs and PGIs (impact on protected product turnover and price, opening new markets and new commercial channels for PDO/PGI products).

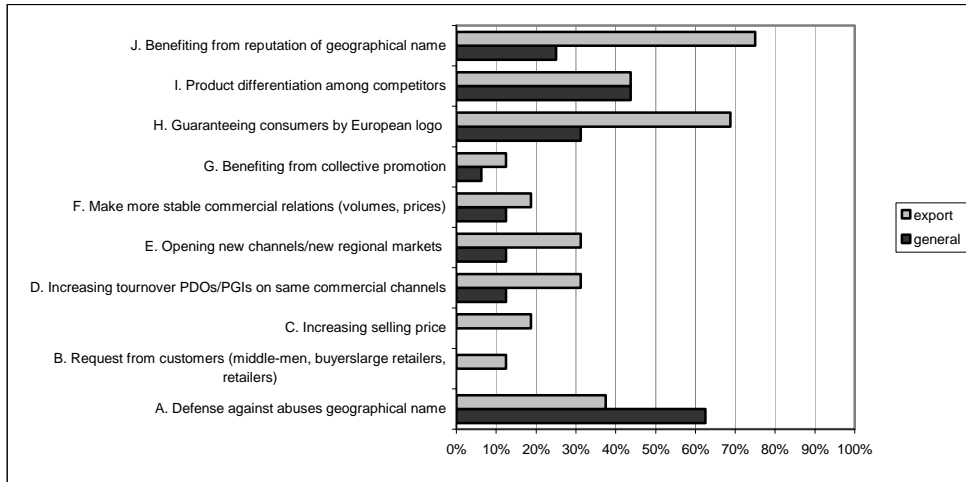
The above functions have been evaluated and then graded by the interviewees in the first step as motivations for the use of PDO/PGI on the markets and then in terms of personal satisfaction on their effective impact on the internationalisation of the firm. Importance range for rating functions in terms of motivation started from a minimum (not important) to a maximum (very important) level of assessment, while for the effective satisfaction gained regard to each function the level started from unsatisfied to very satisfied. Collected motivation and satisfaction assessments have been later scored, attributing them a different number value, variable according to importance and satisfaction levels. For each function, we calculated its respective average index of motivation and satisfaction².

In this way, the motivation index measures the average level of importance producers assigned to each function in terms of driving force to use geographical indications on international markets, while satisfaction index aims at averagely estimating how much firms are satisfied for each performance of PDO/PGI function. These indexes can vary from 1 (minimum value) to 100 (maximum value).

To better understand the role of PDOs and PGIs on international markets, the analysis has moved from a comparison between the driving forces which led producers to generally use the geographical indication and those on international markets (graph 1). At aggregate level some interesting considerations emerge. The first general result is that all the motivations reported by firms for using the PDO-PGI reached a higher score for international markets than the average, but for the Defense against abuses of geographical name. The most important differences can be found in the Use of the geographical name in order to benefit of its reputation that together with the Guarantee to consumers represented by the European Logo seem to be much less important on general use of denominations than on the international markets. On the contrary the defence against abuses of the geographical name seems is reputed highly less important on the international market. This different attitude may be explained by the fact that on foreign markets the use of the reputation of the territory of origin (that in the specific case is Tuscany and Chianti) has a stronger effect on the foreign consumer than, for example, on the Italian one, who already knows the product and the territory. On the contrary it is perceived as more important at national level to use the PDO to defend the product from abuses that are more liable to appear because of the widespread notoriety of the product itself.

² The average motivation index is calculated as follows: Average Motivation Index $(\sum_{i=1; i=4} Mi*fi)/n$, where i are the supposed levels of motivation (total number of 4), Mi stays for the Importance score, fi is its respective frequency and n the number of firms which answered to the question. The 4 levels of importance established in order to assess the motivation for each function were scored as follows: “not important”= score 1, “less important” = score 33, to “important”= score 66, while for the maximum of motivation (very important) we assigned the score 100. The same applies for the satisfaction index calculated as follows: Average Satisfaction Index $(\sum_{i=1; i=4} Si*fi)/n$, where Si stays for the Satisfaction score for each supposed level of satisfaction (“unsatisfied”= score 1, “less satisfied”= score 33, “satisfied”= score 66 and “very satisfied”= score 100), while the rest of components of the formula coincide with those we explained for the Average Motivation Index.

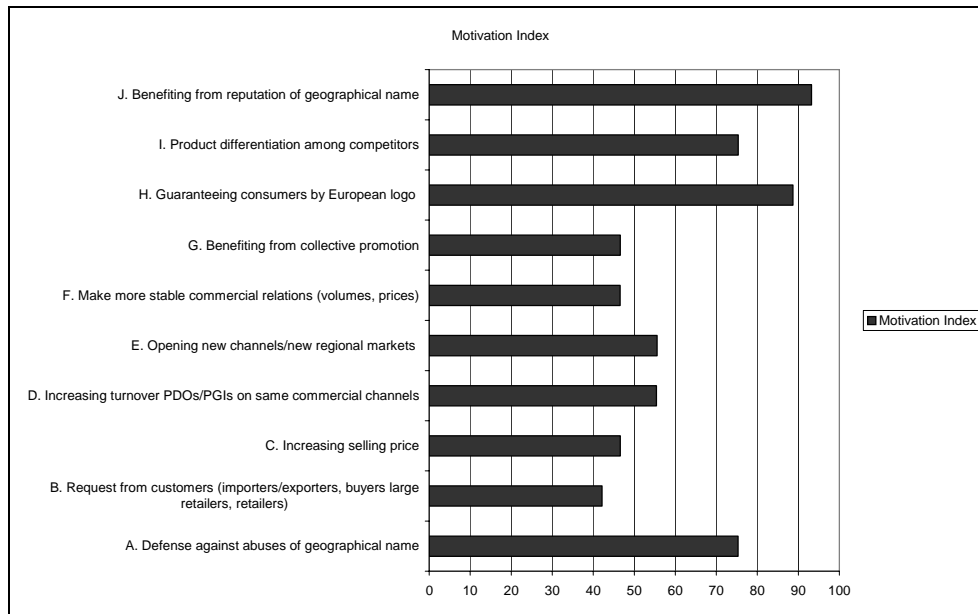
Graph 1 - Motivation for the use of PDO/PGI: comparison between general usage of PDO/PGI and specific usage on international markets



Note: The values are in percentage and calculated on the number of firms answering “very important” on the motivation; multiple answers were allowed)

Source: Direct survey

Graph 2 - Motivation index for the use of PDO/PGIs on the international market

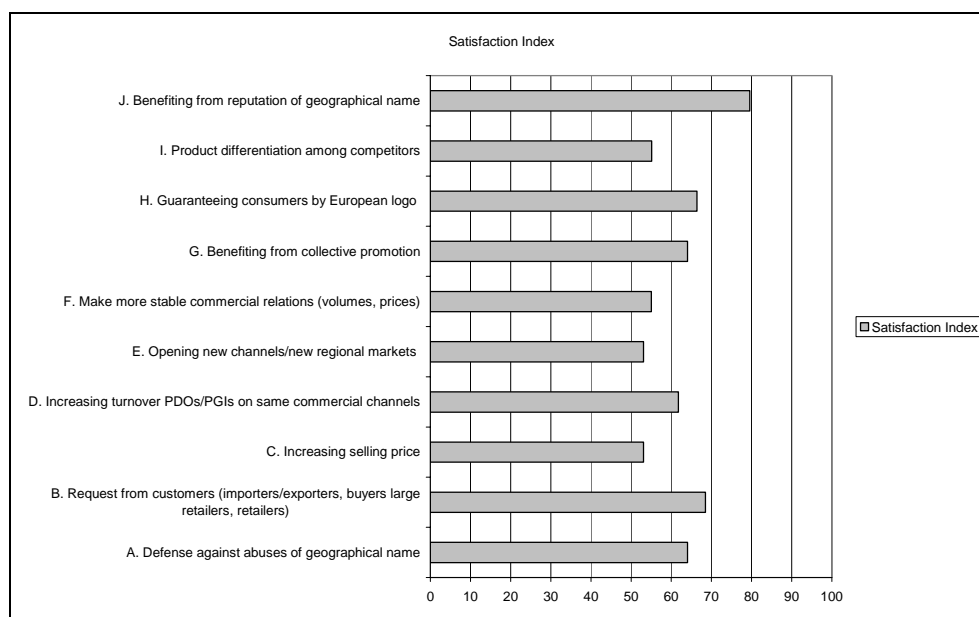


Source: Direct survey

The motivation index on foreign markets shows how a key importance in the internalisation through PDOs and PGIs is given to both offensive and defensive motivations (graph 2). In fact, on the one hand producers state that they use the geographical indication in order to benefit of the reputation of the “Tuscan” geographical name and in order to differentiate their product from that of their competitors, but on the other hand they also use it to defend their product from abuses of the geographical name and to guarantee consumers through a European logo. The situation described, as we will analyse more in depth in the following paragraphs, is in reality the result of different strategies of the single firms according to the product they produce and/or according to the different organisation at individual and system level, and marketing structure.

The aggregate analysis of producers’ satisfaction deriving from PDOs and PGIs performances on international markets (referring to same specific functions used for exploring driving forces) shows an overall good satisfaction for the use of the Reputation of the geographical name as well as for the European logo (graph 3). Nevertheless, some unexpected functions³ of the PDO/PGI on international markets emerge mainly on the marketing field, among which we underline the Request made by the customers for the logo in order to guarantee the origin and the characteristics of the product.

Graph 3 - Satisfaction index for the use of PDO/PGIs on the international market



Source: Direct survey

7. Motivation and satisfaction: the different production systems overall view

Among the driving motivations of firms for the use of PDO/PGIs on international markets (graph 4), the analysis of the selected case studies has highlighted defensive roles (in

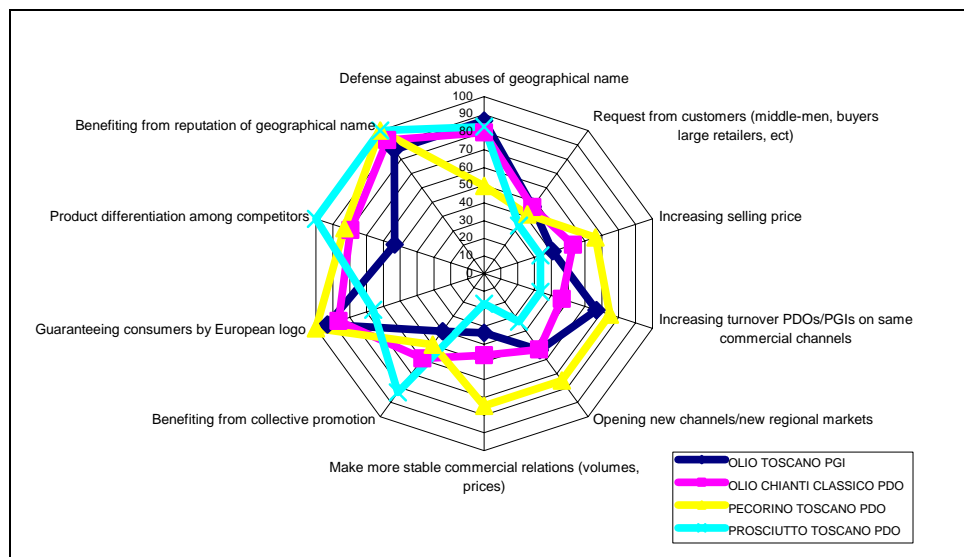
³ Specifically, unexpected functions are those for which the importance level attributed by interviewees as driving forces for using PDO or PGI on international markets is lower than the satisfaction grade associated at the same functions considering them as effective results.

particular for the function of defending the protected product from abuses in using the geographical name), offending roles against competitors (as in the case of product differentiation or exclusive right of benefiting from reputation of origin), but also a strictly “demand driven” role in terms of giving an answer to the explicit Request of a production standard from customers (middle-man, importers-exporters, buyers for foreign large retailers).

Nevertheless, the exam of satisfaction grades (graph 5) has evidenced on the one side a coherence between expectations and satisfaction, as in the case of the use of the PDO/PGI for the benefit from the reputation of the territory, or else in the case of the Guarantee of consumers through the European Logo. Certainly unexpected effects have arisen, in fact there are some functions that had not been identified by producers as important driving forces for the use of the PDO/PGI on international markets, while *ex post* they have proved to be highly satisfactory. Among these functions a primary role is played by “answering to an explicit request by costumers”, which is evident in all case- studies.

In order to have synthetic measure of PDO/PGI impact on internationalisation for the different case studies we have also adopted a weighted satisfaction index⁴, in which the degree of satisfaction related to each function of PDO and PGI has been associated to the degree of importance given to them by firms in terms of motivations. A representation of the results is shown in the graph below (graph 6).

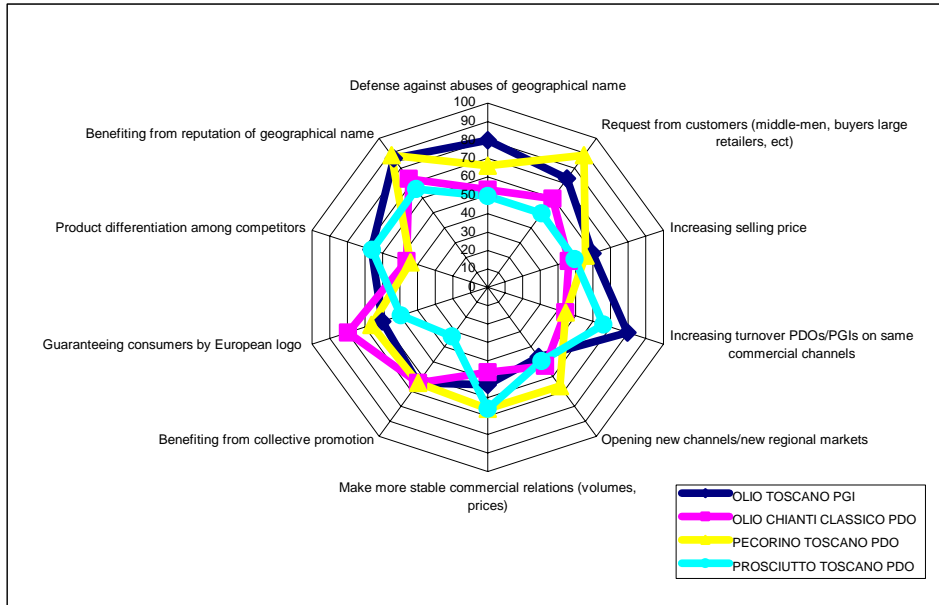
Graph 4 - Motivation index for PDO/PGI functions for some PDO/PGI products



Source: Direct survey

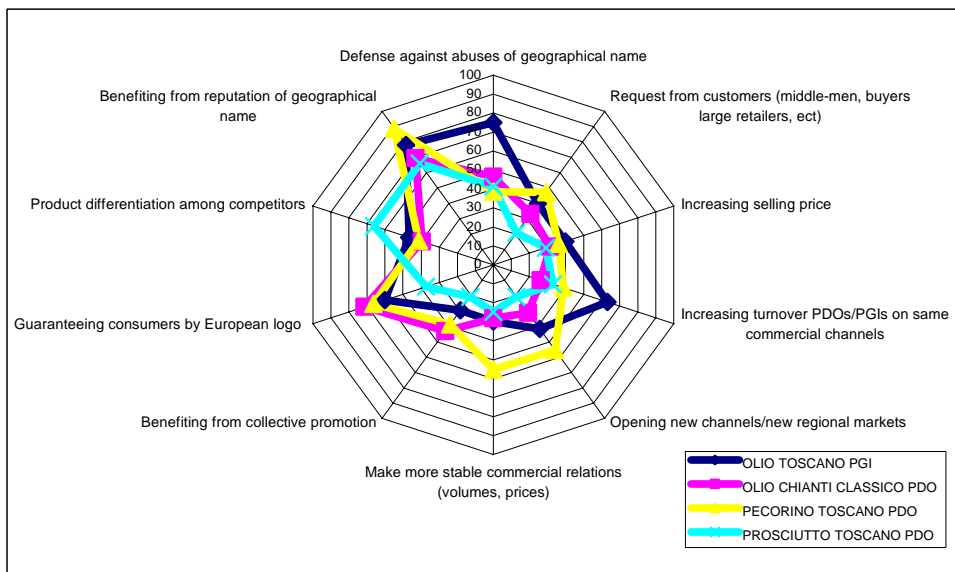
Graph 5 - Satisfaction index for PDO/PGI functions for some PDO/PGI products

⁴ The weighted satisfaction index is calculated as follows: $(\sum_{i=1}^n \sum_{j=1}^4 S_i * f_{ij} * P_j) / n$, where i are the levels of satisfaction, S_i stays for Satisfaction, f_{ij} is its respective frequency, P_j is the value we assigned to importance assessments of each function in order to weight relative satisfaction grades, and n the number of firms which answered to the question. The scoring of factor P bases on following criteria: to “Not important” we assigned weighting factor value of 0.25, to “less important” the value 0.5, to “important” the value 0.75, while at the maximum level of importance we assigned 1. This index can vary from 1 (minimum value) to 100 (maximum value). When the index varies from 66 to 100, higher levels of satisfaction pondered with motivation occur, while the lowest levels measure from 33 to 1.



Source: Direct survey

Graph 6 Satisfaction index weighted according to importance factor for PDO/PGI functions for some PDO/PGI products



Source: Direct survey

Within the graph, owing to the weighting with the motivation, the unexpected functions are not visible as the high satisfaction is lowered by the soft motivation. The different shape of area of each polygon in the graph also underlines a diversity of PDO/PGI impact among different products. It has to be noticed that the effects of the use of PDOs and PGIs on

international markets, as they have been perceived by firms, also depend on different strategies run by producers.

The effective impact in terms of producers' satisfaction regard to PDO and PGI role on international markets does not often match the goals firms expect to achieve by using denominations. Prosciutto Toscano PDO and Pecorino Toscano PDO show a prevalence of "offensive" objectives in their internationalisation strategy while the ones of Toscano PGI oil and Chianti Classico PDO olive oil highlight "defensive" objectives.

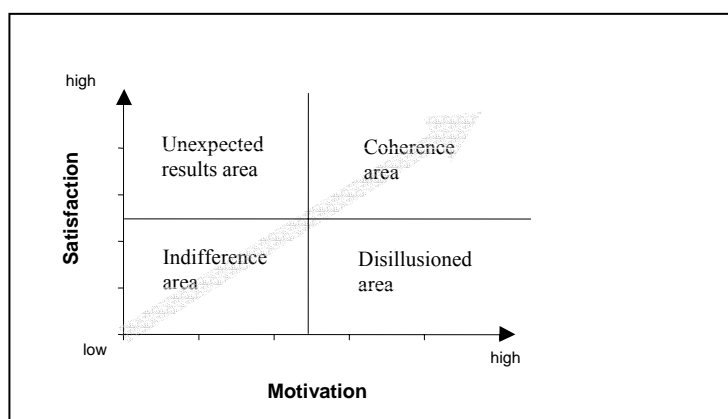
8. The performance at single firm level

As we have explained in the previous paragraph, the discussed indexes of motivation and satisfaction are built as a mean of different positions at firm level and might lead to some misleading conclusions. Therefore, the aim of this paragraph is that of going to analyse more in depth, at single firm level, the existing relation between motivations and satisfaction for the most important functions identified by the interviewees as motivations: the benefit from the reputation of the geographical name, the defence of the reputation of the product from abuses of the geographical name and misleadings, the guarantee of consumers through the EU logo, the differentiation of the product, the explicit request of the PDO/PGI coming from customers (middle-man, importers-exporters, buyers for foreign large retailers).

For these reasons, we have built scatter graphs for each of the main detected functions referring to the two variables: range of importance assigned to PDO/PGI functions as driving forces on international markets and range of satisfaction for their effective performance.

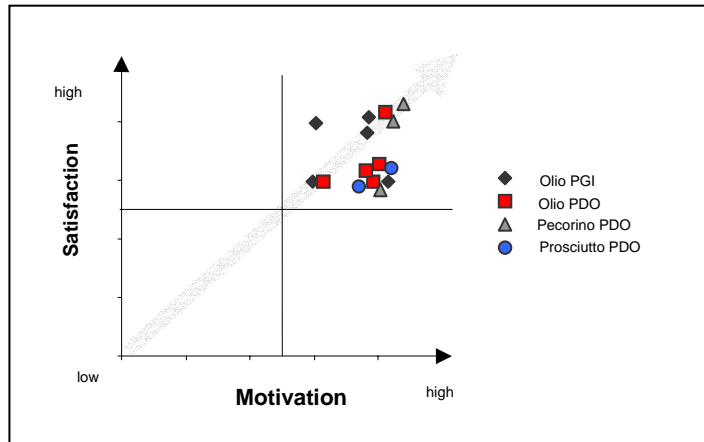
The first quadrant of the graph represents a *coherence area*, where the motivation of the firm for the specific function has been fulfilled through a satisfactory performance; the second quadrant is the *disillusioned area*, where firms who had high motivation for that function, have been disillusioned by unsatisfactory results, the third quadrant is the *indifference area*, where firms had a low motivation for the function and no or little satisfaction has resulted, the fourth quadrant is the *unexpected results area*, where are firms who had low motivation for that function and registered satisfactory or very satisfactory results (see graph 7).

Graph 7- Comparing levels of motivation and satisfaction, a general interpretation of the different combinations



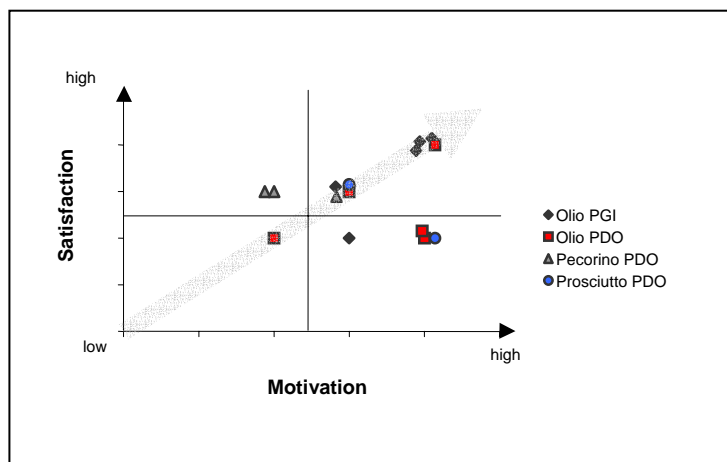
Source: Our elaboration

Graph. 8 - “Benefiting from the reputation of geographical name”, comparing importance levels of motivation and satisfaction



Source: Our elaboration

Graph 9 - “Defence of the product from abuses of geographical name and misleading”, comparing levels of motivation and satisfaction



Source: Direct survey

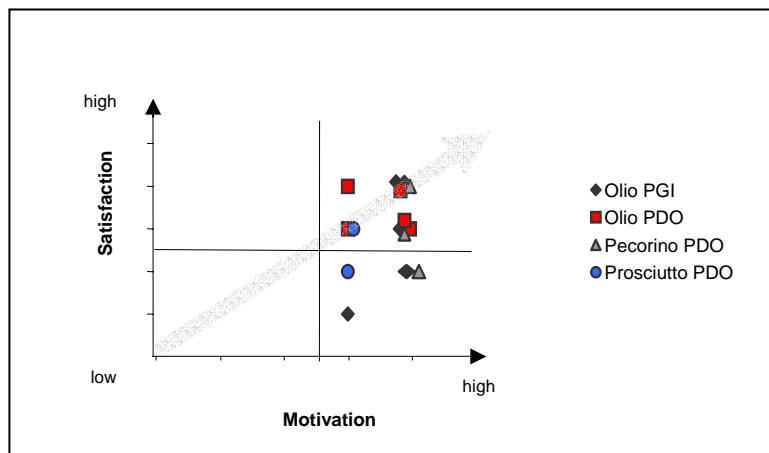
The representation of the different attitudes of the firms (motivation and satisfaction) on some key functions of the denominations towards internationalisation shows a very convergent position for all products on the importance and satisfaction about the benefit from the reputation of the geographical name (graph 8), therefore about associated rent actors can appropriate due to established reputation. Furthermore, considering the reputation of the denominations used (Toscana and Chianti), this impact becomes even stronger and explains why all firms are in the coherence area.

A relevant function is also played by the PDO/PGI in Defending the product from unfair competition about the use of protected geographical name of origin (graph 9). Most interviewed firms are also in the coherence area, as they expressed a level of satisfaction in line with the importance assigned to the function with regard to motivation. However, some of the firms expected a highly stronger effect than the effective satisfaction they achieved (disillusioned area). The highest satisfaction in relation to the level of motivation can be found in the Olio Toscano PGI firms as in the case of two specialised firms (two

cooperatives which together represent the 35% of olive growers of the production system) and the very small producers who, as we will discuss more in depth later, are able to face foreign markets thanks to empowerment activities carried out by the Consortium. However, less satisfaction is expressed by those firms who are already well positioned with their own brand on national and international markets.

In the case of PDO Olio Chianti Classico, most producers presented a level of satisfaction in line with expectations, nevertheless the satisfaction is in average low to medium, which is in part due to the relatively recent recognition of the denomination (2000) and to the efficacy of the control and sanction system.

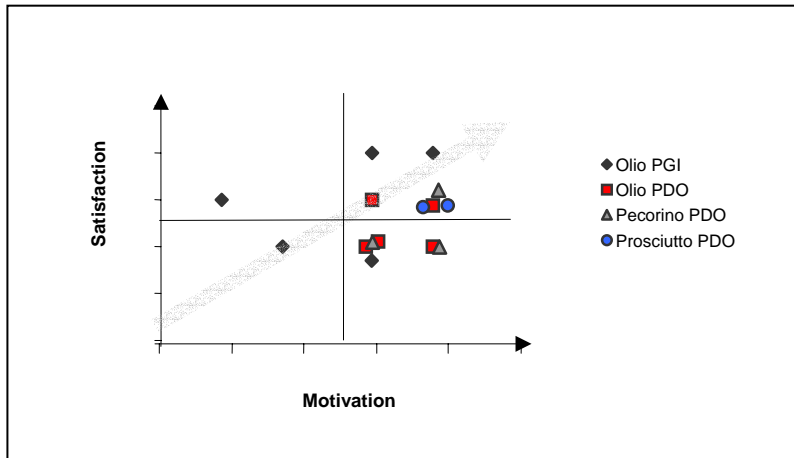
Graph. 10 “Guaranteeing final consumer by EU logo”, comparing importance levels of motivation and satisfaction



Source: Direct survey

As far as the impact of PDO/PGI in terms of guarantee of final consumers due to the presence of EU logo, the scatter below (graph 10) shows that little more than half of the firms are located in the area of high motivation and low satisfaction. This is due to the low information about the meaning of the logo (product traceability, coded production process), besides the consideration that the international legal value of European PGI and PDO is still recognised only in Europe. In the case of Olio Toscano PGI, we must underline that producers expected great performance from PGI use in terms of guaranteeing the final foreign consumer, more than what they expected on domestic market. Most satisfied firms of Olio Toscano PGI are the two main producers/exporters (the cooperatives), while in the case of Olio Chianti Classico there is a larger satisfaction among firms.

Graph. 11 - “Product differentiation”, comparing importance level of motivation and satisfaction grade of interviewed firms



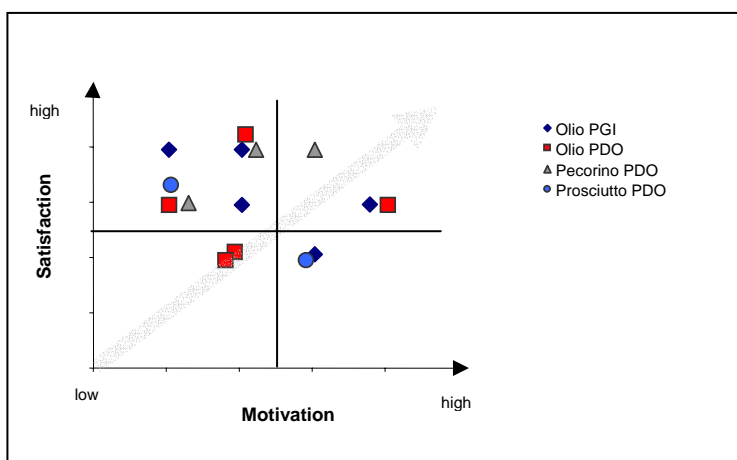
Source: Direct survey

As far as PDO and PGI impact on product differentiation on foreign markets is concerned, most firms are not very satisfied of this function considering also that it was graded as medium to maximum important factor (graph 11).

Therefore, PDOs and PGIs do not appear as a strong differentiation lever on foreign markets, except for Olio Toscano PGI producers who are mainly located in the high satisfaction area of the graph. As it has arisen from previous considerations, in the case of Olio Toscano most satisfied producers regard to the PGI performance are the two main firms selling overseas, while firms located in low motivation/satisfaction area are those which mainly operate on markets by stressing their own brand.

In the case of PDO Tuscan ham, producers find difficulties in differentiating the product from competitors in particular due to the presence of another Italian ham marked with the PDO designation: the Parma ham. This product has been on international markets for a longer time than Tuscan ham, gaining a stronger reputation and wider renown and it seems to reduce the signal value of origin, making it more difficult for Tuscan producers to inform markets about their ham characteristics.

Graph. 12 - “Explicit request from customers”, comparing importance levels of motivation and satisfaction



Source: Direct survey

A relevant result from the survey comes from the role of the PDO as a standard requested from customers (middle-men, importers/exporters, buyers of foreign large retailers) for commercialisation (graph 12). This can be considered as the most unexpected function arisen, being assessed as the most successful one, considering the importance assigned by interviewees in terms of motivation. Pecorino Toscano PDO's producers are all located in the area of "unexpected", as well as the main exporter of Prosciutto Toscano PDO's production system. In the case of Olio Toscano PGI comparing to importance levels in terms of motivation, even for this function the most satisfied firms are the two cooperatives. In the case of Olio Chianti Classico PDO's producers who gained extraordinary effect on trade market by specifically answering to customers' requests thanks to the PDO presence are the firms specialised on the olive oil sector, while the rest (those firms who do not expect/gain great effect in terms of requested standard from distribution sector) are mainly wine producers who have already implemented strong strategies of international marketing specifically for wine.

On the basis of these results and of those of the analysis carried out at product system level, we can express some synthetic considerations concerning each case study.

In the case of Tuscan olive oil, a product with a high impact of export on total sells, the presence of the PGI strongly satisfies producers in order to benefit from reputation of Tuscany, as well as for the increase in turnover and for having a standard to reply to the requests of the market. Nevertheless, the role of PGI as a defensive tool against unfair competition has not yet satisfied the producers, comparing the importance producers associate to this function, though the satisfaction index reaches a good grade. This probably depends on the efficacy of control systems and mechanisms of managing and treating abuses and misleading products. Olio Toscano PGI's interviewed producers also present the highest number of "unexpected" functions associated with the use of the geographical indication on foreign markets. Moreover, producers highly specialised for PGI products, who are also the most internationalised firms of the production system, reached the highest satisfaction grade for most of PGI functions.

In the Chianti Classico Olive Oil case study, the use of the Designation of Origin on foreign markets is basically prompted by the opportunity of benefiting of product geographical reputation, contributing to gain an average level of satisfaction for producers who sell the certified product abroad. However, the PDO does not significantly contribute to differentiate and signal the product (it cannot be considered a differentiation lever for all producers), while allows to participate to a collective system and represents an important quality standard for buyers, middle-men and importers, due to the link to the territory of production and the third – party certified production process. Promotional activities could increase the informative power of PDO on final markets, in particular through creating synergies between Chianti Classico olive oil and wine, supporting the "halo effect" coming from the last one and influencing the reputation of the olive oil.

The Pecorino Toscano cheese case study highlighted how the Protected Denomination of Origin can be an important tool for penetrating foreign markets thanks to the role of standard generally accepted by retailers of foreign markets and the protection against abuses of the geographical name of the product. The use of PDO as a differentiation tool or as a guarantee for consumers can be however unprofitable, if the awareness of consumers about the PDO sign is low.

As far as Prosciutto Toscano PDO is concerned, we observed a dissatisfaction both in functions linked to defensive roles (right of exclusivity to use geographical name of origin) and function linked to offensive categories (product differentiation). Nevertheless, the reasonable justification for rewarding increases in prices and in turnover of PDO exports on the same commercial channels, for facilitations in opening new commercial channels and regional markets, and finally for the steadying effect on commercial relations can be found

in the acceptance of PDO as request standard from middle-men like importers/exporters, buyers of foreign large based retailer who seem to prefer the PDO product because it answers to a precise production process, presenting stable characteristics and product attributes. Finally, a widespread low satisfaction has been registered for the benefit from collective promotion. This PDO function is strictly related to the role played by Consortia in supporting activities for associated firms.

Without a strong participation of Consortia in promoting activities, the only PDO/PGI sign results insufficient for collective promotion, which has to be planned before the use of PDO or PGI sign and can empower previous promotion activities.

However, Consortia in Italy are important pillars in PDO or PGI certification, for the general limited dimension of firms producing typical products: Consortia contribute to collect a critical mass of PDO or PGI product, but could contribute in a more incisive way to help firms to organise themselves to follow common strategies, and increase contractual power of their members both on the market and with the control body in tariffs negotiation.

9. Final remarks

PDOs and PGIs can be adopted as an internationalisation tool, but their effectiveness depends on several factors: the reputation of the product, the reputation of the territory of origin (halo country effect), the importance given by customers to the guarantee offered by PDO-PGI certification (linked to the structure of marketing channels and especially modern channels), the capabilities of firms in implementing PDO-PGIs marketing strategies, the effectiveness of collective organisations (such as Consortia).

As a matter of fact, the analysis of the satisfaction of producers in relation to the motivations expressed has put in evidence a very variegated and complex situation that cannot be explained only through a “product key”. In fact, the study has evidenced a differentiation of impacts of denominations, both among different production systems (inter-diversity), and among firms producing the same agri - food protected product (intra-diversity).

The inter-diversity depends not only on the organisation of the supply chain, but mainly on the reputation of the product and of the territory of origin (halo country of origin), while the intra-diversity is related to heterogeneity of firms of the same production system in terms of dimension, organisation, goals, production volumes, availability of capabilities to operate with foreign markets such as professionals, management skills, knowledge of normative for exporting, etc. Firms with strong a reputation present on foreign markets with their own brands are not interested in PDO or PGI, creating a conflict between (collective) PDO/PGI and firms’ brand name, while the most specialised producers for PDOs and PGIs, often also more export-oriented regard to protected product, present high levels of motivation/satisfaction.

Moreover, due to the basic dimensions of firms producing PDOs and PGIs (in most cases small to medium enterprises), the level of professional skills and knowledge existing in the involved firms are often not adequate to the standards required by internationalisation processes.

A fundamental role in this respect can be played by collective organisations (such as Consortia), as it happens in the case of Olio Toscano PGI. In fact collective organisations (producers’ cooperatives and Consortia) could play a key role in organising the production systems, managing European certifications and supporting international activities of associated firms. Specifically, we refer to those activities able to influence the internationalisation process of PDOs and PGIs either on a direct (collective promotion internationally) or an indirect way (helping producers regard to production processes or general management processes, participating in building local networks linked with other sectors like tourism and handcraft, etc). In particular as far as internationalisation strategies

are concerned, Consortia could support the empowerment of firms, integrating their lack of structural capabilities to operate on foreign markets.

On the whole, the research pointed out the high impact of PDOs and PGIs in the benefit from the reputation of the geographical name and in the consequent appropriation of the rent on the part of producers. A certainly unexpected result in terms of satisfaction (considering the attributed level of motivation) is represented by the use of PDO or PGI on foreign markets on the request of customers (middle-men, importers/exporters and buyers for large retailers): this highlights the importance of PDO and PGI sign as a quality standard generally recognised and certified by a third-party control body. This function also explains the positive global satisfaction for stabilization of relationships between different actors of the supply chain. Therefore, the PDO or PGI signs significantly carry out the function on standard for professional operators, besides certificating the effective origin of product and its production process.

In other words PDO/PGIs cannot *per se* allow to reach the internationalisation goals of the firms, as the access to international markets implies the existence of a number of structural organisational and other pre-requisites, that are often lacking in Origin Products systems.

Certainly, we should take into serious account for future research also the fundamental role of support that the policy maker could play in order to raise the impact of PDOs and PGIs in internationalisation strategies, by smoothing the process through a series of actions that could start from supplying firms with the necessary capabilities to face the international market, as much as investing in raising the consumer information capital in destination markets.

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Evaluation of the Potential Interest of Italian Retail Distribution Chains for Kamut-Based Products

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Summary

Kamut® is a registered trademark cereal (an organic crop) whose origins are much older; it has Egyptian origins and at the present time it is grown in different areas of the world (mainly in Montana and Canada), but considering the agronomic requirements of this crop, the tests in Thailand are the most reliable. Evaluation of the interest of retail distribution chains for Kamut-based products belongs to the researches regarding the evaluation of the quality food products trade. In this case, countries involved are Thailand, one of the most important producers, and Italy, one of the most important market of the EU. Qualitative analysis technique was the most appropriate tool. This survey consisted of in-depth semi-structured interviews directed at Italian large scale retails (purchasing and marketing managers). The final information were obtained through a subjective analysis of the content of the interviews' summaries, a statistical analysis of the content of the interviews and the creation of conceptual positioning maps. The awareness of the product, the communicative factor, the consumers' reactions, the specific requirements of the distribution chains and production areas are some of the most important elements that can influence the creation and the development of a international trade relationship.

KEYWORDS: organic products, quality food products, international trade, Italian large scale retail, qualitative analysis technique

1. Introduction

This survey belongs to the researches regarding the evaluation of the quality food products trade, in particular focuses on the products obtained in places which are culturally and geographically far from the place of distribution.

The analysis concerns Kamut, that is a registered trademark for a special grain (*Triticum turgidum* spp. *Turanicum*, also known as Khorasan wheat), grown following the prescriptions of organic agriculture. It is genealogically similar to modern hard wheat but its origins are much older; after a long period of obscurity, it has been rediscovered and, at the present time, there is a noticeably growing interest for the product thanks to its intrinsic (high nutrition value, particular taste and freshness, high digestibility, high content in selenium) and extrinsic (Kamut® is only grown using organic agriculture methods) characteristics. It was first grown in the area between Egypt and Mesopotamia, for many years it was forgotten, it spread in North-America afterwards, mainly in the North-East and central areas of the Montana and in the North-West area of the North-Dakota, in the USA; in the provinces of Alberta and Saskatchewan, in Canada. Currently, it is grown in different areas of the world, but considering the agronomic requirements of this crop, the tests performed in Thailand are the most promising.

Maybe the most indicative aspect of the Kamut introduction and growing is its importance like a new crop of sustainable agriculture; the production of a high quality cereal without the need of using synthetic fertilizers and pesticides, defines an excellent crop for the application of organic agriculture methods.

The system that manages the licence of use of the registered trademark Kamut® entails the involvement of numerous subjects. Independently from the production place, farmers who want to benefit from the licence must sign a contract with the Kamut International Ltd. or the Kamut Enterprises of Europe bvba. They are two societies that manage the licence of use of the registered trademark in different areas of the world: the former is based in Montana, USA, the latter in Belgium. The contract previews the delivery of certified seeds Khorasan wheat, obtained with methods of organic production and in purity; if during the harvesting, the cereal is in compliance with the contractual detailed lists, it is allowed to show the registered trademark Kamut®. At the moment 90% of the cereal imported in European Union (EU) comes from Canada, where the exporter takes care of the coordination of the dealerships farmers for the production, the warehousing of the cereal, the selection and the delivery in EU. In particular in EU there is only an importer dealership “the Kamut Enterprises of Europe bvba” that satisfied the royalties to the Kamut International Ltd.; this importer sends the container of wheat grains to the authorized importers in every European nation. The importers buy wheat grains, transform it in flour or bran, then the transformers (bakeries, pasta factories, etc) introduce them in the market.

2. Background

Actually the exports in Europe represent 62.5% of the total production of Kamut. The remaining part is divided between Canada, the USA and Japan. Therefore, Europe represents the more important destination market for the Kamut cereal and on such market a lot of attention is put for the chances of further development.

In three European nations (Germany, France and Belgium) nearly all the imported Kamut grains are domestically consumed, while Austria imports and re-exports most of the Kamut grains, with a domestic consumption and production that is minimal.

In particular, Italy imports approximately 70% of all the Kamut wheat exported in Europe. The main processed product is by large extent represented by noodles, followed by bakery products of every kind, puffed cereals, and granola. The ability to the processors operating on the Italian territory, together with the great tradition in the production of cereal-based end products has given as a result a fast and constant growth of this market, that it is today the European point of reference for the production and the innovation on the Kamut-based products.

The production of Kamut-noodles absorbs approximately 35% of the Kamut import in Italy. Until the first half of 2006, most of this typically Italian product was strongly demanded from foreign markets, while the domestic market was not particularly lively. For this reason, the greater part of the processed product took the way of the export.

In the second part of 2006 a fast growing demand from domestic operators was noticed. They have begun to exit from the consolidated mainstream of the national distribution, based on the specialized food stores, beginning to introduce the Kamut-based products in the large retail¹.

Therefore an in-depth survey of this challenging distribution channel in this country represents a fundamental support for deciding about this interesting and strategic distribution option.

This research was commissioned by the Chang Mai Rice Research Centre, a research company based in Thailand, that, through Small Projects Facility plan from the EU, obtained funds in order to develop a plan related to the experimentation and cultivation of

¹ All these information are of exclusive availability of the Kamut Enterprises of Europe bvba, which is not available, for business confidentiality reasons, to their integral diffusion. Therefore, the present paper is based on what is thought suitable to the diffusion in the public domain by such company, on the base of its own communication policy.

the Kamut in Thailand. The Kamut Enterprises of Europe bvba and the section Kamut Italy were also involved in the project. They provided to us the informative material for our interviews.

Currently, Kamut-based products are present in Italy in particular channels including specialist health stores, herbal medicine stores, organic food stores and so on.

Therefore the consideration of large scale retail, which in Italy presents some peculiarities in comparison with other countries of EU, becomes necessary for a wider diffusion. Despite the existence of large companies, the average dimensions of the Italian large scale retail are still fairly small; in fact, the degree of fragmentation is not comparable to any international markets and this fragmentation is probably a reason for the delay of the Italian retail sector development. Italian retail distribution chains often adopt strategies to achieve a complete and qualified supply; these strategies mainly aim to raise competitiveness in the demand side, but the features of these products are not often in line with the technical-economical requirements of this distributive channel. The peculiarities of Italian large scale retail emerge also about the distribution of organic products: furthermore Italy despite being the European country with the largest cultivated area and the third biggest organic food producer in the world behind Australia and Argentina (Tamburrano, 2004) still lacks a production chain structured like a genuine market segment because the most part of the products is consumed abroad and mainly in the countries of the North-Europe. By comparing production areas to the places where organic products are processed and consumed, many studies reveal a dichotomy in the Italian supply chain. Whereas the production is concentrated in the South and in the islands, manufactures and consumers processes are more densely concentrated in the central-north area, where modern distribution also plays a major role.

Italy is currently experiencing a period of stagnation in terms of food consumption but the most recent data show a turning point in this negative trend: after the exceptional negative date recorded in 2004 -0,5%, the food consumptions showed a significant rise in 2005 +1,8% (Sckokai, 2006). Organic products sold in the modern distribution channel seem to be most severely affected by this stagnation of food consumptions. Modern distributors began commercialising organic foods at a time in which the push to consume organic products was very strong. The commercial strategy adopted by distribution chains is predominantly based on the economic convenience of products and it is intended to generate savings for customers (discounts, price cuts, promotions). This proves to be decisive for the purchase of organic products, which are still somewhat expensive despite the fact that prices are more comparable to those of conventional products. Under these conditions, the decision of modern distributors to extend promotions to their organic products may reduce the appeal of such products to consumers (Lunati, 2005).

3. Objectives

The buyers expressed the need to define and to deepen the awareness about the dynamics and the commercialization of Kamut-based products in the markets of the EU. In particular countries involved in the eventual creation of a relationship trade are Thailand, one of the most important producers, and Italy, one of the most representatives and peculiar market of the EU where the supply of quality food products is perceived with scepticism.

In particular, the evaluation of the potential interest of the Italian large scale retail for Kamut-based products is the intermediate aim. The final aim is the evaluation of the opportunities for the creation of a new trade relationship between countries which show different geographical and cultural features. The general objective can be divided into five specific subjects, as follows:

- 1) To find the main reasons that might induce distribution operators to sell Kamut-based products and to find opportunities for the creation of a new international trade channel.

- 2) To obtain information about the expectations of distribution operators regarding the possible reactions of the consumer who face the opportunity to buy Kamut-based products and therefore to evaluate the attitudes of different actors in the channel.
- 3) To underline the factors that might limit or obstruct the introduction of Kamut-based products and the factors which can create limits in the relationships among subjects of the supply chain.
- 4) To investigate the characteristics that might be relevant for the perception of quality of the product and to evaluate the most important characteristics in the relationships among subjects of the supply chain.
- 5) To identify the main products that might compete with Kamut-based products to extrapolate useful information on the different distributive strategies used in the Italian chains.

4. Data and methodology

The choice regarding the methodology was influenced by the need to reveal ideas and to analyse interesting factors about new or unknown phenomena and to understand the complex relationships which exist in the supply chain. In this context, qualitative analysis technique was the most appropriate tool.

The reference sample was defined through a non-probabilistic sampling method and selection of the individuals to be interviewed then followed using a “convenience sampling” procedure. In this case, an attempt was made to ensure an extensive coverage of the territory with respect to the distribution of sales outlets and/or type of distribution organization (co-operatives, private companies, associated/leader companies, smaller businesses).

Particular attention was dedicated to those agents who cover positions regarding the organisation, the knowledge, the promotion of the assortments in the food distribution. Mainly purchasing managers and marketing managers were recruited. The operators were recruited over the telephone, but we had already sent an introductory e-mail outlining the project. In total, 43 contacts were selected, some of the selected subjects declined to participate (16), while other ones accepted but did not really make themselves available for interview (6). At the end of the planned period for collection data, 21 interviews had been conducted (11 in person at the distributor’s workplace and 10 over the phone). The required information were collected (both direct and telephonic interviews) by means of in-depth interview directed. The interviews were supported by a semi-structured outline. Special attention was placed on ensuring that the semi-structured outline was not directly passed to the interviewee but rather that it served as a cue card to help the interviewer to remember the interview topics. The semi-structured outline was composed of five themes that were required for the achievement of the final objective; for each objective a range of possible “inputs” was listed. They were specific questions or statements that the interviewer could use as a tool to encourage interviewees to express their own opinions. The purpose of the outline was to help the interviewee and they did not represent a constraint. Interviewees could express their opinion with total freedom. The presence of an interviewer and an assistant was generally required to conduce this kind of interview. Essentially the assistant had the role to note the main elements of conversation and to record it (if authorised).

The prescribed methodological process comprises the following phases:

- preparation of the interview, involving assimilation of objectives and inputs, preparation of informative materials and equipment for saving and recording;
- administration of the interview;
- interview summary which is aimed at highlighting those elements deemed most important to an initial analysis;
- transcription of the recording (if authorised);
- analysis of the documentation.

The interviews lasted (in average) 45-60 minutes in order to allow for an in-depth investigation of the proposed themes.

The territorial coverage of the interviewed companies reflected the actual distribution of sales outlets in the different Italian regions (Table 1): from the information deriving from the interviews, we can claim that there is a greater presence of total sales outlets in Southern Italy, however most of the interviewed companies are settled in the Central-North regions (Table 2). The coverage of distribution companies interviewed by sales area category reflected the current situation. We show a prevalence of small-medium stores which is typical of Italian retail (Table 3).

The final information were obtained through qualitative analysis techniques; the following steps were carried out:

- Subjective analysis of the content of the interviews

The essential objective of this analysis is to present the most interesting factors arising from each interview in order to gain an extensive overview of interviewees' attitudes towards the themes under investigation. First of all the analysis required the reading of the interview summaries considering the aspects of direct conversations, aspects of not oral communication and characteristics of the distribution companies. The summaries have been written by the assistants interviewers after every interview in order to avoid the loss of useful information. Every important factor, on the basis of the objectives of the survey, is emerged by the reading the summaries and by highlighting extrapolated sentences from the transcription of the interviews. The analysis serves as an initial screening by supporting the subsequent content analysis.

-Statistical analysis of the content of the interviews

The content analysis is a qualitative analysis which can combine a correct interpretation with a major objectivity of the results. The material used for this kind of analysis consists of unabridged transcriptions of the recorded conversations; in order to reduce the workload linked to the management of the data, the decision was made to select a number of interviews which conceptually represented interviewed respondents with different characteristics. A database was created from the recordings by transcribing the unabridged version of the selected interviews. Subsequently the program "Text Smart" of the statistical package SPSS was used for the quantitative evaluation of the content. In this case, the decision was made to adopt a quantitative approach to analyse the results deriving from the unabridged interviews; this approach is more structured, deductive and oriented towards the reduction of information than the qualitative approach. In a balanced way it reduces information into a more limited number of representative concepts.

The analysis stream adopted consisted of the following phases:

- identification of sub-texts for consideration during the analysis and conceptual clarification of the meaning of words or sentences;
- creation of an archive containing words devoid of meaning for the objectives of the investigation ('empty words'²);
- creation of an archive 'purged' of 'empty words';
- semantic categorisation of sub-texts under consideration;
- evaluation of the importance of semantic categories;
- potential association between the semantic categories.

Sub-texts were identified to highlight those segments of conversation with high informative value, segments which were able to express concepts related to the theme of the discussion. These portions of text were retraced to specific semantic categories which could represent their meaning. The importance of the semantic categories identified may not be measured exclusively by examining the frequency with which the headwords representing them are mentioned during the discussion. In order to standardise the value of each semantic

² 'Empty words' (e.g., and, of, from, the) are lexical components which are instrumental to sentence construction but devoid of autonomous meaning (Bolasco et al., 2004).

category with the actual relevance assumed during the discussion, the *Term Frequency-Inverse Document Frequency*³ (TFIDF) index was calculated. This index is based on two assumptions:

- the representativeness of a headword or lexical root increases as the frequency with which they are mentioned increases;
- specificity decreases as the number of interventions in which the semantic category appears increases.

The TFIDF index was then used as a parameter to identify possible conceptual associations between the semantic categories.

Consequently, the analysis leads to the creation of tables listing the frequency of semantic categories within each discussion analysed with the relative TFIDF values, as well as the proposal of conceptual associations between them.

- *Conceptual positioning maps*

This type of analysis focuses on the possibility of defining relationships⁴ between different semantic categories on the basis of their positioning on a map. The objective is, therefore, to draw the cognitive map of the semantic categories under discussion and then interpret its dimension, which represent the structure of its logic. The basic objective behind the mapping of the semantic categories previously identified through content analysis is to unearth and render explicit certain information that was only implicit in the previous analysis.

The maps have been constructed using the technique of Multidimensional Scaling (MDS). In particular, the MDS procedure consists in creating perceptive maps of the phenomenon under investigation through information on the proximity (or similarity) between different objects, also termed “stimuli”. More specifically, the concept of proximity must be intended as the level of similarity (or closeness) or dissimilarity (or distance) that exists between each couple of semantic categories. The co-occurrence matrix is the basis to calculate this value of proximity: it is a rectangular matrix $A_{i,j}$ where the “i” line vectors correspond to the comments of interviewees and the “j” column vectors correspond to the semantic categories identified by the content analysis of the interviews; the value of proximity is calculated on basis the relative frequency of mentions of each category traceable in the co-occurrence matrix. To this end the ASCAL algorithm adopted in the MDS application contained in the statistical package SPSS was employed.

This technique allows us to identify the optimal configuration of available data via a limited number of “factor axes”, which constitute the “dimensions” of the perceptive map, so as to reveal the model at the basis of the data employed (Fabbris, 1997; Hair et al., 2003). In this way one obtains a visual instrument for interpreting the phenomenon under analysis both in an empirical sense and in more rigorous senses, treating the results with other methods of multivariate data analysis.

The phase of evaluation of the validity of the adaptation of the coordinates to the measurements of initial dissimilarity, comes about by calculating the so-called STRESS value (STandardized RESidual Sum of Square), which indicates the variance proportion of the disparities (proximities) not considered in the final coordinate model of the MDS analysis. The closer the STRESS value is to zero, the greater the adaptation of the model to the initial dissimilarity values ($\delta_{i,j}$); the final configuration in euclidian space of the stimuli will therefore more faithfully represent the initial perception of the comparison of stimulus

³ In Text Mining procedures, this represents an indicator used to evaluate the importance of headwords appearing in the text (Salton et al., 1988).

⁴ The relationships that may be established between semantic categories occurring in a text may be of oppositeness (on a conceptual axis they appear at the two opposing extremes), of contradiction (of negation, but not of oppositeness), or of a complimentary nature (relationship between two categories of elements previously described). For further information on the subject, refer to Molteni and Troilo (2003).

pairs analysed. Although many scholars suggested methods exist for calculating this index, in this case we have used the one proposed by Kruskal (in Hair et al., 2003) where STRESS values $\leq 20\%$ were considered acceptable.

Together with the STRESS value, the analysis also considers the RSQ index (Residual Sum of Square), which provides indications on the proportion of spread variance. Normally a high RSQ value indicates that the distances estimated by the MDS algorithm have a good capacity for approximating the initial disparities, and therefore a more faithful multidimensional graphic representation of the phenomena investigated.

In this study, a STRESS value $\leq 10\%$ and simultaneously a RSQ value $\geq 95\%$ were considered acceptable.

The number of dimensions chosen for the perceptive map is the result of a compromise between the validity of the model (STRESS value $\leq 10\%$ and RSQ value $\geq 95\%$) and the need to obtain a map that is easy to understand and interpret (Table 4).

5. Results

Now we describe the aspects that can mainly influence the topic of the international relationships inherent to the commercialization of the quality food products; the complete sequence of the methodological techniques described in the methodological part will be used to highlight the factors which could limit or obstruct the introduction of Kamut-based products.

The achieved results will be described on the basis of five objectives of the research.

5.1 Reasons for introduction

The subjective analysis of the interviews' summaries is useful for this first topic of our discussion. By this analysis, contrasting factors emerge.

In distributors' opinions, Kamut is a new food product, though its origins are much older, which has an high qualitative standard with special characteristics ranging from nutritional/health aspects to ethical/environmental ones.

According to many distributors, Kamut represents an opportunity to increase a wide supply which has been static for many years because of the negative consumptions' trend. The behaviour of managers is not oriented exclusively to meet the needs of a specific group of consumers (non serious intolerances and allergies) but rather it is aimed at broadening their own product mix in order to attract interest from those people who are not apparently motivated by particular physical diseases, but who are driven by impulses which are not known by distributors yet. The eventual introduction of Kamut in the market is linked to each retailer's opportunity to make his own brand. This is an important factor because by now the most part of the Italian distribution chains adopts strategies for the trade of quality food products, therefore it is necessary a strategy oriented to the products diversification.

The business opportunities for the producers, and consequently for the transformers of the raw materials, vanish when they don't provide the product with high standards and provide occasional and not exhaustive exhibitions of formats. This limit could be resolved if the introduction of Kamut-based products was guaranteed by a national agent which could organize with efficiency the connections between the places of production and distribution. The main limit concern the lack of awareness and communication among the interested agents. The link between Kamut and organic production methods does not provide interesting comments. First of all because distributors believe it is important to guarantee a fairly multi-purpose identity of the Kamut-based products; it is necessary to promote multiple properties at the same time, so the organic aspect could be another important product attribute. Secondly, the organic food industry is going through a difficult period in the Italian not-specialized retail sector due to a series of combined factors (e.g. the unfavourable economic scenery) and the risk is that an exclusive Kamut-organic product

could be perceived by consumers only as a ploy to justify the product's rather high price positioning.

5.2 Expectations of distributors regarding the consumers' reactions

The distributors' opinions regarding the consumers' reactions towards Kamut-based products are rather interesting. The distributors hold a favourite status because they are very close to the consumers and they are able to observe their purchases and to infer their reactions. The consumers' role in the distribution chain of a quality food product is clear: in this case the consumers' reactions are even more significant because Kamut is a niche production and so it cannot satisfy the needs of all consumers.

The consumers' hypothetical reactions come from a typical consideration: the general level of awareness of the product results rather low due to the lack of adequate information and clear definition of the product itself. The consumers' hypothetical reactions are influenced by different needs. Among the emerged reactions, the ones deriving from the consumers' willing to try new and unconventional products, different from the standard traditional supply, assumed a relevant status (this one emerges from statistical analysis of the content: frequencies and TFIDF index). The deep knowledge of the characteristics about the food culture creates this need. The research of the historical/environmental factors is one of the motivating aspects; this factor often represents the mean by which it is possible to create a trade channel among countries with different culture. In spite of this, during the purchase process there are consumers who are influenced by ethnocentric factors (traditions valorisation) that generate difficulties for internationalization of the trade relationships.

5.3 Limiting factors

A conspicuous series of factors capable to limit the introduction of Kamut-based products has emerged from the subjective analysis of the summaries of the interviews; these factors assume a different importance in the subsequent analysis which is conducted with a quantitative approach. The statistical analysis of the content of the interviews on the basis of the unabridged transcriptions of the recorded conversations used a initial vocabulary which is composed of 138 "full lexical forms"; these ones have been traced to 24 semantic categories (not all of them are relevant for the interpretation. Those with the lowest frequency are considered because of the methodology chosen during the process of categories identification and the creation of the text database). By the analysis of the frequencies and of the TFIDF index we show in Table 5 that it is possible to interpret with more effectiveness the results. The variations in the index TFIDF provide important information for the interpretation process.

First of all the source of the possible reduced inclination to adopt Kamut-based products is the low level awareness of the product characteristics which determine its qualitative value. This is essentially explained by an insufficient communication and a specific lack of information by institutional bodies and trademark holders at Italian and Europeans levels (SC15); among the identified key words it is therefore reasonable to assume that, in this context, the communication is the crucial factor for the introduction of Kamut-based products in the market. Quoting one of the most significant phrases emerging from the research, namely that "*Information creates necessity*".

If we consider the hierarchy of the semantic categories, if the first one in the list can be considered the main motivation, the second one, equally dense in significance (TFIDF=14,8), can be interpreted as a consequence. In fact the price (SC17) would not represent a critical factor if the product was supported by an adequate information campaign which explains the features of the product in depth: the origin, the niche production, the intrinsic and extrinsic aspects, etc.

The problems related to logistical management questions are predominant and mainly concern the frequent delivery of a wide products quantity and the rotation speed of the stocks. Unfortunately the reduced Kamut-based products quantities, the fact that they are not always available because they are only cultivated in some areas and the actual consumers' demand do not generate a high rotation speed. Besides, the evolution of Italian large scale retail lead to major presence of medium-small size structures (supermarkets and superettes) where limited shelf space represent a substantial obstruction for the introduction of new and not yet well introduced products (and may be they will never work in a consolidated market).

The Italian food industry has a highly fragmented structure; it has a product range lack in terms of the width and depth of supply (SC03) and can hardly promote niche Kamut production: for this reason the Kamut introduction should be obtained through food supply chains managed by a national agent which can correctly manage the supply.

The connection between culinary, cultural and geographic traditions (SC19) has been mentioned less as a factor to enhance the development of the supply chain, because it is a parameter mainly influenced by the territorial coverage of the retail companies, rather than by the interviewee's subjective evaluations. In fact, phrases belonging to this category can be traced to distribution chains service sales points in many different regions of the country and consumer behaviour can be interpreted according to different regional traditions. Italian people love their traditions, particularly their culinary traditions, and in certain regions (the South and islands) it is difficult to successfully introduce new products coming from far-off countries. This generates the need to reflect on whether or not these prejudices might be limited by local production: the fact that there are still experimental productions in Italy is not widely considered, whereas the "Made in Italy" raw material transformation is perceived as a further product quality evidence (e.g.: Barilla and De Cecco⁵).

Among second level transformation products, pasta is the most interesting one: in fact the Italians consume the largest amount of the pasta in the world but the positive perception of consumers does not induce experiments about new raw materials. Experiments regard less standardised products like the bread substitutes and other similar products to test the consumers' consensus. An interesting portion of interviewees claim that the first level transformation products (as the flour) exhibit the best market potentials, because they are versatile products and may stimulate consumers' culinary skills. However the risk is that the distinction features of this product could not be perceived anymore by consumers over time.

In trying to construct a conceptual association between semantic categories, the crucial evidence is the unanimous importance attributed to the "Communicative factor", regardless of whatever opinion may be expressed. Departing from this assumption, we can identify many critical points correlated to the introduction of Kamut in relation to the different phases of the agribusiness process: productive/transformation phase, distribution phase, consumer (Figure 1).

Through the positioning of semantic categories on a map whose dimensions represent the logic structure which is the basis of the analysed data we could determine the drivers of the Kamut market development. The representation of the "stimuli" in a space with three dimensions is the best configuration since the STRESS value is 0.073 and the RSQ is 0.989.

⁵ During the investigation it emerged that De Cecco, one of the biggest Italian pasta companies in the national and international market, distinguished by a high-quality market positioning, is now beginning to produce and offer Kamut-based pasta to Italian retail distribution chains; however, only one of these chains declared any knowledge of this, in fact, it was not mentioned until after the interview.

The disposition of the 24 categories permits an easy interpretation of each individual axis thanks to the clear distinction between the most important aspects (Figure 2). The three dimensions are:

D1 = Economic factor

Examination of the configuration of the semantic categories in the first dimension (D1) permits us to interpret it as the limitation dictated by the product's economic aspects (a high sales price), since the price factor category exerts such a dominant influence over the significance of the axis.

D2 = Requirements of the sector (company management instruments)

Looking at the second dimension (D2) it is immediately clear that at one extremity of the axis the theme of information and communication (SC15) appears, and at the other one there is the theme of management of the assortments within sales outlets of large scale retail (SC16), while all the other categories show the same level of importance for interpreting the dimension. This reconfirms the hypothesis that emerged in the content-analysis phase, where we underlined the limiting factors for the development of the Kamut-based products and the sustaining of its diffusion over time. The contemporary application of both an informative level and an internal organisational level allows us to interpret the axis with the term "Requirements of the sector (company management instruments)".

D3 = Informative promotion at every stage of the production-to-consumption process

In interpreting the third dimension (D3), the hypothesis that emerged during the content-analysis phase is again confirmed, namely that one of the principal drivers influencing the discussion of limiting factors was the need to spread information about the product. In this case, the category of "Awareness" (SC14) and the category "Pressure from suppliers" (SC03) are positioned far from the central vector. In the graph two actors deserve our attention (precisely the most upstream and downstream subjects): the producer/transformer who needs to push his product and promote awareness about its special characteristics, and the consumer who is the final recipient of this informative promotion and determines the eventual commercial success of the product on the market. From these reasons, we can infer the need for putting into practise "pull marketing strategies" (based on attraction) in which companies use product advertisement or sales promotion directed to the consumer so that the purchaser will be induced to "pull" the product along the distribution channels.

It is correct to assign a meaning to this dimension that is explicitly connected to the informative promotion at every stage of the production-to-consumption process.

5.4 Important features for perception of the quality of the product

Kamut-based products' high qualitative level is due to numerous characteristics ranging from nutritional/health aspects to ethical/environmental ones. The statistical analysis of the content, by means of the frequencies and TFIDF values, evaluated the importance of each attribute.

The consumers' perception is mainly influenced by the nutritional/health aspects. Some internal components have a rather beneficial influence on the physical body; this aspect could suggest to deal with Kamut as a functional product. The high protein level might attract the interest of big industrial names on the Italian market who wish to improve the technological characteristics of traditional wheat, and thus implicitly stimulate the attention of the large scale retail.

The organic production method represents an important aspect that must be severely controlled to avoid that a deformed perception of this attribute can reduce the attractiveness of the Kamut product.

The consumers' perception is strongly influenced by the organoleptic characteristics too. A not exhaustive and too different taste from the typical and traditional ones can reduce any further purchase and therefore impact on the initial demand. In any distributors opinions,

however the historical/cultural aspects are associated to a particular taste. The geographical origin influences positively the consumer' curiosity. For the trading of food products, the relationships between distant countries require organoleptique, cultural, law and logistic solutions. Moreover the fact that the word "Kamut" could represent different cultures and traditions can be an interesting competitiveness factor.

5.5 Competitors

Other important issues have not been discussed yet. Given that the most significant competition would come from products that belong to the so-called "Wellness group": within this category the most important competitor is undoubtedly the Spelt in the demand side. It holds a competitive status in terms of recognition because it is a national production characterised by antique traditions, quality and technological versatility. Moreover as for the sign of food supply' contracts, Spelt market is not affected by the specific requirements in the trade relationships extra-EU.

6. Final remarks

The survey revealed some opportunities to introduce and develop Kamut-based products in the Italian large scale retail but the development conditions are closely related to trade strategies; these ones distinguish one distribution chain to the other and determine a different approach in the interested actors (e.g. providers, customers, etc). The survey highlighted that interesting issues might possibly lead to further research activities. These issues could allow to correctly plan international trade in order to match the needs of the local consumers. However it is also important to compare this plan with the standards required in each country for the production and distribution.

Finally through our survey we could highlight important issues which will be useful to better integrate the main production regions (e.g. Asia) to the most important consumption countries (e.g. EU).

This information will be very useful to generate hypotheses for subsequently exploring this problem.

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Tables

Table 1 Large scale retail by sales area category and by geographic area

	Trade Centres	Hyper-markets	Super-markets	Discounts stores	Cash and Carry	Department stores
North-East	81	108	1644	633	94	207
North-West	51	201	1748	772	86	275
Centre	58	88	1410	646	60	313
South and islands	65	113	2558	709	104	321
Total	255	510	7360	2760	344	1116

Source: Giacomini and Mancini, 2005

Table 2 The territorial coverage of distribution companies interviewed

Nielsen Areas	No. Outlets
North-West	2521
North-East	3511
Centre	3159
South	3902
Sardinia	894

Source: Our elaboration

Table 3 Coverage of distribution companies interviewed by sales area category

Sales Area Category	No. Outlets
Hypermarkets	289
Supermarkets	4892
Superette	5144*
Traditional stores	1164*
Discount stores	945
C&C	81

*no large scale retail

Source: Our elaboration

Table 4 **STRESS and RSQ values for the evaluation of the validity of the MDS model and for the choose of the number of the dimensions**

Objectives	Dimensions	STRESS	RSQ
Obj1= Reasons for introduction	4	0,076	0,983
Obj2= The consumers' reactions	4	0,101*	0,955
Obj3= Limiting factors	3	0,073	0,990
Obj4= Features for perception of the quality of the product	4	0,106*	0,957
Obj5= Competitors	2	0,064	0,992

*just above the limit established. The value was considered likewise acceptable

Source: Our elaboration

Table 5 Semantic Categorization: TFIDF index (%values; N=78; Objective 3: limiting factors)

Semantic Categories	Ftd (#)	Ftd (%)	Ft (#)	TFIDF
SC15 - Information/Communication	20	25,6	11	17,0
SC17 - Price	30	38,5	25	14,8
SC16 - Distribution Logistics	18	23,1	12	14,6
SC03 - Pressure from suppliers	9	11,5	8	8,9
SC14 - Awareness	9	11,5	9	8,4
SC06 - Nutrition/Health/Wellness Aspects	7	9,0	5	8,4
SC08 - Environmental Aspects	7	9,0	6	7,8
SC18 - Production/Transformation Structure	6	7,7	6	6,7
SC21 - Brand name of Manufacturer/ Transformer	3	3,8	1	5,7
SC09 - Pharmaceutical aspects / Intolerances / Celiac problems	4	5,1	3	5,7
SC19 - Culinary/Cultural/Geographic traditions	4	5,1	3	5,7
SC24 - Perception of added value/marginality	4	5,1	4	5,2
SC25 - Minor Cereals (Spelt)	3	3,8	3	4,2
SC23 - Product Aesthetic	2	2,6	2	3,2
SC10 - Interest due to specific need	2	2,6	2	3,2
SC22 - Product's geographical origin	2	2,6	2	3,2
SC01 - Widening breadth and depth of product range	1	1,3	1	1,9
SC20 - Organoleptic Aspects	1	1,3	1	1,9
SC13 - Curiosity	1	1,3	1	1,9
SC12 - Indifference	1	1,3	1	1,9
SC07 - Category Integration	1	1,3	1	1,9
SC11 - Interest in product's qualitative characteristics	1	1,3	1	1,9
SC05 - Polyvalence/Transversal/Versatility	1	1,3	1	1,9
SC02 - Demand by a growing consumer target group	1	1,3	1	1,9
Specific occurrences	138			
Total occurrences	849			
Intensity	16,3			

Key:

N= total number of responses which constitute the discussion

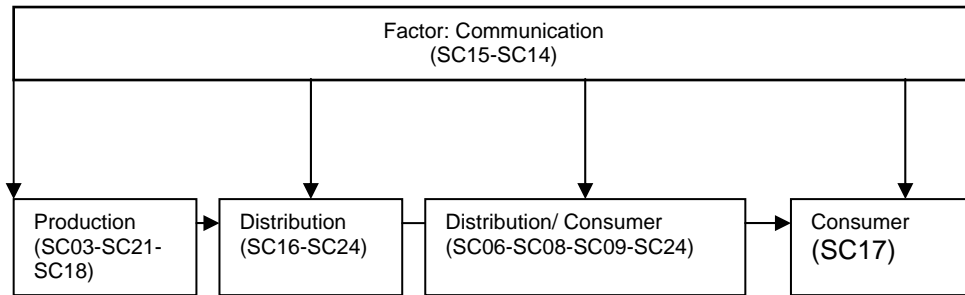
Ftd: number of times that a term which represents the specific semantic category is mentioned in the discussion

Ft: number of interventions in which a term representing a semantic category is mentioned

Source: Our Elaboration

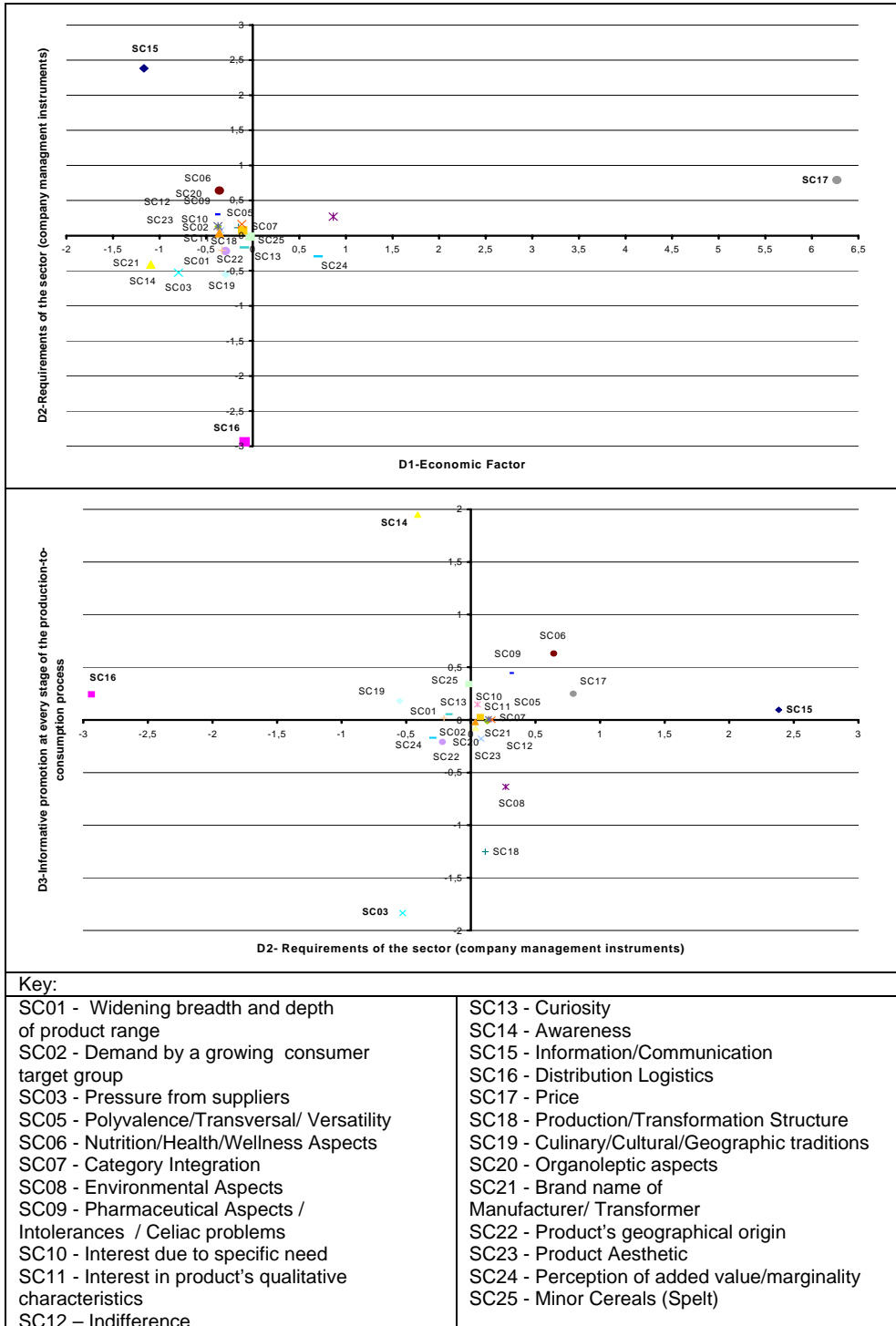
Graphs and Diagrams

Figure 1 Conceptual associations between certain semantic categories (Objective 3: limiting factors)



Source: Our Elaboration

Figure 2 Positioning of semantic categories on the three dimensions considered (objective 3: limiting factors)



Source: Our Elaboration

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Impact of export control policy measures in an attempt to tame Argentina's inflation

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Summary

Starting in mid 2004 and as a result of an increasing domestic and foreign demand, pressure was put on prices of a staple food in Argentina: beef. The government reacted by launching an aggressive plan to fight inflation which included prices control programs, slaughter restrictions and finally, when these measures were not enough, export bans. But such policies, in any case, are short-run, circumstantial measures that do not attack the root of the problem. When it is true that hadn't had the government intervened in the sector both farm and retail prices would have been higher than what they were, the cost of the intervention has been harmful for the economy and it did not solve the real structural problem. Cattlemen blame the government that the constant change in the rules is detrimental to investment and development that go hand by hand with production. The ban on exports has damaged the country's image as a reliable supplier when international contracts had to be broken. Moreover, the latest shifts in trade flows within the Mercosur members should be read as a sign of warning to the Argentinean authorities when deciding to isolate the country, since markets unattended by Argentina quickly find alternative sources of supply even within Argentina's neighbors.

KEYWORDS: Argentina, beef, inflation, export ban, production, trade.

1. Introduction

With more than 3 million tons produced in 2005, Argentina is the fourth largest beef producer in the world, ranking below the United States, Brazil and China.

The better part of the production is consumed locally (about 80%). Beef is a staple food in Argentina and the Argentines are the world's largest per capita beef consumers (above 60 kg annually). Of all foods, beef is the most sensitive when it comes to its impact on the Consumer Price Index (CPI), accounting for 4.5% of its composition and, thus, having a significant influence on the country's inflation levels.

Starting in mid 2004, and as a result of an increasing demand caused by an improved domestic purchasing power and growing exports, pressure was put on domestic prices causing great concern in the government. Authorities mostly attributed the increase in prices to growing international sales and took a series of measures aimed to retract exports, increase domestic supply and control inflation.

Before the government intervention, Argentina was the third largest world exporter, which means it is also a major player in the worldwide markets and its exports play an important role in global trade. Hence, any policy affecting the beef sector does not stay within the boundaries of the national policy but it becomes a matter of foreign policy as well.

2. Background

2.1. About Argentina

Argentina is the eighth largest country in the world. Approximately one-fourth of the total area is given to the flat, fertile Pampas of east and central Argentina. The soil of the Pampas is among the richest in the world and it is used for both farming and ranching. Therefore, Argentina's economy has always relied heavily on its export-oriented agricultural sector. The 38.7 million Argentines are a highly literate population (97%) and the country's transportation and communication infrastructure is good. However, government's mistakes in the economic policy have kept Argentina's standard of living much below its potential.

2.2. Strong bond between the economic policy and the agricultural sector

Agriculture has a huge impact on the economy, currently representing 13% of the GDP. The economic and political climates are heavily influenced by the agricultural sector (and vice versa) and amongst all sectors, beef is a highly sensitive one because of Argentina's cultural dependence on it, accounting for a 4.5% of the composition of the CPI.

The crisis of 2002, one of the worst economic downturns in the recent history of the country, had a tremendous negative impact on the standard of living of the population diminishing significantly its purchasing power. After the crisis, the abandonment of the pegged exchange rate to the U.S. dollar boosted exports, helping the country to return to growth and gradually reviving domestic demand. Due to the improved purchasing power (**Graph 1**), beef domestic demand has been increasing steadily and so have been exports encouraged by the favorable exchange rate. Production responded accordingly until the second half of 2004 when an unusually strong external demand and a still powerful domestic demand, began to push domestic prices up (**Graph 2**). When market conditions improve, a natural reaction of producers is willing to increase the size of their herds and one way to do it is by decreasing the proportion of female cattle slaughtered which, in turn, due to the biological cycle of livestock, shrinks production temporally, placing even more burden on prices in the short-run.

By March 2005, nominal consumer prices had climbed more than 20% in average with respect to July 2004. The situation called for the government intervention. The first measures introduced were price agreements but extended later to:

- Nov 2005: Prohibition to slaughter cattle below 260 kg. Suspension of beef export rebates (about 5%). Increase in export taxes on fresh boneless beef from 5 to 15%.
- Mar 2006: Prohibition to slaughter cattle below 280 kg. Increase in export taxes on processed beef from 5 to 15%. Ban on beef exports for 180 days (excluding the EU's Hilton Quota, beef cuts not consumed domestically, country-to-country agreements, e.g. Venezuela and Morocco and goods in transit).
- May 2006: Partial lifting of the ban: establishment of an export quota for fresh and frozen beef from Jun until Nov 2006 equal to 40% of the volume exported in that same period in 2005.
- Sept 2006: Additional relaxation of the ban: from Oct 1st to Nov 30th monthly exports up to 50% of the monthly average volume exported between Jun 1st and Nov 30th 2005 were allowed.
- Nov 2006: 50% relaxation of the export ban extended from Dec 1st 2006 until May 31st 2007, taking the monthly average of the volume exported between Jan 1st and Dec 31st 2005.

- Dec 2006: Prohibition to slaughter cattle below 240 kg until Mar 2007.

Government measures did not exert a dampening effect on prices until after exports were effectively stopped in March 2006. The categories which prices were brought down the most were those primarily demanded by foreign markets: old cows and heavy steers (above 450 kg). Local consumers, on the contrary, prefer beef from younger and lighter cattle. However, price's downward trend upon the export ban was not meant to last. Successive relaxations of the ban and a still strong domestic and external demand faced a rigid production in the short-run that kept putting pressure on prices which still could not be brought down to pre-intervention levels (*Graph 2*).

3. Objectives

The purpose of this paper is to analyze whether the success of the government's controlling measures justifies the cost of the intervention and if, given the structure and dynamics of the beef cattle industry in Argentina, the measures taken were the most suitable ones to fight inflation. In order to do so, a model framework will be constructed and the relationships between the variables underpinning the sector will be quantitatively assessed. Further, simulations of different policy scenarios will be performed and alternative courses of action will be suggested based on the findings. Finally, the impact of the measures in the economy and in the regional and worldwide markets will be evaluated.

4. Data and methodology

4.1. Data

Monthly data over January 1990 – November 2006 were used. Data were obtained from the Ministry of Economy and Production of Argentina, the National Institute of Statistics and Censuses and various national organizations related to the beef sector. All monetary variables are expressed in pesos (Argentina's currency). The Consumer Price Index was used as a deflator to account for changes in price levels. In the case of the export price of beef and the international price of corn, that were available in US dollars, they were converted into pesos by multiplying by an exchange rate.

4.2. Model specification

The model was specified according to the conceptual framework. In order to analyze the dynamics of the system, linear multiple regression analysis was carried out for the assessment of the behaviour of each of the endogenous variables, as defined in *Table 1*. Each of the equations was estimated separately by OLS. All dependent variables are taken in their logarithmic form, so coefficients can be interpreted as elasticities or semi-elasticities, according to the equation specification.

There are 5 behavioral equations in the model and 1 identity, as described in *Table 2*. The outline of the model with the directional relations among the variables is presented in *Graph 3*. The Gauss-Seidel algorithm was used to solve the model. To evaluate the forecast ability of the model, a dynamic test was performed. This type of test uses forecasts from previous periods, not actual historical data, when assigning values to the lagged endogenous variables in the model. Results seem to follow the general trend in the data.

4.3. Dynamics and behaviour of the endogenous variables

4.3.1. Supply (Production = Slaughter * Yield)

In the case of beef, because of the reproductive cycle, output cannot react immediately to the current market price. The number of heads producers are willing to offer for slaughtering is determined by the size of the herd they want to keep for future production. The general framework used for estimating producers' slaughtering (output) decisions is Nerlove's partial adjustment-adaptive expectations model (Hallam,1990:51,52) which assumes that there is some desired level of supply, S^* , dependent upon expected prices, P^e .

$$S_t^* = \alpha + \beta P_t^e$$

Actual supply adjusts towards the desired level according to the partial adjustment model

$$S_t - S_{t-1} = \delta(S_t^* - S_{t-1}) + u_t$$

and expectations are formed according to the adaptive expectations model

$$P_t^e - P_{t-1}^e = \gamma(P_{t-1} - P_{t-1}^e)$$

Combining these results we obtain,

$$S_t = \alpha\delta\gamma + [(1 - \delta) + (1 - \gamma)]S_{t-1} - (1 - \delta)(1 - \gamma)S_{t-2} + \beta\delta\gamma P_{t-1} + u_t - (1 - \gamma)u_{t-1}$$

which does not contain any unobservable variable and hence, can be estimated. Nonetheless, the estimating equation presents the problem that the disturbances are serially correlated and the explanatory variables include stochastic lagged dependent variables. A common assumption in practice has been that δ or γ are one. This eliminates S_{t-2} and yields a simple coefficient on S_{t-1} from which δ or γ , and hence α and β , can be estimated. Supposing that we set $\gamma = 1$, the model reduces to

$$S_t = \delta\alpha + (1 - \delta)S_{t-1} + \delta\beta P_{t-1} + u_t$$

The short-run price effect is measured by the compound coefficient on P_{t-1} , and the long-run effect by dividing that by one minus the coefficient on S_{t-1} .

There is a cyclical behaviour of the output explained by the fact that beef cattle are both *capital and consumption good*. Calves are generally weaned at 6 months of age and then fed until they reach the adequate weight to be sent to the market. Naturally, animals of different weights and ages are sent to the market, and when it is true it takes approximately 3 years to breed a heavy weight cow, the shortest period of time producers have to wait until an offspring can reach the market is between 18 and 20 months. This was corroborated by regressing production on farm price introducing a PDL of order 2 and up to 30 lags with an endpoint restriction. The largest weight of lagged farm price was indeed observed at month 18. The dynamics of the cycle is represented in **Graph 4**.

Producers can reduce (or increase) the future herd by increasing (or reducing) the proportion of current female cattle slaughtered. In this manner, the total amount of heads slaughtered (and thus, current output) is affected by changes in past levels of the female cattle slaughter proportion. Therefore, allowing for the biological cycle of cattle, prior 21 months female cattle slaughter proportion was included as a regressor in explaining current slaughtering.

When estimating yield, climate conditions were taken into account. The variable MASW (minimum authorized slaughter weight) was also included along with lagged yield values of 1 and 12 previous months, the latter in order to account for production seasonality.

Moreover, because in Argentina the beef cattle industry is mostly extensive, when crop prices increase in dollars, producers tend to shift much of the pastureland to crop production, moving their herds to less fertile grasslands and this affects negatively future beef yields. Thus, the international price of corn was introduced in the equation lagged 11 months, allowing for the annual production cycle of the corn.

4.3.2. Exports

Nerlove's partial adjustment-adaptive expectations model was also used for the estimation of this equation. Therefore, previous month of export price and quantity exported were included as regressors.

Historically, the domestic market has been the chief destination of production with exports absorbing between 13-15% of the total (**Graph 5**) except in 2001, when due to a Food and Mouth Disease outbreak, foreign markets imposed total bans on Argentine beef and exports shrunk considerably. The dummy variable DFMD in the equation accounts for this.

Exports increased 61% in volume in 2004 and an additional 22% in 2005. The dummy variable DFAVEXT refers to the increased international demand and to the extraordinary circumstances in the major producing and exporting countries that have been causing the latest shifts in worldwide beef trade.

Exports shrunk immediately after the ban was imposed. There have been partial relaxations of the ban since May 2006 which have allowed the gradual recovery of the export volumes but government control on exports remain to date. This is captured by a variable representing the authorized export capacity (AEC).

4.3.3. Prices

To show the effect of the export ban on consumer prices, the variable AEC was included in the consumer price equation. Logically, the variable farm price was included as another regressor in the estimation equation.

In the case of farm price, not only production, but also the export quantity and export price were included in the equation. Prices are logically affected by the output and, to a lesser extent, by foreign demand and international prices. These last two variables were also included in the equation in order to give quantitative support to the previous statement.

5. Results

The empirical estimates of the econometric model are presented in **Table 2**. The coefficient parameters are provided in each equation and the coefficient t-statistics are given in parenthesis under the corresponding estimate. It was not possible to make use of the Durbin-Watson d statistic to test for serial correlation due to the presence of lagged values of the regressand in the right hand side of the equations. Therefore, the Breusch-Godfrey (BG) test was applied. The results of the adjusted \bar{R}^2 are provided at the end of each estimated equation. The coefficients of the lagged dependent variables are statistically significant, positive and less than unity in all cases, suggesting that more than one month is required for the sector to fully adjust to the demand and supply interactions.

Overall, the structural performance of the model is good. Except for the slaughtered heads equation, all equations explain over 80% of the variation in the response variables. Likewise, all the dummy variables introduced in the model are statistically significant and have signs consistent with a priori expectations.

5.1. Elasticity and semi-elasticity estimates

5.1.1. Supply

The coefficient of adjustment of slaughtered heads is 0.79. The short-run elasticity of the 18 months previous farm price is 0.08 and the long-run elasticity is 0.10. The inelastic slaughter response on farm price, both in the short-run and long-run, reflects production rigidities and the fact that there is still room for further production expansion. As for the proportion of female cattle slaughtered 21 months earlier, the elasticity on total slaughtered heads is -0.14 in the short-run and -0.18 in the long-run. This inelastic response is explained to some extent because female cattle slaughter is part of the total slaughter. However, the purpose of the inclusion of the variable in the estimating equation was to show how former producers' decisions with respect to herd size (capital good) can also exert an impact on current slaughtering (consumption good). The low impact of the prohibition of lightweight slaughtering on yield, as shown by the coefficient of the variable MASW in the yield equation, accounts for the fact that output reaction can only be modest in the short-run due to the biological cycles and structural requirements to increase the weight of the animals.

5.1.2. Exports

The short-run elasticity of export price is 0.10 and, given a coefficient of adjustment of export quantity of 0.44, the long-run elasticity becomes 0.23. As expected, the long-run estimates are larger than short-run estimates because in the long-run producers have more time to adjust to external demand shocks. Nonetheless, export response on price is inelastic both in the short and long-run. This is due to the fact that the better part of the production is directed to the domestic market and therefore, the possibilities to respond to an increased foreign demand are constrained by the pressure of the domestic market demand and a productive sector incapable to react accordingly. The significant coefficient of the variable AEC is evidence of the damper effect the government measures have had on exports corroborated also by their rapid recovery as the ban was being relaxed.

5.1.3. Prices

The coefficient of adjustment of farm price is 0.06. Both export price and export quantity's long-run elasticities are larger than the short-run elasticities, as expected, both inelastic in the short and long-run. As for the response on production, farm prices are inelastic in the short-run (-0.16) but highly elastic in the long-run (-2.67), indicating that efforts oriented towards increasing production would be more fruitful when attempting to fight inflation.

The consumer price coefficient of adjustment is 0.09. The response on farm price is inelastic, both in the short-run (0.04) as well as in the long-run (0.44), corroborating what it is observed in practice that consumer prices follow farm prices but present fewer variations. The insignificant coefficient of the variable AEC in the consumer price equation accounts for the fact that the decline in prices immediately after exports were banned was due to the natural reaction of the market upon an increased supply but not because the country's export capability is the main responsible for domestic price levels

5.2. Simulation of production and trade liberalization

For the purpose of policy analysis, the estimated model was used to simulate the impact of the following scenarios until December 2008:

- Baseline: continuity of the current degree of government intervention.
- Scenario 1: absence of government intervention.

- Scenario 2: immediate liberalization of slaughter weight and exports from Dec 2006.

Simulation results from Nov 2005 (first month of government control) are presented in **Graph 6**. Over the 25-month simulation scenarios contemplated it was assumed that the strong domestic demand and the favorable external conditions would continue and that no animal-health related issues that may affect exports negatively will occur in the country during the forecasted period.

5.2.1. Supply

In the baseline as well as in the two scenarios, production shows a clear upward trend and larger monthly averages than those historically registered, the baseline presenting the largest. In the case of the baseline, this is explained by higher monthly yields due to the continuity of the lightweight slaughter restriction. In the case of the two scenarios, the increase in production is the result of an increase in the quantity of heads slaughtered during the second half of the forecast, induced by higher farm prices. These behaviors being compatible with the dynamics of the model previously described.

In all three forecasts, yields present the typical cyclical behaviour but only show a moderate upward trend and monthly averages higher than those historically registered when the lightweight slaughter restrictions are pursued, as expected. The immediate liberalization produces a gradual decrease in yields, with monthly averages resembling those of the absence of restrictions scenario and those historically registered, also as expected.

5.2.2. Exports

Not surprisingly, forecast result in exports reaching record levels when the government does not interfere with market forces. Forecasts further suggest that exports would increase sharply upon the country returning to its full export capacity. On the other hand, it seems that the persistence of the restrictions would result into export levels resembling those historically exported, totally disregarding the current favorable external conditions.

5.2.3. Prices

Either in the absence of government control or upon the immediate liberalization of exports and slaughter weight, forecasted prices are higher than if the government intervention is pursued, farm prices showing larger percentage increases than consumer prices when compared to the baseline, as anticipated. Prices in both scenarios show an upward trend at the beginning of the simulation but enter a downward trend by the end of the forecasted period. Only baseline prices present a constant downward trend since March 2006 when exports were stopped. In the short-run, the scenario of an immediate liberalization yields lower prices than those obtained in the absence of any government intervention but these two seem to converge by the end of the forecasted period.

5.3. Policy implications

Forecast results confirm that despite the damper effect on prices was not felt until exports were stopped, this fall was the natural response to an immediate allocation of additional quantities to the local market, not because increased exports were the main responsible for the rise in prices in the first place, but production constraints:

- Even in a scenario of absence of restrictions, with exports immediately reaching and stabilizing at record levels absorbing over 30% of the monthly production (25% more than before the export ban), prices revert the initial climb and show a downward trend during the second half of the forecasted period. Only production

shows a constant upward trend since the beginning of the forecast which explains the later fall in prices. This behaviour shows that a situation of increased production, record export levels and decreasing prices is achievable.

- Despite the higher export levels in the absence of restrictions scenario than those upon the immediate liberalization, prices tend to converge by the end of the forecast which can only be explained by production in the former scenario surpassing that of the latter.

Simulation also allows affirming that lightweight slaughter restrictions have a moderate impact on yields but their ability to influence prices in the short-run is not significant. This can be proved by the following:

- a) Yields in a scenario of absence of restrictions differ from those of the baseline from the very first month the lightweight slaughter prohibition was announced. However, the difference in consumer prices is almost null until the export ban takes effect 5 months later. The government failed to consider that since beef cuts from younger and lighter cattle are the ones preferred by the Argentineans, the prohibition to slaughter lightweight cattle, if anything, was going to contribute to keep putting pressure on consumer prices not only in the short-run but also in the mid term due to the shortage of stock it generates when forcing producers to slaughter heavier animals.

Simulation outcomes also confirm that the export ban has been extremely harmful for the export sector and thus, for the economy of the country:

- a) In the absence of regulations exports reach unprecedented levels allowing Argentina taking advantage of the current excellent market conditions in which it was recovering its historic position of being one of the world's largest beef exporters. These advantageous conditions would be completely overlooked with the persistence of the ban resulting not only in loss of earnings for the country and a reduction of tax collection (beef exports are levied, in average, with a 15% export tax) but also in loss of ground in the highly competitive foreign markets and distrust among importing countries.

5.4. The impact of the measures in the worldwide markets

The impact the measures taken by the Argentine government clearly do not stay within the boundaries of the country but also affect worldwide trade and the country's relation with trade partners and competitor countries. In order to assess this impact, a look must be taken at the evolution of Argentina's beef exports over the last 5 years.

In 2001, due to an outbreak of Food and Mouth Disease (FMD), foreign markets imposed total bans on Argentine beef and exports reached their lowest level since 1970. The **reopening of markets** was achieved in 2002, which, along with a **favorable exchange rate**, contributed to the rebound of exports to its historical levels.

However, major beef producing and exporting countries have been facing adverse situations since 2004, generating exceptional opportunities for competitor countries. In 2005 Argentina's exports reached the highest levels of the last three decades. The structural changes that the beef worldwide markets and trade flows have been undergoing (**Table 3 and Graph 7**) can be summarized as follows:

After ranking second until 2003, due to BSE-related import restrictions from its major trading partners, the **United States** fell to the ninth overall beef exporter in 2004 and have remained far below the first five exporting countries since then. Likewise, **Canada's** beef has been subjected to import restrictions since the first BSE outbreak in 2003. Despite the fact that Argentina does not compete directly with the United States or Canada in its main

destination markets (hormone-related restrictions limit the amount of U.S. beef that can be exported to the EU), the absence in the international trade of two of the major suppliers together with an increased worldwide demand, boosted the opportunities in the foreign markets for other producing countries.

The **EU** became a net importer in 2003. The trade deficits it has been facing since then are the result of a shift in the policy to decouple support payments under the Common Agricultural Policy (CAP) reform. Shortcomings increased EU's prices which were unable to compete with beef coming from South America (mainly from Brazil and Argentina). The EU is currently the largest export destination in terms of value for Argentina because of the significant share of a high quality/high value beef quota Argentina has been awarded for the past 10 years. The **Hilton Quota** is an annual quota applied to high quality beef imported by the EU. Since 1995 the quota granted to Argentina has been 28,000 tons (almost 50% of the total quota). The Hilton cuts were not reached by the export ban and the EU also imports from Argentina large volumes of out of the quota beef. After the ban, consumer prices in Germany, the main EU destination for Argentine beef, increased 50%.

Until 2002 the **Russian Federation** used to satisfy its beef import requirements mostly from Ukraine and Germany. In 2003, Ukraine began to have production problems and the EU run short on export surpluses. As a result, The Russian Federation was forced to look to South America's largest producers: Brazil and Argentina. Currently it is the largest market in terms of volume for Argentina. After Argentina's self-imposed restriction on exports, the Russian Federation increased its beef imports from the rest of the Mercosur members.

5.6. The Mercosur region

Mercosur members (Argentina, Brazil, Paraguay and Uruguay) have also been taking advantage of the latest shifts in global trade, consolidating their positioning in the worldwide markets: the Region accounted for almost 19% of the total global beef trade in 2001 jumping to over 46% in 2006. In the case of Argentina, its worldwide share grew from merely 3% in 2001 to almost 11% in 2005, decreasing to 8% in 2006 (**Table 3**).

With respect to 2005, in 2006 Mercosur countries reduced their exports 1.4% in volume but increased 15.5% in value as a consequence of the higher international prices. Despite Argentina being the second largest beef exporter in the Mercosur and the third world's largest exporter, the increase in exports from the rest of the Mercosur members in 2006 (consolidating their presence particularly in Chile and the Russian Federation) somehow offset the absence of Argentina's beef in the international markets (**Table 4**).

Even when it is true that the quality of the Argentinean beef is highly valued in the international markets, the aforementioned shifts in the intra-regional trade should be read as a sign of warning to the Argentinean authorities when deciding to self-isolate the country's export sector since, as experienced, markets unattended by Argentina quickly find alternative sources of supply even within Argentina's neighbors.

6. Final Remarks

Hadn't the government intervened in the sector, beef prices would have been higher than what they were which, given the significant impact they have in the composition of the country's CPI, would have put additional burden on 2006 inflation levels. However, based on the degree of success the measures have had, the analysis allows concluding that the government intervention has been more successful in generating unrest among cattlemen and in damaging Argentina's positioning and reputation in the international markets than in effectively controlling inflation.

The lightweight cattle slaughter restriction was not going to be fully translated into lower domestic prices because in the short-run it generates a lack of the cuts that are mostly consumed by the population (from younger and lighter animals), while in the mid term it generates a shortage of stock, putting additional pressure on prices. Following, the export ban was not going to pursue the initial downward trend on prices firstly, because before the ban exports represented less than one-quarter of the total national product; secondly, because the cuts consumed domestically are essentially different from the ones demanded by the export markets; thirdly, because upon restricting exports, paradoxically, an even greater part of the production was going to be directed to the domestic market whose improved purchasing power was one of the main sources of inflation on prices. All in all, what the government did not see was that it was a structural problem (insufficient cattle stock to satisfy a growing domestic demand) what caused the raise on prices and, as such, it cannot be fought by taking circumstantial measures.

The government is still applying its controlling measures although the battle against inflation is not over since prices still remain higher than pre-intervention levels. A more sensible alternative would be the implementation of programs aimed to increase production (breeding and feeding efficiency) in an industry that is working below capacity. In this respect, several beef-related organizations in the country have developed and are currently working together with the government on a series of programs directed to increase cattle stocks.

The United States will slowly recover from its BSE-related incidents but it will surely target its efforts in regaining the lost Asian markets that have been taken by Australia and New Zealand. The decoupling of payments in the EU is expected to achieve 90% by 2012, implying that it is very unlikely that EU will revert its current situation as a net importer in the future. This, in turn, will force the Russian Federation to continue to be dependent on South American beef imports and it will also open opportunities in the Middle East and North African markets.

The future looks promising for Argentina. The solution the situation is calling for requires not only the change of the course of action of the government but the active participation of all members in the private sector as well.

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Tables

Table 1. Variables definition

Endogenous variables:

SLGHT : Slaughtered animals, heads.

YIELD : Yield, tons per head (carcass weight).

Q : Production, tons (carcass weight)

XQ : Export quantity, tons.

FP : Farm price, pesos/kg.

CP : Consumer price, pesos/kg.

Exogenous variables:

SLGHTFP : Proportion of female cattle slaughtered over total slaughtered heads, percentage.

RF : Average rainfall, Pampas and North-East Region, mm.

T : Average temperature, Pampas and North-East Region, °C.

CPI : Consumer Price index, chained series 1999=100.

EXCH : Exchange rate, pesos/US\$.

PCORN : International price of corn, pesos/ton.

MASW : Minimum authorized slaughter weight, kg/head.

AEC : Authorized export capacity, on a scale from 0 to 100, 100 = no restrictions.

XP : Export price, pesos/ton.

DFMD : Food and mouth disease dummy, 2001:03 ~ 2002:02 = 1 and 0 otherwise.

DFAVEXT : Favorable external conditions dummy, 2004:06 ~ 2006:09 = 1 and 0 otherwise.

Table 2. Empirical estimates**Slaughtered heads:** Sample (adjusted): 1991:10 2006:11

$$\begin{aligned} \log(SLGHT) = & 2.33 + 0.08 * \log\left(\frac{FP}{CPI}(-18)\right) - 0.14 * \log(SLGHTFP(-21)) \\ & (2.26) \quad (3.22) \quad (-2.04) \\ & + 0.21 * \log(SLGHT(-1)) + 0.27 * \log(SLGHT(-2)) \\ & \quad (2.95) \quad (3.90) \\ & + 0.15 * \log(SLGHT(-3)) + 0.18 * \log(SLGHT(-12)) \\ & \quad (2.17) \quad (3.49) \end{aligned}$$

$$\bar{R}^2 = 0.59$$

Yield: Sample (adjusted): 1991:01 2006:11

$$\begin{aligned} \log(YIELD) = & -0.13 - 0.004 * \log(RF) - 0.003 * \log(T) \\ & (-1.95) \quad (-3.33) \quad (-0.83) \\ & - 0.005 * \log\left(\frac{PCORN * EXCH}{CPI}(-11)\right) + 0.00004 * MASW \\ & \quad (2.11) \quad (2.36) \\ & + 0.81 * \log(YIELD(-1)) + 0.07 * \log(YIELD(-12)) \\ & \quad (19.37) \quad (1.85) \end{aligned}$$

$$\bar{R}^2 = 0.82$$

Production: (identity) $Q = SLGHT * YIELD$ **Export quantity:** Sample (adjusted): 1991:01 2006:11

$$\begin{aligned} \log(XQ) = & 1.58 + 0.10 * \log\left(\frac{XP * EXCH}{CPI}(-1)\right) + 0.01 * AEC + 0.56 * \log(XQ(-1)) \\ & (2.24) \quad (3.21) \quad (7.00) \quad (11.97) \\ & + 0.10 * \log(XQ(-12)) - 0.50 * DFMD + 0.18 * DFAVEXT \\ & \quad (2.63) \quad (-6.49) \quad (2.56) \end{aligned}$$

$$\bar{R}^2 = 0.84$$

Farm price: Sample (adjusted): 1990:02 2006:11

$$\begin{aligned} \log\left(\frac{FP}{CPI}\right) = & 1.55 - 0.16 * \log(Q) + 0.03 * \log(XQ) + 0.01 * \log\left(\frac{XP * EXCH}{CPI}\right) \\ & (2.48) \quad (-2.88) \quad (2.78) \quad (2.66) \\ & + 0.94 * \log\left(\frac{FP}{CPI}(-1)\right) \\ & \quad (51.12) \end{aligned}$$

$$\bar{R}^2 = 0.95$$

Consumer price: Sample (adjusted): 1990:02 2006:11

$$\begin{aligned} \log\left(\frac{CP}{CPI}\right) = & 0.08 + 0.04 * \log\left(\frac{FP}{CPI}\right) + 0.0004 * AEC + 0.91 * \log\left(\frac{CP}{CPI}(-1)\right) \\ & (1.74) \quad (3.76) \quad (1.59) \quad (33.57) \end{aligned}$$

$$\bar{R}^2 = 0.89$$

Table 3: Shifts in worldwide beef trade flows

Total Exports	2001	2002	2003	2004	2005	2006(p)	2007 Oct(f)
United States	1,029	1,110	1,142	209	317	523	680
Canada	575	609	383	557	551	455	440
Australia	1,399	1,366	1,264	1,394	1,413	1,420	1,495
New Zealand	496	486	558	606	589	540	570
Brazil	748	881	1,175	1,628	1,867	1,945	1,985
Argentina	169	348	386	623	762	560(n)	600
Uruguay	145	262	325	410	487	510	520
EU-25	502	485	388	358	255	200	200
India	370	417	439	499	627	750	800
Others	239	310	279	212	224	153	164
World Total	5,672	6,274	6,339	6,496	7,092	6,996	7,454

Source: USDA-FAS Livestock. Units: thousand of tons (cwe). *(p): preliminary, *(f): forecasted, *(n) national estimations.

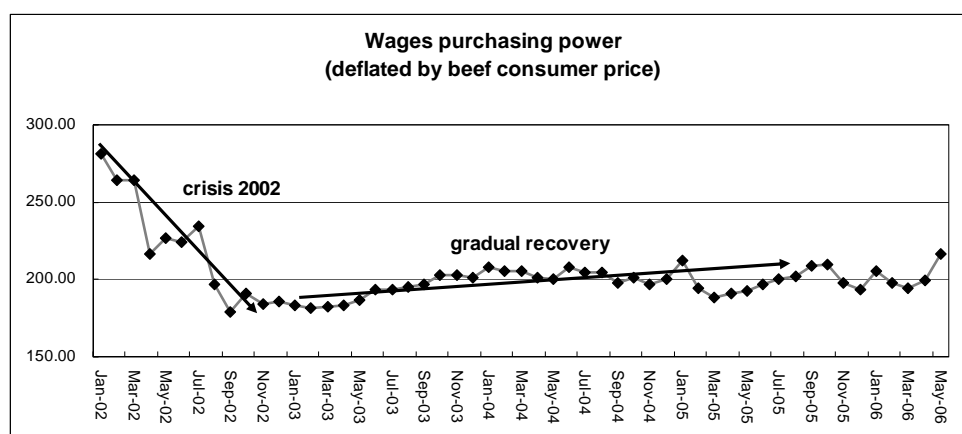
Table 4: Shifts in shares of Mercosur countries in worldwide beef exports

Total Exports	2005	2006 (p)	Net Variation	% Variation
Argentina	762	560	-202	-26.50%
Brazil	1,867	1,945	78	4.17%
Paraguay	193	248	55	28.50%
Uruguay	487	510	23	4.72%
Total Mercosur	3,309	3,263	-46	-1.40%
Total World	7,092	6,996	-96	-1.35%

Source: Ministry of Economy and Production, Argentina. Units: thousand of tons (cwe). *(p): preliminary.

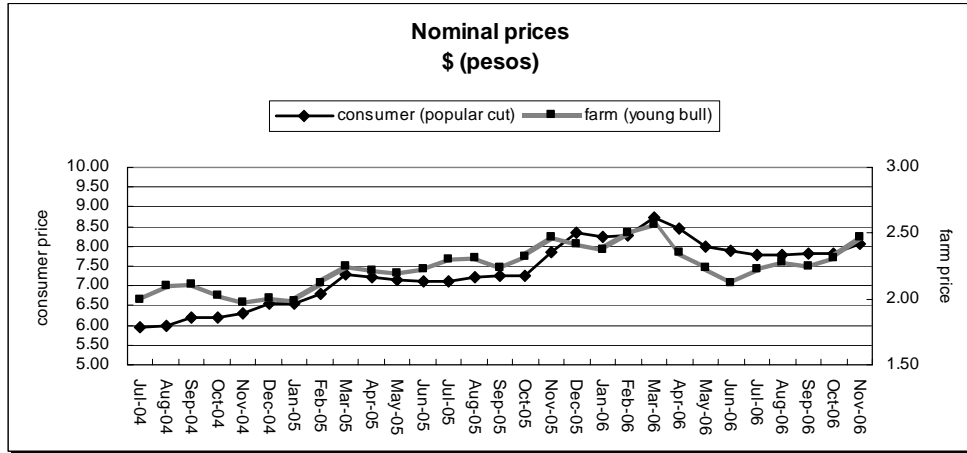
Graphs

Graph 1: Evolution of the purchasing power after the economic crisis of 2002



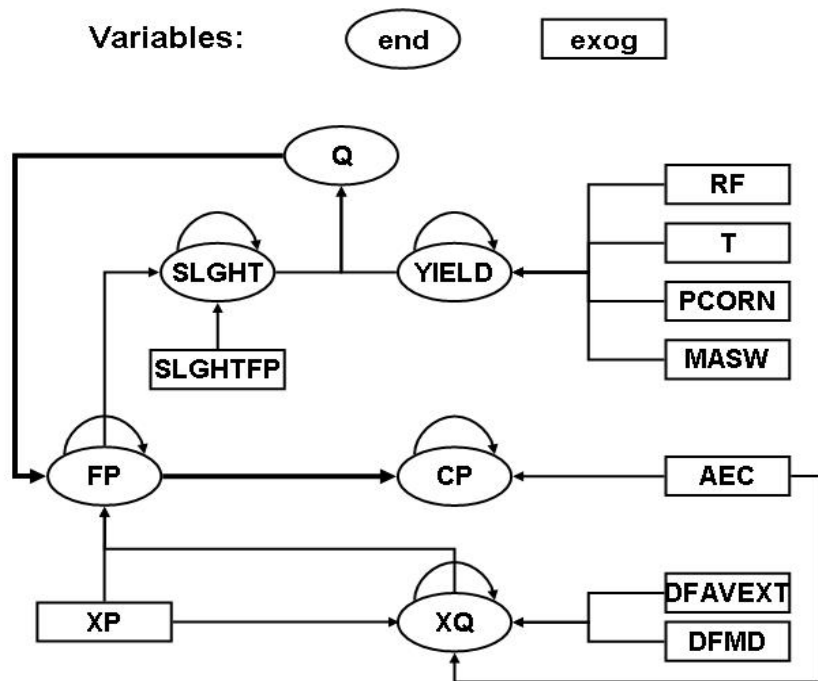
Source: National Institute of Statistics and Censuses; Ministry of Economy and Production, Argentina.

Graph 2: Evolution of nominal prices in Argentina from the second half of 2004



Source: Ministry of Economy and Production, Argentina.

Graph 3: Model framework

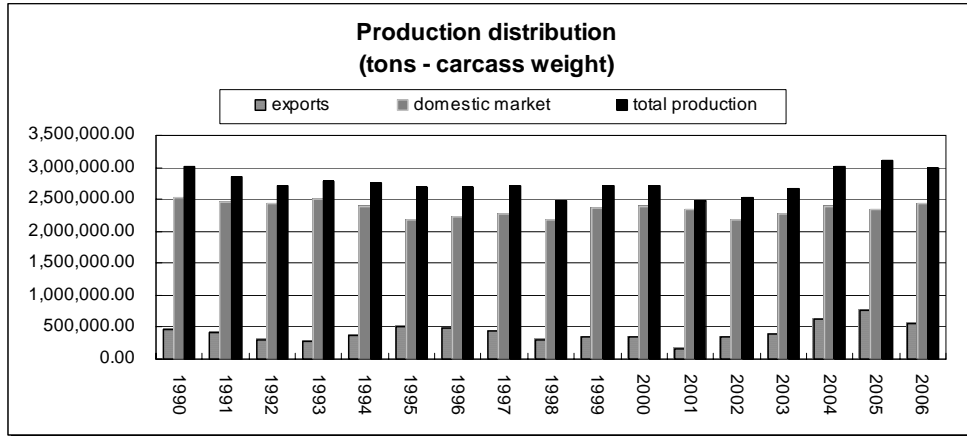


(The thicker line represents the variable exerting the strongest impact on prices).

Graph 4: Dynamics of the beef cycle

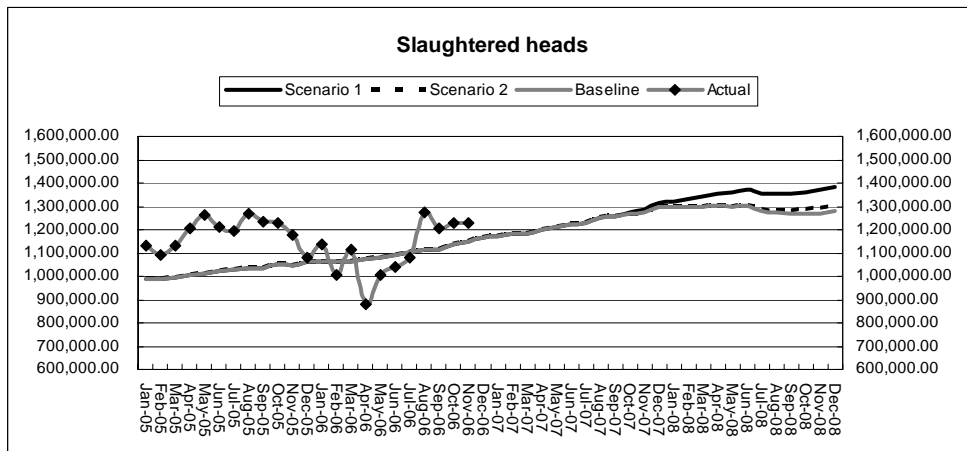
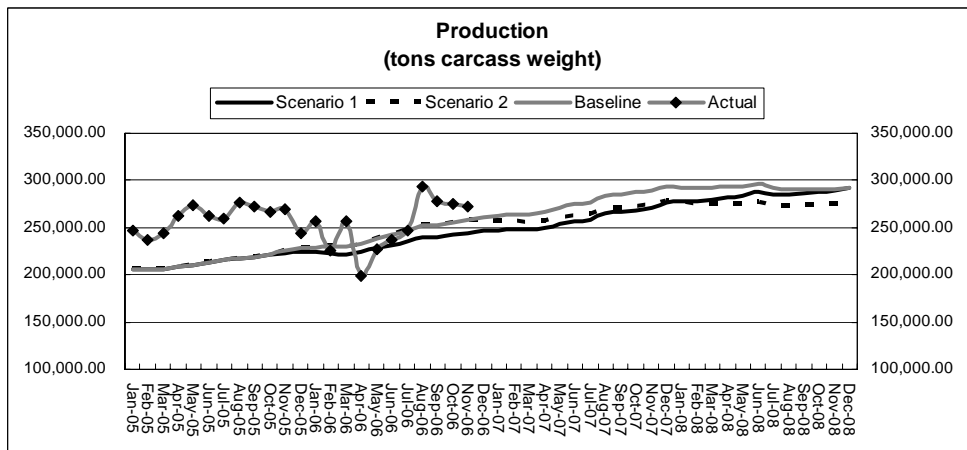


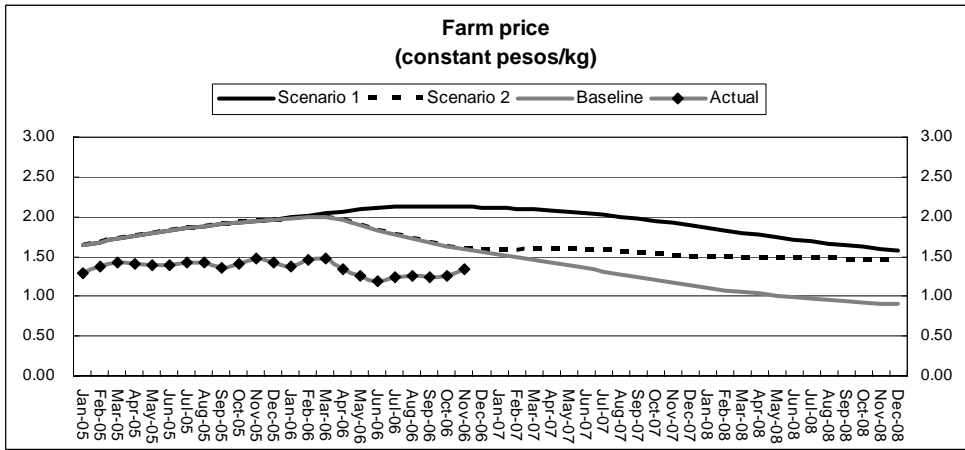
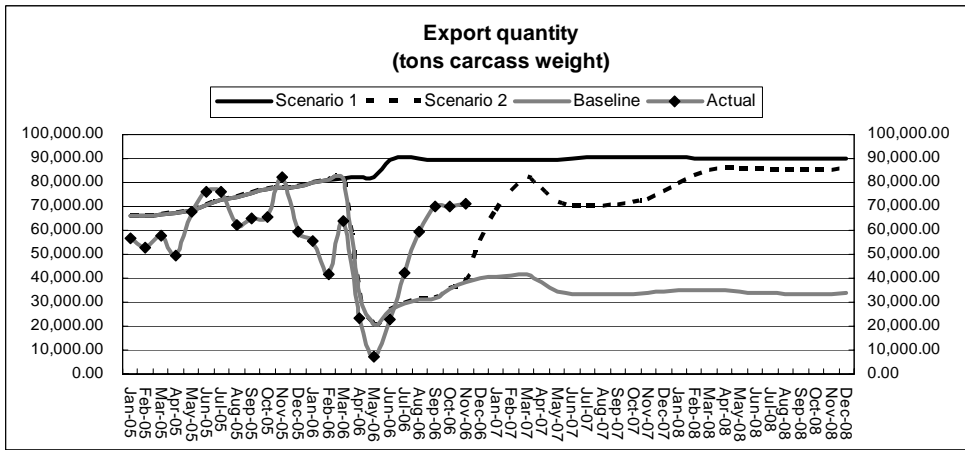
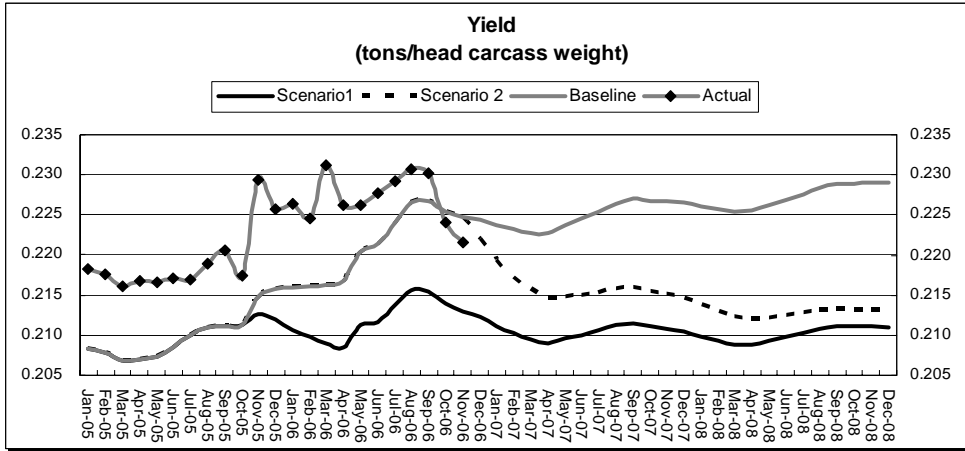
Graph 5: Distribution of production in Argentina from 1990 to 2006

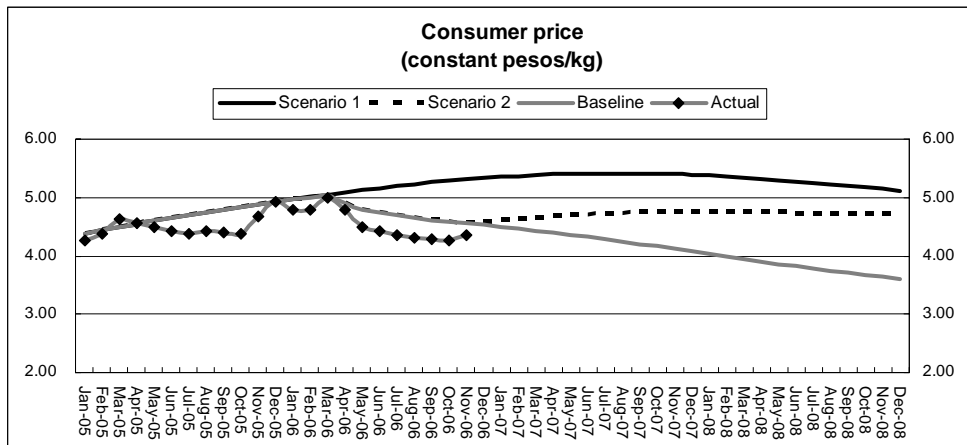


Source: Ministry of Economy and Production, Argentina. *data for Dec 2006: estimated

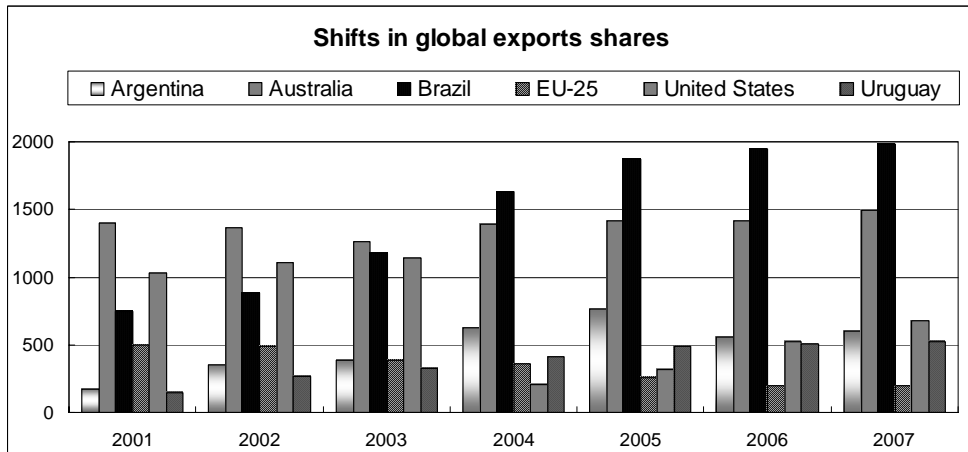
Graph 6: Simulation results







Graph 7: Shifts in global meet exports shares



Source: USDA-FAS, Livestock. Units: thousand of tons (cwe). 2006: preliminary. 2007: forecasted.

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Channel Management and differentiation strategies: A case study from the market for fresh produce

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Summary

The paper analyses the current differentiation strategies in the market for fresh produce. First a short review of the literature on channel structure and product differentiation is presented, in order to identify, on a theoretical grounding the incentives for differentiation strategies. Second, a case study is drawn of a UK channel intermediary organisation carrying out differentiation policies in the fresh produce category (on behalf of UK multiple retailer customers') supplied by a dedicated Italian grower. Results show that in the fresh produce industry there is room for product differentiation, but with contradictory welfare effects.

KEYWORDS: fresh produce, product differentiation, channel structure and management

1. Introduction

The paper analyses the current differentiation strategies in the fresh produce (fruit, vegetable, salad) industry in the light of the new procurement policies carried out by retailers at the global level. These retailers seem to pay a growing attention to product differentiation and innovation, in order to put new value (rather than simply ripping out costs) into the supply chain.

Differentiation strategies are analysed both on theoretical and empirical ground. On theoretical level the main findings of the literature on product differentiation and market structure are reviewed, in order to assess the opportunities and the possible welfare effects of differentiation strategies in the food market. On an empirical level, the current structure and organisation of the fresh produce market are analysed, using data at the aggregate level, and the result of a case study. The case study refers to a single dyadic case approach, in which a primary producer is engaged in 'partner' supply to a principal Category Management (CM) intermediary for channel leading multiple retailers.

The results of the study indicate that in the fresh produce industry there are good opportunities for successful differentiation strategies. Nevertheless actors at the different vertical stages of the marketing channel take very different advantage from it, depending on their "power" to lead the channel. Moreover, because product differentiation tends to foster the oligopolistic structure of the market, it might have general negative welfare effects.

2. Product differentiation and market structure: General statements

Differentiation strategies are pervasive in market economies and are a powerful means of obtaining competitive advantages, as the "master" of competitive advantage claims: "Competitive advantage grows out of value a firm is able to create for its buyers that exceeds the firm's cost of creating it. Value is what buyers are willing to pay, and superior

value stems from offering lower prices than competitors for equivalent benefits; or providing unique benefits that more than offset a higher price. There are two basic types of competitive advantage: cost leadership and differentiation.” (Porter, 1985, p.3). Firms differentiate their product to avoid ruinous price competition and seek some form of monopoly rent. Differentiation offers firms market power, naturally resolving the Bertrand paradox.

The industrial economic literature focuses on the effects of differentiation strategies on market structure, firms’ performances and welfare effects (Beath and Katsoulacos, 1991). A basic tenet is the distinction made between horizontal and vertical differentiation. Products are said to be horizontally differentiated when if offered at the same price, consumers, if asked to do so, would rank them differently showing different preferences for different varieties. Instead, they are said to be vertically differentiated if, when offered at the same price, all consumer choose to purchase the same one, that of highest quality.

Horizontal and vertical differentiation leads to quite different general results in term of market structure. Horizontal differentiation is the implicit assumption at the core of models of monopolistic competition and have basically given rise to two classes of model, based on the assumption of symmetric consumer preferences (or representative consumer) and asymmetric preferences. In the case of symmetric preferences one brand is an equally good substitute for any other and the consumer’s actual choice will depend on income and relative prices. When preferences are asymmetric, brands are not all equally substitute: if a consumer’s ideal brand is i then the consumer prefers brands that are “near” to i in terms of their specification (i.e. in the space of product characteristics in the Lancaster lessicon) more than those that are “far” from it. Asymmetric preferences are assumed in location models, whereas symmetric preferences are assumed in models grounded in the Chamberlin paradigm.

The simplest and seminal location model is the Hotelling model of a spatial duopoly (1929), sanctioning the famous principle of minimum differentiation. Successive studies have shown that the Nash equilibrium in the Hotelling model relies on its restrictive assumption, as the zero conjectural variation assumption, and the prices and the number of firms being fixed exogenously. When these assumptions are relaxed a unique Nash equilibrium do not necessarily occurs. D’apremont, Gabszewicz and Thisse (1979), for example, starting from a different assumption on the initial location of the firms, show that the Hotelling model allows for a solution where the sellers seek to move as far away from each other as possible. In the free-entry circular model of Salop (1979) equilibrium is found where each firm earns zero profits and firms are symmetrically located around the circumference of the circle.

The Chamberlin (1933) large group model leads to the classical long-run monopolistic equilibrium, the one in which profits are zero and the ‘dd’ curve is tangential to the average cost curve. As long as the ‘dd’ curve that each firm faces still has some negative slope, each firm will produce at a point above the level of minimum average cost. Models postulating horizontal differentiation generally back equilibria characterized by many firms earning zero profits and prices above marginal costs. They raise the question of whether the market will produce too many or too few brands as compared with the social optimal, which is the issue previously addressed by Spence (1976). The result is generally a suboptimal number of firms/products, with too many or too few firms in the Chamberlin representative consumer model (depending on the parameters of the model) and unambiguously too much variety in the localized competition circle model.

While a perfect equilibrium is often problematic in the horizontal case, a perfect equilibrium exists in the vertical case consistent with the finiteness property, and stating that at the equilibrium there is a limit to the number of products for which price can exceed unit variable cost and which have a positive share of the market. The finiteness property was introduced by Shaked and Sutton (1983) and the markets in which this is a feature of equilibrium are referred to as natural oligopolies. In the model of Shaked and Sutton the two conditions that the unit variable costs associated with increased quality rise more slowly than consumers' willingness to pay for this and that the main burden of quality improvement falls on fixed rather than variable costs. An important development of the previous model of Shaked and Sutton (1987) is the one that demonstrates that a weak version of the finiteness property still holds when a mix of horizontal and vertical differentiation is accounted for (that is the pervasive situation in the real world where product differentiation never falls under the ideal type of vertical or horizontal).

Summarising differentiation is always a source of market imperfection and welfare loss. In the case of pure horizontal differentiation these effects are mainly linked to inefficient scales of production or to the suboptimal product variety, whereas the market structure approaches the competitive one. In the vertical (or mixed) case the negative welfare effects are linked to the oligopolistic structure emerging as market equilibrium. The limit theorems describing horizontal differentiation state that in the limit as the market gets large enough, an arbitrary large number of firms, each with a very small market share could co-exist in equilibrium.

When carrying out differentiation policies, firms will be earning supernormal profits even though the competitive game is based on the assumptions of non-cooperative Bertrand behaviour and free-entry. This result is in contrast to both structure-conduct-performance paradigm and entry-deterrence theory and is an example of case where structure (the number of the firms) and performance are endogenously determined.

3. Differentiation and channel strategies in the food sector

The economic literature just mentioned refers to the analysis of one industry at time, i.e. on the analysis of competition and market structure at the horizontal level (inter-brand competition). In the food sector the set of prices, qualities and varieties that actually face the final consumers depend on the strategies carried out by different actors in different stages of the distribution channel. These strategies are the results of horizontal as well vertical competition. Vertical competition has traditionally been addressed by the channel literature modelling different channel structure in a manufacturer-retailer relationship. Traditionally three ideal types of structure have been considered (Choi, 1996): exclusive dealer channel (one manufacturer supplying one retailer); monopoly common retailer channel (two manufacturers supplying the same unique retailer); monopoly manufacturer channel (a unique manufacturer supplying two retailers); duopoly common retailer channel (two manufacturers both supplying two retailers). The topic of channel literature has been the analysis of channel coordination/control problems between the manufacturers and its retailers and on the analysis of vertical strategic interaction; this latter defined in terms of "the direction of channel member's reaction to the action of its channel partners within a given demand structure" (Lee and Staelin, 1997, p.185). Previous literature, taking for granted the bargaining power of manufacturers, has focused on the incentive schemes used by manufacturers in order to let the retailers choose the strategies able to maximize the channel total profit while appropriating the largest share of it. Choi, for example, in the introduction of his 1991 article quotes the different forms of governance for the achievement of the maximum channel profit. Because such studies have generally been

applied to non-grocery sectors with few national brands and frequent exclusive selling agreement, the problems of channel coordination with regards differentiating besides pricing behaviours in a multi/manufacture multi/retailer setting (that is the typical channel setting for the food industry), have been paid little attention. Starting with the previous insights of Choi (1991) successive works have explicitly addressed the problem of channel coordination and differentiation in grocery sectors: Lee and Staelin, 1997; Choi, 1996; Choi and Coughlan, 2006; Avenel and Caprice, 2006; Ellickson, 2004.

Choi (1991) first analyses a channel structure with multiple-brand dealers, called common retailers, that well fit the typical structure of food retailing; as department stores, supermarkets and convenience stores. He studies a duopoly model of manufacturers who sell their products through a common independent retailer. He considers three different rules of the duopoly game, that account for different power balance scenario within the channel: a manufacturer Stackelberg game, where the manufacturers can play the role of Stackelberg leaders with respect to the retailer by taking the retailer's reaction function into consideration for their respective wholesale price decisions; a vertical Nash game, where neither the manufacturer nor the retailer can influence the counterpart's price decision (i.e. the manufacturer conditions its wholesale price on the retail price and vice-versa); a Retailer-Stackelberg game, where retailers play the role of Stackelberg leaders. While the first and the third game applies to situation in which few powerful manufacturers (retailers) supply (buy from) many retailers (manufacturers), the second game fits a situation where power is quite balanced in the relationship. Choi solves these models under both the assumption of linearity and nonlinearity of the demand function, finding contradictory results. Moreover, he solves the models under different assumption on the degree of product substitutability between the manufacturers' brands, in such a way as to introduce the analysis of the effect of product differentiation on channel competition. Also in this case the results are affected by the form of the demand function; with contradictory results (for instance he finds that less differentiation leads to increased prices and profits for all the members of the channel).

Choi (1996) extends the previous model by introducing a differentiated duopoly common retailer channel. He analyses pricing strategies of duopoly manufacturers who produce differentiated products and duopoly retailers who sell both products and carry out store differentiation strategies. Both product and store differentiation are assumed to be horizontal and, like the previous work, three games are considered (vertical Nash, manufacturer Stackelberg and retailer Stackelberg). The assumed demand function is adjusted in such a way as to explicitly take into account the two differentiation levels (introducing two parameters, for the product and store differentiation) and to overcome the contradictory results of the previous model as regard profit channel and differentiation. The Stackelberg games are quite different from the previous article, because besides the vertical competition, two horizontal levels of competition must be modelled; the manufacturer level and the retailer level. Accordingly, the equilibrium concept employed is the subgame-perfect Stackelberg equilibrium. Results attained by the model are summarized in the following seven propositions (Choi, 1996, pp.125-129):

“P1: A Stackelberg channel leadership by either manufacturer or retailer results in higher retail prices than those of the Nash game.

P2: Given a set of differentiation parameters, a channel member benefits by playing the Stackelberg leader at the expense of the other channel member who becomes the follower.

P3: Total channel profit is larger when there is no channel leadership. However, vertical Nash is not a stable structure, because each channel member has an incentive to become a leader.

P4: Wholesale prices (retail margins) increase as products (stores) are more differentiated. On the other hand, wholesale prices (retail margins) decrease as stores (products) are more differentiated. Overall, retail prices increase as products and stores are more differentiated.

P5: Product (store) differentiation benefits manufacturers (retailers) at the same time hurting retailers (manufacturers). Therefore, manufacturers want more product differentiation and less store differentiation, while the retailers want the reverse.

P6: Product (store) differentiation and the manufacturer (retailer) Stackelberg leadership have positive synergy effect on the manufacturer (retailer) profits.

P7: The total profit-maximizing combinations of product and store differentiations are not stable because each channel member has an incentive to differentiate unilaterally.”

These results are consistent with the general wisdom that differentiation is used to mitigate price competition and that it tends to produce negative welfare effects. In the analysed case the combined vertical-horizontal competition produces non-stable equilibria that fail to maximize the total channel profit as consequence of the conflicting interests of retailers and manufacturers, and therefore opening the question whether a cooperative solution could lead to welfare improvements. Moreover the sketched channel structure fits the current situation of food marketing channels, either for the double level of differentiation or for vertical power asymmetry that pushes towards non-cooperative vertical forms of coordination; where both the parties seek to seize the leadership (and retailers actually seem to accomplish it).

Avenel and Caprice (2006) model a vertical structure with a vertically differentiated duopoly at the manufacturer level and two retailers who differentiate through the chosen product line (i.e. each of them sell one or both the high and the low quality offered by manufacturers). The focus is on the analysis of the effects of different vertical contractual arrangements on product line differentiation, given different setting of vertical strategic interaction and different levels of costs for quality. Even if this model seems to better apply to non grocery sector (in that the assumption of manufacturer channel as leader and the kind of contractual arrangement that are examined, i.e. exclusive dealing, vertical integration and franchise fee) it can be of some interest for those segments of food market, such as the new functional and nutraceutical products, that imply a vertical differentiation strategy fed by heavy sunk investments in R&D by powerful food companies.

Choi and Couglan (2006) investigate the positioning problem of private labels considering the differentiation strategies carried out by national brands, and the consequent product-line pricing strategies carried out by the retailer. They model a manufacturer Stackelberg game where the manufacturer determines the wholesale price and the quality level of his national brand and the retailer chose: 1) the optimal level of vertical differentiation of her store brand from the national brand, 2) the degree of substitutability between the national and the store brand, 3) the retail margin for the national brands and 4) the price of her store brand. The equilibrium concept is a sub-game perfect equilibrium in which the second stage price equilibrium is reached immediately after the differentiation decisions. In order to simultaneously take into account the effect of horizontal and vertical differentiation the demand function used in the model is derived from a consumer utility function that contains a preference parameters for each product (vertical differentiation) and a parameter measuring the degree of substitutability with respect to other products. The results of the model for the case of two national brands and one store brand suggest that if the quality levels of the two national brands are equal and they are substantially horizontally differentiated, imitating either brand is optimal for the private label. However, when the national brands are allowed to be vertical differentiated, the private label is better off imitating the higher quality brand. Positioning in between is never an optimal solution. In contrast, when the two national brands are horizontally undifferentiated the private label

better response is to horizontally differentiate from both national brands. A consequence of these results is that the more the national brands differentiate, the more store brands carry out imitative strategies leading to head to head competition that pushes national brands towards further differentiation and/or advertising investments. Because high differentiation and advertising investment are sources of market power, these findings are consistent with that store brand literature that have suggested that the anticompetitive effects of store brands can be greater than the competitive ones (Cotteril and Putsis, 2000; Kim and Parker, 1997,1999).

To complete this short review of the main findings attained so far by the literature on differentiation and marketing channels, it is worth quoting a recent study by Ellickson (2006) who empirically applies Sutton's theory of endogenous sunk cost and vertical differentiation to the supermarket industry in the US. During the eighties and the nineties the consolidation process in this industry has been driven by the introduction of innovative automated distribution and procurement systems. If one assumes that the level of concentration is determined by the economies of scale and scope associated with these innovations, as markets grow (and these economies are exploited) the level of concentration should decrease. In contrast in the about 50 spatially defined markets in the US the evidence is of a stable small number of firms (3-6) capturing the majority of the market, independent of the population, with a competitive fringe of smaller retailers capturing a minor share of the market (Ellickson, 2006). Ellickson (2006) builds and tests a model demonstrating that such a structure is a real "natural oligopoly" stemming from a competitive game among the leader firms based on a growing vertical differentiation associated with increasing sunk costs. In his model, supermarkets compete by offering a greater variety of products (where variety is considered as a purely vertical form of product differentiation). This implies larger stores, and therefore larger sunk costs that discourage entry by other firms. As a consequence, quality provided by the oligopolists (proxied by store size) should increase with the size of the market. In other terms high concentration and escalation in quality seem to be both characteristic features of the supermarket industry.

4. Differentiation opportunities in the market for fresh produce

The previous section has shown how, in order to maintain their competitive advantage firms continuously increase their quality effort, either in the horizontal competitive game (manufacturers to manufacturers and retailers to retailers), or in the vertical competitive game (manufacturers to retailers). Once a differentiation strategy has initiated, it continues through time, especially when a quality (vertical) more than a feature (horizontal) differentiation is involved. Consistent with the general findings of the economic theory, the channel literature suggests that vertical differentiation, more than the horizontal one, tends to be associated with high degree of industry concentration and market power. In any case the equilibria (prices and market structures) at any level of the channel depend on a complex interplay between: 1) strategies carried out at horizontal and at vertical level; 2) power asymmetries between upstream and downstream firms; 3) the kinds of governance structures along the channel.

With regards to the fresh produce sector, at least three hints can be drawn on these general findings:

- 1). The sector of fresh produce offers retailers a wide range of possibilities to increase product variety and therefore it can be a core category in the differentiating efforts carried out by supermarkets in the horizontal competitive arena. Examples of fresh produce variety improvement are: new format and packaging; standards- as organic, fair trade, non GMO

and so on-; longer shelf life –through bio and nano technologies or enhanced storage and handling systems-; improved technological foods –functional and nutraceutical-; IV Gamma products, de-seasonality, (i.e. making seasonal products available throughout the year); typical products with an origin denomination; ethnic products.

2). Because the main fresh produce suppliers do not generally have their own supplier brand, in their differentiating strategies retailers do not have to take into account strategic reactions by the upstream counterparties; and hence are more able to entirely appropriate the competitive advantage stemming from the differentiation.

3). Because of the general weakness of the fresh produce sector structure, retailers can easily assume the leadership of the channel and therefore impose transaction governance forms that can accomplish the following goals: maximizing the channel profit; giving themselves the power of appropriating the larger share of the profit; leading suppliers to comply with retailers' differentiating strategies without a real vertical contractual integration.

5. Fresh produce markets and distribution in the UK and Italy

The multiple chain retailers dominate the market for fresh produce in the UK; they have the biggest market share in fresh fruit and vegetables providing 84% of all UK retail sales. There is steady growth in value sales of fresh produce in the UK, which marks it out against a general decline in most food commodities. This trend partly reflects the changing shopping habits of UK consumers but is also driven by the proactive role the supermarkets have taken. The multiples are keen to develop their profile as suppliers of healthy eating products but are also using various strategies to drive interest in the fresh sector, such as introducing exclusive new varieties or introducing new packaging. Mintel (2005) identify 'interest in fresh produce source and origin' from consumers, but however, note that price most often determines purchase decisions, with supermarket competitive pressure forcing price and margins down. The 'Everyday Low Pricing' (EDLP) strategies used by retailers have kept prices down across many basic categories. Such strategies enable the supermarkets to be seen to be offering value for money when compared to competitors. Building value in the fresh produce sector is difficult, price therefore remains the main differentiator for the consumer; and the essential nature of some products also means that some fruit and vegetables have been vulnerable to retail pricing strategies. However, branding and product differentiation will be of key importance to growth and adding value to the market. On this evidence, differentiating foods as being local and/or regional could therefore be beneficial to producers when marketing their produce and should enable them to obtain premium prices.

There is relatively little supplier proprietary branding in the UK fresh produce market, the availability and seasonality of fresh produce make it difficult for supplier branded produce to retain an on-shelf presence. Retailer own-branding has been of key importance to the development strategies of the multiples, who have segmented the fruit and vegetable market with their (for example) good/better/best/organic own-label ranges.

In the UK, supermarkets (both directly and through their intermediaries) set both the agenda and the price for the rest of the supply chain. UK Growers feel that the price control exerted by dominant multiple retailers is having a profound effect on their industry, and are again looking to both new markets and external agencies for support on this matter. In the UK differentiation takes place in the vertical competitive context.

The UK fresh produce supply chain has undergone numerous changes in the last decade, with large supermarket retailers becoming increasingly powerful. The implementation of modern business practices has helped improve efficiency in the UK fresh produce supply chain. This has allowed the chain to break out of the commodity trap and take the fresh produce category out of the commodity trading environment (Fearne and Hughes, 2000: p. 120) by means of innovation and value creation (White, 2000). The overall trend is towards the UK fresh produce industry being dominated by a few large corporations operating on a national level, with some corporations even operating on a European or global scale. Most recently, the takeover of one of the largest UK food retailers, Safeway by Wm. Morrison, has resulted in four major supermarket chains (Tesco, Sainsbury, Wal-Mart-Asda and Morrisons) accounting for three-quarters of retail grocery sales (IGD, 2005). Tesco take a third of the value of UK grocery sales alone.

A further development has been a change from market transactions to market relationships, networks, and interactions (Bourlakis, 2001; Kotzab, 2001). From the retailer perspective (and largely initiated by them) has been the development of Category Management (CM) as a key managerial tool. O'Keefe and Fearne (2002), for example, contend that their analysis of the application of category leadership in the fresh produce industry by UK retailer Waitrose shows that it is possible to successfully apply an integrated network-based relationship approach to what was considered to be a commodity sector.

CM (where a preferred supply takes greater responsibility for the entire supply chain of a given product category) has become universally applied by retailers. The premise is that CM facilitates greater levels of collaboration in vertical supply channels and underpins relationship development (Barnes et al., 1995). This occurs where a single (lead) supplier organizes the supply (from all the suppliers) of a given product category to the retailer. However, such initiatives are seen by some to be simply moving risk and cost onto the supplier and away from the retailer (Allen, 2001). This is an argument put forward in Dapiran and Hogarth-Scott (2003) who contend that the development of CM has not necessarily increased cooperation in supply chains and can be used by retailers to reinforce power and control.

Retailers are looking for fewer and larger suppliers who can work with them in vertical 'partnership' (Hingley, 2001; White, 2000). This approach delivers considerable advantages for retailers, in that they can influence entire food channels for given products through singular dyadic interfaces with nominated channel leading intermediaries, or 'Super-Middlemen' (Hingley, 2005a). Reducing the number of points of contact for supply not only derives benefits in terms of transaction cost savings, but also relational benefits in dealing with fewer but closer 'partner' suppliers. This has resulted in an overriding trend towards supply chain concentration of a market determined by the standards of large-scale retailers.

In Italy fresh produce accounts for more than the 24% of the total value of agricultural production (valued at prices received by farmers), and contributes to the positive part of the food trade balance sheet; with a self-sufficiency rate equal to 114%. Notwithstanding this positive data, the Italian fresh produce industry is in the middle of a deep crisis. In his last report on the industry the CIA, the main farmers union (CIA Nuova Agricoltura, 2006) reported the loss of Italian leadership in the European market. During the last ten years the Italian share of the total fresh produce markets of European partners (EU 15) has continuously decreased, meanwhile imports into Italy registered a sharp increase of +56% from the EU-25 and of 112% from outside the EU. The loss of competitiveness has been due to the enduring weakness of production structure (small firms) and to poor logistic structures compared with the recent consolidation and innovation processes within Italy's traditional competitor, Spain; and in the new fresh produce specialized countries, Egypt,

Morocco, Tunisia and Turkey. Also, new entrants to the European fresh produce market like China, Chile, Argentina and Uruguay seem to be stronger on the both levels of structures and organisation.

When asked how to overcome this crisis and recover a leading position in the domestic as well as the export market, farmers associations, experts and public officers of the Ministry for Agriculture, all give three simple answers: horizontal integration at agricultural level for achieving network externalities in the production and selling activities; quality improvement and better exploitation of the comparative advantages Italian producers have with respect weather, natural conditions and product variety; better relationships with big retailers that sell more 60% of the production and are the only actors in the distribution channel that actually can “persuade” consumers to reward the Italian product.

Differentiation strategies by leading supermarkets along with a preference for Italian suppliers could help Italian farmers to exit the crisis. Evidence from both consumers’ attitudes and retailers’ marketing strategies seem to indicate that this is a practicable way. It is interesting to note also that collaborating growers in Southern-Italy are taking the branding initiative in fresh produce, whereby most recently in Sicily, a consortium of Sicilian fruit growers from the Calatino South Simeto District have unveiled a new brand - Puraterra. The name is a reference to the pure soil and the high quality of the organic produce, cultivated on a total area of 100,000 hectares. Blood oranges, grapes, cactus figs, peaches and artichokes will be supplied under the new brand (Anon, 2007).

A recent survey by INDICOD (<http://www.indicod-ecr.it/>) on consumer preferences for fresh produce shows at least five notable attitudes:

- 1). As regards product attributes consumers rank this as follows: i. sensory attributes (taste, appearance and smell); ii. price; iii. convenience (time and energy saving in food shopping, storage and preparation disposal); iv. origin and traceability.
- 2) As regards organic products, almost half of the sample bought these at least once in the last month.
- 3) When explicitly asked, 65% of consumers disclose their preference for Italian products.
- 4) 60% of consumers in the sample are happy with the non-packaged, unbranded display of produce with free service but would like to receive more information on origin and product characteristics.
- 5) Young women in the sample are strongly interested in convenience attributes of produce, with a high willingness to pay for it.

Currently in Italy the market for produce is led by supermarkets, nevertheless with a still large share (about 38%) covered by traditional trade. Over the past fifteen years supermarkets carried out a price-based competition, enhancing procurement efficiency (mainly by operating their own distribution centres) and shrinking suppliers margins. This led to the substitution of Italian suppliers (with poor production structure and management capability) with foreign suppliers (mainly Spanish) that better fit buyer organisational and cost needs. Nevertheless some changes recently occurred with a growing attention for differentiation and local procurement policies.

Currently, about 55% of the Italian grocery market is covered by 5 groups with the following shares: Coop Italia 17,1; Carrefour Italia (with four different flags/formats Carrefour, GS, Diperdì, Docks Market), 10,4; Auchan, 9,6; Conad, 6; Esselunga, 8,3. (source: Food, 2006, La mappa degli ipermercati e dei supermercati in Italia nel 2006 Dati IRI, Milano). During the last ten years all these leading groups, except Auchan, launched an own-branded line of high quality fresh produce, and an own-branded line of organic fresh produce. Moreover both Carrefour and Conad started a line of Italian traditional product

(“Terre d’Italia” for Carrefour, and “Percorso Italia” for Conad) and all increased the offer of IV gamma products (fresh cut, prepared, dressed, ready-to-eat), with a growing range and larger display.

Summarising the Italian market for fresh produce, according both the consumer attitudes and the consequent supermarket strategies, there seems to be split between an unbranded/undifferentiated segment, where sensorial attributes and price are the key leverages of competition, and a highly differentiated/ semi-branded segment; where quality, variety, origin, convenience, and every sort of added value are the keys elements for obtaining premium prices and competitive advantages. The second segment, of course, might be the one interesting for Italian growers struggling to maintain their market shares.

6. Methodology

It was decided to approach the question of product differentiation in vertical channel structures using a single dyadic case approach, in which a primary producer is engaged in ‘partner’ supply to a principal CM intermediary for channel leading multiple retailers. It is believed that this constitutes the most appropriate method to emphasise detail, depth, and insight, as well as understanding and explanation (Patton, 1987; Sayre, 2001). In this research we used semi-structured, personal interviews that allowed access to respondents’ thoughts, opinions, attitudes, and motivational ideas. The two organisations which form the key vertical channel interaction were selected for their ability to contribute new insights, as well as in the expectation that these insights would be replicated (Perry, 1998). The cases were selected for reasons of being typical examples (Miles and Huberman, 1994; Patton, 1987) of fresh produce supply (the grower) and fresh produce category management intermediary (the buying and value adding organisation in ‘partnership’ with multiple retailer customers). Interview questions were standardised around a number of topics (Dibb *et al.*, 1997). Questions were kept deliberately broad to allow interviewees as much freedom in their answers as possible (Glaser and Strauss, 1967). The findings are taken from the words of the respondents themselves, thereby aiding the aim of the research, whilst gaining much more information than would have been available from alternative research methods (Corbin and Strauss, 1998). Within-case analysis involved writing up a summary of each individual case in order to identify important case level phenomena.

The principal areas for exploration identified in the preceding literature are:

- The impact of vertical competition on channel coordination
- Competitive advantage through value-adding in vertical chains (cost leadership and differentiation strategies through branding, production and technological systems and seasonal variation opportunities)

7. Case analysis and findings

The two halves of the vertical-channel dyad are as follows. FP Marketing (name changed for reasons of anonymity) is the central marketing organisation for its own and associated growers produce against customer programmes and is based in the UK, with an annual sales turnover of over 100 million euro. It co-ordinates crop production and volumes both in the UK and overseas and supplies consolidated and value-added (packaged) fresh produce to large multiple retailers in the UK, under retailers’ own-label. 90 per cent of their business is in supply to UK multiple retailers, the remainder constitutes product that does not meet retailer specifications, and is marketed to UK wholesalers or processors. The group also has its own transport company. The product range is protected (e.g. glasshouse) fresh produce crops (tomatoes, cucumbers, peppers and so forth) from UK, Northern and Eastern Europe and the same range from protected/ unprotected sources in Southern-

Europe. The emphasis for this study is on tomato production and marketing and the vertical relationship of a tomato producer and value-adding intermediary to multiple retailer customers.

FP Grower (name changed for reasons of anonymity) is a Southern-Italy based family grower business of some 20 types of fresh produce, most notably tomatoes, and has an annual sales turnover of 10 million euro. They have 180ha, (80ha glasshouse and 100ha open field, in order to manage demand throughout the year). They grow and undertake primary value-adding functions (washing and basic packing in preparation for delivery). Their principal dedicated and 'partner' customer is FP Marketing. 60% of their product goes to intermediaries like FP Marketing and 35% direct to retailers, with the remainder 5% to wholesale markets. 80% of FP Grower's customers are overseas (UK, Austria, Switzerland and Germany). FP Marketing does invest some funds in varietal and agronomic development in Southern-Italy, but own no means of production in the region. The two organisations concerned in this case analysis are, therefore, separately owned and managed. Interviews with FP Marketing concerned the Commercial Director (CD), and Development Director (DD), and interview with FP Grower concerned the Commercial Director.

FP Marketing are a Category Management (CM) supplier to UK multiple retailer chains. As the CM process has evolved in the UK, their principal retail customers have pushed FP Marketing to focus and category manage the supply of fresh produce protected crops, hence they have foregone their interests in other crops (for example, in leafy salads); but have gained business in (notably) tomatoes. This meant that FP Marketing was able to expand their remit, responsibilities and sourcing of tomatoes on behalf of their predominant retail customers:

We have got Northern European growers, right the way from Belgium to the UK. We have now expanded into Poland for new sources, and that covers the UK seasonal supply/demand. FP Marketing (CD)

What the CM system does is allow retailers to co-ordinate category supply through category leaders like FP Marketing. The intermediary organisation benefits from more business, but must take on an enhanced role and associated responsibilities, and this is becoming increasingly expensive for suppliers. However, FP Marketing does see this as part of a (service based) value-adding process:

...we have to provide services; we have to provide more resources. That is our added value to the customer, we supply all that technical (input), the agronomists, the ideas, the trials, the NPD, all of this development. There is not a charge for that. FP Marketing (DD)

Multiple retail chains will specify quality assurance through determination of produce from accredited sources. These are normally European baseline production standards, environmental growing conditions and so forth; and different customers in different countries may expect variations by different accredited standards. FP Grower, for example, offers four types of certifications including EUREPGAP and is trialling a limited acreage of organic certified produce. With respect to further utilising quality and production systems as a means of market differentiation, UK retailers have developed their own further standards, additional to or inclusive of baseline accreditation:

(Named UK retailer) have got a (named variety of) Cherry tomato, and we grow that for them. And (a) particular grower has got (additional) standards in his greenhouse. Normally it is EUREPGAP standard throughout the industry, but (named grower) has gone the next

level which is (named retailer's standard). This is the next level in terms of technical excellence. FP Marketing (CD)

Production and quality standards are also important to FP Grower, but he sees that variations in environment standards/ as well as other areas such as diverse labour laws not controlled by retail customers, as frustrating and undermining:

...foreign competitors (growers in other countries) take advantage from different labour regulations and different pesticide/use regulations, without a real policy of price and quality transparency being carried out by retailers. Product from (named countries) with low food safety standards is arriving... and sold in Italian supermarkets without clear information on its origin. FP Grower

The CM role for FP Marketing includes managing the seasonal supply of product that takes in Northern European protected crop (as described above), but also that from Southern Europe. Equally important is devolved responsibility for product differentiation. Access to Southern-Italian tomatoes (typified by that produced by FP Grower) allows this differentiation. This region is notable for vine ripened tomatoes. These are specific variety, late-harvested (left on the vine until very red, mature and full-flavoured). This source allows distinct advantages in variety, climatic conditions and grower expertise not possible in Northern-Europe in order to produce a product with distinct taste and flavour advantages:

...generally (the advantage is a) combination of better growing conditions, lower growing costs and the growth technique, the tomato speciality technique.....by harvesting something on the vine you can take it to the next stage of maturity it will give it that extra shelf life and flavour and life advantage.... The flavours and varieties they (Southern-Italian growers) are producing are market leaders. FP Marketing (CD)

The motivation of FP Marketing is to try to add-value to the products it supplies to supermarket customers in order to avoid the 'commodity-trap' of being in an unbranded business, in which retailer own-label is the predominant identity:

In commodity areas supply is far greater than demand and by their nature supermarkets will use that against us. So, we work to try and put identity to products.....and try to add value to it, and try and raise awareness with our customer. We look at varieties and taste, we try not to be in value and standard (retail lines), our ideal aspiration is to be in 'special' and 'finest' (retail lines)... because you can get a higher value for it. FP Marketing (DD)

Remember all of our products are our customers', (retailer) own brand, there is no identity of our company. It is a way of promoting the grower, the variety, the techniques they are using and most importantly, the flavour. The flavours and varieties they are producing are market leaders. FP Marketing (CD)

It is interesting to note that FP Grower does not share the FP Marketing's emphasis on product specialisation based on regionality. This may be a matter of perspective, where FP Marketing are sourcing produce from many countries, varieties, types and production methods; and FP Grower sees his produce as simply tomatoes determined by:

...general quality standards and procurement accountability. FP Grower

FP Grower's motivation is to find a wide market for his produce, whilst FP Marketing, with their CM-based interaction with retail customers identifies opportunities for sub-branding by regional identity:

We have now got customers (i.e. UK retailers) who are even putting grower's names on the packs. FP Marketing (CD)

I think (that) they (UK retailers) see (sourcing from) Italy as a way of adding value.It is all a way of trying to sub-brand down to the grower. FP Marketing (DD)

In this way, retail customers' (through the expertise and packaging operations of FP Marketing) in the UK are keen to differentiate for both UK and overseas (for example, Southern-Italian) produce as a means of further value-added.

In terms of branding, FP Grower does have a named identity, but as this is mainly used as an identifier on outer cases for wholesale and intermediary customers, brand identity does not appear on pack at retailer level; and if there is pack identity it is with the retailer's own-label brand. FP Grower's customers collect product (using their own transport arrangements) from them at the farm, which is packed 'on demand' to customers' specification. As a result FP Grower does not benefit from directly attributed brand identity. FP Grower's principal customer, FP Marketing is responsible for all of the value-adding in terms of packaging and on-pack marketing for UK retail customers. FP Grower puts loose raw material (tomatoes) into plastic returnable trays. This is collected by FP Marketing's own transport to take the produce to the UK. It is there that further value-adding takes place in terms of consolidation, grading and packing into punnets to the specification of specific retail customers under their brand identity. So, FP Marketing also does not have brand identity on-pack; value-adding for them is derived from the kind of service elements described above (continual sourcing throughout the seasons, new varietal sourcing, consolidation, packaging, NPD and so forth).

The vertical channel arrangement between FP Grower and FP Marketing, does offer FP Grower something that they do not have from other customer sources, and that is a contractual agreement:

....we have full exclusivity with them (FP Grower)... in (for supply to) the UK. FP Marketing (DD)

FP Marketing are supplied exclusively with tomatoes on the basis of an annual contract. The contract is signed in October before planting, and delivery of the product is from March until the following October. FP Grower

As a result, FP Grower is happy with this arrangement as it provides security of business that is not forthcoming from other customers, who provide regular business, but not price stability:

FP Marketing is the only customer who buys through contract. Other customers just order product when they need.....for every order there is a price negotiation. The price is not stable because when products come from abroad (Spain and Morocco)... (FP Grower is near to ports in Southern Italy) ... the price falls suddenly, leaving no bargaining power. FP Grower

The arrangement with FP Marketing is much the preferred way of doing business for FP Grower, as they are worried about:

The excessive power of retailers who are not interested in collaborative agreements but only look for lower prices and higher margins. FP Grower

This may be a further reason why FP Grower has not developed customer markets dedicated to varietal type, production method, or regional association; as these things are more difficult to achieve without further contractual/ collaborative agreements. However, FP Grower is looking to expand through exploiting seasonal gaps with 'UK customers interested in winter production' and to add service value through 'further quality and logistic improvement'. They also have more long-term thoughts about horizontal and vertical integration of their own, through producer collaboration with other growers to sell direct to the public; via retailing of a producer group's own range of produce.

Vertical co-ordination through a CM type system does have clear advantages for primary producers like FP Grower and intermediaries like FP Marketing, through the consistency of a planned contractual arrangement. As this further develops, this can allow further market differentiation (through, for example, production method or varietal specialisation or emphasis on regional identity). However, control remains firmly in the hands of the multiple retailer customers, whose name and identity value-adding services are conducted in:

.....supermarkets are very cute (clever), they outsource some of their work to us... We do their work for them, whether it in inventory, in marketing, in procurement. We are continually doing that, so it is a cost that we are bearing, FP Marketing (DD)

Fresh produce is still very price sensitive and commodity suppliers/ supply chains substitutable, and it is easy to enter the commodity fresh produce market in supply to retailers:

It (CM) is very beneficial, but that does not take away from the fact that we live and work in a very marginal (profit) industry. FP Marketing (DD)

But CM based supply does, in return provide some security, as it allows intermediaries and primary suppliers to add-value through service. Most of the value-adding services are conducted by the intermediary (in this case FP Marketing) and that allows:

.....more ownership of the business. FP Marketing (DD)

FP Marketing do acknowledge that there may be scope for more of these value adding activities to take place closer to the country and point of production:

If they (growers/ grower groups) were able to produce a finished article in Italy, pre-packed in a plastic tray, then you (they could) start driving costs out of the business. FP Marketing (CD)

From this point Italian growers/ grower groups could exploit Italian retail demand for value-added products:

If it works for us (value-adding) in Northern Europe, why should it not work in the home market? And it is closer, the costs are lower, they can deliver into those markets (within Italy) a lot cheaper. FP Marketing (CD)

However, FP Marketing are quick to point out that to supply the retail market outside of Italy, for example the UK, it would be much harder to replace what they do in terms of providing the consolidation (and all that requires in carrying a continual, multi-seasonal and vast range of products and sources); and all of the value-added services that large UK retailers' require.

8. Concluding remarks

The current competitive structure of the food system is such as to give strong incentives to differentiation strategies. Evidences from the economic literature on market differentiation suggest that the degree and the kind of differentiation (vertical/quality versus horizontal/feature) in the food marketing channel will depend on several interplaying factors: form and preference parameters of the demand function; competitive pressure at vertical and horizontal level; forms of vertical governance structures; power asymmetries between upstream and downstream firms in the channel. In any case differentiation is likely to be associated with high degree of concentration and market power.

A theoretical general finding is that equilibria in differentiated markets are not stable and that a welfare assessment is difficult given that the net welfare effect of differentiation depends on the degree of market power (and the associated monopoly inefficiencies) owned by firms at equilibrium, the consumer preferences for differentiated products and the form of the differentiation cost function.

With regards the market for fresh produce it has been shown that a differentiation strategy in this sector might benefit retailers more than in other sectors, due to the absence of brand policies (and consequently of vertical conflicting strategies) by suppliers. Results from the presented case study seem to be consistent with the theoretical findings. In the sketched marketing channel made of the vertical channel interface between 'FP Grower' and 'FP Marketing' and the final retailer, the retailer is the leading actor of the differentiation policy and the one who mostly benefits from it. In the analysed case, it is identified that higher product differentiation can add value to the channel value. As predicted by the theory, the differentiation strategy can be carried out because the power asymmetry in the channel favour the party (the retailer) who possess the resources (consumer and market segmentation information, economic strength and managerial skill) required to making the differentiation policy succeed. The theory also predicts that the vertical governance form must be such as to give sufficient incentives to upstream channel partners to comply with the retailer differentiation policy. In the example, the performed annual contractual arrangement gives growers a benefit, in term of sales planning and assurance; which offsets the relationship disadvantages due to the retailer's buying power. The channel organisation also leaves the marketing intermediary (FP Marketing) the right incentives to incur the specific investment requested for the success of the differentiation policy.

A general result of the study is that when retailers engage in product differentiation it is more likely that the terms of channel relationships shift from collaborative to competitive types with the power imbalance (Sodano, 2006) becoming the disciplinary means by which vertical coordination is achieved and maintained. As a consequence the relationship marketing idea that channel partners look for equitable collaborative relations seems to be contradicted by the evidence that "it may be wise for suppliers to accept some inequity as the cost of doing business" (Corsten and Kumar, 2005), especially when smart large retailers carry out successfully competitive strategies with positive spill over effects on the upstream firms. This viewpoint is concurred by Hingley (2005b) in analysis of fresh food chain supplier-supermarket relationships, where acceptance of channel asymmetry is advocated. Following this, the question to be answered is how much power is allowed for in the system without being a threat for the general social welfare and how to assess the anticompetitive effects of power imbalance in the channel in antitrust contexts?

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Ecological characteristics and new competitiveness strategies in fresh vegetables market

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Summary

The intense process of internationalisation of the food market is giving rise to new competitive scenarios. The growth of market shares by new export countries, along with other consumer and retailer's issues impose different marketing policies for agri-food products. In particular, a wider awareness of consumers for environmental and health issues is modifying the structure of demand for fresh products. In the past, the country of origin and a convenient quality/price ratio were the main strategic strengths for gaining and maintaining international market shares. Nowadays market shares are gained by moving towards new product attributes, namely environment friendliness and food safety. This paper aims to suggesting new and more successful marketing strategies. The case study is the German market of cherry tomatoes. An analysis of German consumer preference was performed on stated choice data. Results provide interesting insights. Product attributes related to the environment are found to be relevant. As these are defined as "faith" attributes, we speculate that German consumers refer to product origin country as a proxy of its environmental aspects. Two separate competitive segments emerge, one with a higher level of environmental quality (Germany and Italy), and Turkey, Spain, France and Holland. Finally, results point out how policies need to be redesigned and focused on new and more complex issues expressed by consumers in modern and developed markets marketing.

KEYWORDS: competitiveness strategies, cherry tomato German market, environmental friendly, fresh vegetables, Mixed Nested Logit

1. Introduction

The process of intense internationalisation of the food market is giving rise to new competitive scenarios, mainly concerning quality products. A growing concern of consumers for environmental friendliness and health issues is slowly changing the structure of demand for several goods, including that for fresh products. Up to a few years ago, country of origin and a convenient quality/price ratio were the main strategic strengths for gaining and maintaining quotas in international markets. Nowadays, the important role played by new retailers is orienting the market towards new product attributes. This, as a consequence, affects market shares distributions across the largest conventional export countries.

In the present study these issues are tackled with the aim of suggesting new and more successful marketing initiatives for producers facing these changed market needs.

The case study concerns the German market of cherry tomatoes. Germany is a large importer of fruit and vegetables and its market shows the features described above. In the paper we present results derived from a two-step analysis conducted in Germany and

focused on survey data. The first step of the analysis is centred on focus groups run in representative cities. This phase shed some light on German consumers' preferences and opinions on fruit and vegetables. It also provided useful suggestions for the development of the questionnaire and choice set design which were integral parts of the multi-attribute choice survey which made-up the second step of the study. This was administered to a representative sample of German consumers. A consumer preference analysis was then performed by estimating random utility models on the choice data collected in this survey. Product attributes surveyed were: country of origin (Italy, Germany, Holland, Turkey, France and Spain), protected geographic indication, organic production, biodegradable packaging.

Results provide some indications on the development of potentially successful marketing strategy and highlight as a fundamental motivation underlying quality perception the environment friendliness of the product.

As cues related to this product dimension are defined as credence attributes, German consumers refer to product country of origin as a proxy for its "environmental value content". As a consequence, they seemed to perceive two different competitive segments: the first, with a higher level of "environmental" quality, including tomatoes from Germany and Italy and, the second, including tomatoes from Turkey, Spain, France and Holland.

Finally, results point out how policies need to be redesigned and focused on new and more complex marketing issues relevant to modern consumers in developed markets.

2. The Focus groups

A research was conducted in Germany on cherry tomato market characteristics. Consumer's preferences were analysed through focus groups and quantitative models in order to outline choice behaviour and opinion towards products and their countries of origin.

In 2005 4 focus groups were held, two in Berlin and two in Frankfurt. All 39 selected participants were in charge of food shopping in their respective households and half of them had purchased Italian products in the last 6 months or sooner. Participants were equally distributed between sex groups and were distributed in two age groups (between 25 and 44 and between 45 and 60 years old) in each city.

The information that emerged during the discussions outlined the purchasing habits of German consumers' and their preference for Italian products, agro-food in particular. As in most developed economies, household grocery shopping was described as organized on a weekly basis, with the weekly shopping at the big distribution stores taking place during weekends and the daily shopping at supermarket as well as at *delicatessen* shops and street markets.

German consumers' pay particular attention to the environmental aspects of products and this is confirmed by the high importance participants gave to organic products and environment friendly processes. Strictly related to these aspects is considered the country of origin non as a product attribute *per se* but as a guaranty of attention towards environmental issues on the basis of the past reputation enjoyed by the products from each exporter country. From the focus group emerged that some countries are, in fact, generally regarded as reliable in consistently delivering good quality, others have the reputation of producing with high environmental impact via means of intensive processes and deliver mass-produced low quality products. In particular, local products are considered highly reliable because of the efficient national control systems, as well as fresher and less manipulated and more environmentally friendly because of the shorter transport distances (low food miles).

As a country of origin Italy emerged as being generally well regarded amongst focus group participants. Italian products inspire confidence and better quality production, particularly

for the favourable climate condition that makes possible to produce with low-input techniques.

The German market has long been accustomed to Italian products. Indeed, consumers showed a clear opinion about them and their origin: during the focus-group discussions, in fact, no confusion about real and fake Italian brands was recorded amongst participants.

Participants that expressed interest in product characteristics and country of origin emphasized the need for a clearer and more easily recognizable labelling policy, such as the use of a visible trademark assuring the exact origin of the produce. They acknowledge Italian products quality characteristics and appreciate them; however, specifically for fruit and vegetables, local products can benefit from a wider and better distribution and shorter distance to the shelf.

In conclusion, a relative not widespread distribution of Italian fruit and vegetables in conjunction with difficulties in an immediate and clear identification of origin emerge as the actual issues to tackle for Italian producers. A *Real Italian* trademark is suggested as a means to induce more consumers to choose original Italian products.

Nonetheless, only the group of *regular users*, that is individuals using regularly Italian products, declared a higher willingness to pay for such a form of labelling ensuring a genuine guaranty.

3. The survey

For the quantitative analysis, a representative sample of 360 individuals was selected and interviewed. The sample was randomly selected in five German cities: Berlin, Stuttgart, Munich, Cologne and Hamburg (72 each city – Fig. 1).

Figure 1. - Map of Germany with sample location



Face-to-face interviews were conducted in-hall, in public venues in the city centres. Individuals were selected among those who declared to be in charge of grocery shopping and to be consumers of cherry tomatoes. The main sample characteristics are reported in table 1.

Table 1. - Sample descriptive statistics (n: 300)

	Percentage
<i>Gender</i>	
Male	29.10
Female	70.90
<i>Tot</i>	<i>100.00</i>
<i>Class of age</i>	
18 - 29	23.30
30 - 39	33.00
40 - 49	20.70
50 - 59	13.70
> 60	9.30
<i>Tot</i>	<i>100.00</i>

The interview was based on a questionnaire structured in three sections. The first section was focused on purchasing and consuming models for consumers of cherry tomatoes. The importance of some real and immaterial product attributes was investigated in a seven-item Likert scale, going from 1 for “Not important at all” to 7, “Very important”. The attributes considered were organic certification, geographic indication, packaging, if ready to use, taste, transport from farm to shelf, price and growth level.

According to consumer’s answers the identification of the country of origin of cherry tomatoes is not perceived to be a problem. The 78% of them do their grocery shopping in supermarkets and discount stores (Tab. 2).

In fact, more than half of the sample stated that they buy this product at least once a week. Taste, appearance and degree of maturity are the highest ranked attributes. However, none of the attributes listed performed with a rank significantly below 4 (the lowest was packaging with 3.9 - Figure 2).

Italy holds the second best reputation for producing high quality cherry tomatoes: in fact, it is ranked second following Germany (Tab. 4).

Table 2. Percentage of buying location

Alternatives	Percentage
Supermarkets	65.00
City market	19.33
Discount	13.00
Other	2.67
<i>Tot</i>	<i>100.00</i>

Consumers can be generally defined as frequent consumer of cherry tomatoes (Tab. 3).

Table 3 - Distribution of how often interviewers declared to buy fresh tomato

Alternatives	Percentage
3-4 times per week	14.33
1-2 times per week	53.67
1-3 times per month	28.67
less than once per month	3.33
<i>Tot</i>	<i>100.00</i>

Figure 2. – Sample average Likert score of cherry tomato attributes

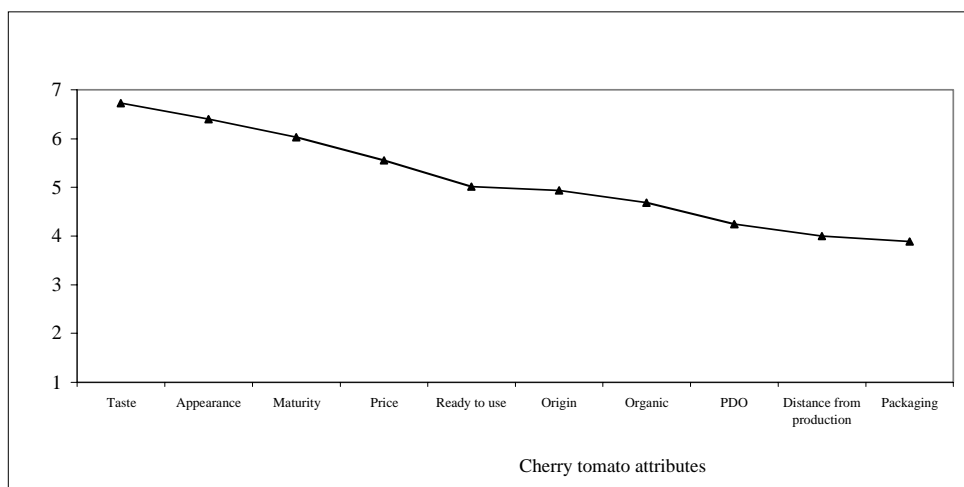


Table 4. - Best origin country of cherry tomato

Alternatives	Percentage
Germany	32.00
Italy	23.00
Spain	21.00
Turkey	9.00
France	8.00
Holland	7.00
<i>Tot</i>	<i>100.00</i>

On the other hand, the majority of the sample ranks Holland as the worst producer for this product. Italy is considered the worst producer of cherry tomatoes only by a very small share of the sample (5%) and the best by a high percentage (23%) (Tab. 5).

The second section of the questionnaire consisted in a choice experiment. Important insights emerged from focus groups led in designing the experiment. Five attributes of cherry tomatoes were considered: country of origin (France, Spain, Italy, Turkey, Holland, Germany), packaging (biodegradable and non biodegradable), European certification of

geographic indication (PDO/PGI), organic certification and the price in Euro/kg (1, 1.5, 2, 2.5, 3). An orthogonal design on these attributes and levels produced 45 profiles, which were then shifted six times according to recent prescriptions in experimental design (Ferrini and Scarpa, 2007). Every consumer was interviewed on three sets, with 6 profiles each. The hypothetical scenario for choice experiment was presented as follows: “*Imagine you are in the shop where you normally buy fruit and vegetables: the following 500 grams packages of cherry tomatoes are available. Would you buy any of them? Which one in particular?*”

Table 5. - Worst origin country of cherry tomato

Alternatives	Percentage
Holland	46.00
Turkey	20.00
France	13.00
Germany	10.00
Spain	6.00
Italy	5.00
<i>Tot</i>	<i>100.00</i>

This approach has the advantage of being cognitively undemanding on the side of the respondent (DeShazo and Fermo 2002). Data from consumers’ response were analyzed accounting for substitutability across different export countries by means of a mixed logit with an error structure design to capture correlation in a similar way to a nested logit, as reported in the next section. Finally, the last section of the questionnaire investigated the socio-economic characteristics of the respondent.

4. Random Utility Model with additional error component

Consumer’s preferences estimation is achieved by means of a random utility model specified on qualitative attributes as described in packaging labels. The RUM model can be implemented to account for varied correlation across utilities of the similar type, but more flexibly than the traditional nested logit (for a general exposition see Train 2003, for details on substitution patterns see HERRIGES and PHANEUF 2002 for performance under misspecification see SCARPA et al 2005). In order to do this mixed logit models are specified with random utility specified as including error components in addition to the conventional Gumbel error. The assumption remains that the chosen cherry tomato is the one maximizing utility in the choice set, hence the probability of selection is linked to the probability of this tomato to provide highest utility across those available.

While conditional on the Gumbel error the selection probability of a type of cherry tomato is logit, the marginal probability requires integration over all the possible values of the additional zero-mean normal errors denoted by $\varepsilon_n \sim N(0, \sigma^2)$:

$$\Pr(U_j > U_{\neq j}) = \int_{\varepsilon_n \in \Omega} \frac{e^{\beta_n x_j + \varepsilon_n}}{\sum_{j=1}^J e^{\beta_n x_j + \varepsilon_n}} f(\varepsilon_n | \Omega) d\varepsilon_n,$$

where $f(\cdot)$ defines the assumed distribution for the additional errors and Ω is a set of parameters determining the behaviour of this distribution. Such probability does not have a close form and hence simulation methods need to be employed for its computation during

the estimation of the parameters from the observed choices. Techniques to achieve this are well illustrated by Train (2003) and need not be repeated here.

As reported in section 3, five characteristics of cherry tomato were used to estimate the choice probability for a German consumer:

1. Country of origin (Germany, Italy, French, Spain, Turkey, Holland), dummy coded using Germany as baseline;
2. biodegradable packaging (YES=1,NO=0);
3. PDO/PGI (YES=1,NO=0);
4. Organic (YES=1,NO=0);
5. Price (in Euros).

Table 6 reports results from the mixed logit error-component model.

According to what expected the coefficient for PRICE has negative sign and is statistically significant: *ceteris paribus*, price increase reduces the choice probability.

German consumers, as highlighted by other authors (Giraud *et al.*, 2007) and discussed in the previous part of this paper, are particularly attentive to ecological characteristics of products purchased: ORGANIC attribute has positive sign, thereby increasing the probability of choosing specific tomatoes. This attribute guarantees, on average, a premium price of 0.72 Euro per 500 grams of product.

Table 6. - Results of the Random Utility Model with additional error component

Variable	Coefficient	b/st.dev	p_value
France	-0.281	-2.83	0.0017
Turkey	-0.101	-1.075	0.2825
Holland	-0.227	-2.32	0.0201
Organic	0.249	3.814	0.0001
Price	-0.343	-7.471	0.0000
<i>additional error component</i>			
IT_D_Org β		fixed	
IT_D_Org σ	0.191	1.319	0.1872
<i>random parameter (normal distribution)</i>			
Spain β	-0.107	-0.927	0.3540
Spain σ	0.428	1.719	0.0856

N.Valid Obs = 359

Log_L = 1840

However, particularly interesting is the role played in consumer's choice by COUNTRY OF ORIGIN. Results of the econometric model, in fact, suggest that the country of origin has a statistically significant influence on the choice but different depending on the country: Italian and German origins have a positive effect on consumer's choice, whereas origin from France, Spain, Turkey and Holland have a negative influence using as reference the domestic production. Nonetheless, Spain is the only country related to which German consumers showed some degree of taste heterogeneity. In fact, the null that this attribute is randomly distributed could not be rejected. The estimates of mean and standard deviation for the distribution of this attribute imply that about 40% of consumers show a positive attitude to Spanish tomato.

Preference towards Italian and German product is confirmed in the econometric model with error components by the presence of a correlated preference structure (common error term in the utilities) that places Italy and Germany together separately from all the other countries: the common error component for German or Italian origin shows a significant estimates for the standard deviation. The reasons underlying this preference are explained by the presence of the common error component in the utility structure of the model which displays a significant standard deviation: the variable *IT_D_ORG*. This represents the spread of the additional error component associated with Italian and German origin, and the event that the chosen tomatoes, came from an organic production technique.

This error component is additional to the Gumbel error and provides the model with a correlation structure similar to a nested model (Herriges and Phaneuf, 2002).

This result suggests that for cherry tomatoes it is Germany and not the other Mediterranean countries that should be considered direct competitors to Italian export, as instead is commonly perceived by Italian trading organizations. That the utility structure is consistent with the interpretation that consumers have an opinion about tomatoes with Italian and German origins which is different from the rest of the origins. Not only do they perceive them as high quality and environmentally friendly products, but they also set them into a different category from those of all the other investigated countries.

In conclusion, the interpretation of the nest is consistent with our understanding of motivations underlying German consumers' preference towards local and Italian cherry tomato, that are the perception of "ecological and territorial" aspects and a greater attention to the environment they associate to productions and producers of these countries.

5. Final remarks

Competitive markets are contexts where valorization and promotion strategies are best implemented. The agro-food sector shows a diversified and continuously evolving framework. For some typologies of products, such as the Italian fruit and vegetables, product differentiation on worldwide markets has been entrusted by means of generic and immaterial attributes often grouped under the "Made in Italy" label.

New competitors, the evolution of consumption and demand models, the increasing relevance of big chain organization have raised the need for generating new strategies of market penetration. A decreasing market share in country such as Germany, which represents one of the wider foreign markets for many Italian fresh products, can be considered as an indicator of how important analyzing Italian strengths and weaknesses has become nowadays.

Such scenario represented the main motivation of this research study. It involved one market (Germany) and one product, cherry tomatoes, which is well known and deemed by European consumers as typically Italian.

The first result obtained concerns a new and unexpected definition of competitive groups which characterize the segment of cherry tomatoes in the German market. That is, it was possible to define, through a RUM model with flexible substitution patterns, the existence of two well defined groups of countries: Germany and Italy on one side, and Turkey, Holland, France, and Spain, on the other side. Consumers deem the two groups as producing two different quality levels of cherry tomatoes. More specifically, a higher quality standard is associated to the first group of countries.

A second relevant result is the characterization of an attribute involved in forming the quality concept in consumer's perception: ecological attributes such as organic.

This attribute, in fact, contributes to give the product in analysis a higher ecological and territorial character when related to country of origin.

Last, but not the least, result is the significant role played by price in German consumers' choice, as cherry tomatoes are a fresh product consumed quite often if not daily.

The described scenario is one in which new promotion and penetration strategies have to be put in place. The results suggest that for Italian export products the direct competitors may not be other export countries, such as Turkey, Holland or France are for cherry tomatoes, but domestic production itself. Modern German consumers look for something more tangible than the “Made in Italy” label because it is considered nonspecific and often self-referential. It seems necessary to attribute to this label a more specific content.

One of the possible strategies might be to satisfy the emerging needs of post-modern society (Fabris, 2005) that are related to a higher need of food safety, and with a low environmental impact of both production and distribution.

A significant effort of policy makers and entrepreneurs must be done in this direction if the lost competitiveness has to be recovered. Such objective, however, must be pursued together with renewed economic and organizational system efficiency. Price plays, as expected, an important role for consumers. So, a higher price would mean losing consumers that might decide to substitute Italian products with the ones coming from the second group of countries that seem are working to get the best quality/price ratio rather than the best possible quality product.

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Food Safety in International Trade: The Spanish experience in Mediterranean products

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Summary

Food international trade between developed and developing countries is increasing as a consequence of the worldwide liberalization movement. Tariffs and technical barriers are decreasing and many exporters in developing countries are ready to supply to developed markets. However there are non-tariff barriers, some of them related to food safety. The goal of this paper is to analyse how some food safety and quality control measures may be overcome by Less Developed Countries following some indications, such as a benchmarking analysis. The identification of “best practice” in operating firms may be useful to others. We describe the evolution of international trade, the situation at destination and origin markets through the international channel. It is important to identify the role of food safety and traceability in food international relations. A case study is mentioned with the analysis of the fresh food export supply in Spain.

KEYWORDS: international trade, food safety, benchmarking, Spanish export supply chain, traceability

1. Introduction

Increasing the agricultural trade between EU and LDC is a challenge as a first step to interact economic and social relations at long run. Besides marketing strategies oriented to consumer behaviour and other elements as liberalization of commercial barriers, there are important factors in order to get efficient import-export relations.

The goal of this paper is to call the attention that quality control and traceability are not discriminatory against developing countries, as they are compulsory for all the products in the EU market. Therefore, agro food exporters towards EU market should be prepared to apply adequate measures of quality control and traceability in their food products.

A short review of food international trade between DC and LDC is presented, with discussion on the problematic points in the food chain. A long-term solution for developing countries to sustain an international demand for their products lies in building up the trust and confidence of importers in the quality and safety of their food supply systems. This requires improvements within national food control systems and within industry food quality and safety programmes.

In this paper we analyse the food safety and quality control with the Spanish fresh food exporting sector as a reference in a benchmarking analysis. As one of the fruit and vegetable leader exporting countries in the world it is of interest to identify some of the main activities in the supply chain. Thus, a field work was carried on regarding both the citrus and tomatoes sectors, and the main results are shown. The study focuses the attention in the identification of key no-compliance areas in food safety and quality, through the benchmarking and traceability.

In order to know the “best practice” for fresh produce safety and quality in food exports chain, it is necessary to implement inspections and certifications.

Summarizing, we describe the situation of the Spanish Export Supply Chain, the characteristics of the benchmarking for safety and quality in the agricultural foreign trade relations. Finally, we include some of the main results and conclusions of the EU project “The impact of international safety and quality standards of the competitiveness of Mediterranean products” (E 01022208), whose research program was developed by the authors altogether with other colleagues from several countries.

2. Characteristics of food international trade between developed countries (DC) and less developed countries (LDC)

The evolution of International Trade (Figure 1), during the last decades, shows us how agricultural products are less dynamic than manufactures or energy, and yearly variations (Figure 2) are in general lower than the others. However, even agricultural trade is about 10 per cent of the total international trade, it has a strategic position and the negotiations in WTO, are quite often dependent upon the agreement on agriculture.

Less Developed Countries and the non-Governmental Organizations on Development (NGOD) are making a special emphasis in opening the borders of the rich countries and allow the entrance of products coming from them, with the conviction that it will impel the development. Even though is a good starting point, (and could be considered necessary), it does not guarantee that a desirable economic development would be reached. Other requirements, frequently forgotten, must be fulfilled.

Thus, it has to be taken into account the efficiency of the commercial chain which goes from the producer of underdeveloped areas to the consumer of rich countries (Camps, T. 2004). Any failure in its steps can imply a discontinuity in the supply or an abuse of dominant position of brokers who take great part of the benefit. Thus, the experience shows that even in Developed Countries a collapse in the prices perceived by farmers is not automatically reflected in the equivalent fall in consumers’ price. For that reason, we must consider the scenario as a whole and consider that the added value generated by the possible liberalization of markets in rich countries must be addressed essentially to help marginal areas and needed population. Otherwise, with a mere agreement on reduction of tariffs we have only covered the first stage.

We will focus our attention on three scenes: the destination market of the product, the origin market and the union channel of both (Briz J., Trueba I., 2006).

Destination market

In a market liberalized of quotas and tariffs, the products from LDC will find several problems, (e.g., Non Tariff Barriers, NTB) derived from exigencies in quality and food safety required by consumers. This type of barriers cannot be considered discriminating since the demand is the same for national producers and foreigners. It is the case of traceability requirements that came into effect in January 2005 in the European Union (EU). A different matter is the regulation of bio terrorism in the U.S.A., where the exigencies are applied only to imported products. In the case of the EU, it provides support on equipment and education of experts, so if there are qualified experts in the LDC they can fulfil the controls of quality and traceability in the exports directed to the EU.

Another aspect to consider is the distribution system used. Until now, some products from LDC are sold through Fair Trade logo. This is a good initiative that is consolidating, oriented to a sensible public within the Third World. "It is an alternative trade that offers producers' routes to commercialize their products according to ethical criteria which integrate economic, social and environmental criteria" (Alvarez, D., 2005). Nevertheless, if the imports increase in volume, is necessary to think about the use of regular trade channels able to absorb those amounts in a good relation quality/price. Multinational companies related to retailers may develop a good role, given their commercial agility. It is necessary to consider the participation in traditional channels of wholesalers and retailers to support this initiative.

Origin market of products from LDC

Since the goal is to help small farmers improve their income, they must be the receivers of a great part of the added value obtained by the liberalization of markets in DC. Trade circuits in underdeveloped areas are usually inefficient, with lack of transparency and abuse of dominant position of certain economic agents. For that reason, a good proportion of the benefits may be lost in the way or with fraudulent practices or corruption, which would produce frustration and discrimination.

In addition, farmers oriented to export products are usually the richest ones, whereas the marginal ones are centred in self-consumption or, in the best case scenario, in the domestic market. Consequently, it is necessary to evaluate the opportunity of those poor ones to receive the benefit, for which there are to design support policies, among them: proper distribution of land and other productive factors, the search of market windows, infrastructure improvement in origin markets, transports, storage, in addition to the traditional agricultural extension services.

International trade channels

The logistic, financial and administrative complexity of the agricultural exports, limits the participation of Small and Medium Enterprises (SME's) that in the best of the cases are centred in very specific fields where they have evident comparative advantages. For that reason, this commercial link could perceive great part of the added value, without being perceived by the link of the chain, the farmer. Therefore, it is necessary to impel competitiveness, transparency and application of ethics codes in the companies like the one established on the OECD. Citizens' position can reach success, as it happened with the pharmacists releasing the rights of property for medicines against AIDS in the LDC.

Another aspect to consider in marketing channels is the customs bureaucracy which faces the international trade relations. The discretion of the Administration, slowness of the operations, bureaucratic overlapping and lack of coordination between civil employees and industrialists is added to the existing lack of transparency.

As an example and according to the "United Nations Conference of Tariff and Trade" (the UNCTAD) (WTO, December 2005) a normal transaction in border requires the participation of about 25 agents, 40 documents, 200 data items (a third of which are repeated 30 times). The temporary delay, cost and errors made, are a big weight to carry for the companies, forced to give the merchandise in a determine place and time. According to the WTO, the agility in this transaction could generate up to 0.26% of the GIP of the countries, which almost counts double of the benefits derived from tariff liberalization. The situation is still more serious in the SME's that operate with small volumes, where unitary effects are greater. It all affects to competitiveness in the international scene, mainly to the LDC.

It is important to take into account the importance of food trade in the economic development of LDC, since many programs and plans depend on the income from exports, mainly agricultural.

International trade is associated to globalization and it was analyzed by Prof. J.E Stiglitz, a Nobel Prize of Economy, with great teaching experience, researcher and professional at international organisms. He considers that for Developing Countries, especially Asian ones, the commercial liberalization was being done slowly and gradually. The reduction of its protectionist barriers was implemented after having a competitive national sector, with the capacity to create jobs that absorbed those weaker sectors. The success of globalization is obtained when new markets are created, for those products in which investment and innovation have taken place, making them strongly competitive.

Nevertheless, we have witnessed the problems faced by many Developing Countries, which opened their borders following indications (or almost impositions) of international organisms like the International Monetary Found (IMF), and carried the bankruptcy of companies, destruction of jobs, and weakening of their socio-political systems. As the mentioned author says, some of the most important factors have been the speculative financial movements in short term.

He indicates there is hypocrisy of the western world encouraging the liberalization of their exporting products, but maintaining protectionism of products where they are more vulnerable. As a consequence it has been created a hostile atmosphere towards the globalization in favour of the national sovereignty in economic, cultural and political field, without consideration of the positive aspects.

Food security in the food exporting chain: Basic approach

It is important to distinguish between food security, food safety and integral food security that it includes both.

The *Food Security* responds to the need to have the available food amount at any moment and place for the survival of people. In this area, organisms such as FAO have a relevant role. *Food Safety* has complementary problems, especially concerning developed countries that have preoccupation in health and hygienic (Briz et al., 2003).

Market economy shows that, in a certain way, its operation acts as a safeguard to maintain a certain level of food safety, since companies need to have the confidence of their clients (consumers). Nevertheless, the market does not guarantee enough levels of food safety. On one hand, consumers cannot define exactly their needs and have difficulties in identifying the degree of food safety they demand. On the other hand they do not respond to the enterprise's efforts in food safety, by paying higher prices.

Some firms in Food Industry face unfair competition from other companies that do not respect safety discipline, so they have lower costs. This problem repels to all the companies supplying similar products. It is interesting to highlight that food safety has a wider range, concerning possible negligence. There are social costs derived from the attention of public services, loss of working hours, minor labour yields and global distrust that may cause asymmetric movements in the markets and deviation of natural resources.

Public powers must be involved through regulations, inspection and actions, that guarantee innocuous foods to their citizens. Within these regulations those of the foreign trade are fitted.

In the international field the concerns for the Sanitary and Phytosanitary measures (SFS) has a greater dimension and displays greater problems. On one hand there is a greater heterogeneity in food supply and the regulations vary depending on the country; on the other hand consumers have different socioeconomic characteristics and different levels of communication and information.

That is why it is not uncommon to face problems related with food safety. There are several solutions, from the total cease of trade flows until the problem is solved, direct negotiations between the affected countries, the intervention of international organisms like the WTO and the World Health Organization (WHO), or the improvement of productive and elaboration processes that have caused the conflict.

The process of increasing globalization forces the companies to get involved in the markets of other countries, taking care of the sanitary – hygienic - legislations and of quality in order to attend different consumers segments. Besides the international regulations, companies oriented to foreign countries usually have their own quality regulations, frequently more demanding, if they are positioned with known marks, since any problem is quickly transmitted to other countries.

The operating system and consequent sanitary quality controls in the international relations (Mitchell, L.J., 2003) can follow diverse modalities according to the participation degree and enterprise responsibility. There is the possibility of exporting directly the finished product to its destiny markets or establishing their own factories in other countries.

When an investment is made in facilities and manufactured in foreign countries, companies have the advantage that products are already within the destiny market and do not face commercial barriers. However, in addition to their own hygienic and quality regulations, must fulfil the regulations established by the corresponding governments with respect to processing and manufacturing.

Food sanitary requirements in developing countries

International trade implies an extension of the commercial chain, supplying distant markets at more competitive prices and greater variety of products, with more opportunities for the LDC. Great efforts are being made to open the borders of rich countries through tariff disarmament, without paying attention to the subject of sanitary security and control.

It is important to consider that globalization implies sanitary and quality risks that can interfere in any of the links of the chain. In order to avoid these risks, the opportune controls are required, which means a greater operative cost. Normally, the disagreements in this field are usually solved through the World Trade Organization (WTO) by a group of experts on sanitary and phytosanitary measures without greater consequences. The regulations on quality and food safety are considered to be trade barriers. However, controls and certifications may be an intensification of exchange flows because of the greater confidence of consumers.

Therefore, it is necessary to strengthen international cooperation, where rich countries facilitate to the LDC the economic and human resources that allow the improvement of their control equipment and systems. The EU is aware of this subject and especially in these last years when it has established cooperation projects and studies to identify the main problems and search solutions.

Quality and food safety controls are going to cause discrimination in the market, being fomented by that companies which obtain products adapted for consumption. The effects in the LDC may be important, since companies oriented to exportable products will constitute groups, providing the entrance of foreign currencies, and advantages on those oriented exclusively towards the domestic market. The distortion can be harmful if food production diminishes for basic feeding and affects imports. Therefore a degree of food sovereignty would be lost, depending on the international market with the inherent risks.

In this case, the public powers and the private sector must reach an agreement to obtain the balance between the self-supply and exports. Each country has its own peculiarities and, in any case, a frame must be contemplated including broad, viable and sustainable geo-economic areas that surpass national borders. Also, in destiny markets of developed countries there is an increasing preoccupation for food safety, trying to improve control and information systems (Buzby, J.C., 2003). Previously, food scandals had local dimensions and passed unnoticed for mass media. Nowadays, the complexity of food chains and its amplitude, multiply the risks at world level, quickly spread by the New Technologies of Information and Communication (NTIC).

3. *The role of food safety and traceability in agro food international trade*

Food safety regulation has undergone significant changes in many developed economies during the last decade. Due to the recent developments, some countries have increased their national efforts in maintaining high quality standards and ensuring the safety of food supply for both domestic consumption and export. However, it is recognised that Developing Countries have difficulties in meeting certain requirements associated with the implementation of sanitary or phytosanitary measures and which come in connection with technical regulations, standards and conformity tests (IMF/World Bank, 2002). As more sophisticated governments and industry introduce regulations, there is the risk that new regulatory barriers will be erected. This is of particular concern for Developing Countries, where existing infrastructure may not allow for the adjustments needed to meet new requirements.

In exporting countries with established and organised supply lines, the co-ordination of safety and quality through private retailer supply relationships or through a centralised organisation is possible. Traceability systems for food safety may represent a technological barrier to exporting firms in Less Developed Countries. The process is much more problematic where there are fragmented supply chains, less direct multi-producer relationships with exporters, and less vertical integration in the supply chain. Food systems in developing countries are not always as well organised and developed as in the industrialised world, and moreover, knowledge of standards is often lacking.

Food safety is more likely to be a concern in fresh food product international trade than in other types of agricultural trade (Unnevehr, L.J., 2000). Firstly, since fresh products are transported and consumed in fresh form, handling throughout the entire supply chain can influence food safety and quality (Zepp, G. et al., 1998). In addition, it is the relatively high perishability of fresh produce and the susceptibility to damage and disease pre- and post harvest that imposes high requirement levels for quality assurance. Secondly, standards in Developed Countries tend to be significantly higher than those in developing countries; hence compliance with those standards may require greater initial investment in quality control and health system in Developing Countries. Thirdly, fresh commodities are subject to increasing scrutiny and regulation in Developed Countries where food safety hazards are better understood and more often traced to their sources.

The long-term solution for Developing Countries to sustain an international demand for their products lies in building up the trust and confidence of importers in the quality and safety of their food supply systems. This requires improvements within national food control systems and within industry food quality and safety programmes (FAO, 1999). 'Farm to table' process control to manage both quality and safety is increasingly in demand in developed countries, and new institutions are evolving to certify production practices (Unnevehr, L.J., Jensen, H.H., 1999). Hence, there are market incentives for developing exporters' countries to adapt these management practices, and to co-ordinate safety and quality management more closely with importers.

A key to product quality and safety management throughout the fresh produce supply chain is *traceability*, enabling product tracking and accountability at each stage. Nowadays, the facility to trace fresh produce production and handling practices is required by the importer/retailer complex, and all major operations, from planting to export, must be documented. This approach ensures a better understanding of the steps and conditions to which fresh produce have been subject (Ait-Oubahou, A. and El-Otmani, A. 2000). Traceability requires the identification of all physical entities (locations) from where fresh produce originates and where it is packed and stored.

Due to the globalisation of the fresh produce supply chain and because of the diversity of international produce supply chain practices, the fresh produce sector in March 2001 agreed upon *Fresh Produce Traceability Guidelines* (FPT guidelines). The FPT Guidelines were developed together with the Euro-Handels-Institute (EHI), the European Association of Fresh Produce Importers (CIMO), the Euro Retailer Produce Working Group (EUREP), the European Union of the Fruit and Vegetable Wholesale, Import and Export Trade (EUCOFEL) and the Southern Hemisphere Association of Fresh Fruit Exporters (SHAFPE) to provide a common approach to tracking and tracing of fresh produce by means of an internationally accepted numbering and bar coding system – the EAN•UCC system (EAN International, 2001). The adoption of the guidelines is voluntary and the degree to which companies will implement them may vary because of differences in commercial operations. However, the use of common identification and communication standards will significantly improve the accuracy and speed of access to information about the provenance of fresh produce. Therefore, it is likely that this traceability model will be a requirement for fresh produce exporters in the near future.

As a final word in this section, it must not be assumed that there is an easier commercial option in domestic markets for firms who do not wish to meet the challenges of more sophisticated export markets. There are many reasons besides the ethical and moral imperatives why firms must strive to achieve high levels of performance in respect of safety and quality. Social and economic losses due to poor food safety and quality are probably as serious, if not more serious in developing economies where standards and systems are lower, than are losses in advanced economies (Poole, N. et al, 2002). Improvements in the health and safety of poor people are fundamental to international efforts to achieve the Millennium Development Goals for poverty reduction, as is the development of vibrant food systems where the sector is, or has the potential to be, a major source of employment, export earnings and other macro-multiplier effects.

4. Case study: Fresh agro food export supply in Spain

Spain is the second largest European fresh produce producer after Italy and the largest world exporter. The fresh produce sector represents around 45% of total agricultural production in Spain. It generates over 450,000 jobs, and in several Autonomic

Communities the activity of the sector is fundamental to rural employment (M. Garcia et al, 2003).

During the last years, production and market performance has been very positive but producers are facing internal and external problems. The competitive advantages of Spanish vegetable production are focused on low production costs and out of season production that effectively out-competed nearby community competitors (France, Holland and Italy).

However, these competitive factors have shown themselves to be fragile, in that low prices are important but are not the only determinant element of the consumer's choice and the European markets have been opened increasingly to competition with third countries. In the last decade, the Spanish horticultural sector has been losing competitiveness through an improper modernization of the production and marketing structures.

One of the major problems for the fresh produce sector is the fragmented and small scale production. Within the context of third countries' competition and the concentration of demand (with increasing requirements) there is an urgent need for producer organisations and vertical integration. With this objective the European Common Agricultural Policy (CAP) in fresh produce has imposed the formation of Producer Organisations (OPFH) in order to receive subsidies. In the year 2000 there were 675 OPFH in Spain, with 582 having processing plants, and representing half of the total production value. 100% of banana and tomato firms are organised in OPFH, with 30% in Citrus, 20% in fruits and 7% in vegetables (MAPA 2005). As a consequence, the analysis of the marketing channel and traceability it's important

The Spanish export chain with a long tradition and socio-economic importance may be of interest for entrepreneurs either in other exporting sectors or developing countries. In order to know the "best practice" for fresh produce safety and quality in food export chain, it is necessary to implement inspections and certifications.

Food marketing systems can be viewed as a chain of individuals and firms, who produce, deliver and consume food products. The food chain does not just concern the supply of products but should be viewed as a series of interactive and interconnected flows of goods, services, incentives and information between the different participants in the market chain (Poole, N. et al, 2002).

Notable in this complex model is the concept of feedback effects that tend to make the chain more responsive and efficient. As feedback between firms and individuals occurs, individual decisions to produce, sell and buy become better coordinated. Information flows are the key to firm interaction, and the focus of the methodology presented in this paper has much to do with information exchange throughout the supply chain (i.e., from producers, exporters, importers, to retailers) about standards and compliance. In highly coordinated food markets, it is the creation of information and responsiveness to information that results in the food system delivering to consumers the products that satisfy their preferences. These preferences are influenced by many exogenous factors as well as the subjective influences of the individual decision makers.

The number, size and functions of firms within the food chain, access to market and the competitiveness of the system are structural features. The way firms interrelate and their individual strategies make up the conduct of the system. The outcomes in terms of efficiency and effectiveness are performance characteristics. Efficiency in terms of interstage margins and value addition and firm profitability are common indicators of performance in agrifood systems; of primary importance, however, is the safety of food

products themselves. Improved market coordination is most likely to be one of the tools to improve market performance in respect of food safety and traceability.

Generally, there is high efficiency in the organisation of Spanish exports. Direct connection of exporters with distribution companies give more flexibility and better information through the marketing chain than is seen in other countries. This is one of the arguments that places an integrated marketing process in a better position than wholesale or “veiled marketing” where there is not a continuous producer-retailer experience.

In the last few years in Spain there has been an increasingly concentrated demand in the food distribution chain. Along with the fragmented nature of supply, this causes serious imbalances in the markets, giving exporting companies a weak position in the market. The consequences of fragmented supply to Spanish exporting companies are multiple: it prevents the enterprises from incorporating added value, inadequate design and promotion; it does not permit the exporting enterprises to acquire large commitments; and marketing costs are high which weakens the position of the professional associations and limits their capacity to press the national and EU administration in order to defend their interest and position in the CAP.

In relation to the structure of the Spanish exporter companies, strong fragmentation and spatial concentration are important factors. Thus, enterprises dealing with more than 25,000 tonnes of exports are concentrated in Andalusia, Murcia, Valencia and the Canary Islands. In this last region, the cooperative system has major participation in export.

The cooperative sector in Spain is responsible for about 30% of exports and involvement in the domestic market is probably greater. The cooperative sector includes *Sociedades Agrícolas de Transformación* (SATs) as well as traditional cooperative organisations. SATs differ from traditional cooperatives in that their membership and business is not restricted to a specific geographical area. Figure 3 summarises the main relationships in the fresh produce supply chain for exports.

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If we consider the bigger exporter enterprises, some of their characteristics are:

- Great concentration on marketing activities. There are group of enterprises that have joined activities in the marketing channels through some joint-ventures, either in origin or in destination. There are also groups of family enterprises that maintain a joined marketing management’s functions. Thus, export companies have a great capacity to adapt to market conditions, either to the slow growth of consumption in some markets or to big changes in production and export of new products, such as Iceberg lettuce, broccoli, and Galia melon.
- In general, many enterprises are simultaneously producers and exporters, regardless of the juridical structures. Perhaps, the only exception is Almeria. This kind of integration is one of the most relevant strengths in the foreign trade.
- Strong participation in the regional production of export enterprises, especially in the Canary Islands, Alicante, Huelva, Seville, Cadiz, Almeria and Murcia, in products like tomatoes, lettuces, melon, peaches and strawberry.

- Many export enterprises are trying to orient their activity to greater distribution enterprises. For that reason, they pay special attention to homogeneity, quality, and regularity in the quantities supply, during a long period of time. Simultaneously, they have been able to create alliances with wholesalers and importers in destination countries.
- In the future, we foresee a continuation in the concentration process of the producer-exporter companies, especially in the marketing area, trying to provide adequate logistic and commercial services.

5. Best practice and benchmarking in a more efficient export supply chain

An export supply chain showing 'best practice' for fresh produce safety and quality involves many inspections and certifications. Some of these controls will be carried out by government authorities, both at exporting and importing countries, based on public standards and regulations, while others will be undertaken by private organisations (i.e., third party certification) on behalf of importers/retailers and based on private specifications.

In exporting countries with more established and organised supply lines, the co-ordination of safety and quality through private retailer-supplier relationships, or through a centralised organisation is made possible. The process is much problematic in developing countries when there are fragmented supply chains, more indirect multi-producer relationships with exporters, and less vertical integration in the supply chain.

We have to outline the different stages of the fresh produce export supply chain. Given the scope of this report, the analysis will focus on the control activities carried out in exporting countries, leaving out of the study those activities undertaken by importing authorities in country destinations.

Exporters will receive the produce from their suppliers in an unsorted or partially sorted conditions and requiring further processing (i.e., washing, grading, selection, etc.), and/or packaging. It is essential at this stage that the raw material is safe, legal and meets the standards laid down by the packer/exporter/importer/retailer.

At this stage a number of quality and safety checks will be carried out:

- Produce quality, weight and labels checked for conformance with specifications
- Produce inspected for physical contaminants and mechanical damage, including chill damage
- Need for ripening assessed
- Produce sampling for quality testing specific to product (e.g., sugar content in citrus)
- Produce sampling for phytosanitary purposes
- Produce sampling for pesticide residue checks

Traceability depends basically upon accurate and timely record keeping. The EAN system includes the transmission of traceability data by electronic means, a technology that is not available to all the firms interviewed in this study. The EAN standard bar-coding system allows the identification of all locations where the fresh produce originates from and where it has been packed and stored. Some firms in this study are able to track produce units around the pack house itself using barcode recognition apparatus. Hence a more simplified scheme for best practice could be that followed by ANECOOP, the largest second-tier co-operative in Spain in the fresh produce sector

Carrying out a benchmarking exercise will enable the comparison of the level of implementation of food safety and quality practices, across countries, across sectors and across different sizes and ages of firms, with the identification of key non-compliance areas for exporting companies in the countries under study. The process involves working with those operators considered to be examples of 'best practice' in the industry and those firms with less market share.

In UK industry, a study by the Food and Drink National Training Organisation also used a scoring system in a benchmarking process for the food and drink manufacturing industry. The objectives of this research were to set a benchmark for UK food and drink manufacturing companies to identify and promote world class manufacturing activities, to establish a set of benchmarking criteria founded on international best practice for UK companies to measure themselves and identify areas for continuous improvement and to produce an industry action plan. The key areas looked at were:

- business measures
- personnel and training measures (statistical data)
- skills profiles.

The benchmarking process involved a questionnaire on Business Measures and Personnel and Training Techniques, explored with senior management team during a visit to company and then assessing the skills of personnel on visits to manufacturing operations (García, M. et al. 2003).

Some of the key strengths of the benchmarking process in previous studies, has been the bringing together of participants from companies in various sectors and of various sizes, providing a forum for exchanging information and experiences to help resolve problems (e.g. Andersen *et al*, 1999). In this study, the objective of using benchmarking was to increase the knowledge about the supply chain management process, to identify best practices in the industry and to enable the industrial project partners to learn from the best practice. Studies such as Prado (2001) focus on the face-to-face interaction and teamwork between participants in the benchmarking process, highlighting the importance of the information sharing or dissemination stage of benchmarking. The benchmarking process usually results in the development of a series of actions within each company involved in the exercise.

Thus, benchmarking involves:

- Identification and examination of specific key areas or performance areas in the process under study
- Identification of firms with best practice in the area
- Exchange of information and experiences
- Production of an action plan

A benchmarking framework is given by Shah, J. & Singh, N. (2001):

- Stage 1: Selection of performance measures, depending on the firm's competitive focus, market niche and strategy
- Stage 2: Benchmarking exercise on the firms in the industry, using the selected performance measures. This enables the identification of firms with "best performance" in terms of the selected measures.
- Stage3: Information about specific strategies of the "best performance" firms to be obtained from sources in the public domain. This information can be related to the specific performance measures of the firms.

- Stage 4: Leveraging this knowledge to find what bearing the firms' performance measures have on their specific practices and policies.

For this study, specific performance measures were identified for application across the sectors. By carrying out case studies of exporting firms, the relationship between producers and exporters was examined and a comparison with existing best practice in infrastructure and management practices carried out. In this benchmarking exercise, a qualitative rather than quantitative approach is used to explore each Key Performance Indicators (KPI). This is due to the difficulty of assigning quantitative measures to the supply chain characteristic indicators which are being examined here.

Benchmarking is a tool for improving performance by learning from best practice and understanding the process by which they are achieved. This project in particular focuses on 'process benchmarking' by comparing operations, work practices and business processes in the fresh produce exporting industry in Morocco and Turkey, with those in Spain.

Specific performance measures (KPI) were identified for application across industries. The indicators were decided upon through an examination of the supply chains for each target sector and a study of the areas and levels in which safety and quality systems could be controlled through the supply chain. (Some indicators were also based on EUREPGAP (2001) and Güngör & Güngör (2000)).

Each KPI was explored using questions, which made up a questionnaire for use as a discussion guide during visits and interviews with exporters. A qualitative rather than quantitative approach was initially used to compute each KPI due to the difficulty of assigning quantitative measures to the supply chain characteristic indicators examined in the study. Qualitative data was then classified into three levels. The different elements within each of the three levels in the framework aim to characterise that level, indicating the firm's policies and practices in this aspect, rather than specifying certain criteria, which they must meet. Some points of the framework depended upon a combination of answers in the questionnaire.

The benchmarking project considers several areas for the analysis of food safety and quality management (Table 1). For each area, a number of KPIs were developed comparison in the benchmarking process.

In order to compare the firms involved qualitatively, a framework was developed. This framework followed the structure of the questionnaire, and classified the information gained from each firm into three levels. Some points of the framework depended upon a combination of answers in the questionnaire. For example, "Production flexibility" was based upon the producer's ability to change crops/varieties grown in response to market demands as well as the exporters' ability to source from different producers with different product bases, in order to meet different market requirements. This, itself, is dependent on the producer-exporter relationship, and the nature of the contract between them.

The different elements within each of the three levels in the framework aim to characterise that level, indicating the firms' policies and practices in this aspect, rather than specifying certain criteria which they must meet. For example, classification of production practices in terms of safety and quality management depends firstly upon the actual production practices that take place and, importantly for this study, the exporter's knowledge about these production practices and ability to control them or gather information about them.

6. Final remarks

Evolution of international trade will rely, beside the traditional factors (comparative advantage, cost, price policies) in other less traditional elements, such as food safety and

traceability. Consumers in developed countries, especially in the EU, are very much concerned upon quality control and food scandals. Therefore new strategies should be applied by potential exporters from LDC, in order to get into the EU market.

In the case study we include traceability in the Spanish fresh product export trade as a new strategy in the coming future. Food safety and quality control may allow to get an adequate traceability and thus to get consumer and retailer confidence in the competitive markets. We show in this paper the results of the benchmarking analysis carried on in exporting companies. The identification of “best practice” in leading enterprises may help a better performance to others and facilitate indirectly the traceability of the products

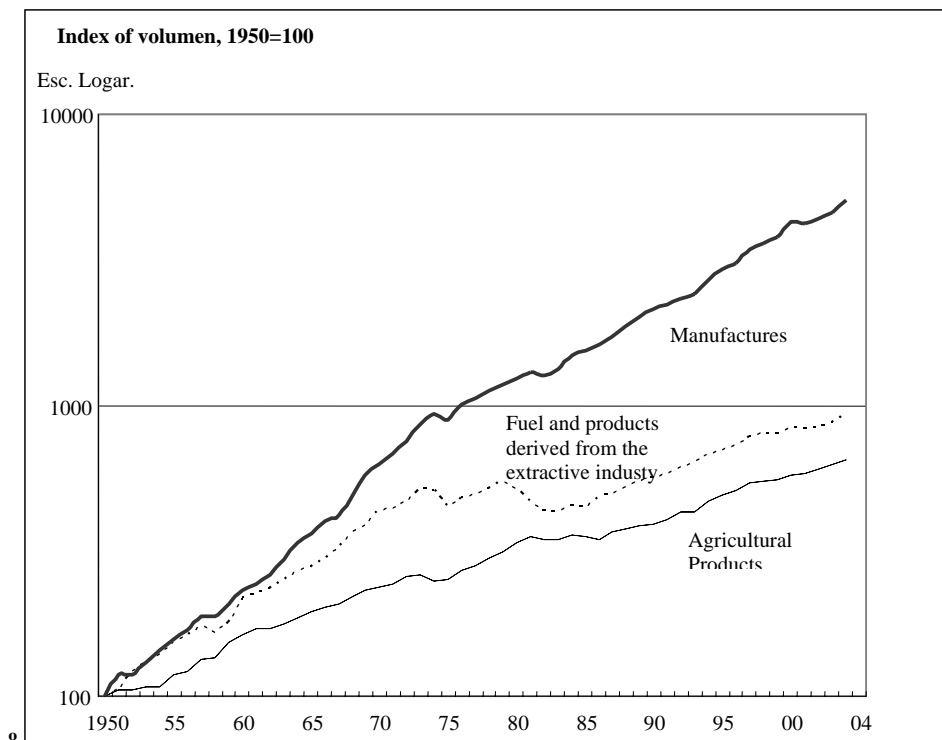
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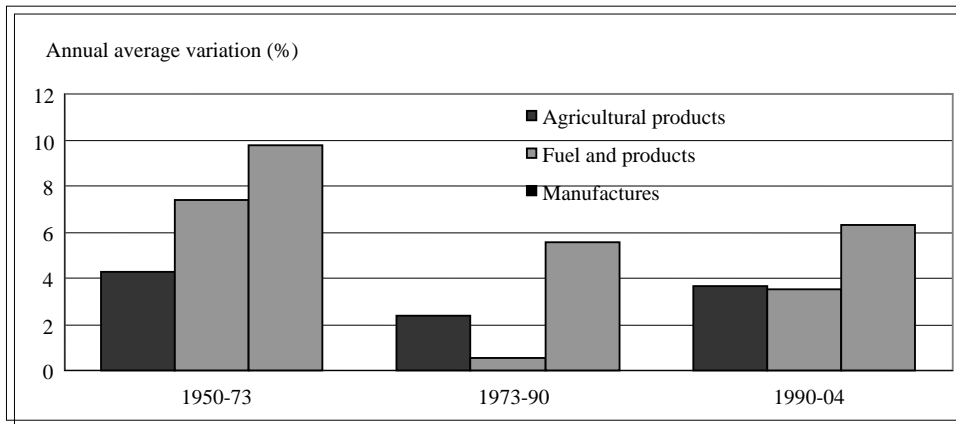
Graphs and Diagrams

Figure 1: Evolution of International Trade



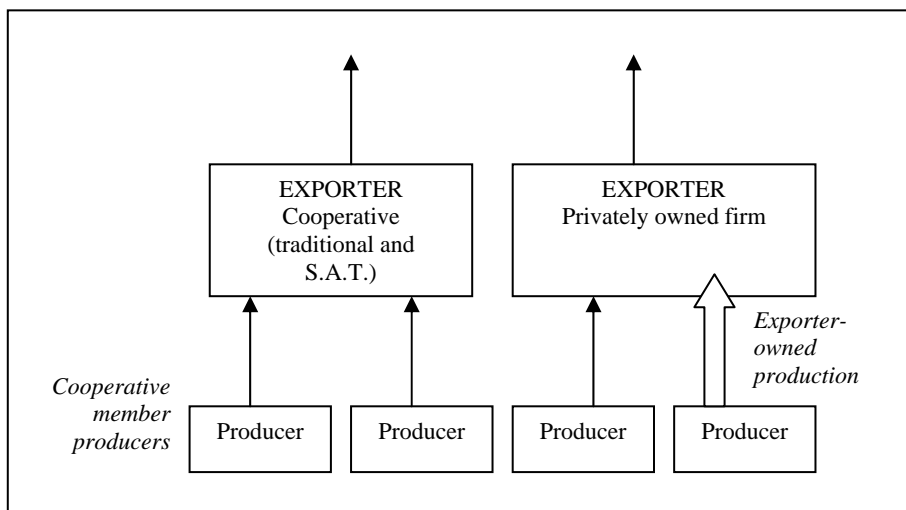
Source: WTO.

Figure 2: Annual Variation of International Trade



Source: WTO.

Figure 3: Spanish fresh produce export supply chain



Source: García M. et al.

Table 1: Key Performance Indicators

Areas of Analysis	KPI for comparison in benchmarking framework
1. Supply base	1.1. Degree of specialisation 1.2. Export volume 1.3. Number of producers and fragmentation of supply 1.4. Varieties 1.5. Forecasting systems 1.6. Production flexibility
2. Supply chain management	2.1. Producer-exporter relationship (Type of producer-exporter relationship, e.g. co-operative, private firm) 2.2. Vertical integration 2.3. Degree of co-ordination of operations 2.4. IT infrastructure and integration for supply chain management 2.5. Customers: Countries exported to 2.6. Customer contracts 2.7. Customer visits
3. Traceability and tracking	3.1. Traceability systems 3.2. Segregation
4. Crop protection	4.1. Producer practices 4.2. Exporter communication
5. Harvesting	5.1. Harvest hygiene 5.2. Harvest quality (Product homogeneity, effect of climate, consistency in production)
6. Processing and packaging	6.1. P&P technology 6.2. P&P quality 6.3. Labelling
7. Storage & Transport	7.1. Exporter storage knowledge 7.2. Storage capacity 7.3. Storage quality 7.4. Transport quality
8. Export Quality Control (QC) Process	8.1. Quality Certification 8.2. QC staff 8.3. Worker knowledge 8.4. Product sampling for QC 8.5. Laboratory access
9. Packhouse worker health, safety and welfare	9.1. Training 9.2. Worker welfare, health and safety
10. Environmental management	10.1. Environmental management

Source: García M. et al.

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Analogous Products and Food Quality Product: Two Poles of the Competition

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Summary

The globalisation of processing industry and the consolidation of the international retail trade, together with the increase of imports after the EU access, supported the competition hot up and saturation of domestic food market.

Both food processors and food retailers are exposed to increasing competition. In order to maintenance on the market they are increasingly pressed to minimize their costs and/or to accomplish higher prices for products with competitive advantage. Besides of that all participants of the agri-food chain are pressed to intensify marketing support of their goods.

Aiming to reduce the costs, some of processors choose the way by the substitution of part of the input material by another, cheaper one. On the other hand, the offer of foods with specific quality attributes such as organic foods, regional marks, specialities or other quality food products is a way, how to surpass the sharp competition.

On the background of the retail network development, of shopping behaviour and of development of competition, this study recapitulates main marketing trends on the food market in the Czech Republic, the reasons of these trends and their impacts. In the study a space for food quality products on the Czech market is being searched in the competition with products of lower price categories.

KEYWORDS: competition, marketing, quality

Introduction

The amendment of economical and business environment, which went the Central and East European Countries during past seventeen years through, together with the global development of food market, influenced the development on the food market in the Czech Republic.

The essential determinants, which influenced contemporary development of domestic food market, are rapid development and change of retail network, change of shopping behaviour, free access of European goods on the Czech market after the EU enlargement, globalisation of processing industry and others.

Background - Food production and consumption

Food industry, with it's share of 12 % on the Czech processing industry and with about 10 % of the Czech labour source being employed in this branch, ranks among five most important industrial branches in the Czech Republic.

From the European point of view, direct foreign investments tide in this branch between 1993 and 2004 represented 11 % of the total amount of foreign investments. There are three distinct phases in the tide of foreign investments in Czech food industry:

Beginning of nineties of the past century: most of foreign investments in this sector have been realised in this period, predominantly in a form of privatisation of state enterprises. In this period companies as Danone, Nestle and Unilever buyed Czech companies, usually with the domestic mark.

End of nineties of the past century: with the end of privatisation, the tide of foreign investments leaved off and most of foreign investmets has been realised in a form of modernisation and enlargement of existing plants.

From 2004: abolition of trade barriers within the old and new EU countries, increasing purchasing power of new member countries inhabitants stimulated recovery of foreign investors interest. As the Czech market is relatively small, most of inetors, comming in the Czech Republic, builds processing capacities for export quantities.

Consumption of food in the Czech Republic allocated into basic categories exhibits the table 1 enclosed. According to household books statistics the share of consumers' expenditures for foods and beverages in 2004 amounted to 22,9 % of the total consumption expenditures (of that 19 % for foods, 2,2 % for non alcoholic drinks, 1,7 % for alcoholic drinks).

Objectives

Development of foods distribution network

Development of foods distribution network is one of the factors, which significantly affects the foods demand and which participates on the changes of shopping behaviour. The choice of shopping place and consumers' requirements on shopping conditions are determined especially by the structure of foods distribution network.

Multinational marketing chains entered the Czech market in 1995. Since that time the number of large-area stores as well as the total shopping floor space is growing. The share of small stores dropped.

The study Shopping Monitor made by companies *INCOMA RESEARCH*, Praha and *GfK*, Praha contains actual information about shopping habits and purchase preferences of Czech population. The study is focused on the main aspects of shopping behaviour, shopping preferences and consumers' satisfaction with their shopping conditions. The study presents results of quantitative research made by personal questioning through the network of qualified interviewers on the representative database of 2000 persons. The database of persons questioned is made by stratified multilevel random sampling of respondents in the age of 15 – 79 years.

In the frame of the study a range of criterias by foods shopping were examined, the most important being:

- the main shopping place
- satisfaction with the frequency of Czech products on the market
- satisfaction with the frequency of brand products on the market
- satisfaction with shopping conditions, price labeling, the main shopping place of particular food types etc.

On the base of permanent monitoring of the recent development on the market and actual information of last presented study 2005/06 we can evaluate the development of chosen factors of shopping behaviour in the time series of 1997 – 2005 respectively 1999 – 2005.

The main shopping place for foods

This factor is one of the key indicators being examined. The study Shopping Monitor proved that, as well as in the recent years, also in 2005 the basic criterias for the choice of the main shopping place for foods were:

- easy accessibility of the shopping place (for 67 % of respondents),
- favourable prices (for 58 % of respondents),
- large assortment scale of goods (for 46 % of respondents).

The development of the main shopping place for foods indicates the table 2 enclosed. The particular shopping units, classified in the examination, are defined by *INCOMA RESEARCH*, Praha and *GfK*, Praha as follows.

Hypermarket: self-service shopping unit with more than 2 500 m² shopping area, significant distribution of non-food assortment, more than 18 cash desks.

Supermarket: self-service shopping unit with 401 – 2 500 m² shopping area, complete dominance of fast moving consumer goods, 4 – 18 cash desks

Discount: self-service shopping unit, complete dominance of fast moving consumer goods, the extent of shopping area corresponds to supermarket one, the assortment is significantly limited and the price level is low.

The stated data exhibit that in examined period 1997 – 2005 the share of those respondents rapidly increased, who prefer hypermarket as the main shopping place. The increase culminated in 2003. There is significant increase of preferences for discounts, too and the share is still being growing. On the contrary, the share of respondents, preferring supermarket as the main shopping place for foods, continuously drops from 2001. The drop of preferences exhibit also counter shops and small sel-service shops. Generally, while in 1997 the marketing chains shopping places (hypermarket, supermarket, cash and carry, discount) were preferred as the main shopping place for food by 34 % of respondents, in 2005 these kind of shopping places were preferred by 77 % of respondents.

The table 3 exhibits preferences of particular marketing chains by shopping of foods in the Czech Republic. The most successful marketing chain is Kaufland, having 16% share of shopping preferences among all marketing chains presented on the domestic food market and having by 7 % more preferences than the second one – Penny Market.

Satisfaction with the frequency of Czech products on the market

The respondents are with the frequency of domestic products on the Czech market generally satisfied. The share of “very satisfied” and “rather satisfied” respondents in 2005 was together 89,6 %. Development of results of this examination in figures exhibits the table 4. The biggest number of satisfied respondents appeared in 2001, then the number declined a little. The decline of the share of satisfied respondents reflects likely increasing share of imported foods, being offered in marketing chains. The foods of Czech origin have good position at Czech consumers. Czech producers have a good chance to establish themselves on the domestic market because the demand for domestic foods does exist.

Satisfaction with the frequency of brand products on the market

The development of this factor is similar to the development of satisfaction with Czech food products. However the decline of “very satisfied” and “rather satisfied” is bigger than at Czech products. This trend is probably an impact of the fact that increasingly more consumers realize what are the brand goods, their serviceability and advantages. The share of “very satisfied” and “rather satisfied” respondents in 2005 was together 82,7 %. Development of results of this examination in figures exhibits the table 5.

Satisfaction with shopping conditions

Among the shopping conditions, which are determinants of shopping satisfaction, were included opening time, assortment scale, price level, freshness and quality of foods, cleanness of the shopping place, pleasant staff, servicequickness etc. The development of results of examined factors in figures exhibits the table 6. Generally the satisfaction with shopping conditions in the examined period increased. The biggest share of “very satisfied” and “rather satisfied” at most of aspects was in 2001, later the number declined a little. The increase of satisfaction is likely an impact of rapid changes of shopping network because in this period a rapid increase of large-area shopping places appeared. On the other hand, the consumer got used to a high quality of shoppings conditions and their requirements increased.

Development of foreign trade

The supply and the competition on the domestic food market was significantly influenced by the accession of the Czech Republic to the European Union because the exchange of agrarian and food commodities with the EU countries represents a crucial share of the Czech agrarian foreign trade.

The export of agrarian and food commodities to the EU 25 participated on the total Czech agrarian export in 2005 by 84,8 % and corresponding import participated on the total agrarian import by 89,3 %. The access to the EU market and the abolition of the most of barriers made easy the movement of goods on all agri-food chain levels. Subjects, which practically realize this trade exchange, can be classified into three main categories.

Strong and smaller trade companies

Marketing chains

Producers

Traditional foreign trade being realised by trade companies is increasingly complemented by foreign exchange in the frame of marketing chains and by production subjects. Increasing significance of marketing chains and producers is determined by consolidation of international retail and by globalisation of processing industry.

Consolidation of the international retail: Multinational character of marketing chains and positioning in a great number of European countries set up conditions for the exchange in the frame of the chain. The distribution of goods with the lowest purchasing prices in the chain without any respect of boundaries, strategy of central stores and other ways of minimization of costs are the main reasons.

Globalisation of processing industry: The establishment and the development of mergers, strategic alliances, joint ventures and direct foreign investments on the level of processing industry builds a space for foreign trade in the frame of one production company. The effort to grow, the attempt to gain raw material sources and other factors support rapid development of this phenomenon.

General trends in agri-food chain, i.e. globalisation of processing industry and consolidation of the international retail together with the expansion of multinational chains in the Czech Republic and the accession to the EU participated on the extension of food supply in the Czech Republic and on the grow of competition on the domestic market. The actual food market is saturated as both volume and assortment are concerned and the space for any market slot is limited.

At this situation the further persistence of processors and retailers on the market is dependent on:

- minimization of costs
- accomplishment of higher prices for products with competitive advantage
- promotion of the goods.

Analogous products – a way to minimization of production costs?

The EU access and the adoption of all principles, requirements and norms represented a considerable investments burden for a plenty of food producers. Further technology investments for the costs minimization are for a lot of producers limited by financial exhaustion and by financial obligations from the pre-accession period.

Aiming to reduce the costs, some of processors choose the way by the substitution of part of the input material by another, cheaper one. At animal products, part of the animal protein is being substituted by material of vegetable origin. On the market there appears than analogous products, which are targeted to the same consumer as standard products and which have a position of competitive products. The lower producer costs become the competition advantage. Substitution of animal component appears partly at smoked meat products but predominantly this effect comes into practice at milk products.

There are several spheres generating, respectively supporting this kind of competition and facilitating the distribution of these products to the consumer.

Analogous products are output of processing industry, the competition is generated on production level within the frame of one branch.

The sale of analogous products is supported on the retail level.

The sale of these products is supported by the sector of services, i.e. in public catering.

Ad a. As for the use of alternative raw components the analogous products do not meet requirements for milk products and they can not be classified as milk products. However these products wittingly evoke the image of standard products, by following practices namely:

Small amendment of well known name of standard milk product.

The producers evade the term “cheese” or “butter” so that they use other word which directly evoke this term. For example following approaches are typical:

The brand (name) of processed cheese is so well known, that using the name only, without the word cheese, evokes the idea of cheese at the consumer.

Eventually, the term of “butter” is used in a tiny form (something like “small butter”) and the consumer understands that he buys butter.

Another way is to use certain characteristics of the product. The idiom “cheese to fry” is substituted by the substantive, deducted from the verb “to fry” without using the word cheese (something like “for frying”). However, the consumer, on the base of visual characteristics, understands that he buys cheese to fry.

The invention in this sense is great.

- Distribution in the packing generally used for standard product.

Analogous products are mostly packed in such packing, which is very similar to packing of these standard products, which they compete to.

Ad b. The sale of analogous products is supported on the retail level. Among the principle ways, how to boost these sales ranks:

- Allocation of the goods.

Analogous products are offered among standard products, non separately, without any differential information. With respect to the same external look (form, packing, colour, etc.) and to their name, the differentiation from standard products is a very difficult task for the consumer.

- Orientation of promotion campaign.

The shopping preferences research proved that more than 70 % consumers buy milk products in hypermarkets, supermarkets and discounts, i.e. in the marketing chains stores. Marketing and promotion campaign lead by marketing chains in the Czech Republic is predominantly targeted on the low price. Promoting activities of marketing chains indirectly contribute to the sale of analogous products.

Ad c. The use of analogous products in public catering is for consumers an especially unfavourable matter because use of substituents in this sphere is difficult to be detected by consumer himself. Here, the consumer is fully dependent on the institution of quality control.

In the Czech milk sector there appear analogous products which compete to processed cheese, fresh cheese, butter, soured products and dry milk products. Their share on the milk market can not be

identified exactly because corresponding research has not been made until now. For the time being, the quantity seems to be marginal with the rising trend.

Analogous products with their name, form, packing and way of sale mislead the consumer. Their qualitative and taste characteristics do not correspond to standard products. These points of issue are objects of the interest of Consumers Defence Association in cooperation with Czech Agricultural and Food Inspection Authority. At the time being, the publicity of this phenomenon is eligible so that the consumer would be informed about the presence of this phenomenon and its' impacts. The question is, if even after radical information campaign Czech consumers:

- would be able to identify analogous products on the market,
- would prefer standard products with higher prices,
- would buy analogous products accepting the lost of qualitative characteristics.

Quality food products on the Czech food market

On the other hand, a way how to compete is to produce the items with such competitive advantage which allows setting higher prices. This way proposes the offer of foods with specific quality attributes such as organic foods, regional marks, specialities, very high value added foods or other quality food products. High quality and exceptional qualitative and taste attributes become the competitive advantage. However this strategy requires advanced market demand because the saleability of these products is based on consumers' willingness to pay for the over standard quality.

Organic foods

The Czech organic food market is marginal for the present, however there is a dynamic development. Mapping of this market is regularly occurred by a firm, specialized in consulting activities in this sphere of the food market. The examination is being made through questionnaires covering all the production – consumption vertical.

The examination exhibited that in 2005 organic foods participated on the total food consumption in the Czech Republic by about 0,18 %. The annual growth of return reached 30 % and the cumulated growth of return from 2002 to 2005 reached 233 %. The growth of turnover is based on the consumers demand increase which is however satisfied by the increase of imports.

The share of organic agriculture area on the total agriculture area reached in 2005 together 5,98 %. The main organic production commodities of the Czech farmers are cereals, herbs and condiments, meat, milk (goat milk in particular) and potatoes. A weakness of the Czech organic food chain is processing stage. There is not sufficient volume of processing capacity with respect to produced quantity. The main reasons are:

The market is too small, so that big conventional processors would be interested in. Financial requirements for separating of organic processing do not ensure return on investments. The activities of big processing plants in this sphere are rare.

Small processors do not dispose of funds for investments needed. Besides of that, strict hygienic standards practically eliminate traditional ways of processing and production on farms.

From the EU accession the import of organic foods increased significantly. The imports are focused on processed food products in particular sauces, spreads, beverages, sweeteners, oils and fats and on pulses, seeds and nuts. From 2005 also fresh goods is imported, in particular fruits and vegetables, milk and milk products. The most of imported food products come from Netherlands, Germany, Italy and Belgium.

Organic foods distribution ways

The main distribution ways are supermarkets and hypermarkets. Organic foods are offered there with production labels, however private labels start to be put on the market (Billa – Ja! Natürlich., Ahold – Hyp, Tesco – Tesco Organic).

The second important distribution ways are specialized outlets of health nutrition. These kinds of shops are situated in bigger cities predominantly.

Marginal number of organic foods is sold on farms, local markets, and in small foods shops. The new phenomenon is internet organic shops, offering wide assortment of this kind of foods.

Market share of particular kind of shops on the total organic food sales exhibits the table 7. The share of super- and hypermarkets reached 57 % in 2005, the share of specialized organic foods shops 37 %.

Organic foods prices

Significant part of consumers turns off shopping organic foods because of their price. As price comparison of conventional foods to organic foods is concerned, there are several aspects:

- The comparison is a moot point as for finding the equal qualities in both categories is difficult. The price difference is based just on the qualitative difference. One example for all: virgin and refined oil.
- The price difference is enlarged by many times extremely low price of conventional foods.
- High prices of organic foods are determined by low competition on organic food market which is connected with a low concentration of the distribution places.
- Low concentration of production and distribution contributes to increase of logistics costs.

An impact of all mentioned aspects is the organic food price level by 40 % to 350 % higher than the same of conventional foods.

Organic foods consumers

The higher price level defines the group of organic food consumers in the Czech Republic.

- Consumers liable to their health and to the environmental impacts of their behaviour.
- Mothers with children.
- High incomes consumers.
- Foreigners from developed countries.

Regional marks, specialities, very high value added products

Regional marks and regional specialities use their characteristic taste quality to come out of their assortment group and to address consumers. The position of the Czech food industry in this sphere has many reserves. Until now 3 products with this kind of protection were approved, another about 30 ones are discussed.

The market of very high value added foods exhibits more dynamics. Various kinds of semi-products, frozen ready foods, products with minimum time taking preparation etc. have a good perspective to establish themselves on the markets.

Promoting activities

Agri-food chain represents a multilevel system of links and relations which together create an environment of cooperation and competition. Who of the participants of the agri-food chain will be successful and who not is in large extent decided by the final participant of the chain, by the customer. This customer becomes the arbitrator of the whole chain and in the sharp competitive environment it becomes a target of a strong marketing campaign.

The best assumption to develop and to realize various marketing strategies and methods is on the side of strong capital subjects.

In fact, on the Czech food market, we can trace several main marketing streams.

- Marketing lead by marketing chains - focused predominantly on the low price.
- Marketing lead by marketing chains - focused on food quality products, however, in comparison of price promotion, less frequent.
- Marketing lead by the state institution - is focused on quality food products, however determined by the domestic origin of these products.
- Marketing activities of big producers.

Ad a. Marketing and promotion campaign lead by marketing chains in the Czech Republic is predominantly targeted on the low price. Such a kind of promotion is more or less persistent. Czech consumers tend to prefer the price to the quality. Most of marketing strategies of the chains are based on this consumer's orientation, using:

- every day low price strategy (EDLP) combined with
- promotion actions (Hi – Lo strategy) for chosen products

The EDLP strategy represents strict conditions for suppliers which finally can have impacts to products' quality. The activity "Marketing chains check" effected by the Food Chamber of Czech Republic in 2005 exhibited a lot of quality failures.

The promotion actions in Hi – Lo strategy press suppliers to extremely low prices. There is an usual practice that within the frame of these actions, such goods are supplied, which do not keep the usual standard quality. The final effect is loss of consumers' confidence. In spite of that promotion actions are popular at Czech consumers.

Ad b. Promotion of quality food products by marketing chains is being lead time to time only and is focused before all on consumers of wine, cheese, organic meat and healthy nutrition. This kind of promotion does not reach the power of persistent price promotion.

Ad c. Marketing activities of The State Agricultural and Intervention Fund, reflecting increasing trend of foods imports, are based on the good relation of Czech consumers to the domestic foods and on the willingness to buy them. There are two pivotal marketing programmes for the support of the foods of domestic origin, called „Značka Klasa“ (Klasa mark) and „Najdi si svého výrobce“ (Look for your producer). Both programmes are focused on the identification and promotion of domestic foods by domestic consumers.

Značka Klasa. This programme provides certification of the chosen foods with the Klasa mark. This mark is lent to the producers after fulfilling strong qualitative criteria's including domestic origin and is a guarantee of the quality. This mark is lent for the period of three years with a possible prolongation and all the period the certified goods are followed by the State Agricultural and Food Inspection. All the foods certified with Klasa mark are included to the promotion programme of the State Agricultural and Intervention Fund. The accordance of Klasa privilege is now determined by the domestic origin, however the change of criteria's are being discussed so that this mark would be granted irrespective of the country of origin. In the future this mark should represent high quality foods products. On 9th January 2007 together 1340 food products from 191 producers were certified.

Look for your producer. This programme is a register of Czech food producers, which should help to the consumer with the better orientation on the food market. The register is on internet sites. In the first step the consumer can find information about the concrete product, in the second step he can make a query, the response of which is available to all register users.

Ad d. Promotion of foods made by processors themselves is predominantly focused on promotion of innovated products. The methods used in the Czech Republic corresponds to usual approaches, besides of advertising in mass media, processors organise various promotion actions directly in shopping places supported by tasting etc.

Results - Quality food products perspectives on the Czech market

For the establishment of the quality food products on the Czech market it is necessary to draw consumers' attention for the high quality, to describe the advantage of this quality and to persuade the consumer to pay for this quality. For this sake following procedures are supposed to be improved:

- the consumers' know-how
- distribution channels
- assortment

Ad a. With respect to the fact that the favourable shopping places of foods are marketing chains stores, the significant part of the information campaign reclines upon these subjects. The time to time promotion of QFP should change to continuous promotion. While the specialized QFP shops are visited purposefully by consumers informed and interested, marketing chains should use the chance to address consumers being not informed or not interested until now.

- In promotional leaflets focused on low prices there could be regularly presented QFP columns including besides of the offer also explanation of concrete quality food product advantage.
- Within the frame of supermarkets there could be established special section with counter sale with high professional staff. Especially the qualification of the service staff seems to be an actual point of issue. A considerable deterioration of service staff hangs together with the boom of marketing chains. Qualified and well informed service would support the QFP sales.
- Tasting promotions provide a chance to persuade the consumer. Also here the qualification of the staff involved is one of the basic elements of the success. Usually tasting promotions made are realised by temps with missing precise knowledge of the offered assortment.

Ad b. Traditional retail distribution channels should have a competition in the distribution chains reflecting shopping trends amendments.

- Shopping centres displaced on the edge of town handicap non motorized consumers and exclude quick shopping. Convenient shops situated in consumer's residence should profit of the allocation and of the qualified service granted by qualified staff. There are also indispensable social aspects of consumers' residence shops. With respect to the fact that with the boom of marketing chains centres an important part of small residential shops dissolved and that consumers were used to such a kind of shops, we propose that there is a space for convenient shops.

- The number of consumers, who want to spend a minimum time by shopping, is growing. From this point of view, non traditional distribution places, as e.g. petrol stations, represent a chance. Here is a space for foods with very high value added for direct consumption.
- Quality foods products should benefit from the consumers' preference of shopping centres by establishing of specialized shops allocated in the shopping galleries.

Ad c. Trends of shopping behaviour development should be respected by the foods assortment.

- The aim to spend a minimum time by shopping forms a space for "easy to prepare" foods. In this category there is an opportunity for a large assortment scale, many taste variants etc.
- The introduction and building a mark means to distinguish the product from the other products competing by a characteristic feature. A range of Czech established and traditional marks died out in a period of transformation of property rights of the processing plants. These effects were negatively accepted by the consumers. If we consider the contemporary wide assortment supply, we suppose that there is a space for original marks as a guideline for consumers' orientation on the market.
- Organic foods and health nutrition foods come to awareness of Czech consumers. Bigger competition would reduce the price which finally would contribute to their marketability.

Final remarks - conclusions

Development of foods distribution network is one of the factors, which significantly affects the foods demand, it participates on the changes of consumers' shopping behaviour in the shopping place choice, shopping conditions requirements and other shopping aspects. The development of large area stores and shopping centres in the Czech Republic evoked a significant influence of the multinational marketing chains on the Czech consumers.

The prices of foods on the Czech market are dropped by high saturation of the market with the impacts to the assortment competition and to the competition between particular chains. Aiming to reduce the costs, some of processors choose the way by the minimization of costs, detriment to foods quality. On the other hand there is a group of producers, preferring the way by introducing and establishing quality foods products.

Promotion of marketing chains is predominantly focused on low prices, while promotion of quality food products has many reserves. The Czech consumers are sensitive on the price amendments in spite of the growth of consumers' incomes. However this does not mean that they can not understand the quality. The share of consumer preferring quality foods products is increasing.

Generally it is evident that the goods of both sides of price spectrum go on the market by the best, while the interest for products in the middle of price level is not so intensive. With a proposed further growth of consumers' incomes we can prospect that the consumers demand will incline to high quality foods products. The support on the level of production should consist in assortment innovations. The reserves on the retail level consist in promotion in favour of quality foods products, qualified staff and better shopping accessibility. With respect to significant reserves in all these aspects we propose that the perspectives for quality foods products on the Czech market are good.

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Tables

Table 1: Food consumption in the Czech Republic (kg/head/year)

	2004	2005	Index 05/04
Meat total (carcass weight)	80,5	79,7	99,0
- bovine	10,3	8,7	84,5
- veal	0,1	0,1	100,0
- pork	41,1	41,0	99,8
- poultry	25,3	26,1	103,2
- other	3,7	3,8	102,7
Fish	5,5	5,5	100,0
Milk and milk products in milk equivalent excl. butter	230,0	238,2	103,6
Eggs	13,7	13,7	100,0
Butter	4,6	4,7	102,2
Lard	4,7	4,7	100,0
Vegetable fats and oils	16,0	16,1	100,6
Sugar refined	42,6	41,6	97,7
Cereals in flour equivalent without rice	105,6	106,0	100,4
Potatoes	73,0	73,0	100,0
Pulses	2,1	2,1	100,0
Vegetables in fresh equivalent	79,8	81,0	101,5
Mild zone fruits in fresh equivalent	50,3	49,0	97,4
South fruits	33,5	33,0	98,5

Source: Ministerstvo zemědělství ČR, Zpráva o stavu zemědělství za rok 2005

Table 2: Main shopping place for foods (% of answers)

	1997	1998	1999	2000	2001	2002	2003	2004	2005
Hypermarket	1	4	16	20	29	30	37	35	36
Supermarket	24	26	23	30	26	21	19	20	15
Small self-service shop	49	41	32	22	20	23	18	20	17
Counter shop	13	12	10	8	5	5	5	3	5
Cash and carry						2	2	1	3
Discount	9	13	15	17	18	18	19	22	23
Other kind	4	4	5	3	2	2	0	0	1

Source: INCOMA RESEARCH, Praha; GfK Praha, Shopping Monitor

Table 3: Marketing chains preference by shopping of foods (% of answers)

Retail chain	Preference
Kaufland	16
Penny Market	9
Plus Diskont	8
Tesco hypermarket	7
Jednota	7
Albert	6
Hypernova	6
Lidl	4
Delvita	4
Billa	3
Carrefour	3
Globus	3
Hruška	3
Interspar	3
Makro	3
Other	15
Total	100

Source: INCOMA RESEARCH, Praha; GfK Praha, Shopping Monitor

Table 4: Satisfaction with frequency of domestic products on the market
(% of answers)

	1999	2000	2001	2002	2003	2004	2005
Very satisfied	42,2	40,6	39,8	47,2	48,3	45,2	40,8
Rather satisfied	48,4	50,1	54,2	46,6	44,9	47,9	48,8
Rather unsatisfied	7,7	7,8	5,8	5	3,7	3,9	5,2
Very unsatisfied	0,1	0,2	0,2	0,1	0,5	0,2	0,4
No answer	1,6	1,3		1,1	2,6	2,8	4,8
Total	100	100	100	100	100	100	100

Source: INCOMA RESEARCH, Praha; GfK Praha, Shopping Monitor

Table 5: Satisfaction with frequency of brand products on the market (% of answers)

	1999	2000	2001	2002	2003	2004	2005
Very satisfied	28,2	32	30	36,3	38,3	33,7	27,1
Rather satisfied	57,2	54,4	58,8	50,7	49,7	52,9	55,6
Rather unsatisfied	10,2	10,6	10,2	10	7,7	8,7	10,7
Very unsatisfied	0,8	1,2	1	1	0,7	1,1	1,2
No answer	3,6	1,8		2	3,6	3,6	5,4
Total	100	100	100	100	100	100	100

Source: INCOMA RESEARCH, Praha; GfK Praha, Shopping Monitor

Table 6: Satisfaction with shopping conditions by shopping of foods (% of answers
"very satisfied" and "satisfied")

	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
Opening time	96	96	94	97	97	98	97	97	96	94
Assortment scale	88	91	91	93	93	95	95	95	92	92
Prices	67	66	72	84	81	84	86	90	86	86
Freshment and quality	91	90	91	94	95	96	95	95	93	91
Cleanness	94	90	88	94	94	96	94	94	93	90
Pleasant staff	90	91	90	92	93	94	90	90	87	86
Service quickness	86	86	81	85	85	88	84	84	84	81

Source: INCOMA RESEARCH, Praha; GfK Praha, Shopping Monitor

Table 7: Market share of particular kind of shops on the total
organic food sales in 2005 (in %)

	Market share
Super- and hypermarkets	57
Specialized organic foods shops	37
Small foods shops - unspecialized	2
Other - farms local markets, internet	4
Total	100

Source: Green marketing, Český trh s biopotravinami 2005

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Geographical Indications of Origin as a Tool of Product Differentiation: The Case of Coffee

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Summary

An increasing interest in geographical indications of origin (GIs) as a tool of product differentiation can be observed in the so-called specialty coffee sector. Similar to the approach for wine in France and Italy, more and more coffee-producing countries try to establish appellations systems for coffee. Whereas some countries and regions such as Colombia or Jamaica have already legally protected GIs for coffee, most coffee GIs are still informal meaning that no legal protection has been obtained so far. But the recent acceptance of the term Café de Colombia as a Protected Geographical Indication (PGI) in the EU and the Ethiopian Trademark Initiative document the increasing engagement of coffee-producing countries to achieve an appropriate legal protection for their GIs. From an economic point of view, data from US online retail stores indicate that single-origin coffees receive significant higher retail prices, with 100% Kona coffee from Hawaii and Jamaican Blue Mountain coffee being the most expensive ones. Furthermore, results from a hedonic pricing model based on internet auction data for single-origin coffees show that the country and the region of origin is already an important determinant of prices paid by importers and roasters.

KEYWORDS: Geographical Indications of Origin, coffee, legal regulatory systems, price premium, hedonic pricing analysis

“Coffee is now where wine was ten years ago”¹

1. Introduction

For quite a long time the coffee market was considered a market with nearly no product differentiation at all. This picture has been changing since product and process quality are becoming more important to consumers. Especially the product origin as a proxy for product and process quality is gaining in importance in consumers' buying decisions. As a reaction to this rising consumer demand for diversification an increasing product differentiation based on geographical origin can also be observed in the coffee market, particularly in the so-called specialty coffee market (Kaplinsky and Fitter 2004; Lewin et al. 2004).

Specialty coffees are not precisely defined but cover a wide range of somehow differentiated coffees, such as organic, fair trade and bird-friendly coffee. Besides these kinds of coffee another type of specialty coffee called single-origin coffee or coffee with a geographical indication of origin (GI) has been emerging in recent years (Daviron and Ponte 2005; Lewin et al. 2004). While the bulk of coffee is sold to consumers as blend, meaning that coffees from different mostly unidentified origins are mixed, single-origin coffees are the total opposite of blends. Like the term specialty coffee the term single-origin is not precisely defined so that single-origin coffees can originate in one country, one region or even one estate or farm (Knox and Sheldon Huffaker 1996).

¹ Statement by the chief buyer of the major UK retailer of coffee (Kaplinski and Fitter 2004:7).

Product differentiation based on geographical origin is not a new development. It has got a rather long history, especially in southern European countries. “Parmigiano Reggiano” is a well-known example of a Protected Designations of Origin (PDO) under Council Regulation (EC) No. 510/2006 with having ancient origins in the 13th century. But what is new in recent years is the growing number of products labelled with GIs at the European as well as at the international level. Since the EC No.510/2006² came into force in 1993 the number of applications per year has steadily increased and today over 700 products are registered either as PDO or as Protected Geographical Indication (PGI).

Moreover, geographical indications are a current topic at the international level. The Agreement on Trade-Related Aspects of Intellectual Property Rights (TRIPs), which became effective in 1995, is considered the first multilateral agreement giving an explicit definition of the term “geographical indication”. According to the TRIPs definition “geographical indications” are “indications, which identify a good as originating in the territory of a Member, or a region or locality in that territory, where a given quality, reputation or other characteristics of the good is essentially attributable to its geographical origin” (TRIPs Article 22.1). Furthermore, TRIPs requires from every signatory to establish minimum standards for the protection of GIs through their national law. Developed countries had to implement the TRIPs requirements by 1996, developing and transition countries by 2000 and for the least developed countries the final date for the implementation was extended to the year 2006 (Calboli, 2006:183; Liebig 2000:9).

All these recent developments document the rising interest in GIs. While in the past GIs have been mainly a product differentiation tool in European markets and for European producers, recently more and more developing countries discover this marketing instrument for their products. But whereas quite some studies dealing with European GIs exist, studies dealing with GIs in developing countries are seldom. Thus, the overall objective of this paper is to provide insight into recent developments of the world coffee market and to explore them with a particular focus on GIs. To achieve this broad objective, the legal framework of GIs in the coffee market shall be explored first in order to find answers to the following research questions:

- Which GIs do already exist in the coffee market?
- How are these GIs protected and by which legal means?
- In which markets are these GIs protected?

Second, the economic impact of GIs, especially the price effect, shall be examined.

Questions arising in this context are:

- Which price premium can be achieved by GIs?
- Do price premia differ across countries and regions due to the geographical indication?

The paper is structured as follows. Section 2 will give an overview about the legal situation of GIs in the coffee market. Section 3 will explore the economic aspects of coffees with GIs. This is done in two parts. First, an overview about available coffees labelled with GIs and their retail prices in the US market is given. Second, data from several internet auctions in which single-origin coffees are directly bought by importers or roasters are used to estimate a hedonic pricing model. This econometric tool shall give some first hints how the country or region of origin influences the price for high-quality coffee controlling for other relevant product attributes such as coffee variety, sensory quality and certifications like organic or fair trade.

² Council Regulation (EEC) No. 2081/92 on the protection of geographical indications and designations of origin for agricultural products was replaced by Council Regulation (EC) No. 510/2006 in March 2006 as a response to a WTO-Panel ruling criticising two main components of the former regulation (EC 2006).

2. Legal Aspects – Main Actors and Recent Developments

While TRIPs is considered the first multilateral agreement giving an explicit definition of the term “geographical indication”, it is not the first multilateral agreement dealing with this kind of intellectual property right at all. Other multilateral agreements in this context are the Paris Convention for the Protection of Industrial Property from 1883, the Madrid Agreement Concerning the International Registration of Marks from 1891 and the Lisbon Agreement for the Protection of Appellations of Origin and their International Registration from 1958. All these agreements do not explicitly deal with the term geographical indication but with “indication of source” or “appellation of origin” (APO). How these three concepts differ can be seen in the following figure.

< Figure 1 >

Indication of source is the broadest concept. It only requires that the product originates in a certain geographical area. Thus, no link to quality or reputation is implied. This point distinguishes the definition of indication of source from the other two concepts. A product labelled with a geographical indication or appellation of origin must have quality characteristics that are essentially due to its geographical origin. Since in some aspects the concept of appellation of origin is even narrower than the GI concept, it can be concluded that all appellations of origin are geographical indications and all geographical indications are indications of source. But not all indications of origin are geographical indications resp. appellations of origin (WIPO 2002). The situation becomes even more complex when the European regulation is considered. The EC Regulation No. 510/2006 distinguishes Protected Designations of Origin (PDOs) and Protected Geographical Indications (PGIs). The requirements on a product to become a PDO are higher than to become a PGI, since in the former case *all* stages of production must take place in the defined geographical area, whereas in the latter case at least *one* stage of the production must be located in the specified area (European Commission 2004).

Following from these points it can be stated that not only one single definition of geographical indications and one way to protect GIs exist. Moreover, a plurality of different regulatory systems under which GIs are protected can be observed across different countries (Thevenod-Mottet 2006:26; WTO 2004:75). GIs may be protected through special means of protection (e.g. PDO/PGI), as trademark (e.g. USA) or through other already existing laws such as laws on the repression of unfair competition or the protection of consumers (ibidem). Whereas the majority of developed countries have got quite well-developed regulatory systems, this is often not the case in developing countries. Here the establishment of regulatory systems to protect intellectual property in general and geographical indications in particular is often in its early stages (van Caenegem 2004:170; Josling 2006:343). Many important coffee-producing countries belong to this group of countries.

So far no international register for GIs does exist. Therefore, an overview of already protected and registered GIs in the coffee market will be provided by surveying the literature and using data from trademark bases as well as from governments and grower associations. In this context it is necessary to distinguish between the domestic and the foreign market. Since coffee consumption in producing countries is still at a low level with the exception of Brazil, the export markets are more important in terms of income than the domestic market (Lewin et al. 2004:59). Thus, a look at registered GIs in the main export markets is indispensable. The main export markets for single-origin coffees are Japan, the United States and Europe. Therefore, after looking at the protection of GIs in the domestic market an overview about protected coffee GIs in these foreign jurisdictions will be given.

< Table 1 >

As can be seen from Table 1 all coffee-producing countries under consideration have already implemented laws to protect intellectual property in general or laws for the

protection of geographical indications in particular. In most countries these laws were established quite recently, reflecting the deadline for implementation of the TRIPs requirements. Furthermore, Table 1 supports the statement that no single definition of geographical indication and no single regulatory framework for its protection exist. Countries belonging to the Andean Community such as Bolivia and Colombia distinguish indications of source and denomination of origin³ as two legal concepts in the category of geographical indications. Other countries such as Costa Rica, Guatemala, Honduras and Mexico deal with the terms geographical indication and denomination of origin and Indonesia protects geographical indications under its trademark laws. This approach is similar to the US approach. In the United States geographical indications are not recognised as a separate class of intellectual property. However, geographical indications can be protected under the existing US trademark law (Josling 2006: 347).

What is really striking is the fact that to date only three geographical indications for coffee are registered and protected in their domestic market or under a multilateral agreement, respectively. The term *Café de Colombia* is a protected denomination of origin for green coffee beans in Colombia, whereas the Mexican coffees *Café Chiapas* and *Café Veracruz* are registered and protected in Mexico under national law and additionally as appellations of origin under the Lisbon Agreement.⁴ *Café Veracruz* was registered by Mexico in 2001 as an appellation of origin for “green or roasted coffee”. In 2004, the registration for “*Café Chiapas*” followed. The registration for *Café Chiapas* goes beyond the one for *Café Veracruz* in that way that the registration covers “green or roasted/ground coffee of the *Coffea Arabica* species” and “the appellation of origin may be used, subject to authorisation for this purpose by the Mexican Institute of Industrial Property (IMPI), by any individual or legal entity directly involved in extraction, production or elaboration of *Café Chiapas*, in the territory designated in the general declaration of protection, and in compliance with the corresponding official law” (WIPO 2007). This difference between the two APOs stresses one important point that has to be kept in mind in the context of geographical indications, the scope of protection. In the case of *Café Chiapas* the scope of protection could be interpreted in that way that only coffee processed or even ground in the region of Chiapas can be sold as *Café Chiapas* (Schulte 2005). Some law experts argue that instead of supporting the local coffee growers and contributing to rural development such a wide scope could even harm the coffee growers, as traders may not bear the risk of buying coffee that is already roasted or even ground in the country of origin (Schulte 2005).

To date the GI “*Genuine Antigua*” is not protected by national law. In 2000 the *Genuine Antigua Coffee Growers Association (APCA)* was founded and since 2003 the Swiss food inspection company *Société Generale de Surveillance (SGS)* certifies coffee grown in the Antigua region meeting certain requirements regarding altitude, soil and processing methods. This certified coffee is labelled as *Genuine Antigua (APCA Homepage)*.

Additionally, Table I contains information about recent projects in the context of coffee and GIs. Costa Rica, Colombia, Guatemala, Indonesia and Ethiopia can all be regarded as leading actors in the coffee sector with respect to the establishment of GIs. While Colombia has already established a national GI, recent efforts are under way to establish regional and estate coffees besides other specialty coffees such as organic or relationship coffees (FNC Website). For this purpose 86 distinct “designated micro-climates” based on a set of variables, including location, rainfall, altitude and processing methods were recently defined (Germain 2005). A regional approach is also followed by Costa Rica and

³ In most cases appellation of origin and denomination of origin are interchangeable and just reflect a different translation. In Spanish versions of legal texts often the term “*Denominacion de Origen*” is found. In the English versions this term is either translated as “*Denomination of Origin*” or “*Appellation of Origin*”.

⁴ Today the Lisbon Agreement has got 26 member states. For a complete list see <http://www.wipo.int/treaties/en/registration/lisbon/>

Guatemala. Both countries have already identified seven different growing regions, every region with an individual profile (ICAFE Homepage; ANACAFE 2006). To date all these growing regions are still informal, but in all countries efforts are under way to formalize these regions through legal means (ibidem).

Guatemala and Costa Rica take also part in the GEOCafé project, which has been developed by funding from the USAID⁵ Quality Coffee Program. Farms, cooperatives, and mills in participating countries are precisely mapped with GPS devices, and data are collected for each of these entities, ranging from geographic and climatic farm conditions, socio-economic data, harvesting periods, certification issues, type of protective trees and methods of coffee processing. By using these data interactive online coffee maps are created making virtual visits to coffee farms and coffee regions possible. These maps shall also form the basis for the establishment of appellation systems for coffee (GeoCafé Homepage).

The comparison between fine wines and single-origin coffees is often made in the literature (Lewin et al. 2004; Kaplinki and Fitter 2004; Daviron and Ponte 2005). The introductory statement “coffee is now where wine was 10 years ago” illustrates this. The establishment of appellation systems for coffee similar to the appellation systems for wine in France and in Italy is regarded as a possible way for coffee producing countries to embed value at the production level (Daviron and Ponte 2005:230; Neilson 2005:203). The findings from above point out that many coffee-producing countries agree to this view.

In a next step data to protected GIs in the main export markets was collected. Since unfortunately no data could be obtained for the Japanese market, only the US and the European markets are considered.

< Table 2 >

Following from Table 2, Colombia, Ethiopia, Jamaica, Hawaii and Mexico have already protected and registered coffee GIs in the US and the European market. While Colombia and Jamaica had started to rely on trademark protection in the 1980s, all other registrations were made in the last few years. Under the Ethiopian Fine Coffee Trademarking and Licensing Initiative the government of Ethiopia has filled trademark applications in over 30 countries, including the US and the EU, for Harrar, Sidamo and Yirgacheffe, three different coffee-growing regions (EIPO 2006). This initiative has caused a dispute between the Ethiopian Intellectual Property Office (EIPO) on the one side and the Specialty Coffee Association of America (SCAA)⁶ on the other side about the correct way to protect geographical indications in the coffee sector. The WTO recommends using certification marks for the protection of geographical indications and this is also the position of the SCAA (SCAA 2006). But the Ethiopian government considers trademarks as the better way of protecting its coffee GIs. Whereas both concepts rely on the same principal economic rationales, the protection of goodwill against free-riding by third-parties and the reduction of consumer search costs, there are substantial differences between these two concepts (Josling 2006; WIPO 2003). First, trademarks identify the manufacturer of a product and can be sold and licensed. Second, no reputation or quality-link is necessary. In contrast, certification marks are a collective right and inform the consumer that the goods possess certain characteristics, e.g. a specific origin. Furthermore, the owner of the right is not allowed to produce but can promote the certification mark. Thus, owners of certification marks are often governmental bodies. Contrary to trademarks, certification marks can not be sold or licensed (Josling 2006:348). While a detailed analysis of the advantages and disadvantages of both concepts lies outside the scope of this paper one important point can be derived from this dispute. GIs and their protection are not without controversies and

⁵ United States Agency for International Development

⁶ SCAA was founded 1982 as a reaction to the decline in coffee quality offered by mainstream roasters. Today it is the world's largest coffee trade association with over 3,000 member companies (SCAA 2007).

even in the coffee sector itself the opinions about how to protect and enforce this intellectual property differ widely. This is also stressed by the point that in Europe Harrar is already registered as a common trademark, whereas in the United States no final decision about the registration of Harrar as a word mark is made so far.

As can be seen from Table 2, both legal means, i.e. trademarks and certification marks, are used for protecting coffee GIs in the US market. While trademark protection can be found both in Europe and in the United States, the protection of PGIs resp. PDOs is only possible in the EU. In 2005, the National Federation of Coffee Growers of Colombia (FNC) applied for the registration of “Café de Colombia” as a PDO. This was the first application of a non-EU country and the first application for coffee under Regulation 510/2006. Just recently, in December 2006, the summary application was published in the Official Journal of the EU. If no statement of objection will be received within six months the name will be registered as a PGI (EU Commission 2004; Official Journal of the European Union 2006). The published summary application contains the specification of the product, including the definition of the geographical area and the methods of production. While harvesting, wet processing and hulling are defined and all three processing stages must take place in the specified geographical area, this is not the case for the roasting process. This could explain why the term Café de Colombia will become a PGI and not a PDO, for which the FNC initially applied for. Moreover, the application informs about the factors that are responsible for the link between the quality of the product and the geographical origin. According to the summary application, the essential characteristics of Café de Colombia among others are the soil quality, the typical climate of the country, specifically the mountainous areas of the tropics, the altitude and the selective hand-picking of the coffee bean by bean (Official Journal of the European Union 2006).

3. Economic Implications of Geographical Indications of Origin for Coffee

3.1 Data and Methodology

While quite a number of studies deal with geographical indications from a legal point of view, economic analyses, especially empirical price or cost-benefit analyses of the impacts of geographical indications are rather scarce (Josling 2006:340; WTO 2004:87). This is especially true for non-European countries and coffee. The coffee market in general is very well documented but data and analyses regarding the single-origin market are very limited (Lewin et al. 2004:117).

To explore the economic effects of GIs for coffee, in a first step a survey of US internet retail stores selling single-origin coffees was conducted. The US market was chosen, because in this market the availability of single-origin coffees is rather high compared to the European market, where this type of coffee is just emerging (Lewin et al. 2004: 112). Basis of the search for online retail stores was a listing of current SCAA Wholesale Roaster members, from which roasters having an online store and selling directly to consumers were selected. Price data for different single-origin coffees from 100 online retail shops were obtained. All prices are retail prices in US-\$ per pound for roasted coffee covering the period August to December 2006. The prices include tax but exclude shipping costs. Considering the number of online retailers offering a certain type of coffee as a proxy for popularity the most “popular” single-origin coffees together with their retail price were identified. These data were used to compare retail prices for single-origin coffees to the general average retail price. Additionally, available data regarding the volume of single-origin coffees sold to the various export markets were collected. Sources are individual country reports for Colombia and Indonesia, and statistics from the Genuine Antigua Coffee Growers Association.

Furthermore, by using data from several internet auctions for single-origin coffee a hedonic pricing model was estimated. This econometric tool is used to determine the implicit value of the region- resp. country-of-origin for high-quality coffee controlling for other relevant product attributes such as variety, sensory quality or certifications. The hedonic approach is quite common to explore the value of different wine growing regions and some studies applied this approach to European GIs such as olive oil or cheese (Santos and Ribeiro 2005; Schamel 2006; Schamel and Anderson 2003). One study can be found that used internet auction data for specialty coffee to estimate the effect of sensory and reputation quality attributes on specialty coffee prices (Donnet and Weatherspoon 2006). We follow a similar approach but our data set is more comprehensive.

The first internet auction for specialty coffee took place in Brazil in 1999. Following from this the Cup of Excellence (COE) competition and internet auctions were established in seven Latin-American countries⁷. The procedure is as follows. Farmers submit a sample without a fee to the organization committee. These coffee samples are cupped by a national and international jury and each coffee receives a score for its taste profile ranking from 0 to 100. This approach is very alike to the one in the wine industry, where expert quality wine ratings are widely used (Schamel and Anderson 2003:359). Only coffees with a score higher than 84 points are awarded the Cup of Excellence and are sold to the highest bidder during an internet auction (COE Homepage). Contrarily to the price data from the online retail shops these prices are prices at the importer or roaster level. All data regarding the awarded farms are available on the COE Homepage. These include the received score, the price paid by the bidder and several characteristics of the farm such as altitude, annual rainfall, farm size and soil type. Often details to certifications, e.g. organic or fair trade are also available. Besides these COE auctions other internet auctions for high-quality coffees were established, in Ethiopia the Ecafé Gold, in Costa Rica the Crop of Gold and in Guatemala the Exceptional Cup auction.

Data from the COE auctions covering the period 2003-2006 were collected to estimate a hedonic pricing model to investigate the country-of-origin effect on the auction price. Additionally, data from the Ethiopian and the Colombian auctions for the years 2005 and 2006 were used to investigate the value of the individual region controlling for other variables like score, variety, altitude and quantity sold in pound. An overview about the data sets including descriptive statistics is shown in Annex 1. Ethiopia and Colombia were chosen because of two reasons. First, for these two countries more or less comprehensive data sets were available. Second, both approaches to establish a GI for coffee, a national or a regional one, are covered in this data set. While Colombia has pursued a national GI strategy in the past, it has started to define regional coffees just recently. Contrarily, in Ethiopia the differentiation of coffees based on their regional origin is used by exporters and roasters for over 100 years (SCAA 2006). Therefore, we suppose a significant regional price differentiation in Ethiopia. No significant regional price differentiation is expected in Colombia, since the establishment of coffee regions is in its infancy.

The estimated hedonic price function is

Coffee price = f (score, rank, lot size, origin, coffee variety, coffee-growing area, altitude, competition year).

Thus, the characteristics of the coffee included in the analysis are: the achieved score and the ranking in the cupping competition, the size of the coffee lot expressed in kg, the country- or region-of-origin, the botanical coffee variety, the size of the coffee-growing area in ha, the altitude in metres, the competition year and the ICO composite indicator price. The ICO compositor price is included to control if price changes on the world market influence the prices paid in the internet auction or if the prices are totally decoupled from general price trends. Score, lot size, altitude and coffee-growing area are metric variables, whereas rank, origin, variety and competition year are dummies.

⁷ Bolivia, Brazil, Colombia, El Salvador, Guatemala, Honduras, Nicaragua

What distinguishes this hedonic pricing model from others is the fact that the price under consideration is not a retail price in the final market but a price paid by the importer or roaster to the farmer. Therefore, we assume that the demand at the importer or roaster level is a derived demand proportional to the consumer level.

3.2 Results

3.2.1. Prices and Quantities

Although just few coffee GIs are legally protected, quite a large variety of single-origin coffees is available in the US specialty coffee market. Taken the number of retail stores offering this kind of coffee as a proxy for popularity the most popular single-origin coffees can be divided into three main groups: the Latin American Coffees, the East African Coffees and the Island Coffees, including Indonesia, Jamaica and Hawaii. In the Latin American group Colombia Supremo was offered by 52 online shops, followed by Costa Rica Tarrazu (38) and Guatemala Antigua (33). This is consistent with the depicted picture of leading actors in chapter 2. The most popular East African coffees are coffees from Kenya (77), Tanzania (41) and the Ethiopian coffees Harrar (39) and Yirgacheffe (33). The group of Island coffees comprises Sumatra Mandheling (67), Sulawesi⁸ (40), Java Estate (31), 100% Kona (41), Jamaica Blue Mountain (28) and Papua New Guinea (27). The average retail prices for these different single-origin coffees are presented in Figure 2.

<Figure2>

All these coffees sell for at least three times the average US retail price for roasted coffee. The Latin American coffees range between 9 and 10 US-\$ per pound. The East African and Indonesian coffees are slightly more expensive, the average retail price lying between 11 and 12 US-\$/lb. The most expensive coffees are the Hawaiian 100 % Kona and the Jamaican Blue Mountain with an average retail price of 29.87 resp. 43.44 US-\$/lb. If standard deviations and coefficients of variation are calculated for all coffee prices under consideration, the two most expensive coffees are also the coffees with the highest variation in price.

<Table 3>

Information about sold quantities of single-origin coffees is even scarcer than for price data. But some information could be collected from the sources mentioned above. Following from Table 3, the annual coffee bean production and export quantity of Genuine Antigua is around 3,000 metric tonnes (mt). Without appropriate legal protection systems and their enforcement the incentive for free-riding is quite high. This is often cited for Genuine Antigua Coffee, with different sources stating that the annual volume of coffee sold as Genuine Antigua amounts to 23,000 mt, seven times the amount of actual production (Raknekar 2004; EU Commission 2003).

In Indonesia, 3,600 mt of Arabica coffee were exported with geographical indications related to Sulawesi, constituting less than 2 % of the total Indonesian coffee export volume. Besides Sulawesi, North Sumatra and East Java are the main origins for high-quality Indonesian Arabica coffees. The data in Table 3 just covers coffee exports from Sulawesi. This coffee is not labelled uniformly but either as Sulawesi, Toraja, Kalosi, Toraja Kalosi or Mandheling depending on the export destination. In the Japanese market, the most important export market for the Indonesian high-quality coffee, the term 'Toraja' is preferred; while in Europe the same kind of coffee is labelled as "Kalosi". Sometimes even the term Mandheling is used to label coffee originating from Sulawesi. This is fraudulent, because Mandheling is a coffee growing region in North Sumatra (Neilson 2005).

For all three listed single-origin coffees the Japanese export market is the most important one. This is especially true for Jamaica Blue Mountain, for which no reliable data on export

⁸ This includes all coffees either labelled as Sulawesi, Celebes Kalossi or Celebes Kalossi Toraja.

volumes could be obtained. But it is estimated that about 85 % of all Jamaica Blue Mountain coffee is sold to Japan (Lu 2006).

3.2.2. Hedonic Pricing Model

A linear and a log-linear model were estimated by using ordinary least squares. For both model specifications a Reset F-Test was conducted and the results indicated to prefer the log-linear specification. The results are presented in the following table.

<Table 4>

First, a comprehensive model was estimated including all available variables. Altitude was excluded as this variable was lacking for Brazil. Moreover, data to processing methods and certifications were also excluded; because they were either too fragmentary or no significant variance was given. Therefore, the score, the rank, the lot size, the coffee-growing area of the farm, the botanical coffee variety, the country-of-origin and year dummies were included. Rather high correlations could be observed between the year dummies and the ICO coffee indicator price, since the coffee price increased constantly over this period. Therefore, just the year dummies were included in the model. No serious multicollinearity could be detected among the remaining explanatory variables.

The overall goodness of fit is satisfying with an adjusted R squared of 0.64. While the score, the ranking, the lot size, the country-of-origin and the year dummies are highly significant, this is not true for the size of the coffee-growing area and the different coffee varieties. Therefore, in a next step a reduced model was estimated. The results indicate that the score as well as the ranking have got a significant positive influence on the price, with the 1st rank being the most important determinant of the price. This is plausible because receiving the 1st place in the COE competition is a very good marketing tool for the final market. The lot size has got a significant but marginal negative influence on the price. Compared to the base year 2003 the prices paid in the following auction years increased. If instead of the year dummies just the ICO indicator price is included, the same positive influence on the price can be observed. This indicates that the increasing auction prices over time can be mainly due to increasing world market prices for coffee in general. Since for the individual coffee varieties no significant results could be obtained, a new dummy variable was constructed testing the hypothesis that lots consisting of only one coffee variety receive a higher price as lots consisting of several coffee varieties. The results confirm this hypothesis as the variable “more than one variety is grown” has got a negative influence on the price. This influence is significant on the 1% level, but compared to the other variables the influence is rather low.

All country-of-origin dummies are highly significant leading to the result that a coffee of the same quality in terms of score and achieved rank coming from Honduras is sold at a price discount compared to all other included countries of origin. The ranking of countries in the hedonic pricing model confirms the picture given in chapter 2 and found in the literature (Knox and Sheldon 1996:49pp.). Guatemala is seen as the leading supplier of high-quality coffee, whereas Honduras still has to establish an image of a high-quality producer. Besides Guatemalan coffees, which receive a price premium of around 95 %⁹ compared to Honduran coffees, coffees from Bolivia receive a price-premium of 77 %. Colombian and Brazil coffees are higher priced as Honduran coffees but ranked under coffees coming from Guatemala or Bolivia. One shortcoming in this context is the fact that prices do not include transportation costs. Of course, this fact could lead to a biased preference scheme between supplier countries because of differing transportation costs. Therefore, as a first approximation the difference between the CIF-prices for coffee in the US-, the German and the Japanese market reported by the UN Comtrade database and the producer prices reported by the FAO and the International Coffee Organization for the

⁹ Since the dependent variable appears in logarithmic form the percentage interpretation of the dummy variable has to be calculated as $100 \cdot (\exp(\beta) - 1)$ (Wooldridge 2003:226).

years 2002 and 2003 were calculated. The results indicate that transportation costs calculated as the difference between CIF prices and producer prices range between 15 and 45 US-Cent per pound, depending on the country of origin and the destination. This level is reported by other studies, too (Daviron and Ponte 2005:210). Since the important point for our analysis was not the absolute value of transportation costs but the relation between coffee-producing countries, the countries were ranked according to their amount of transportation costs. If transportation costs were an important component in the decision of the bidder we assumed that countries receiving a price discount were countries with high transportation costs and vice versa. This could not be proved by the data (see Annex 2). Moreover, the results indicate that countries receiving a price premium, e.g. Guatemala and Bolivia are also countries with high transportation costs. Thus, we suppose that in the mass coffee market transportation costs are an important determinant considering producer prices of 0.50 US-\$ for green coffee and retail prices of around 3.25 US-\$ per pound for roasted coffee. But considering auction prices for specialty coffees with a mean of 3.84 US-\$ per pound and retail prices ranging from 15.00 US-\$ to over 50 US-\$ for a pound of roasted coffee, transportations costs can be seen as a more or less negligible determinant of the auction price.

<Table 5>

The results regarding the implicit value of the region-of-origin are presented in Table 5. The variety variable was not included, because of missing data (Ethiopia) or a missing variance (Colombia). The influence of the variables score and rank as well as lot size is similar to the one presented above. One difference can be observed for the variable rank in the Ethiopian model. None of the three variables has got a significant influence on the price. In contrast to this, almost all regional dummies are significant with a quite high impact compared to the other included variables. This is especially true for Ethiopia. Coffees from the region Yirgacheffe receive a substantial price premium compared to Sidamo or other Ethiopian coffee regions. The discount for other growing regions is almost one-third compared to coffees from Yirgacheffe, other things equal. Contrary to our hypothesis the results from Colombia indicate that in the specialty coffee segment buyers already differentiate between Colombian coffee regions. Compared to the reference region Huila all other growing regions sell at discounts between 15 % (Nariño) and 25 % (Cauca).

4. Final remarks

As data on exported quantities document, the single-origin coffee market is still a niche market. But growth rates in this market seem to be quite high. Many coffee-producing countries have already decided to invest in the establishment of appellation systems of coffee and are trying to formalize these regions by legal means to address the rising consumer demand for diversification and quality. While today the main actors in this field are Colombia, Costa Rica, Guatemala and Ethiopia, this trend can be observed in almost every coffee-producing country.

The main export markets for single-origin coffees are the United States and Japan. In Europe these coffees are just emerging. This picture is stated by the internet auction results for single-origin coffee. In all cases half or even more than half of the coffees were bought by Japanese importers or roasters. Additionally, the results from the hedonic pricing model show that in the specialty coffee sector coffees from individual coffee-growing regions receive price premia due to their reputation. These findings are very similar to findings in the wine market. But whereas wine is a finished product when it is sold by the winemaker, this is not true for coffee. In the case of coffee the coffee producers sell a semi-finished product. This point is very important with regard to the scope of protection a GI receives. Protecting the whole process from harvesting to roasting would definitely alter the whole supply chain and trade patterns. To some extent this change in the supply chain governance can already be observed. Ethiopia is licensing the use of the terms Harrar, Sidamo and

Yirgacheffe and there is the tendency that specialty roaster get in direct connection with the producer to make sure that the coffee they purchase has got the desired origin and quality (Ponte 2002:17).

Single-origin coffees are coffees telling a story. This can be observed particularly in the COE internet auctions. In the first years just few information about the individual coffee awarded the COE was provided. Nowadays a whole story about the coffee including agronomic data as well as personal data about the farmer and pictures of the farm are available and can be used as marketing tool for the final market.

However, the identification and establishment of growing regions and especially the enforcement of the legal protection in foreign markets is not a costless action. The results from the US market point to the fact that single-origin coffees achieve high price premia. But how much of this value added will flow into producing countries and if benefits outweigh the costs coupled to the establishment and enforcement of the geographical indication needs further exploration.

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Tables

Table 1: Intellectual Property Systems in Selected Coffee-Producing Countries

Country	Legal Regulation	Registered GIs for Coffee	Current Projects
Bolivia	Decision 486 of the Andean Community, 2000: <i>IOC and DO</i>	None so far	
Brazil	Brazil Industrial Property Law No. 9.279 (1996): <i>IOC and DO</i>	None so far	
Costa Rica	Law on Marks and other Distinctive Signs, 2000: <i>GI and DO</i>	None so far	ICAFFE ¹ has established the project "7 Regions, 7 Coffees".
Colombia	Decision 486 of the Andean Community, 2000: <i>IOC and DO</i>	Café de Colombia	Project "Los Cafés Especiales Colombianos"
Ethiopia	Law on Intellectual Property	n/a	Ethiopian Fine Coffee Trademarking and Licensing Initiative:
Guatemala	Law on Intellectual Property, Decree 57-2000: <i>GI and DO</i>	Genuine Antigua ²	Coffee Atlas 2006/2007 : 7 regional coffees are defined; Pilot Project Antigua: Establishment of Guatemala's first DO under the name "Antigua Coffee"
Honduras	Law on Intellectual Property, Decree 12-99: <i>GI and DO</i>	None so far	
Indonesia	Trademark Act of 2001	None so far	Pilot project to study the possible application of GI protection in the Kintamani region of Bali
Jamaica	The Protection of Geographical Indications Act, 2004	n/a	
Kenya	Industrial Property Act, 2001	None so far	
Mexico	Law on Intellectual Property, 1994: <i>DO</i>	Café Chiapas ³ Café Veracruz	

Legend: DO = Denomination of Origin; GI = Geographical Indication; IOC = Indication of Source; n/a: could not be specified

Notes: ¹Costa Rican Coffee Institute (ICAFFE); ² Not protected by legal means but certified since 2003 by Société Générale de Surveillance, a private food inspection company. ³ Both terms are protected as Appellations of Origin under the Lisbon Agreement.

Sources: Own presentation based on EIPO (2006); Garcia Muñoz-Nájjar (2001); Gerz and Avelino (2006); Mawardi (2005); WIPO (2004); <http://www.sice.oas.org> and <http://www.antiguacoffee.org>.

Table 2: Protected GIs for Coffee in Europe and the United States, January 2007

Name	Type of Protection	Year of Registration	Owner
Europe			
Café de Colombia	CTM - Figurative	2001	FNC ¹
100 % Café de Colombia	CTM –Figurative	2004	FNC
Juan Valdez 100 % Café de Colombia	CTM – Figurative	2005	FNC
Café de Colombia	CTM – Figurative	2006	FNC
Denominacion de Origen Café de Colombia	PGI	2006	FNC
Jamaica Blue Mountain Coffee	CTM – Figurative	2004	Coffee Marks Ltd.
Jamaica High Mountain Supreme	CTM – Word	2003	Coffee Marks Ltd.
Harrar	CTM – Word	2006	Government of Ethiopia
Sidamo	CTM – Word	- ¹	Government of Ethiopia
Yirgacheffe	CTM – Word	2006	Government of Ethiopia
USA			
Colombian Juan Valdez	CM	1981	Republic of Colombia
100% Kona Coffee	TM	1969/2005	FNC
Jamaica Blue Mountain Coffee	CM	2000	Department of Agriculture of the State of Hawaii
Jamaica High Mountain Supreme	TM	1986	Coffee Marks Ltd.
Harrar	TM	2003	Coffee Marks Ltd.
Sidamo	TM	- ¹	Government of Ethiopia
Yirgacheffe	TM	- ¹	Government of Ethiopia
Café Veracruz	TM	2006	Government of Ethiopia
	CM	2005	Consejo Regulador del Cafe-Veracruz

Legend: CM= Certification Mark; CTM= Community Trade Mark; FNC = Federación Nacional de Cafeteros de Colombia; PGI = Protected Geographical Indication; TM= Trademark. ¹ In these cases no final determination as to the registrability of the mark has been made.

Source: Own presentation based on CTM-Online (2007), Official Journal of the European Union (2006), Schulte (2005) and TESS (2007).

Table 3: Export Volume of Selected Coffees with GIs, 2002

Country	Export quantity (in metric tonnes)	Share in total coffee exports (in percent)	Main export markets
Colombia <i>Regional GIs</i>	8,100	1.40	Japan
Guatemala <i>Genuine Antigua</i>	2,940	1.42	US and Japan
Indonesia <i>Toraja, Kalosi, Mandheling</i>	3,644	1.13	US and Japan

Source: Own presentation based on FAOStat; Giovannucci et al. (2002); Neilson, J. (2005).

Table 4: Regression Results for the COE Auction Data Set

Dependent Variable	Comprehensive Model		Reduced Model ¹	
	Log(price)		Log(price)	
Score	0.077***	(10.06)	0.081***	(11.22)
1 st Rank	0.814**	(7.36)	0.799***	(7.52)
2 nd Rank	0.262**	(3.12)	0.250**	(3.21)
3 rd Rank	0.288**	(2.93)	0.244**	(2.62)
Lot Size in kg	-1.63*10 ⁻⁴ ***	(-8.02)	-1.56*10 ⁻⁴ ***	(-8.10)
Coffee-growing area	2.84*10 ⁻⁴	(1.40)	-	-
Coffee Variety				
<i>Reference: Bourbon</i>				
Catuai	-0.014	(-0.30)	-0.087** ¹	(-2.88)
Caturra	0.079*	(2.19)		
Colombia	0.225	(1.59)		
Pacama	0.031	(0.27)		
Typica	0.177	(1.83)		
Others	0.007	(0.11)		
Country of Origin				
<i>Reference: Honduras</i>				
Bolivia	0.491***	(7.63)	0.574***	(10.43)
Brazil	0.453***	(8.21)	0.415***	(9.27)
Colombia	0.272***	(4.31)	0.362***	(7.29)
El Salvador	0.287***	(4.07)	0.274***	(4.93)
Guatemala	0.603***	(7.94)	0.666***	(10.59)
Nicaragua	0.187**	(3.22)	0.238***	(5.15)
Year Dummies				
<i>Reference: 2003</i>				
2004	0.144**	(2.98)	0.133**	(2.96)
2005	0.115**	(2.60)	0.085*	(2.02)
2006	0.269***	(6.25)	0.248***	(5.98)
Adjusted R squared	0.64		0.63	
F-Statistic	49.82		74.14	
Number of observations	589		637	

Note: ***, **, * indicates significance at the 0.1%, 1% and 5% level, respectively; t-values are presented in parentheses; ¹ For the reduced model a new variety variable was constructed: The reference case is that the offered lot consists of just one single variety. All other lots consisting of more than just one variety are summarized to one group for which the regression coefficient is presented.

Source: Own computations.

Table 5: Regression Results for Colombia and Ethiopia

Dependent Variable	Colombia		Ethiopia	
	Log(Price)		Log(Price)	
Score	0.066***	(3.95)	0.115***	(3.82)
1 st Rank	0.789***	(3.61)	0.086	(0.46)
2 nd Rank	0.229*	(2.29)	-0.065	(-0.36)
3 rd Rank	0.332	(1.12)	0.015	(0.06)
Lot Size in kg	-1.17*10 ⁻⁴ ***	(-2.07)	-3.26*10 ⁻⁴ **	(-3.39)
Regional Dummies				
<i>Reference: Huila/ Yirgacheffe</i>				
Cauca / Sidamo	-0.285**	(-2.98)	-0.227*	(-2.20)
Nariño	-0.158**	(-2.71)		
Tolima	-0.278***	(-3.89)		
Other	0.040	(0.54)	-0.384**	(-3.06)
Adjusted R squared	0.54		0.54	
F-Statistic	15.48		9.68	
Number of observations	111		53	

Note: ***, **, * indicates significance at the 0.1%, 1% and 5% level, respectively; t-values are presented in parentheses.

Source: Own computations.

Graphs and Diagrams

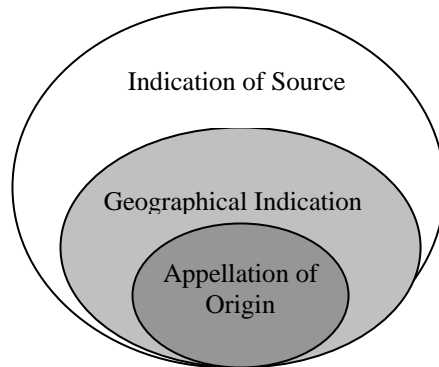


Figure 1: Relationship between Indication of Source, Geographical Indication and Appellation of Origin

Source: Own presentation based on WIPO (2002).

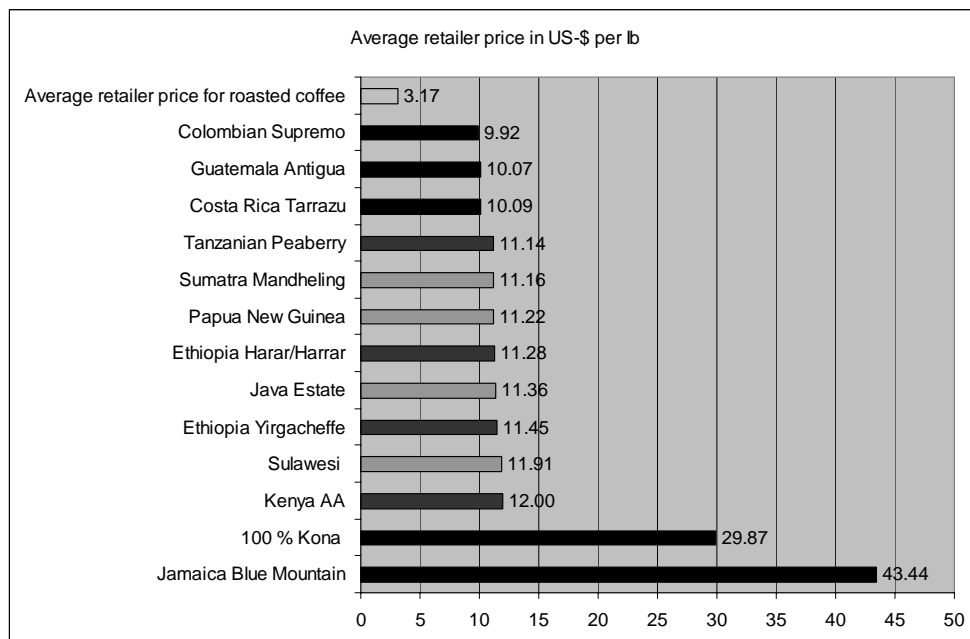


Figure 2: Average Retail Price in US-\$ per pound, August - December 2006

Source: Own presentation.

Annex

Annex 1: Descriptive Statistics of the Data Sets

	Country		
	COE Data 2003-2006	Colombia	Ethiopia
Price (in US-\$/lb)			
Weighted Mean	3.84	4.31	2.94
Min	1.20	1.85	1.50
Max	49.75	19.10	10.65
Score			
Weighted Mean	86.61	86.81	87.94
Min	80.25 ¹	84.05	85.03
Max	95.85	93.72	92.50
Lot Size in kg			
Mean	1,429	1,202	1,286
Min	620	980	480
Max	8,417	5,253	2,220
Number of observations	638	111	53
Number of coffees bought by			
Japanese companies	312	67	28
US companies	152	15	18
European companies	138	23	5
Others	23	5	1
N/A	13	-	1

Notes: ¹In Nicaragua in the COE competition 2003 the threshold was a score of 80 instead of 84. This was changed in 2004.

Source: Own computations.

Annex 2: Transportation Costs

	Difference between the US CIF-price and the Producer Price in US-\$ per pound, 2002	Difference between the US CIF-price and the Producer Price in US-\$ per pound, 2003
Bolivia	0.297	0.361
Brazil	0.223	0.317
Colombia	0.272	0.393
El Salvador	0.329	0.379
Guatemala	0.415	0.382
Honduras	0.149	0.107
Nicaragua	0.152	0.183

Source: Own computations based on FAOSTAT, ICO Database and UN Comtrade.

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Objectiveness in the Market for Third-Party Certification: Does market structure matter?

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Summary

The globalization of trade in high quality foods is stimulating the development of international food standards and certification systems. Third-party certification has evolved as a means of ensuring that product information and signals on quality and safety attributes are sound and reliable. Certification can only provide credible market signals if it operates objectively and independently. This paper investigates the potential trade-off between certifiers' objectivity and the level of competition in the rapidly expanding market for third-party certification of quality foods. Based on a theoretical supply chain framework a nested panel analysis is applied to a set of accredited certifiers for the EurepGAP fruits and vegetables standard. Our results indicate that increasing economies of scale and market share in certification do matter.

KEYWORDS: Third-party certification, objectiveness, market structure, nested panel analysis, EurepGAP

1. Introduction

Markets for high-quality foods have changed dramatically in recent decades and especially in the advent of the new millennium, creating an increasingly complex global food system. A multiplication of food-safety outbreaks diminished consumers' confidence and trust in the ability of the agro-food industry and governmental authorities to assure the provision of safe and high quality foods. Increasing vertical coordination in food supply chains has triggered a shift in structures from single firm to multi-stakeholder supply-chain configurations (Barkema and Drabenstott 1995). A particularly critical issue of this new paradigm of food supply is the emergence of opportunistic behaviour associated with information asymmetries between contracting parties.

Credible quality signalling evolves as a pivotal element facilitating transactions among agents in the food chain. Reliable product information becomes even more important when firms' differentiating strategy involves credence attributes such as food safety, organic farming or fair trade. Shifts in governmental consumer protection strategies and stricter private food quality and safety standards impose greater responsibility on food operators, especially retailers, which are being forced to assume a "gatekeeper's" role as guarantors of food quality and safety. This is certainly the case in the UK, where the Food Safety Act of 1990 requires a stricter control of production and processing along the supply chain and forces retailers to assume their share of responsibility on the provision of food safety (Henson and Northen 1998). Across Europe retailers are adapting to the new market agenda developing imposing quality assurance systems on supplier's to assure the safety and quality of their products and to mitigate product liability (Hatanaka, Bain and Busch 2005)

In the European Union private and public authorities have defined and specified a number of new quality assurance and labelling systems relying on control and certification schemes provided by independent and impartial agents. These control systems reassure partners in

the food chain and consumers' of the quality and safety of products. In recent years several new control and certification bodies have been created and compete to offer its services to firms seeking certification from good farming practices to processor specifications in various standards. Thus, new markets emerged where firms compete to provide food quality and safety certification services for different private or public food standards.

This paper focuses on the recently created certification services market. The main goal is to analyse how the structure of the international market for third-party certification of high quality foods influences the objectiveness of third-party certifiers and thus the credibility of the certification process.

Third-party certifiers (TPC) have evolved as independent and credible institutions designed to ensure quality and safety standards across food markets. Third-party certification is one way to assess and to monitor firm's compliance with standards, practices, principles, and/or legal requirements, where 'certification' is the voluntary assessment of and approval by an accredited party and an accredited standard (Meuwissen et al. 2003). Product and/or process certification may reduce uncertainties and lower overall transaction costs that arise from information asymmetries between producers and retailers in vertical supply chains [Caswell et al, 1998; Tanner 2000; Deaton 2004; Manning and Baines 2004].

As the demand for private third-party certification of quality assurance schemes increases so does the level of competition among accredited certifiers as additional TPCs enter the market. Busch et al. (2005) and Tanner (2000) point out that the credibility of third-party certification critically depends on the objectiveness and independence of the certifier. As the competitive structure in the TPC market is shifting there may be a trade-off between the objectiveness of third-party certifiers and market structure as shown by Lizzeri (1999). If this is the case, the role of third-party certifiers as an efficient and signalling institution has to be questioned [Carriquiry, Babcock and Carbone 2003; McCluskey 2000].

The paper is organized as follows: Section two provides an overview of the economics of third-party certification with an emphasis on recent work and its implications on food markets. Section three proposes an analytical framework relating the structure of the TPC market to the objectivity of the certification process. The fourth section presents an empirical case study using panel data on the Euro-Retailer Produce Working Group (EUREP) Good agricultural practices (GAP) quality assurance system in the international fruits and vegetables market. Finally conclusions are drawn.

2. The Emergence of Third-Party Certifiers and Their Role in Food Chains

According to the traditional neo-classical economic model both suppliers and buyers in the market are fully informed about the homogenous commodity that is exchanged. In fact, today's global food system is rather characterised by highly diversified products and far reaching information deficits on both side of the market (Jahn, Schramm and Spiller 2005). Empirical studies on food markets suggest that third-party certifiers may in fact facilitate the mitigation of market failure due to information asymmetries between market participants. Caswell et al. (1998) argue that third-party certification may reduce transactions costs where uncertainty about product attributes exists. Henson and Reardon (2005) and Fulponi (2006) analyse the impact and use of third-party certifiers to mitigate uncertainty and reduce information asymmetry between producers and retailers in vertical food-supply chains. Carriquiry, Babcock and Carbone (2003) investigate the relation between the stringency of third-party certifiers and optimal quality systems in terms of agricultural output. Only if these organisations are successful in establishing a positive reputation will their certificates be accepted as credible signals in the market place.

The above studies emphasise the benefits of independent signalling and certification institutions. However, none of them considers the fact that nowadays most certification systems are privately organized. While public certification authorities enforce standards

through laws and fines, private certification institutions constitute economic agents that typically follow some form of economic profit-maximisation rule. Therefore, as Jahn, Schramm and Spiller (2005) state the analysis of third-party certification systems has to acknowledge the existence of opportunistic behaviour rather than assuming that private certifiers will always be capable of carrying out certification in the most efficient and effective manner.

In his seminal paper Tirole (1986) analyses the relationship between three agents (principal, agent and supervisor) in an organization viewed as a network of intertwined contracts. Tirole (1986) offers important insight into the importance of independence of the third party in transaction processes. He shows that with a dependent third party, coalitions may emerge between market partners (supervisors and principals or supervisors and agents). If coalitions emerge, the process of revealing information is hindered.

Using a game theory approach Lizzeri (1999) looks at the impact of the certification's market structure on gathering and revealing information. He shows that if the third-party certifier is a monopolist, it will reveal only part of the information gathered which creates a monopoly rent and decreases social welfare. Contrarily, under a perfectly competitive third-party certification market, all private information is revealed and social welfare is optimal. Therefore, market structure needs to be considered when analysing the market mechanism for third-party certification.

Tanner (2000) provides an insiders view to the nature of a third-party certifiers. He notes that TPCs need to be experienced organizations and demonstrate expertise in certification procedures. While Tanner claims that a critical point to the role of TPCs is their true independence, he also suggests that "the third-party's relationship with the first-party, the client food company, is also more supportive and "arm around the shoulder" than the relationship between the company and the regulator" (p. 415). Tanner reveals an ambiguity in the role of TPCs. Being supportive to the certified firm may imply a relaxation of the certification process and expose a conflict of interests between the TPC's independence and the need to act cooperatively with the certified firm. Baumman (2001) and Giannakas (2002) provide empirical evidence of opportunistic behaviour in the organic control schemes, estimating that frauds in organic labelling were about 10% in Germany and varied between 15 and 40% in southern EU member states. Evidence of imperfect certification enforcement and fraud is also supported by Anania and Nistico (2003) and McCluskey (2000).

Manning and Baines (2004) stress the importance of certifier accreditation through accreditation institutions to assess and ensure independence and objectiveness of certification process. They claim that accredited TPCs offer more guarantees of independence, impartiality, competence and sustainable performance to consumers or other stakeholders. However, accreditation is a largely formal process that does not include the actual monitoring of the working process. So far, researchers have a limited understanding of the quality and thoroughness of control procedures that may prevent opportunistic behaviour but also may create barriers to market entry. Jahn, Schramm and Spiller (2005) criticise that the lack of supervision is the reason behind the introduction of 'control-of-control' mechanisms in many of today's private agrifood certification systems. In fact, incumbent providers of certification may have strong incentives to prevent market entry of new competitors in a rapidly growing certification market and evolving regulations. Moreover, TPCs established in one food industry may find it easier to achieve accreditation for another industry, than it is for a newcomer in the market.

Deaton (2004) analyses the role of third-party certifiers using an information economics framework. Along with the assumption of independence of third party certifiers, Deaton further assumes certification will only provide effective signalling service if low quality producers have higher certification costs than suppliers of high quality products. Thus independence of TPCs is related to the ability and willingness to discriminate between low and high quality producers. Given the competitive pressure that is common to many

retailer-led food supply chains, suppliers might view certification of their product as an externally imposed regulation in order to protect market shares. Hence, suppliers may have low interests in thorough and costly inspection procedures and third-party certifiers may have an incentive to reduce certification costs (Jahn, Schramm and Spiller 2005).

Following Tanner (2000), Deaton argues that accreditation agencies play a crucial role ensuring TPCs remain independent from their clients. Jahn, Schramm and Spiller (2005) also discuss the implications of imperfect certification markets by drawing on the existing financial auditing literature and new institutional economics.

Henson and Reardon (2005) argue that as many food markets are shifting from a price-based to a quality-based competition third-party certifiers will become an increasingly important and powerful player in many high-quality food markets. This trend may create larger and more powerful TPCs over time whose profit-maximizing self interest may affect the quality of the certification service. This justifies a closer scrutiny on both the structure of certification markets and their role as signalling credible institutions. A critical question is whether increasing competitive pressure in the certification market will affect the outcome and hence the reliability of the certification process?

3. Analytical Framework

The theoretical economic literature investigates the role of market intermediaries, auditors and certifiers in different contexts and markets. In here the aim is to propose a framework to analyse how market structure impacts the provision of credible by third party certifiers. Jahn, Schramm and Spiller 2005, analyse the reliability of certification focusing on the relationship between a standard owner and certifying bodies. In turn, here the focus is on transactions between third party certifiers and firms seeking certification. More specifically the aim is to investigate whether competition between certifiers impacts the quality of certification.

Previous work has analysed the role of intermediaries as agents disclosing otherwise private information and at the impact of the market structure on its effectiveness. Three main findings are relevant for our analysis: First, Tirole (1986) shows that increasing competition between third-party certifiers and either buyers or sellers of food products may lead to noisy signals and hinder the objectiveness of the certification process. Second, the number of third party certifiers in the market may affect the amount of information revealed (Lizzeri 1999). Third, Deaton (2004) suggests that the role of TPC as signalling institutions decreasing information asymmetries critically depends on their objectiveness.

Other factors affecting performance of third party certifiers found in the literature are the institutional setting in which the certification body operates; the effectiveness of monitoring by a “control-of-the-control” agent; or the public or private nature of the certification body (Jahn, Schramm and Spiller 2005).

The framework proposed here illustrates the structure of a private, business to business certification, such is the EUREPGAP standard or those emerging from the ISO 9000. With the underlying assumption of a private standard owner Figure 1 illustrates the institutional structure of a third-party certification system where the owner of the voluntary standard establishes accreditation system to guarantee and streamline the flow of certified product up to the retail.

[Figure 1]

Assuming a leading position of the retail sector in the supply chain, the suppliers provide certificates to signal standard compliance with the retail standard. The certificate is issued by a certifier based on an establish standard that is laid down and overviewed by the standard owner. Certifiers in turn have to prove their eligibility to conduct inspections through ISO 65/EN 45011 standard accreditation. Finally, the standard owner is

responsible for the development and ultimate monitoring of the specific standards and its control procedures.

As the majority of private food safety and quality schemes are based on ISO 9000 standards, third-party certification providers are offering market based inspection and certification services. Depending on the nature and scope of the standard the costs of certification and associated inspection routines might be high (Nadvi and Waeltring 2002). Moreover, leading accredited third-party certification bodies, like SGS, DNV (Det Norske Veritas) Moody's and Integra BVBA that provide certification services internationally might sub-contract national standard organisation. While the standard owner aims at the highest possible level of compliance, the competitive structure of the certification market may affect this goal. In fact, individual certifiers that are sub-contracted to become agents of larger certification companies may pursue different stringency levels and certify products or processes that otherwise do not meet standard requirements. Hence, changes in the competitive structure of the certification market may have significant implication for both certifiers and associated suppliers.

A credible certification scheme is one where high quality products have higher chances of being certified, than low quality products ones (Carriquiry, Babcock and Carbone 2003). If a TPC is truly objective, independent and competent it will not only be able to minimize both type I and II certification errors but also will resist any pressure to relax its procedures. Off course objectivity and competence is costly and these costs will raise the more detailed and accurate is the certification process. Assuming that the level of objectiveness increases with firm size and reputation asset, then multinational certifiers may not only have better chances of being accredited but also of getting more contracts to provide certification. Reputation asset itself is dependent on the level of experience a certifier has in the market. Increasing competition may either increase the level of stringency or reduced it. An increased competition may prevent reputed firms from relaxing their level of monitoring, especially if the control of the controllers is effective. However, it may also occur that higher pressure from other firms competing to provide certification hinders objectivity in certification and thus has a negative impact.

To get accreditation certifiers must demonstrate their independence and objectivity, but once this stage is overcome, these firms have to sell their services of certification and compete with other accredited firms for a fixed number of firms seeking certification of products or processes. There may be a difference between the procedures justifying the accreditation and their use in practice, such that the reality of the certification process is quite distinct from what was intended and announced to obtain accreditation. The argument tested empirically in the next section is that increasing competition will increase the gap between the intended level of quality certification and what is actually observed. Overall two seemingly important issues will be analysed. First, it is necessary to treat the objectivity of TPCs in relative, rather than absolute terms. This is because if TPCs compete in the provision of certification services there will be inevitably differences in the level of service provided. Second, given a fast growing market for third-party certification it is worthwhile to investigate what factors determine TPCs objectiveness and how they impact the ability to provide credible signals to the market.

4. Data, Empirical Model and Results

To illustrate the hypothetical relationship between competition and the objectiveness of third-party certifiers a case study is constructed based on the international certification market for the EurepGAP standard in the fruit and vegetables industry. We select the fruit and vegetable industry because it is the origin of the EurepGAP standard system. A particularly interesting feature of this pre-farm-gate-standard for good agricultural practices is its limitation as a business to business label that cannot be promoted to consumers. To enter the certification market for EurepGAP, third party certification bodies have to be

accredited according to the EN 45011 or ISO65 norm. These norms state that third-party certifiers should be independent, impartial, and confidential and have integrity (EurepGAP 2006). Currently EurepGAP recognizes over 100 control bodies in more than 70 countries. These compete to certify producers seeking contracts with retailers. By analyzing data available through the EurepGAP web site it is apparent that large multi-national certifiers compete against smaller national certifiers that only operate in single countries. The system allows for sub-contracting of certification services for EurepGAP in the fruit and vegetable sector. This makes a particularly interesting case study for the competitive environment in the market for third party certification.

4.1 Data Set

The empirical data used in this analysis is partly obtained directly from the EurepGAP web site (EurepGAP 2006). EurepGAP publishes and updates comprehensive information relating to the approval of TPCs for EurepGAP's quality assurance system certification, that have applied for accreditation under EN 45011 or ISO65 norms. This information includes a list of currently approved and operating certification bodies in over 100 countries. EurepGAP publishes detailed firm information together with dates of firm's application and final approval of EurepGAP accreditation (EurepGAP 2006). Other relevant information on the specifics of fruit and vegetables markets in countries where EurepGAP is active was obtained from public statistical sources (FAO 2007).

4.2 Empirical Model

A nested panel-model approach is used to analyse the impact of current market structures in the market for EurepGAP certified fruits and vegetables on the level of competition in a cross-section of over 100 TPCs in 28 countries and in the year 2006. The number of accredited TPCs in the certification market of country i is regressed on the date of accreditation of a TPC (2000 - 2007), and the timelag between a TPC's application and accreditation under EurepGAP. Other explanatory variables are the number of countries for which a TPC is approved under EurepGAP, and its individual share in the market for certified fruits and vegetables in a country i . The degree of country i 's export orientation is measured as the relation of its total value of agricultural and food exports and the quantities of fruits or vegetables produced. Finally, geographical specifics of TPC markets in different world regions are introduced through dummy variables.

The following nested panel model is specified:

$$\begin{aligned} Comp_Cert_{it}^j = & \alpha_0 + \alpha_1 (Time_of_Entry_{it}) + \alpha_2 (Activity_{it}) + \alpha_3 (SHARE_VEGGIE_{it}) \\ & + \alpha_4 (SHARE_FRUITS_{it}) + \alpha_5 (EXP_AGRI_{it}) + \alpha_6 (EXP_FOOD_{it}) + \alpha_7 (SGS) \\ & + \alpha_8 (AMERICAS) + \alpha_9 (EUROPE) + \varepsilon_{it} \end{aligned}$$

$Comp_Cert$ is our dependant variable and denotes the number of competitors of TPC j in country i and in the particular year 2006. The error ε_{it} is assumed to be normally distributed with mean zero. Table 1 presents definitions and descriptive statistics of the dependent and independent variables.

$Time_of_Entry$ represents the month and year of entry of a TPC into the EurepGAP system. Note that there is an increasing number of TPC around the world has applied for accreditation under EurepGAP system. We hypothesize that a later entry into the system entails higher competitive pressure as the number of incumbent certifiers increases.

$Activity$ is a proxy of a TPC's scale of operation providing information on the number of countries in which the company certifies fruits and vegetables for EurepGAP. As can be seen from Table 1 the average TPC certifies produce in around 13 countries. However, the standard deviation indicates a large band with. From the dataset we can identify TPC's

active in only a single country and global players – like SGS – that certify produce for EurepGAP in over 35 countries.

[Table 1]

Large-scale TPC's will thus have a competitive advantage over smaller and more "national" certifiers within EurepGAP, due to significant differences mainly in cost structures and reputation assets. Moreover, larger companies that are diversified across many markets will be less affected by increased competitive pressure in a single market. Hence, we hypothesize a negative impact of *Activity* on the level of competition.

Share_Veggie and *Share_Fruit* describe the TPC *i*'s share in country *j*'s market for certified vegetable and fruits, respectively. With increasing market shares of individual certifiers in a market we assume lower levels of competition, as the underlying market structure deviates toward more oligopolistic structures and a monopoly when a single certifier covers the entire quota of certified produce.

Exp_Agri and *Exp_Food* are proxies for export orientation of a relevant country with respect to its overall exports of agricultural and food products, relative to the size of its fruit and vegetable sector. We assume that an increasing involvement in international fruit and vegetable trade positively affects a country's importance within the global EurepGAP system. Hence, we hypothesize positive signs for these variables. The variable *SGS* equals one for countries in which this global player in the market for third-party certification is present and is zero in all other countries. TPC's like SGS are global market leaders in certification and quality assurance for foods. Markets in which these players are present will attract market entry of smaller TPC's and therefore increase the level of inter-TPC competition.

Americas and *Europe* are geographical dummy variables. Our data set identifies South America and Europe – the origin of EurepGAP – as areas of major activity. Hence, we hypothesize that these two geographical regions show greater levels of competition among producer contracts and amounts of produce to be certified.

Table 2 presents the panel model estimates. Among several model specifications Exact-Maximum Likelihood Estimators (ExactML) corrected for first-order serial autocorrelation revealed the best results based on the Schwarz-Bayesian Information Criterion (SBIC). Statistically insignificant F-tests could not reject the null hypothesis of equivalence of ExactML and fixed-effects models at the 95-percent level. The estimates of the nested panel model are generally well behaved.

[Table 2]

4.3 Empirical Results

Our results reveal a relative competitive advantage of larger and more diversified TPC's. As indicated by the variables *Activity* and *Share_Fruit* increasing diversification of activity, in terms of the number of markets a TPC certifies product and an increasing market share result in lower levels of competitive pressure from competitors. This result is significant with regard to the market for EurepGAP certified fruit. The variable *Share_Veggie* also shows the expected negative sign but is insignificant.

The variable *Year_of_Entry* provides valuable insight on the relation between market entry and the level of competition. The EurepGAP certification and quality assurance system has gained increasing recognition and importance in international food trade since its inauguration in 1997. The positive sign indicates that over time, increased entry due to rising numbers of accredited TPC's has significantly increased the level of competition among certification bodies and across countries.

The internationalization of trade in foods and agricultural products in recent years has been a driving factor of increased importance of international standardization and certification systems as is EurepGAP. Increasing uncertainty about product characteristics such as product quality and food safety levels are inherent attributes of today's global food trade. For many countries, in particular developing countries that supply fruit and vegetables to European and North American high-value markets, reliable certification of produce are vital. Our model results reveal that rising levels of export orientation in food production, relative to the country's size of vegetable and fruit production have a positive impact on the number of competing TPC's. Interestingly, the exact opposite result is obtained with respect to a countries export orientation in agricultural trade. Increasing levels of agricultural or commodity exports have a significant negative effect on the penetration of this market by TPC's for EurepGAP.

Another variable that provides important insight into the specifics of the EurepGAP system is captured in the variable SGS. As hypothesized earlier we assume a significant effect of reputation assets and economies of scale on the competitiveness of certification bodies within the global EurepGAP system. The dummy variable shows that the presence SGS as one of the market leaders accredited under EurepGAP has a positive effect on certifier competition. Unfortunately, the variable is insignificant.

Finally, the model shows results on the impact of geographical market location on competition. Our data set reveals that EurepGAP plays a major role the fruit and vegetable sectors of many South American countries. Another focus of EurepGAP, of course, is within Europe. Against the hypothesized impact, both variables show negative sign. For TPC's operating from South American countries we observe a significant and negative impact on the level of competition among quantities of fruits and vegetables produced under EurepGAP. The same effect can be seen for Europe, but remains insignificant.

5. Concluding remarks

Third-party certifiers are playing an increasing role in international quality food markets, as consumers increasingly demand clear and credible signals when they purchase high quality and safe food. Global food procurement and trade entail increasing uncertainty and information asymmetries. Competition in food markets is shifting from a firm and price based to a supply chain and credence attributes based configuration, where private third-party certifiers emerge as important signalling institution.

Previous research has addressed the importance of third-party certifiers in food market as a credible signalling institution that facilitates the reduction of uncertainties related to information asymmetries in credence food quality and safety attributes. The main argument is that to properly fulfil their role TPCs must be independent and objective (Tanner 2000, Deaton 2004, and Busch et al 2005). This paper maintains that the objectiveness of private third-party certifiers may be affected by the competitive structure of the certification market. Namely, with an increasing number of certifiers in a market, objectiveness may be hindered.

Based on panel data of the EurepGAP standard in the international fruits and vegetables market our empirical analysis provides first empirical evidence and valuable insight into the competitive structures within the international EurepGAP standard and certification system. Moreover, the results are intended to stimulate the ongoing discussion on the role of third-party certification in food product as important means to assure quality and safety of consumer foods.

However, the study and in particular our empirical analysis also reveals the need for more detailed market data to investigate the differences between market segments of certified produce and residual commodity market qualities. Such information is vital to the analysis and better understanding of the implications international food standard system such as EurepGAP and others have on the performance of many food market.

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Tables

Table 1: Definitions of Variables and Sample Statistics Table

Variables	Variable Description	Mean	Standard Deviation
Dependent Variable			
<i>Comp_Cert</i>		8.58	5.87
Explanatory Variables			
<i>Time_of_Entry</i>	Month and year of EurepGAP accreditation	8.27	4.67
<i>Timelag</i>	Time gap between a TPC's application and EurepGAP approval	2003.64	1.57
<i>Activity</i>	Number of countries <i>i</i> in which TPC <i>j</i> certifies product	12.87	11.53
<i>Share_Veggie</i>	TPC <i>j</i> 's share in the market for certified vegetables in country <i>i</i> (tons)	821.15	3230.50
<i>Share_Fruits</i>	TPC <i>j</i> 's share in the market for certified fruits in country <i>i</i> (tons)	0.24	0.27
<i>Exp_Agri</i>	Country <i>i</i> 's value of agricultural exports per ton of vegetable and fruit produced in 2006	15694	16960.18
<i>Exp_Food</i>	Country <i>i</i> 's value of food exports per ton of vegetable and fruit produced in 2006	13645	14559.73
<i>SGS</i>	Presence of global TPC player SGS in country <i>i</i>	0.73	0.44
<i>Americas</i>	Geographical dummy variable North and South American countries	0.13	0.33
<i>Europe</i>	Geographical dummy variable European countries	0.72	0.44

Table 2: Explaining Inter-TPC Competition in the International EurepGAP System for Fruits and Vegetables^a

Variables	Estimate^b
Year of Entry	0.006*** (0.00) 8.43
Activity	-0.208*** (0.03) -5.99
Market Share Vegetables	0.0001 (0.00) -0.97
Market Share Fruit	-0.003*** (0.00) -2.86
Export Orientation Agricultural Products	-0.093*** (0.03) -3.60
Export Orientation Foods	0.094*** (0.02) 3.62
Presence of SGS	0.724 (1.03) 0.70
South America	-4.057*** (1.54) -2.62
Europe	-0.801 (1.39) -0.57
Rho	0.12
Test Statisticis:	LogL:-864.05 DW: 1.34 R2: 0.496

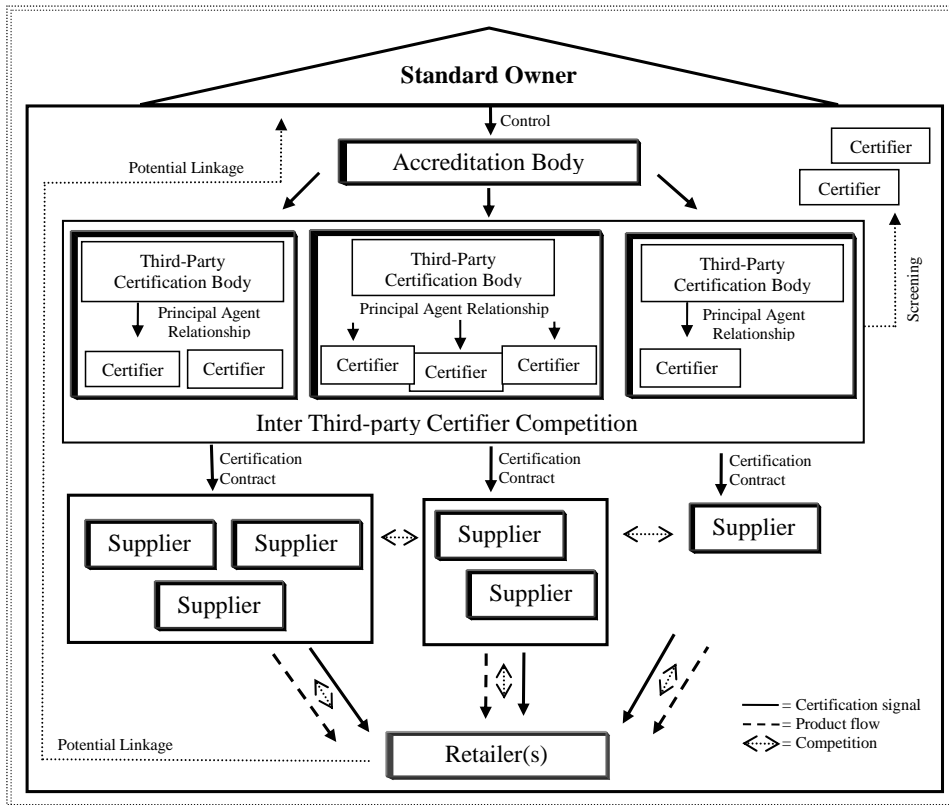
^a Dependent variable: Number of competing TPC's in country i.

^b ExactML random effect estimates of elasticities corrected for serial correlation. t-statistics and standard errors (in parentheses) computed with White's heteroscedasticity-consistent standard errors.

***, ** and * statistically significant at the 99%-, 95%-and 90%-level, respectively.

Figures

Figure 1. Schematic Structure and Competitive Relationships of the Certification Market



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The acceptance of GMO Seeds in German agriculture: empirical results

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Summary

Genetic engineering – hardly any other issue has been discussed so intensively along the value chain of food industry and agriculture in the past few months. Although GMO seeds are more commonly used in the world-wide agriculture European countries and in particular farmers in Germany are more reserved towards this topic (agricultural initiatives against the GMO seed report that already 5% of the agricultural acreage in Germany is announced as GMO-free zones¹). Why do farmers reject to cultivate GMO seeds? The scientific discussion mainly addresses consumer's acceptance of GMO-Food (e. g. LOUREIRO / HINE (2001), BAKER / BURNHAM (2002), BAKER / MAZZOCCO (2002)), there are hardly any cognitions about farmer's acceptance.

With the objective of closing this research gap and as a neutral contribution to the discussion about agricultural genetic engineering within the German agriculture we interviewed 370 German farmers about their attitudes to GMO seeds. The results of the study exhibit indications about the acceptance and the probability of utilization of GMO seeds. Furthermore the outcome evinces which factors can explain farmer's attitudes to agricultural genetic engineering. In addition the study gives indications about the willingness to pay for GMO seeds.

The theoretical funding for the empirical study arises from the social psychology by using the Theory of Planned Behavior (TPB) of AJZEN (1985) to predict farmers' intentions about GMO seeds. Transferring the considerations of Theory of Planned Behavior, we developed the following construct to predict the adoption of GMO.

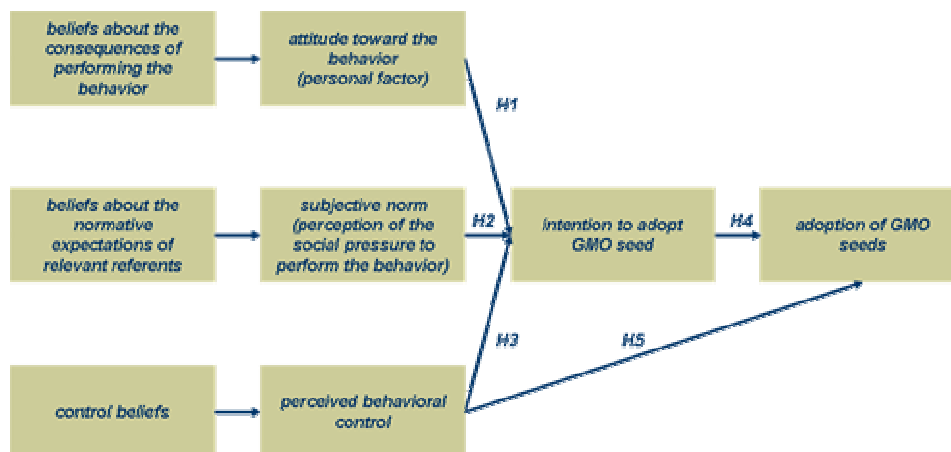


Figure 1: Theory of Planned Behaviour

¹ Own calculations based on <http://www.faire-nachbarschaft.de/> and <http://www.situationsbericht.de/>.

The reached sample manages averagely an acreage size of 228 hectares (σ 491.93), the answering farmers have an average age of 43.97 years (σ 12.38). Doubtless the sample is not representative, however, it allows interesting conclusions on the research question from the viewpoint of larger farms in north-western Germany. In the following a brief view on the most important results of the study is given.

The statements about the attitude towards agricultural genetic engineering show a little drift to a positive opinion. However, the presumption of adoption estimated rather low. The interviewed farmers reject the statement *I am about to adopt GMO seeds in the future*. If a specific product is presented to the farmers and the probability of adoption tested, a quite positive answering arises. Herewith the farmers show a partly inconsistent attitude. The high standard deviations, particularly with the concrete question of adoptions, are another record of the different positions within the agriculture.

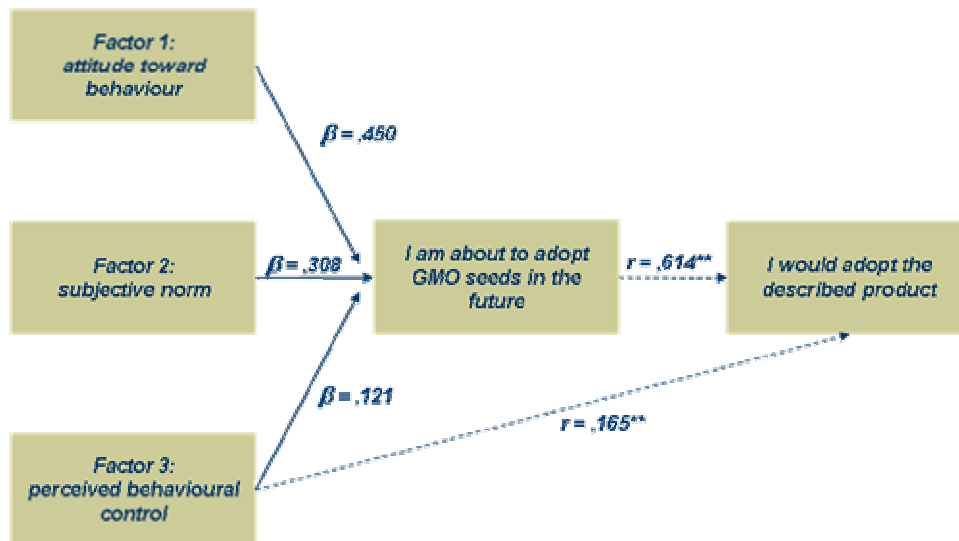
Item	n	Mean	Std. deviation
What do you generally think about genetic engineering in the agriculture?	369	0,22 ¹	0,956
I am about to adopt GMO seeds in the future.	369	-0,40 ¹	1,074
I would adopt the described product (Bt corn or roundup-ready sugar beet).	320	0,36 ¹	1,206
How sure are you with your attitude on genetic engineering in the agriculture?	368	0,45 ²	0,924

¹ on a scale from +2 ("I strongly agree") to -2 ("I strongly disagree")

² on a scale from +2 ("I am very sure") to -2 ("I am very uncertain")

Table 1: Attitude towards agricultural genetic engineering

In order to specify the results, factor- and regression-analysis were calculated to have a first estimation of the Theory of Planned Behaviour related to the adoption of GMO seeds. The results show that the factors "attitude toward behaviour" and "subjective norm" have a broad impact on the intention to work with GMO seeds in the future. The factor "perceived behavioural control" has only a small influence on the intention.



** Correlation is significant at the 0.01 level (2-tailed); * Correlation is significant at the 0.05 level (2-tailed).

β = standardised β coefficient; r = coefficient of correlation

Figure 2: Calculation of the Theory of Planned Behaviour

It is demanding to identify factors which influence the intention and behaviour of German farmer's towards GMO seeds. Thereby the Theory of planned behaviour is not absolute suitable to explain the adoption of GMO seeds. Our calculations point out, that the individual opinion on agricultural genetic engineering and the subjective are important factors of influence. Surprisingly, the perceived behavioural control (e. g. the perceived risk through unclear liability rules) has no capacious influence on the attitude to adopt GMO seeds. In the next step the data set must be used to evaluate an entire model to explain farmer's intention to agricultural genetic engineering.

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Consumer attitudes toward GM food with hypothetical functional characteristics

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Summary

Since their introduction in the early 1990s, genetically modified organisms in agriculture tended to emphasize improved yield. Europeans, perceiving unacceptable risk and too little benefit, resoundingly disapproved of GMO use in agro-food processes. More recently, research has turned to developing products that use GMO components that better match consumer interest, including nutritionally enhanced foods, environmentally friendly crops, and other areas. The question that arises is whether Europeans perceive that the new, prospective benefits outweigh the old risks, opening the market to such products.

This paper investigates consumer preferences for a number of hypothetical genetic modifications in a widely consumed food product: yoghurt. We explore the issue using discrete-choice, multi-attribute, stated-preference data. Our analysis of the data shows that consumers attribute low importance to prospected benefits in judging gene technology applications. Moreover, data demonstrates that consumers don't feel that labels and certification alone offer sufficient safeguards from perceived danger. Conversely, better information through scientific research does seem to have an impact.

KEYWORDS: GMOs, functional properties, willingness to pay, choice modelling

1. Introduction

In 2006, the sixth edition of Eurobarometer survey on risk perceptions was released (Eurobarometer, 2006). Compared to the previous editions, this analysis revealed that Europeans are more confident about the positive contribution that technology transfer can bring to society. People were more informed, and a optimism about biotechnology approached levels registered in early 1990s, when the first Eurobarometer survey was carried out. That is a reversal of the trend of decline registered in the period 1996-2005.

Nevertheless, the great majority of respondents appeared seriously convinced that their health could be damaged by biotechnology applications in the agro-food sector, and particularly by genetically modified organisms (GMOs). Eurobarometer results pointed out the persistence of strong concerns with food safety and quality. GMOs are seen as not useful, risky and morally unacceptable (ibid.).

People clearly identified several factors as dangerous. First was the risk that antibiotic resistance might be transferred to humans through consumption of GM food. Moreover, many people are afraid that environmental equilibrium may be damaged by crosspollination between GM and non-GM crops.

In this study, we tried to assess whether consumers have lower aversion to GM agro-food products if these products incorporate potential benefits to the consumer. In particular, we try to verify if consumer attitudes towards GMOs differ for various types of benefits. Because yoghurt is an important locally produced good, we used it on our study.

The remainder of the paper is organized as follows. Section 2 illustrates the background and motivation to this study, section 3 describes objectives, section 4 data and methods, estimation and results are illustrated in section 5, and we draw our final remarks in section 6.

2. Background

Several studies have demonstrated that uncertainty about agro-biotechnology applications applies to many fields, including human health, sustainability, environment safety, and ethical issues (Martinelli, 2004; Bucchi & Neresini, 2004; Frewer, 2003, Wolt & Peterson, 2000). Altogether, these factors are decisive in building attitudes towards GM products (Martinelli et al., 2005; Slovic, 2000). Moreover, Science itself is intrinsically unable to provide univocal and thorough knowledge on agro-biotechnology implications for present and future generations. Scholderer & Frewer (2003) and Bucchi & Neresini (2002) have proved that scientists' conflicting statements about GMOs effects emphasize the public concern. Consequently, Europeans feel very confused as regards different applications of agro-biotechnology (Gaskell et al., 2004; Observa 2000, 2002, 2003; Evans & Durant, 1995). In particular, citizens-consumers tend to base their evaluations on self-made estimates of the risks and the benefits of a given technology and these appraisals can strongly differ from those of experts and technicians (Savadori et al., 2004). As a consequence, GM applications in health care receive great support, while GM food and xenotransplants seem to be least supported (Eurobarometer, 2003; Frewer & Shepherd, 1995; Bredahl et al., 1998). Generally, opposition seems to be stronger when people recognize only the perceived risks of a technology application, while the benefits are of negligible importance (Gaskell et al., 2004). Thus, consumers can have distinct opinions of the same technology according to its purpose: if DNA technologies are beneficial for health, they are likely to receive greater support than technologies that do not offer similar benefits (Gaskell et al., 2003).

On the other hand, GMO cultivation is rapidly spreading around the world. The International Service for the Acquisition of Agri-Biotech Applications (ISAAA) reports that in their first decade of commercialization (1996-2005), the global area of GM crops has increased more than fifty fold. In 2005, biotech crops covered about 90 million hectares, an increase of 9 million hectares compared to the data available for the year 2000 (ISAAA, 2005). This trend in GMO crop diffusion might suggest that farmers may have some advantage in cultivating GM plants. In fact, the first generation of GMOs was developed to increase yields, tackling production problems such as the cost of fertilizers, adverse weather and climatic conditions, and plant pests and weeds.

3. Objectives

The introduction of crops produced with biotechnologies has raised concerns, shedding light on the need to develop more careful research with regards to other aims than simply benefits to farmers (Phillips & Corkindale, 2002). At present, the great challenge for the DNA transfer technologies in agriculture is to develop new varieties with unique functional properties that benefit consumers. Another crucial priority is environmental sustainability. In this view, GM plants can be bred to supply desirable nutrients for human diet, to improve taste in foods, to support environment-friendly production practices, but also to produce medicines and vaccines (ABEurope, 2003). As a consequence, it is possible that future GM food products with ascertained benefits for their users will be available on the shelves (Marin & Martinelli, 2005). This possible scenario raises the question as to whether consumers will change their attitudes toward GM products given promised potential benefits and partially known risks. Thus, we want to investigate whether development of GM products more attentive to consumer needs could outweigh the negative perceptions of agricultural biotechnologies. Accordingly, our study interest lies in the citizen-consumer attitudes towards GMOs and specifically in the factors that can affect final choice when different purposes are associated with GMOs in food processing.

Deep understanding of citizen reaction to technology transfer and the ability to properly interpret the motivations behind such responses are crucial to institutions for governing innovation democratically and efficiently. Analyzing how positive or negative attitudes

translate into actual behavior can make a valuable contribution toward identifying people's needs and priorities with reference to gene technology.

In this framework, using an economic approach, we try to understand purchase behavior as a tangible expression of an individual's choice to consume or reject GM food products.

4. Data and methodology

The evaluation of consumers' attitudes towards OGM was undertaken for the Province of Trento, which is located in north eastern Italy. In this territory the economy is mainly based on agricultural activities, environmental services, and tourism. As dairy production is one of the most representative activities in Trentino, we selected yoghurt as a target product for our analysis. In our simulation, yoghurt is hypothesized to be the product of conventional food processes or, alternatively, of practices based on GMOs for different aims, namely higher agricultural yields, lower environmental impacts, or the hypothetical prevention of serious health diseases.

The telephone survey was carried out during the Spring of 2006. We asked to a random sample¹ of 532 Trentino people² to choose the preferred yoghurt among 4 alternatives in a choice experiments context.

We apply a Discrete Choice (DC) approach (Train, 2003; McFadden, 1974a, 1974b, 1976, 1981, 2000; McFadden & Ruud, 1994; McFadden & Train, 2000; Hensher *et al.*, 2005) to model consumer preferences for different hypothetical GMOs in food.

DC models have been applied in marketing, transport economics, and recently in environmental economics and agro-food marketing to estimate the value of goods characterized by the absence of a market price (Adamowicz *et al.*, 1994).

Consumer preferences about GMOs in food were previously analyzed using choice modeling. Lusk *et al.* (2003) examined the use of GM in cattle breeding, Novoselova *et al.* (2005) in the pork production chain, Baker and Burnham (2001, 2002) in corn-flakes. Hu *et al.* (2004) compared individual valuations for different perceived risks and benefits associated with GMOs. Burton and Pearse (2002) estimated willingness to pay for different characteristics of conventional and GM beer, while Canavari *et al.* (2005a, 2005b) focused on WTP for eggs and biscuits containing GM ingredients with different purposes (namely, increasing yields and improving nutritional content).

DC methods draw upon Lancaster's economic theory of value (Lancaster, 1966) and Random Utility Theory (Marschack, 1960, McFadden, 1974a).

Lancaster describes each good as a combination of characteristics or attributes. Every attribute has a specific role in the definition of the total value of the good.

Following the Random Utility Theory, the utility that the decision-maker n obtains from alternative j (U_{nj}) is known to him but not to the researcher. The researcher can only observe some attributes of the alternatives and of the decision-maker. The difference between U_{nj} , the true utility, and V_{nj} , the observed utility, is ε_{nj} , that captures all the factors not included in V_{nj} (Train, 2003). Assuming a maximizing utility behaviour, alternative i will be chosen among all the alternatives if it provides the decision-maker with the highest utility.

$$U_{nj} = V_{nj} + \varepsilon_{nj}$$

$$P_{ni} = \text{prob}(U_{ni} > U_{nj} \quad \forall j \neq i)$$

¹ People were selected from the Trentino telephone directory; the use of the MS Excel® Random Number Generator enabled us to draw the names randomly.

² The target for our study was specified as the person responsible for household food purchases.

$$\begin{aligned}
&= \text{prob} (V_{ni} + \varepsilon_{ni} > V_{nj} + \varepsilon_{nj} \quad \forall j \neq i) && \text{Eq. (1)} \\
&= \text{prob} (\varepsilon_{nj} - \varepsilon_{ni} < V_{ni} - V_{nj} \quad \forall j \neq i)
\end{aligned}$$

Different levels of attribute may be found in the good and the total utility of the good can be viewed as the sum of the individual utilities provided by each attribute. Every change in the attribute levels produces different goods or services: DC Methods focus exactly on the value that people confer on such changes in attributes.

In this study, when the consumer buys a yoghurt, the combination of attributes she/he is looking for could be given by the price, health functionalities, the kinds of production processes used, or the percentage of GMOs presence. Considering the different yoghurt options together, a consumer compares the costs and the benefits of each alternative on the basis of her/his personal preferences for the attributes. The final choice will be the yoghurt that maximizes her/his utility, the one for which she/he is most willing to pay.

Data for the DC analysis are collected using specifically designed questionnaires in which respondents are faced with different bundles of attributes and levels. People interviewed are asked to choose the product with the best combination of attributes and levels, that is which provides the highest level of utility. In order to obtain monetary values, different prices for different bundles of attributes are included in the choice sets.

Indeed, a key element in performing a DC analysis is represented by the choice of attributes and levels.

In order to determine relevant yoghurt attributes and for designing alternative choice scenarios we performed two focus groups (Marin & Martinelli, 2006). Attributes identified were the food processing (conventional vs. biotechnology), the presence/absence of health and environment-friendly properties, and the price.

Only the price was expressed with quantitative levels³. The other attributes were specified as dummy variables (0,1).

Questionnaires consist of four sections. The first part introduces the general objectives of the study. Moreover, some attitudinal questions are included to get the respondents involved in the interview and to collect general information on their ethical values, priorities and habits. Accordingly, questions were asked on the general knowledge of GMOs, on the stated attitudes toward different uses of gene technology (by Likert scales) and on the purchase behavior with reference to yoghurt.

The second set of questions involves the respondents in two choice experiments among different kinds of yoghurt. This section provides the main core of the survey, namely the monetary valuation of the different functionalities associated to gene technologies in food processes. People are presented with a short description of the available options⁴:

- a conventional yoghurt, which was specified to be the respondent's generally purchased one;
- a yoghurt obtained from milk derived from GM feed for increasing yields;
- a yoghurt obtained from GM milk with an hypothetical low environmental impact;
- a yoghurt containing GM enzymes with hypothetical anticancer properties.

The third part of the survey aims at investigating the purchase habits for particular products, like the organic food, the environment-friendly products, the fair-trade goods and the nutritionally enhanced (functional) food. Two specific questions are addressed to investigate the risk-taking attitude and the willingness to support institutional initiative to promote local agro-food production (namely, a local quality brand).

³ We identified the price levels as percentage increases or decreases from a baseline determined on the average price of a conventional product.

⁴ Each choice experiment contains the "None of these", the "Do not want to answer" and the "Do not know" options.

Finally, the survey collects the usual information on the socio-economic and demographics characteristics of respondents.

Models used to estimate the willingness to pay (WTP) for alternative yoghurts are the *Multinomial Logit* (Equation 2) and the *Random Parameter Logit* (Equation 3).

The Multinomial Logit Model is the generalization to more than two alternative of the Logit Model. If the error terms are independent and identically Gumbel distributed, with location parameter 0 and scale parameter μ , the probability that a given individual choose alternative i is given by the following Logit probability:

$$P_{ni} = \frac{e^{\beta' x_{ni}}}{\sum_j e^{\beta' x_{nj}}} \quad \text{Eq.(2)}$$

where: β' is the inverted vector of estimation parameters and X is the vector of the attributes known by the researcher.

A limitation of the Multinomial Logit model is the property of the Independence from Irrelevant Alternatives (IIA). The Mixed Logit Models partly overcome this limitation.

Among these, the Random Pareter Logit Model allows coefficients to change randomly in the population. In this way it allows to consider taste heterogeneity.

The probability that a given individual chooses alternative j is given by:

$$P_{nj} = \frac{1}{R} \sum_{r=1}^{r=R} \left[\frac{\exp(\chi_{nj} \phi_{nr})}{\sum_{k=1}^{k=m} \exp(\chi_{nk} \beta_{nr})} \right] \quad \text{Eq.(3)}$$

where P_{nj} is conditional on the distribution of β and represents the average value obtained from R repeated draws of β from the distribution $f(\beta)$.

5. Results

The questionnaire was submitted to a random sample of 532 individuals. The response rate was 60,5%, which is typical for telephone based surveys (Bateman et al., 2002).

The sample consisted of a majority of women⁵ (57%) and in most of the cases was represented by quite young people (64% within the 20-40 year class and 28% within the 41-60 class). The majority of the respondents' households were composed by at least 3 units (69%) and in 28% of the cases there is at least one child less than 14 years old from birth. Average income per household was more than 2000 €/month in about 45% of the cases, while the educational level was good because 33.5% have a high school diploma and 40% a university degree.

Erudition on the issues concerning Genetically Modified Organisms appeared to be spread, as 94% of the sample stated that they know what the term GMO means. As regards general attitudes toward gene technology applications in agriculture, only 9.4% of the respondents strongly agree with the growth of GM crops aimed at increasing yields for farmers and, in case, at reducing prices for consumers, while 34.6% totally disagree. On the contrary, 23.8% and 24.1% respectively agree with the development of *environment-friendly* GMOs and GMOs with anti-cancer properties. The quota of discordant opinions for the *environment-friendly* GMOs was 39.4% and it rose to 41% for the health functional GMOs. We noticed that percentage of acceptance/discordance for these last two kinds of GMOs were very close, probably depending on the fact that some people may have interpreted the

⁵ Women are more represented in the sample because we asked for the person who generally buys food.

lower concentration of pesticides in crops due to the use of *environment-friendly* GMOs as an additional health benefit rather than as a way to preserve ecosystem.

Moreover, a number of respondents could have created two categories in their mind: benefit for farmers and benefit for consumers. If this is true, in responding to this question they have not weighted separately the two options *environment* and *health*.

Finally, some respondents may have not believed credible the anti-cancer functionality.

The amount of uncertain people (partly agree and partly disagree) was more than a half in each of the applications considered: specifically, 56% of respondents were doubtful about the use of GM crops for increasing yields, 55% were uncertain whether to support or not *environment-friendly* GMOs and nearly 59% had some hesitation in giving definite judgments on functional GMOs.

Uncertainty reflects also on the need for better and more complete knowledge on agrobiotechnologies to be obtained by scientific research (47% strongly agree and 35% fairly agree that public research on this matter should be supported). This data is coherent with the total amount of people who were unwilling to bid 50 Euros with a probability of 1% to win 5000 Euros, that has been taken as a proxy for the risk-aversion quota in the sample (79.5%). This value suggests that in presence of uncertainty about the future respondents prefer refusing great compensations than losing their assured stake.

Almost all the respondents stated to purchase yoghurt produced in Trentino Alto Adige (97%). Hedonistic components (specially taste) and intrinsic health properties (mainly, the action on the immune and digestive systems) were identified as the main purchase reasons for the yoghurt as a snack or light meal (50.4% and 41.1% respectively). Price has little influence on the decisions to consume yoghurt (only 6.6%), but its importance increases when conventional and functional yoghurts are compared together. Accordingly, while taste ranks first, price is the second and third most important factor affecting the choice of a specific brand of yoghurt.

The frequent purchases of ecologically sound (48%), fair-trade (44%) and organic (43%) products suggests the idea of an ethical attitude among respondents. 44% of the people, instead, have never bought nutritionally enhanced food before, showing a lack of interest in this kind of products.

In a region that elected the sustainable development as a guideline for the local economic development, like Trentino is, the relevance of aspects pertaining quality, healthiness and integrity of cultures may appear evident in people's imaginaries. Thus, in the general vision of the Trentino supply, agro-food product seems already to incorporate higher value attributes. Probably depending on this matter, about one third of the sample (34.6%) stated that they would not be willing to pay extra money for a local Non-GM mark with the aim of further promoting the local production, while 23% proved to be hesitant about this opportunity.

Purchase behaviors and willingness to pay for the different options of yoghurt were observed using the Multinomial Logit and the Random Parameter Logit models⁶.

The dependent variable for both the models was specified to be the choice (0,1) among the available yoghurt alternatives on the basis of the price (in Euro), the process (conventional or GM) and the benefit (yield increase, environment-friendly, health functionality) attributes.

Parameter estimates provided by the Multinomial Logit Model are reported in Table.1. The price coefficient has a negative sign, as expected, indicating that an increase in the price of yoghurt will produce a reduction in the utility for the consumer.

The variables associated to gene transfer techniques have also negative sign, suggesting that the utility for respondents is inversely related to the presence of GM attributes. The GM

⁶ 634 observations were usable for the Discrete Choice Analysis.

variables in the model are statistically significant at the 0.05 level, while the price was significant only at 0.1 level.

The values provided in Table 1 show that, among the negative attitudes toward GM yoghurt consumption, the functional yoghurt appears to be the less disregarded, with a coefficient of -1, while the alternative containing milk from GM feed for increasing yields is the more disliked. This result suggests that our respondents have different valuation criteria for judging the GM applications, and that the presumed benefit could have an influence in determining behaviors toward GMOs.

Monetary values are defined identifying the partworths associated with some changes in the attribute levels. Namely, the partworths describe the rate at which our respondents are willing to trade-off conventional yoghurt with each of the GM yoghurts⁷.

Accordingly, the GM yoghurt related to increasing yields would need a 2.8 Euros discount for leaving our respondents indifferent as compared to the conventional alternative. Similarly, environment-friendly GM yoghurt would require a price discount of 2.5 Euros, while this value becomes lower for the functional GM option (1 Euro discount) (See table 2). The negative willingness to pay for GM yoghurts suggests that currently there is a flat denial of these products among our respondents. They firmly believe that conventional yoghurts are strongly preferable to the GM ones, even if enriched with new appealing properties.

The low difference in price discounts between the yoghurt related to increasing yields and the environment-friendly one reflects a discordance with attitude expressed before. This results seems confirm the part of the literature skeptical on the presence of a relationship among attitudes, intentions and behavior (Ajzen and Fishbein 1975, Ajzen, 2005; McGuire, 1985; Kraus, 1995; Wilcock *et al.*, 2004).

In particular in this study we can find some possible explanation of the discordance. First of all the attitudinal questions asked for personal opinions towards different uses of DNA transfer techniques, while in the choice experiments people are asked to choose what they eat. Stating one's personal accordance with a question is far different from experiencing it. Perceived risk exposure in the second circumstance is greater than in the first one and, as said before, our sample revealed to be basically risk adverse.

Accordingly, our respondents probably do not trust the GM food, but their choice behavior might have been different if they were asked to purchase a GM non-food product - i.e. GM applications could receive greatest support outside the agro-food sector, as suggested by Frewer & Shepherd, 1995; Bredahl *et al.*, 1998.

The lowest price discount for GM functional yoghurt indicates that even if the general view of GMOs in the food sector is negative, their uses for enhancing the nutritional value could be more easily accepted, provided that the benefit is realistic and valuable.

The estimation of the Random Parameter Logit Model (see table 3) doesn't allow us to distinguish taste heterogeneity, i.e. to identify a GM supporters segment of demand⁸. A widespread negative attitude towards the consumption of food obtained from GMOs seems prevails.

Such opposition can be confirmed by the big discount rates required for comparing a generic GM yoghurt with a conventional one (see table 2).

6. Final remarks

Consumer concerns about food safety are an important issue that public authorities and private organizations have to deal with constantly, especially when GMOs are involved. Previous studies suggested that one of the most important factors affecting the public perception of GMOs can be identified in their perceived lack of benefits (Gaskell *et al.*,

⁷ The rate is the negative ratio of each attribute to the price coefficient.

⁸ The size of the sample could be one of the reasons of the inability to highlight taste heterogeneity.

2003, 2004). Thus when gene technologies are able to supply new “value added” products that respond efficiently to consumer health priorities, acceptance is likely to increase, at least in some cases (Canavari *et al.*, 2005 a, 2005b).

This paper reviews and analyses this hypothesis using discrete choice methods. Results seem to highlight a strong negative attitude toward the consumption of GM food in Trentino. Accordingly, the majority of the respondents are not willing to pay money for GM yoghurts even if they offer health, price or environmental benefits.

The local context might have played a crucial role in determining such attitudes, assuming that Trentino agricultural production is generally characterized by high quality attributes. Local production practices are deeply rooted to tradition, history and other values that describe the identity of the territory. Such standards are in contrast with the image of extensive and impersonal agriculture that the gene technologies suggest.

Moreover, attitudinal questions show that risk aversion probably affected responses.

Price differences alone did not achieve any effect in terms of choosing the GM yoghurts.

However, neither environmental benefit nor health functionality seem to change consumer preferences. Results suggest that, currently, the perceived costs of the gene technology implications far outweigh the potential benefits that people could possibly gain.

Nevertheless, functional GM yoghurt received the lowest level of negative utility. Accordingly, some interaction between the kind of utility provided by the GMOs and their levels of acceptance can be seen.

An important finding deals with the stated need of deeper knowledge through the scientific research. Respondents felt that neither labels nor certification seem capable of always safeguarding consumers from hazard; thus, their presence alone does not increase confidence, while better scientific information on the risks and benefits of gene techniques seem to be required.

There is a need for more research on the issue of purchase behavior for GM food, with the aim of testing the effect on the public perceptions of different technologies available for producing such applications (i.e. “sustainable” biotechnologies) which in turn answer in a more efficient way to the social demand of safety.

7. References

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Tables

Table 1. Multinomial Logit Model for Yoghurt

Variable	Coefficient	Standard Error	b/St.Er.	P[Z >z]	Mean X
PEURO	-.9955544977 *	.54898387	-1.813	.0698	
YIELD	-2.805719625**	.19507972	-14.382	.0000	
ENV	-2.460660058 **	.21171911	-11.622	.0000	
HEALTH	-1.004661685**	.24894843	-4.036	.0001	

Statistically significant at the 0.1 level; ** Statistically significant at the 0.05 level
Source: our elaboration

Table 2. Partworths associated with the GM attributes in yoghurt

Attributes	Coefficients	Part-worths
PEURO	-0,995	
YIELD	-2,806	2,818
ENV	-2,461	2,472
HEALTH	-1,005	1,009

Source: our elaboration

Table 3. Random Parameter Logit Model for Yoghurt alternatives

Variable	Coefficient	Standard Error	b/St.Er.	P[Z >z]	Mean X
<i>Random parameters in utility functions</i>					
PEURO	-.9903165441	.54483736	- 1.818	.0691	
YIELD	-2.828603683	.19744887	-14.326	.0000	
<i>Nonrandom parameters in utility functions</i>					
ENV	-2.461578129	.21133193	-11.648	.0000	
HEALTH	-1.006393893	.24991407	- 4.027	.0001	
<i>Diagonal values in Cholesky matrix, L.</i>					
sPEURO	.6457653781E-01	.23245424	.278	.7812	
sYIELD	.6658882037E-01	.20639151	.323	.7470	
<i>Below diagonal values in L matrix. V = L*Lt</i>					
YIELD:PEURO	.1712161138	.17350484	.987	.3237	
<i>Standard deviations of parameter distributions</i>					
sdPEURO	.6457653781E-01	.23245424	.278	.7812	
sdYIELD	.1837090869	.16854542	1.090	.2757	

Source: our elaboration

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POSTERS

Authentic and Fake Italian Food Products in the World

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Summary

Counterfeiting is a growing and increasingly dangerous phenomenon. There has recently been an enormous growth in the illegal market for designer goods with a 'name' or trademark (counterfeit goods), as well as goods made without paying for the intellectual property rights (pirated goods). Quite apart from having economic consequences, counterfeited and pirated articles threaten the health and safety of EU citizens, their jobs, Community competitiveness, trade, and investment in research and innovation. The agrofood Italian production, famous all over the world for their qualitative characteristics, it reenters among the products that are imitated. The imitation of such products certainly risks to damage the Italian productions, above all in comparison to the parameters of the quality and the food safety, both instruments of marketing used by the Italian producers in the international markets. The purpose of the paper is develop a collective understanding of the extent of the food (agro-food) counterfeit problem. The carrying out of the study foresees, initially, to consider the volumes of counterfeit commodities to world level and the politics harvest in action from the various countries to oppose this phenomenon. Subsequently the agrofood productions will be analyzed, and particularly those Italian, object of imitation trying to quantify their characteristics and to measure its effects on the economic systems.

KEYWORDS: counterfeit, Italian food production

1. Introduction

On the international scene Italy is one of a number of countries which possess a rich and varied agricultural and food heritage, due to its historical and cultural traditions, its wealth of natural resources and variety of pedological and climatic environments. The food industry plays a significant role in the Italian economy in terms of both turnover and employment, and is of strategic importance not only to meet domestic requirements but also on account of the export capacity it offers.

As is known, food production in Italy is increasingly oriented towards quality, especially in the form of certified products, both traditional (i.e. those recognised by the Ministry for Agriculture) and organic. In 2005, the turnover for sales of these products was 30 billion 560 million Euros, representing an increase of 2.8 per cent as compared with 2004. Export figures were also considerable, amounting to over 4 billion 678 million Euros, an increase of 10.3% on 2004 (MIPAF, 2005). Currently there are over 700 certified PDO (Protected Designation of Origin), PGI (Protected Geographical Indication), and TSG (Traditional Speciality Guaranteed) products in Europe (including wines) and as many again awaiting recognition by the EU. The economic strength of these products is significant above all in Italy, the European leader in this sector, with 155 recognised products.

In this context, Italian food products are often counterfeited and imitated. The former case refers to adulterated products, obvious fakes, the misleading use of geographical origin or counterfeited sell-by dates; the latter refers to the use of "Italian-sounding" names or images. In reality the problem does not only concern food products: the phenomenon has

reached enormous proportions, affecting products of all kinds, violating intellectual property and thus becoming a legally pursuable offence.

The purpose of the paper is develop a collective understanding of the extent of the food (agro-food) counterfeit problem, and to identify effective anti-counterfeiting measures to be taken by governments and the private sector.

The aim of the study is initially to consider the volume of food production, particularly in Italy, and then that of counterfeit commodities at a worldwide level.

It will then focus on the phenomenon of illegal counterfeiting at a European and national level (thus neglecting the phenomenon of imitation), investigating the evolution of seizures by EU customs authorities and trying to quantify the consumption of fake Italian products. Finally, the main lines of development of EU regulations drawn up to combat the phenomenon will be traced.

2. The value of Italian food products

Italy possesses a vast food and wine heritage that needs protecting and at the same time promoting at an international level.

Typical national products (DOC, DOCG, PDO, TGI, PGI) are the “jewel in the crown” of a highly differentiated and diversified range of products, and the presence on the international market of consumers who are becoming increasingly aware of nutritional aspects, in terms of calories, and the genuine, original and unique nature of certain products has created fertile ground for the popularity of the “Mediterranean diet” and the products it comprises. In the last few years Italian food and wines have become a distinctive feature of Italian style, representing one of the factors contributing to the success of products “Made in Italy”.

Typical and traditional food products are produced throughout the country and this has favoured the development of a national food “awareness”, thanks to which great attention is paid locally to supporting this sector, viewed as being of primary importance.

The Italian food industry is second, in terms of turnover, only to the metal and mechanical sector and, according to the most recent data available (INEA, 2006) in 2005 the production amounted to a value of 102,400 billion Euros (base prices), representing 5.1% of the GDP in the year 2004.

There are more than 70,000 companies working in the sector (13% of the total amount of manufacturing industries) and they provide employment for about 450,000 workers (9.0% of the total) mostly concentrated in the central and northern regions. Most are small to medium enterprises, although takeovers occurring over the last few years have resulted in over 50% of the turnover being made by a limited number of multinationals and large Italian corporations. The growing attention paid to quality and the promotion of company images has not, however, sufficed to qualify the whole sector from an entrepreneurial viewpoint. Whereas the great number of Italian agricultural and food enterprises points to the wealth of the sector, it also shows its inherent structural weakness: the fragmentation of the supply deprives the Italian food industry of the bargaining power it needs to fully penetrate international markets and compete with its foreign counterparts.

This structural weakness is, however, in part compensated for by specialisation, considering that a large number of small enterprises offer typical products of quality, often with protected designation of origin, which place them in profitable market niches protected from competition by large industrial groups.

In the framework of Italian import-export movements, the weight of the food industry is falling slightly: in 2005 it deteriorated, exhibiting a negative balance passing from 6,856 to 7,190 million Euros (Tab. 1). The most recent data (October 2006) point to good prospects for the future, showing an improvement in Italy’s structural deficit towards the rest of the world with the negative balance dropping to 6,316 million Euros. Most Italian food products exported go to the EU (68.5%) and North America (13.4%). In 2005, six countries

accounted for 63.9% of total exports: Germany (21.3%), France (12.1%), the USA (11.5%), the UK (9.6%), Switzerland (4.5%) and Spain (4.9%). The same applies to the first ten months of 2006.

In terms of the most important commodities, in 2005 in decreasing order by the value exported we have: wine (16.8%), fruit and vegetable products (14.1%), preserves and juices (8.8%), confectionery (8.7%), meat (8.2%), oil and fats (7.7%), pasta (7.3%) and dairy products (7.2%). The situation in October 2006 was similar: wine (16.6%, or 2,562 million Euros), fruit and vegetable products (13.4%, or 2,078 million Euros), confectionery (9.3%, 1,439 million Euros), meat (8.1%, 1,251 million Euros), oil and fats (8.3%, 1,287 million Euros), pasta (7.3%, 1,125 million Euros) and dairy products (7.1%, 1,091 million Euros). The top five food products exported by Italy are representative of the Mediterranean tradition: red and rosé VQPRD wines, pasta, canned tomatoes and tomato paste, olive oil and biscuits; as regards imports, the top five products show up the weakness of certain sectors of the Italian food industry: imports are mainly beef and pork, frozen crustaceans and molluscs and bovine breeding stock.

The Italian share of the international market in this sector has been stable for several years, oscillating between 3.8% and 4%, which is substantially in line with the overall Italian share of worldwide import-export movements. Observing the range of certified D.O.P. and I.G.P. products, the turnover in 2004 was estimated at about 7.8 million Euros, over 1.5 million of which derived from exports. More specifically, the estimated total turnover can be subdivided into the following sectors: cheeses 4,346 million Euros, about 14% of which is exported; processed meat products 2,800 million Euros, 22% of which in exports; fruit, vegetables and cereals 75 million Euros, about 17% in exports; olive oil 46 million Euros, over 41% exported. Exports of D.O.C.G. and D.O.C. wines, which accounted for 21% of the world market in 2002, exceeded 3 billion Euros (CNEL 2004).

3. *The value of counterfeit products*

It is difficult to quantify the flow and provenance of counterfeit products at a world level. In past years the Counterfeiting Intelligence Bureau set up by the International Chamber of Commerce (ICC), stated that the value of counterfeit goods ranged between 5-7% of worldwide trade, amounting to 200-300 billion Euros a year (Counterfeiting Intelligence Bureau 1997). More recent studies claim that the sale of counterfeit products or reproductions represent as much as 9.5 of world trade. About 27 per cent of counterfeit products come from the Mediterranean basin and are destined for sale in Europe, the United States, Africa and Eastern Europe. 73 per cent, on the other hand come from South-East Asia; their destinations are about 60 per cent to the EU and the remaining 40% to non-EU markets. As regards capacity for counterfeit production, the countries with the largest number of enterprises devoted to this activity are, in order of magnitude, Thailand, China, Korea, The Czech Republic, Turkey and Taiwan. In these countries the phenomenon accounts for a significant part of the GDP. In China alone, the counterfeiting industry has a turnover of over 34 billion dollars a year. The sectors most hit are toys, ceramics, hi-tech, electronic and mechanical products, and textiles (IPI 2004).

As far as the European situation is concerned, according to a report published by the European Commission's Taxation and Customs Union Office, in 2005 38% of products intercepted entering the EU came from China, 10% from Thailand, 8% from Hong Kong, 7% from Turkey, 4% from the USA, and 33% from other countries. This is certainly destined to grow: counterfeit products seized in 2005 represented an increase of 118 per cent as compared with the previous year. These phenomena are in practice difficult to measure: EU statistics make it possible to quantify the overall amount of products seized by EU customs authorities, but they are lacking in detail as food products are not grouped specifically but generically classified as "foodstuffs, alcoholic and other drinks".

With all due caution as to the reliability of the data, it is still possible to trace certain trends in the phenomenon being observed. In the European food sector, there has been a constant growth in counterfeiting in the last five years, going from 10 cases of products seized by customs authorities to 50 cases in 2005. The number of items seized went from about 2,350 million to 5,230, and the percentage of food products seized as compared with the total went from 4% to 7% (Tab.2).

If we observe the provenance or origin of the food products seized, it can be seen that the countries most involved are Turkey, China and Thailand, which correspond in substance with the provenance of counterfeit products in general. A surprising finding is the high value attributed to "other countries", which would suggest that although some countries can be defined as leaders in the field of counterfeiting, there are a series of satellite countries producing counterfeit goods, albeit in lesser quantities (Tab. 3).

As regards Italian food products, it is again difficult to provide an estimate of the economic damage caused. According to Federalimentare, the Italian Federation of Food Industries, it can be quantified, at least as far as the American market is concerned, as amounting to 1,510 million Euros, i.e. 70% of the corresponding value of the counterfeit products (Federalimentare 2003). From analysis of the data it is evident that there is a lack of balance between the level of the counterfeit phenomenon in the EU and in North America. Also evident is the economic damage, in terms of exports, suffered by Italy, not least in consideration of the fact that the phenomenon is rapidly expanding; despite cautious estimates which do not predict geometrical progression (i.e. annual figures constantly doubling), Federalimentare estimated that a threshold of 5.4 billion Euros would be reached in 2006 (Tab.4).

4. Legislative measures

Considering that counterfeiting, imitation and piracy have become a consolidated phenomenon of international proportions, and that besides having serious economic and social repercussions they jeopardise the regular functioning of the market and deceive consumers, there is an urgent need for legislative measures, provisions and initiatives to limit their effects, in particular on the competitiveness of enterprises, both Italian and foreign, in the international context in which they operate.

The earliest EU intervention in this direction was the European Commission's Green Paper, adopted in 1998, which launched general consultation on the issue; the most recent are EC Regulation 1383/2003 which replaced Reg. 3295/94 and Reg. CE 1891/2004.

In recent years the EU has also issued communications (COM (2000)789 def.; COM (2005) 479 def.) and directives (2004/48/CE), with the aim of improving and strengthening the fight against counterfeiting and piracy, and in particular at making better use of existing information systems; reinforcing cooperation between the private sector (e.g. the holders of intellectual property rights) and public authorities (customs authorities); and standardising and harmonising both EU measures and the framework of procedures and sanctions established by the Member States.

The most recent provision extends customs control from counterfeit goods to cases of encroachment on intellectual property rights regarding food products with protected designations of origin. It also expedites procedures for those needing to assert rights to trademarks, especially small to medium enterprises.

It is also known that the EU recognises protection for products with designation of origin, especially food products, although this protection does not extend beyond the EU itself. The only protection available for non-certified products appears to be the registration of trademarks together with the compulsory use of labelling indicating the origin of products, thus allowing consumers to know what they are buying.

Interest has also been shown at an international level, especially by the World Trade Organization (WTO), although the debate would currently appear to have dried up.

At a national level various initiatives have been taken in Italy to protect food (and other) products in the attempt to prevent imitations and thus competition with products genuinely made in Italy.

The juridical basis supporting the activity of the customs authorities regarding goods suspected of being counterfeit is mainly provided by Art. 4 of the 2004 “Legge finanziaria” (Finance Bill) and EU regulations.

The measures set forth in the Finance Bill introduce heavier penal sanctions concerning counterfeiting; the setting up of an operations centre with a database containing images scanned during customs checks; a multimedia database with the aim of protecting both products and holders of trademarks (the FALSTAFF Project); the creation of single customs offices to reduce the time required for customs clearance; the transmission of Ministry circulars and directives to Customs offices regarding the rationalisation and application of customs intervention; the sharing of information with other organisations for the purpose of intercepting illegal trafficking.

The essential driving force behind the fight against counterfeiting is operating in “partnership” with the system of enterprise, with the aim of acquiring detailed knowledge of the nature, structure and requirements of the market and thus facilitating the role assigned to customs authorities, above all by extending their territory of competence within the EU and the further opportunities this expansion would provide.

5. Final remarks

The amount of “fakes” on the market has now reached enormous proportions, with significant consequences for various sectors, including the food industry, and heavily penalising Italy’s export capacity. But the limitations in market access, with imitations stealing a large amount of space from authentic products, are not the only effects, as these imitations are often accompanied by aggressive price lowering strategies which induce consumers to opt for counterfeit products. In addition, the resulting image of poor quality certainly does not help the global image of the sector.

From the concise survey conducted EU statistics do not make it possible to analyse the phenomenon in great detail: although they quantify the amount of goods seized by customs in the EU, they provide very little detail, classifying food products under the generic heading “foodstuffs, alcoholic and other drinks”, thus not identifying not only products with DOP and IGP certificates but also conventional ones. In addition, there is no data regarding investigations conducted by non-EU countries, nor is it possible to know the proportions of the phenomenon outside the EU.

It seems clear that countries in which the fake industry is rife are focusing increasingly on widely and commonly used products and observation of the provenance of the products seized shows that it is substantially the same as that of generic counterfeit goods. This means that there is no specific specialisation: fakers tend to fake in all categories of goods.

The problem is without doubt of international interest: to fight the phenomenon it appears necessary not only to intervene by means of regulations (the recent legislative measures adopted in the EU seem appropriate) but also to establish trade agreements under the guidance of organisations such as the WTO, so as to guarantee products of quality, both Italian and European.

6. References

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Tables

Table 1. The agro-food Italian balance (millions euros value)

	Export			Import			Saldi		
	2004	2005	Var %	2004	2005	Var %	2004	2005	Var.
Wine	2.866	2.986	1,04	256	279	1,09	2.609	2.707	97
Fruit and vegetable products	2.468	2.511	1,02	2.346	2.559	1,09	122	-48	-170
Preserves and juices	1.458	1.551	1,06	1.594	1.544	0,97	-136	7	143
Confectionery	1.609	1.566	0,97	685	659	0,96	924	906	-17
Oil and fats	1.162	1.370	1,18	1.813	1.853	1,02	-651	-482	168
Meat	1.419	1.461	1,03	3.507	3.827	1,09	-2.088	-2.366	-278
Pasta	1.251	1.305	1,04	29	34	1,16	1.222	1.272	49
Dairy products	1.242	1.281	1,03	2.745	2.756	1,00	-1.504	-1.475	28
Others product	4.337	4.494	1,04	11.692	12.203	1,04	-7.355	-7.709	-355
Total	17.810	18.525	1,04	24.667	25.715	1,04	-6.857	-7.190	-334

Source: ICE data processed on basis of ISTAT information

Table 2. Counterfeit in EU: number of cases registered and number of articles seized by product type "foodstuffs, alcoholic and other drinks"

	2000	2001	2002	2003	2004	2005
Number of cases registered by customs	10	18	13	17	53	50
Number of articles seized	2.340.334	4.106.663	841.259	1.489.908	4.432.161	5.228.896
Percentage of total seized	4	4	1,0	1,6	4	7

Source: data processed on basis of information from European Commission — Taxation and Customs Union

Table 3. Counterfeit in EU: number of cases registered expressed as % by origin (product type “foodstuffs, alcoholic and other drinks”)

Origin	Number of cases					
	2000	2001	2002	2003	2004	2005
Turkey	20%	33%	10%	18%		16%
China	10%	17%	20%	6%		8%
Thailand		11%	20%			
Poland	20%			18%		
Czech. Rep.	10%					
Spain	10%			6%		
Japan	10%					
Chile			10%	18%		
Ukraine				12%	13%	10%
Honk Kong			10%			
Indonesia			10%			6%
Iran			10%			
Greece			10%			
Russia					13%	12%
Dominican Rep.					9%	
USA					6%	
Hungary					4%	
Argentina					4%	
Others	20%	39%		22%	51%	48%
Total	100%	100%	100%	100%	100%	100%

Source: data processed on basis of information from European Commission — Taxation and Customs Union.

Table 4. Italian food products and the counterfeit: estimated consumption of illegal products (2002)

Area	Export	Estimated consumption of illegal fake products – protected Italian designations	
	Value	Value	Inc. % export
USA + Canada	2.157	1.510	70
European Union	8.443	422	5
Other countries	3.345	668	20
Total	13.945	2.600	18,6

Source: Federalimentare (2003)

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What about the food ‘quality turn’ in South Africa? Focus on the organic movement development

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Summary

This paper depicts how the general turn from mass consumption toward increased qualitative differentiation of products - the ‘quality turn’ - manifest in the South African agro-food system. The strong influence of these quality trends on agro-food systems evolution has been widely discussed in Europe and North America. We show that identifying quality related dynamics is bringing an interesting perspective into understanding some of the evolution of the local agro-food system.

The discussion is mainly based on the perspective of the organic sector. Most domestic retailers' food quality positioning is in line with consumer trends, being general and price orientated. However, the retail sector has been entering and driving quality related niche markets, especially organics, fostering new organizational arrangements through certification schemes development. Price premiums and consumer behavior analysis associated with organic production reveal significant consumers' willingness to pay for immaterial product attributes (e.g. health) and reflect the current supply and demand imbalance in the organic sector. The leading role of the retail sector in conveying quality movements is instrumental in understanding the discussed evolution. Pointing out the growing interest in farmer's markets provides elements to foresee new development in the agro-food system and departure from the retail driven quality movement.

KEYWORDS: Quality, Organic food, Retail sector, South Africa, Consumer behaviour

1. Introduction

The general food quality trends of the last decade (e.g. convenience food, organic food, fair trade, local food...), that resulted in product and market proliferation and differentiation had a strong influence on the evolution of the agro-food systems. These have been widely described and analyzed especially in the European and North American context where it mainly resulted from endogenous dynamics. However, little has been written on an emerging country such as South Africa. The purpose of this paper is to depict this ‘quality turn’ in the South African food system where it is much more influenced by the global and external expansion of the trends mentioned above.

The structure of the paper is as follows. After shedding more light on the main characteristics of the general global food quality trends, we highlight how they manifest in the South African agro-food system. As part of the background, we present the main characteristics of the South African agro-food system at its different stages: distribution, consumption and production. We focus our analysis mainly on the development of the organic food sector, which has known a very recent but huge growth in South Africa, and which is also one of the most prominent trends in the alternative food quality movement globally. By pointing out the prominent role of the retail sector in this growth, we highlight the evolution of the different stages of the agro-food system. Building upon another interesting new trend in the South African agro-food sector - the growing interest in

farmer's markets -, we conclude with some final thoughts on possible future development in the agro-food system.

2. Background

2.1 General agro-food quality trends

It is a well established fact that the agro-food system has been evolving in many parts of the world in the last decades based on the industrialization of agriculture and agro-food processing. This has resulted in an increased offering of standardized products and a commoditization of food products, which have been underlying the development of the mass consumption model. However this Fordist regime of mass production/ consumption has been characterized by a pronounced decline triggered by a movement towards market diversification and product proliferation.

Recent developments in food science and technology have supported the growing offer of convenience food by adding services to products (such as prepared food, pre-cut fruits and vegetables, ready to eat food...) and of functional food that integrates dedicated health services. Simultaneously, the emergence of place-based and socially embedded food practices and products have given rise to the proliferation of alternative agro-food networks (Goodman, 2003; Murdoch et al., 2000). The combination of these developments constituted a turn from the mass consumption model toward an increasing qualitative differentiation of products and demand (Allaire, 2002) referred to by Allaire (2003), among others, as the 'quality turn'.

This focus on quality and the associated proliferation of products arose, at least partly, in response to evolving forms of consumptions based on food origin and quality (Renard, 2005). Changes in food demand and consumption have been driven by recurrent food crises, which triggered consumers' distrust and their increased food safety awareness, by growing social and environmental concerns as well as some forms of local food activism that developed in reaction to globalization trends (Ponte and Gibbon, 2005). The quality turn is clearly related to the globalization of food networks and by the market saturation for 'commodity' type products (Allaire, 2003; Ponte and Gibbon, 2005).

This product proliferation and differentiation is associated with what Allaire, (2003) describes as "*the immaterialization of food and institutionalization of quality*", which is translating into an increasing complexity of quality and new quality conventions. Other factors, in addition to price, are gaining importance in transmitting knowledge about product quality to consumers as well as in the competition among actors in the supply chains. As stated by Sauvée and Valceschini (2003), "*In the current competitive universe, the definition of quality and the information on qualities are from now on at the heart of the competitive strategies of economic actors.*"¹ New regulatory models and new forms of coordination in agro-food networks are emanating from the diverse notions of quality and practices that have emerged (Ponte and Gibbon, 2005). The institutionalization of quality is often associated with the development and implementation of new certification frameworks. These practices of certification define mechanisms of market entry and often create strong barriers to entry, constituting source of power for those controlling them (Renard, 2005; Ponte and Gibbon, 2005). As stated by Reynolds (2004: 738), "... *certification represents a powerful new form of network governance...*".

¹ « *Dans l'univers concurrentiel contemporain, la définition de la qualité et l'information sur les qualités sont désormais au cœur des stratégies compétitives des acteurs économiques* »

As noted by several authors and in particular Renard (2005: 423), the large retail sector has taken the lead and is now playing a significant role in the development of these certification schemes: *“The proliferation of quality seals and certifying organizations has coincided with big retailers’ appropriation of the quality-label strategy, and self presentation to consumers as protectors of food quality.”* In addition to contributing to their image, selling specific quality type products is used by retailers as part of their strategies to better target specific consumer segments, as stated by Tim Harford that is quoted in the Economist (2006:72): *“Fair trade coffee, like the organic produce sold in supermarkets, is used by retailers as a means of identifying price-insensitive consumers who will pay more, [Mr Harford] says.”*

On the other hand, with the growing importance of quality foods, other practices and institutional innovations have been emerging, reemerging, and/ or enhanced, such as *“direct marketing, short food supply chains, local food systems and the renewed legitimization of artisanal food practices and regional cuisines.”* (Goodman, 2003: 2.

It is thus interesting to understand if and how these quality trends have been developing in South Africa and how they have been affecting the South African agro-food sector. As our main focus in depicting the quality turn in the South African context will be on the organic sector, we conclude this section by briefly describing key features of the international dynamics in this segment, mainly based on Reynolds (2004) who gives a comprehensive overview of the evolution of organic agro-food networks. The organic sector that was initially built on alternative movements did not escape from the large retail movement toward appropriating the different alternative labeling schemes. *“Once supplied by alternative movement venues such as farmers markets, box schemes, and small food coops, organic products have made dramatic inroads in conventional distribution channels. Most major supermarket chains and many institutional suppliers now offer organics, taking advantage of their popularity and their 20-40% price premiums.”* (Reynolds, 2004: 733) This increasing retail control over mainstream Northern organic markets goes along with the enforcement of standardized certification procedures that impose huge administrative and technical burdens on producers, and, in some cases at least, with the development of preferential procurement arrangements as has been observed in different regions and countries (Reardon et al., 2001; Reardon et al., 2003). This especially impact on small and peasant producers, which practices are generally not adapted to these requirements, and consolidates the position of large scale farmers that are more likely to ensure consistent supply of standardized products (See among others Reardon and Berdegue, 2002; Weatherspoon and Reardon, 2003). According to Reynolds (2004: 737), *“the mainstreaming of organic foods in Northern markets has critical implications for the governance of domestic and international supply networks, delimiting acceptable production processes, product specifications, and types of enterprise participation.”* (Reynolds, 2004: 733)

However it is interesting to note that the dominance of the retail sector over mainstream growing organic markets has not caused the disappearance of alternative organic markets, which are supported by dedicated consumers, giving rise, according to Reynolds (2004: 734) to *“...a bifurcation between market- and movement-oriented organic distribution systems and consumers.”*

2.2 The South African agro-food system

2.2.1 The South African marketing system: prominence of the retail sector

South Africa is characterized by two parallel economies, with a clear wealth and rural/urban divide: the so called first or 'modern' economy consisting of established consumers who represent 25.5%, and are mostly urban and emerging consumers representing 42.7%, and the second or marginalized economy, which accounts for 31.8% of the population and is mostly rural (SAARF, 2005).

From an agribusiness perspective, the South African agro-food sector is dominated by the large retail sector, notwithstanding a still clear divide between urban and rural food system. Indeed, this domination is much more pronounced in urban areas. The supermarket phenomenon has played an important role in food distribution in South African food since the 1980's. The growing urbanisation process and development of suburbs far away from the central business district has been accompanied since the 60's by the development of suburban shopping centres and hypermarkets marking clear retail outlet growth in size. The small corner shop format progressively evolved into larger scale supermarket format. Recently, supermarket format has been diversified with retail stores ranging from convenience stores and forecourts to hypermarkets. Botha and Van Schalkwyk (2006) describe the formal retail sector as a wide spectrum of neighbourhood convenience stores, speciality stores, boutiques, chain supermarket stores, department stores and large wholesale and retail outlets. Supermarkets account for more than 55 % of national food retail (Weatherspoon & Reardon, 2003). South Africa has a mature formal retail market, solely occupied by domestic retailers and highly concentrated, with four dominant players: Shoprite/Checkers and Pick 'n Pay, both with 33% market shares, SPAR with 26% market shares and Woolworths with 8% (personal interview with retailers during 2006).

In parallel to these well developed retail chain groups, a very large and growing informal market, especially for fresh fruit and vegetables, also exists in South Africa. It is generally prevalent in many rural regions (especially former homeland areas), townships, taxi ranks, train stations and street corners where supermarket retail outlets are absent or have been absent. The informal market includes traditional independent stores such as general dealers, cafes, spaza shops, street vendors, hawkers and tuck shops as well as primitive little street corner stalls (United States Department of Agriculture, 2005). On the two largest Fresh Produce Markets in South Africa, in Johannesburg and Pretoria, purchases by informal traders represent significant portions of about 50% and 29% of fresh produce trade respectively². The level of consolidation in the informal sector has proven difficult to ascertain since very little information is available for this sector.

The third marketing format in South Africa is that of direct sales by producers. Direct sales include sales through roadside or farm stalls near large cities, sales to hawkers and informal traders. In general, South African consumers do not have a deep-rooted tradition of food purchasing at farmers' markets. However, farmers' markets (e.g. in the Western Cape) are becoming increasingly popular among wealthy consumers. More emphasis will be put on this aspect later in this paper.

Given the focus of the paper on the recent international food quality trends and their manifestation in South Africa, we will mainly deal with the formal South African

² Source: Personal interview with the senior manager of commission business at the Johannesburg Fresh Produce Market and with the marketing manager of the Tshwane Fresh Produce Market in August 2004, for the Regoverning Markets project.

marketing system as it is unlikely that these quality trends will affect the informal sector directly. Furthermore it would be very difficult to capture influences on the informal sector based on the limited secondary data available.

2.2.2 General consumer trends

Some of the major global trends in food consumption - consumers' focus on health, convenience and the growing impact of private supermarket labels (ACNielsen, 2005a, 2006a) - are taking stance in the South African context. Health foods are usually associated with a price premium which only wealthier consumers can afford. However, the movement towards healthy staples in the form of consumption of larger quantities of fruit and vegetables, which is a more affordable health movement, is the fastest growing health activity across all the consumer wealth groups in South Africa. Local consumers also express increasing needs for convenience foods due to factors such as longer working hours, more women entering the work force and the current lack of efficient public transport. Affordable convenience is important for consumers in the lower wealth groups as confirmed by a study by ACNielsen on retail dynamics (ACNielsen, 2006b) indicating that the retail shopping behaviour of South African consumers are mainly driven by lowest overall price (39% of survey respondents) and convenient store location (36% of survey respondents). Since South African consumers are extremely affected by price constraints, private supermarket labels are important and growing in South Africa, but are usually associated with discount / value for money brands.

In addition to these major food trends in South Africa, there are not yet strong alternative food quality movement. However, there is a small but growing interest especially for organic food, but also for free range produce and food purchased at local markets (instead of supermarkets). It is interesting to note that more general quality considerations were some of the very important considerations of consumers when selecting a grocery purchase location, especially in terms of the availability of high quality fresh food, better selection of high quality brands and products and quality in-store service as revealed by ACNielsen retail dynamics study (ACNielsen, 2006b).

Even though wealthier consumers are the main target group for alternative quality foods (mainly due to the price premium associated with the products), there is a movement among less wealthy consumers to spend on selected luxury items within their budget constraints. Furthermore, the emerging middle class is a large portion of the population and is moving into wealthier consumer groups over time. South Africa's growing middle class has the income, education and potential interest in alternative quality food products and could contribute to further growth in the these markets, especially for the organic food sector in South Africa, thus constituting a significant target group for large retailers.

2.2.3 The structure of South African primary agricultural sector

South Africa is characterised by very prominent dualism in its agricultural production. On the one hand there is a very well developed commercial agricultural sector characterised by a relatively small number of producers (about 60000 commercial farmers) owning 87% of the total agricultural area and producing more than 95% of the marketed output (Vink and Kirsten, 2003). On the other hand a subsistence and/or small scale agricultural sector characterised by a very large number of producers (about 3 million small-scale farmers), of whom a majority is settled in the communal areas, making up about 13% of the agricultural land area. Their production levels are generally low due to a traditional land tenure system, a lack of physical infrastructure, a lack of credit facilities, a low access to input markets and

a high level of emigration of the active population. In most rural households the farmers who remain on the farm are those with the lowest opportunity cost, which is defined by the external labour market which favoured adult man (notably for mines and industry). As a consequence, many rural households are headed by women or pensioners (D’Hease and Kirsten, 2003). They produce food primarily to meet their families’ subsistence needs (NDA, 2001). In these less-developed rural areas of South Africa, which have historically been neglected, agriculture is an important contributor towards food security and rural incomes. Historically, the level of commercialisation has been limited and agricultural activities have tended to be small-scale with a restricted contribution towards the household livelihoods (Lahiff and Cousins, 2005). Some of the implications of the growing organic sector in South Africa, especially for small-scale agriculture, will be discussed later in this paper.

3. Research objectives and approach

The main objective of this paper is to investigate the ‘quality turn’ in the South African food system and its influencing factors. The specific research objectives are to:

- Identify the manifestations of the general food quality trends, outlined in the background section, within the South African context.
- To discuss the impact of alternative food quality trends on South African agro food systems in its different stages –production, distribution and consumption - through a perspective on the organic food sector in South Africa given its evolution, present status and future prospects.

The analysis in the paper is mainly focused on the development of the organic food sector, which has known a very recent but huge growth in South Africa, and which is also one of the most prominent trends in the alternative food quality movement globally. Furthermore, given the prominence of South African retailers in the South African formal agro-food sector, especially in the urban and wealthy part of South Africa, and in particular in driving growth in the local organic sector, the analysis stresses the retailer sector’s behaviour and its implications. Various issues related to the South African organic industry are discussed and argued, based on literature and some empirical data. The empirical data specifically refer to retail prices that were used to calculate the price premiums associated with organic food in the South African context.

4. Results

In this section, an interesting perspective into the understanding of the evolution of the agro-food system in South Africa is presented by pointing out that the quality turn is mainly conveyed through the large retail sector.

As detailed below, from a retail perspective, organic food is the most significant food quality movement in South Africa. Selected major South African retailers are the dominant purchase outlets for organic food in South Africa. Even though the organic food industry is still a very new phenomenon and lags far behind the developed world, the sector has shown exceptional recent growth. Contrary to the organic movement in European and North America countries, the food organic industry in South Africa did not start from ‘*loosely coordinated local networks of producers and consumers*’ (Raynolds, 2004). The substantial growth of the South African organic food sector is mainly attributed to the entrance of major retailers. According to Mead, the chairman of SA organics (2006:1), “*The entrance of the major retailers has heralded substantial growth for organics in South Africa.*”

Before focusing on the various issues related to the South African organic industry, we first briefly present an interpretation of the current state of development of food quality differentiation trends in South Africa through the quality positioning of the dominant South African supermarket chains.

4.1 Main retail chains quality positioning

As evident from corporate marketing information on the major retailers' websites, most supermarket chains' positioning on food marketing and quality strategies are still very general and price orientated. The Pick 'n Pay retail group, whose target markets are consumers in the middle and high wealth categories, focuses on a wide range of quality products at competitive prices. However its website contains a lot of information for customers regarding organic and free range products (www.pnp.co.za). Shoprite, which target groups are lower and middle wealth groups, (www.shoprite.co.za) advertises its convenient range at the lowest prices. Checkers, which is part of the same retail group and is more oriented towards satisfying the needs of the middle and upper wealth groups, emphasises "...lowest prices, regular special offers..." (www.shoprite.co.za). Emphasis in Checkers has been placed on specialist departments such as the bakery, meat market, cheese and delicatessen counter, and wine store. Over the past year the focus on convenience has seen a strong increase in prepared food while the fruit and vegetable departments were expanded. SPAR, which has a broad geographical base and the largest rural footprint in SA among the major retail groups, targets a wide range of consumer wealth groups and focuses on "...convenience and differentiation in terms of service and quality...", as well as on matching competitors' price and product ranges (Source: www.spar.co.za). SPAR is not a major player in the organic retail market in South Africa. Thus, it is evident that the quality positioning of Pick 'n Pay, Shoprite / Checkers and SPAR are still very general.

However, the exception in this regard is the retail group, Woolworths - the market leader in superior quality food products (www.woolworths.co.za). Examples of Woolworths quality food products are free range eggs, lamb, chicken; products linked to origin - Karoo lamb; organic food; badger friendly honey and hormone free dairy products. Their advanced quality positioning is also evident from their market positioning statement on health and superior taste experience, and with environmental sustainability and animal welfare taken into consideration: "*The good food journey is the name we've given to our ongoing quest to bring you food that's better for your **health**. It's produced by people who regard **animal welfare** as deeply important; believe that a **healthy sustainable environment** is vital; and are absolutely passionate about bringing you the **best possible taste experience**.*"³

An important part of Woolworths' quality strategy is the communication of quality issues to consumers (especially in terms of organic, free range and food additive issues), on their website as well as through in-store advertising (e.g. posters and labelling information with special quality messages to consumers). In terms of food safety assurance, Woolworths' information, as provided on their website, is also much more detailed than other major retailers. Product development and traceability based on technology and science are clearly at the heart of their communication strategy: "*We are on a never ending quest to bring you more variety and more ways to delight your senses with great flavours - and good conscience. By carefully considering each ingredient, subjecting every product to **ongoing analysis** and providing all the **on-pack information** you need to make informed choices, you can be sure that food from Woolworths is food you can **trust**.*"

³ Source: www.woolworths.co.za. Emphasis has been added to the quotation.

Even though there is already a social responsibility component (notably farm worker welfare) in Woolworths' engagement with farmers, ethical and social considerations are still not communicated to consumers as part of the marketing strategy.

Overall, as could be expected, retailers' positioning is very much in line with the general consumer trends depicted in the background part. Price still represents the main vector for communication as being still, for the vast majority of the consumers, the main purchase determinant, and convenience is also emphasised. The main quality trends that are taking stance in South Africa, that is mainly organic production and general quality considerations such as the importance of freshness, are present in at least some of the retailers' positioning.

This overview also shows, on the other hand, that even the market leader in quality strategies, which positioning is reflecting the global quality trends, do not yet emphasise place based and socially embedded food products. These are still very much absent from the formal markets.

4.2 Quality trends and changes in the agro-food system: insights from organic sector in South Africa

4.2.1 Growth and retail perspective

In South Africa, organic food is a niche market aimed at consumers in higher wealth groups. Even though the organic food industry in South Africa is still far behind the rest of the world, the sector (local consumption and exports) has shown exceptional recent growth from R5 million in 2003 to R155 million in 2005, of which at least 80% was fresh produce (Mead, 2006⁴).

The phenomenal growth mentioned in the background section is mainly attributed to the entrance of major retailers (Mead, 2006). It is expected that growth will continue exponentially for the next few years. The prominent role of South African retailers (specifically Woolworths and Pick 'n Pay) in driving the growth in the sector is emphasized by the following statement by Leonard Mead (as reported by Hall, 2005): *"Woolworths has driven growth in organic foods demand, and with Pick 'n Pay clearly stating its intention to expand its organic product range we expect to see a leap in this figure in the next few years."*

Woolworths views organic food as a significant 21st century lifestyle trend. In 1999, they introduced an organic product range of 10 products, which expanded to a present range of over 200 products (Hall, 2005). This retailer experienced growth in organic food sales of more than 50% year-on-year during the period 2003 to 2005. According to Pick 'n Pay CEO Sean Summers (as reported by Hall, 2005), Pick 'n Pay has predicted that the potential market for organic produce will be 5% of total produce sales in the short term, 10% in the medium term and up to 20% in the long term.

At present the organic product ranges of the local retailers include a wide range including vegetables, fruit, herbs, dairy products, breakfast cereals / bars, mayonnaise, salad cream / dressing, rooibos tea, instant coffee, pasta and wine. Pick 'n Pay offers a wider selection of organic fresh produce than Woolworths.

⁴ In the absence of official data monitors, Organics SA (the umbrella body for organic agriculture in SA) pulls together figures from the biggest players in the organic industry: retailers, producers and certifiers. Leonard Mead is the chairman of Organics SA

4.2.2 Legislation and certification

At present there is no organic food legislation in South Africa and consequently products have to be certified organic by a third-party ISO 65-accredited certifier. South Africa's draft regulations on organic production within the Agricultural Products Standards Act of 1990, has been a work in progress since 2000 (Africa Research Bulletin, 2006). However, consumers in the formal markets are asking for assurances that everything marketed as organic follow the standards of organic production. Currently certification schemes are privately driven and imposed on producers as a market entry requirement by local retailers and/or international importers.

According to Organics South Africa there are five third party organics certification bodies in South Africa: Afrisco / Ecocert, BCS, BDOCA / Debio, SGS and SKAL/Controlunion. All legitimate organic farmers / packhouses / manufacturers / box schemes are subjected to a comprehensive annual inspection, where the farm and all farm records are examined. Retailers are exempt from this requirement if they only sell pre-packaged food provided by a certified supplier. Annually, a certificate is issued to the producer who successfully passed the inspection. Any organic produce sold by the farmer must be labelled as organic and must include a reference to the name of the Certifying Body. Globally there are more than 70 sets of standards setting the rules and regulations of organic production. A producer have to engage in organic production in accordance with the standards of the country where the produce will be sold, e.g. for South Africa – the draft South African Standards, or the SGS Organic Production Standard, EU - EC-Regulation 2092/91, USA - USNOP standards, Japan – JAS (www.organicsouthafrica.co.za).

Pick 'n Pay only procures organic produce from farms / packhouses that have been certified by an accredited certification body (specifically SGS, Ecocert, British Soil Association, BDOCA and Afrisco). Organic produce have to be clearly labelled as “organic” and the supplier's certification number must appear on the food label. Certification is an annual process. In addition to the role of the certification bodies, Pick 'n Pay food technologists also regularly inspect all organic suppliers (www.pnp.co.za).

Woolworths has had its own distinctive organic logo since 1999. In addition to the logo the certification number or logo of organic certifying authorities such as Ecocert, Afrisco, SGS, BDOCA, Soil Association and BCS, should also be on the product label. Woolworths adhere to International Organic Standards, and procure organic produce only from organic farmers who are regularly audited and certified by specific certification bodies. For processed products a minimum of 95% of the ingredients of agricultural origin in the product are certified organic. When a product is labeled 'organic in conversion' it is / contains a crop of agricultural origin, from a farm that has been farming organically for one to three years, but has not yet reached full organic certification. For products labelled as 'Made with organic...' between 70% and 95% of the agricultural origin ingredients are certified as organic (www.woolworths.co.za).

4.2.3 Price premiums analysis

In order to get insights into the functioning of organic markets in South Africa, the price premiums associated with a range of organic products offered by Woolworths were calculated by comparing the prices of organic products with similar conventional food products. This gives an initial understanding of the price premiums associated with organic produce in South Africa. The analysis was based on price data from the Woolworths on-line shopping systems during February 2007. The results are shown in Table 1.

Table 1: Calculated price premiums for organic food sold at Woolworths (February 2007)

Food type:	Price premium:
Vegetables	18%*
Yoghurt	26%
Greek feta cheese	31%
Mixed processed vegetables	44%
Breakfast cereals / bars	47%
Bananas	72%
Salad dressing / mayonnaise	110%
Tea / coffee	112%

The vegetables premium (*) has been calculated as an average of the price premiums of the whole range of vegetables available for purchase during February 2007 (onion, spring onion, beans, garlic, baby marrow, sweetcorn, butternut, pumpkin).

According to Reynolds (2004), price premiums typically range between 20 and 40%. South African price premiums thus appear to be in the high range for most products, except for some vegetables. As revealed by the high price premiums, consumers' willingness to pay for immaterial product attributes associated with organic food appears to be significant among the entire range of available organic produce. Premiums for processed products are much higher than for unprocessed food such as vegetables. Even within the range of vegetables, ready-to-cook mixed vegetables benefit from a price premium 16 percentage point higher than the average price premium for organic vegetables. These differences in premiums among processed and unprocessed organic products tend to support the idea of the retailer being the price maker and thus setting a higher price premium for value added products. However, many other factors probably enter into play in these price settings, such as the convenience service in addition to the organic attribute which is another valuable asset from a consumer point of view and the relative price insensitivity of the relatively small consumer segment that purchases this specific type of products.

4.2.4 Consumer perceptions towards organic food

Given this exceptional growth and high price premiums, questions arise regarding the organic purchasing behaviour of consumers. A global survey by ACNielsen on consumers' attitudes towards organic foods (ACNielsen, 2005b) provided some comparative results in this regard between South Africa, Europe and North-America. The organic food types purchased regularly by consumers in these different regions are summarized in Table 2.

Table 2: The organic food types purchased regularly by consumers in South Africa, Europe and North-America

Food product category:	% of respondents in country / region:		
	South Africa:	Europe:	North-America:
Fruit	37%	28%	17%
Vegetables	37%	25%	17%
Poultry	35%	17%	14%
Eggs	42%	34%	19%
Dairy	31%	21%	14%
Processed foods	14%	7%	9%

Source: Compiled from data reported in ACNielsen (2005b)

Interestingly, according to this survey, despite being a very new phenomenon in South Africa, the proportion of consumers regularly buying organic foods is higher than in the

two main Northern organic markets. The importance of organic fruit, vegetables and eggs is also evident, confirming observations of the organic product offering of South African retailers. Processed foods appear to be less popular in the different regions, which can be related, at least partly, in South Africa to the high prices associated with them.

The data in Table 3 indicates that health is a major consumption motivation in all three regions, even if very recent emphasis toward environmental concerns driving organic food purchasing may be currently manifesting in Northern countries, as in the United Kingdom as revealed by The economist (2006: 71): “*Peter Melchett of the Soil association, Britain’s leading organic lobby group says that environmental concerns, rather than health benefits are now cited by British consumers as their main justification for buying organic food.*”

Table 3: A summary of consumers’ main reasons for purchasing organic food alternatives in South Africa, Europe and North-America

Purchase reason:	% of respondents in country / region:		
	South Africa:	Europe:	North-America:
Healthy for me	53%	41%	57%
Healthy for my children	16%	16%	19%
Better for the environment	17%	19%	11%
Kinder to animals	8%	12%	2%

Source: Compiled from data reported in ACNielsen (2005b)

The growing organic food consumption in South Africa is strongly motivated by the general category of healthy food and healthy food alternatives as in Northern countries.

Interestingly, while in Europe and North America, high prices are the main factor preventing consumers from purchasing organic food, the main reason expressed by consumers in South Africa for not purchasing organic food, is the lack of availability (37% of respondents), even though high prices are also a problem (26% of respondents) (ACNielsen, 2005b). This lack of availability arises from a great imbalance between supply and demand, as confirmed by Mead (2006) and discussed in the next section.

4.2.4 Supply and demand imbalances

The domestic and international demands for organic products are dramatically higher than the supply. On an international level the demand for organic produce in Europe and the US is increasing and with it the demand for organic produce supplied by producers from Africa (including South Africa) (Africa Research Bulletin, 2006). The export market is well established in South Africa and looking for professional growers.

On a national level, the tremendous growth in the sector shows a big reactivity from the consumer side. However, “*Local retailers are failing to find reliable and sustainable suppliers of natural and organic products locally*” (David Wolstenholme, exhibition director of the Natural and Organic Products Exhibition 2006, reported in Farmers Weekly of 31 August 2006).

South Africa has only about 515 000ha of certified organic land divided into 97.1% pastureland, 2.1% land for rooibos production, 0.38% for fruit, 0.33% for vegetables, 0.03% for wine and 0.02% for essential oils. This is significantly less than Australia’s ten million hectares according to the SOEL survey released in November 2004 (Benno, 2005) South Africa has about 230 certified organic operations of which about 77% have gone into conversion during the period 2003 to 2005 (Mead, 2006, as reported by Food Review and Africa Research Bulletin). According to Diana Callear, the managing director of Ecocert-afrisco, there is about 400 to 500 organic farms in SA.

Supply and demand imbalance is to be related to the retail driving the organic food movement in South Africa. They have stimulated a significant demand, which is rapidly growing. Local retailers cannot rely on an endogenous social and farming movement as observed in Northern Countries, since it is almost non significant or at least invisible in South Africa. South African commercial farming production systems are based on a very sophisticated model of technology intensive agriculture, which basically rely on economies of scale associated with very large scale farms. Thus adaptation to organic standards represents a major shift from this type of farming system as emphasised by Hall (2005): *“Organic farming is more expensive than conventional farming, due to start-up costs, conversion and accreditation. Organic farmers are vulnerable to adverse weather and pests because chemical pesticides may not be used, often resulting in lower yields and erratic supply. The factors add to the cost of the produce, which can be between 20%-30% more expensive than conventionally grown products...”* Organic farming systems in South Africa still need major research inputs on soil fertility, integrated pest management, potential problems arising from cross-pollination by GMO's and industrial pollution as well as compatibility with profitability.

The organic production could thus appear to offer an interesting comparative advantage for resource poor farmers as, as pointed out by the Africa Research Bulletin (2006), most of them have been practicing organic like farming for centuries given their lack of resources: *“African farmers have grown organic produce for centuries – by default, through not being able to afford agro-chemicals or machines. Their fortune seems reversed as this type of ‘poor man’s farming’ is gaining respectability – a fact that conventional commercial farmers are slowly waking up to”*

It is interesting to note that a few, initiatives are taking place at the small-scale farmers level, notably in Kwazulu Natal and the Western Cape, where farmers in addition to NGO technical support can also benefit from provincial state support. This is the case of the Ezemvelo Farmers Organisation (EFO), which benefited of support from organic and agricultural experts, and supplies Woolworths with organic production (www.woolworths.co.za). In 2001, this group of small-scale, subsistence farmers was the first one to convert from traditional agriculture to certified organic farming. EFO members use traditional farming knowledge to produce traditional root crops (organic taro, sweet potatoes and baby potatoes produced using an old landrace) for a high-value organic niche market that granted access to increased sales. This group has become a model of Black Economic Empowerment in South Africa.

Other initiatives can also be mentioned such as, in the Limpopo Province at Makhado, the Letaba Organic farmers' Association, a certified organic Black Economic Empowerment farming project supported by the Organic Farmers Group continued mentorship and marketing programme, which supplies Pick'n Pay and Spar.

However if we consider the way the organic sector has been developing in South Africa through the retail sector, the capacity of small farmers, and more generally of rural populations, to successfully enter and on a significant scale this market remains questionable contrary to what the Africa Research Bulletin (2006) suggests: *“Converting existing agricultural land into organic farmland or starting new organic farms could create jobs and generate income for the masses of rural unemployed who are making a meagre existence across the continent”*. As has been shown in particular by Louw et al. (2007), general supermarkets requirements create high market entry barriers for small scale farmers in South Africa as in many other developing countries. And in addition to these, supplying organic products also implies adopting the certification procedures imposed by the retailers.

It is thus very likely that, as stated by Reynolds (2004) in particular with regard to South/North organic trade and already mentioned in the first part of the paper, most small scale farmers will be excluded from the formal organic market in South Africa.

Furthermore, organic production entails a real long term commitment from farmers (e.g. producers face a three years organic compliance process before being fully certified), which seriously constraints retailers' capacity to incentive producers towards organic production. However, long term contractual arrangements that have been established in many cases as part of retailers' preferential procurement systems (Louw et al., 2006) can support large scale farmers' investments in shifting toward organic farming. Given the huge imbalance between supply and demand, some direct investments in organic production from the retail sector are underway.

In addition to the technical and financial constraints associated with the shifts toward organic production in South Africa as discussed above, an additional factor to consider in explaining the supply and demand imbalances is the procurement competition between the local and export markets, both expanding tremendously as mentioned earlier.

The high price premiums associated with organic food, allowed by the existence of high consumers' willingness to pay for immaterial product attributes associated to organic food, reflect the current supply and demand imbalances, and thus the structure of the South African organic sector, which is strongly shaped by the formal retail sector.

5. Final thoughts

Given the prominent role of the retail sector in the evolution of the organic sector, it is interesting to consider the development at the local level of an alternative quality related market outlet - food purchasing at local farmer's markets. This is a common phenomenon among European consumers but, as described in the background part, is still in its infancy stage in South Africa. As confirmed by the up market South African lifestyle magazine House and Leisure (Buitendach, 2007), the 'market movement' is becoming more popular, even though it is still far from a main stream food trend: *"Markets are the new malls"; "The 'market movement' is a reaction to confined, commercial, artificially lit, air-conditioned shopping centers and is in line with the international trend towards meaningful living. An antidote to malls, markets offer a laid-back, sociable outing. Plus they provide the opportunity to buy from small, specialized stores that offer great products..."*

There are currently at least 16 of these local markets in South Africa, providing an alternative food purchase experience for consumers. The food offering of these markets encompasses a number of new quality trends such as organic food, fresh farm produce, South African culture food (e.g. koeksisters, milk tart, potjiekos), free-range produce, boutique cheeses, gourmet food, home-industry style baked goods and home-made processed fruit products (such as jams and preserves).

In the last decades, the South African retail sector established as the main actor in the formal agro-food sector. It has been capturing most of consumer purchasing power and setting the rules governing this system. The 'quality turn' largely conveyed by the retail sector, which has been highlighted through the discussion of the organic sector evolution, is associated with organizational changes in the formal agro-food system, and is influencing the positioning of producers, retailers and consumers in the agro-food system. As has been described and analysed globally, the establishment of new certification schemes largely driven by the retail sector has been the main vehicle of the institutionalization of quality in South Africa. From what has been depicted in this paper, it can be foreseen that the

growing interest in new food quality trends, as underpinned in the organic sector development, will support further development of innovative organisational forms that have recently taken importance in the South African agro-food system, such as contractual arrangements with farmers. These arrangements were primarily driven by the consolidation of the retail and processing industries and their re-organization of procurement schemes (Sautier et al., 2006). Commercial farmers have been the main beneficiaries of these arrangements. New quality trends such as organic production appear to be far removed from conventional South African farming practices. They could be more compatible with small holder farming practices. However, certification procedures create high entry barriers, in particular due to asset specific investment requirements. Contractual arrangements can provide farmers with the incentives to commit to the certification process. Under current procurements systems, large scale farmers are more likely to benefit from new quality trends development driven by the retailers.

In contrast to this retail driven quality movements, the 'market movement', mentioned above, that is supported by new consumer purchasing behaviours could create an alternative market channel for and conveys further development of new quality food trends. Furthermore, the flourishing of alternative food movements in South Africa - especially development oriented toward place based and socially embedded products - could consolidate this rise of farmers markets. By providing scope for trust based on proximity rather than on formal certification schemes, these new developments of the quality turn through alternative marketing schemes could be more inclusive for small-scale farmers. They could create new opportunities for those that struggle accessing formal organic channels governed by the retail sector.

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EU Market Access: The Way Of Licensed Warehousing System for Turkish Food Producers and Exporters

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Summary

Licensed warehousing system plays a very important role in all transfers of food products from the place of origin to ultimate users in developed countries. Public warehouses, operated as an independent business offering a range of services, such as storage, handling and transportation. "Licensed Warehousing Law", was accepted on 10.02.2005 and this is a new subject in Turkey. In this research, the licensed warehousing system in Turkey is evaluated from the point of view of industrial and agriculture officials. Confidential face to face interviews were held with the authorities of Industry and Trade Ministry in Ankara. The very new licensed warehousing law connote many questions. Who will be getting the benefits of qualified storing, small-sized enterprises or big ones? What will be benefits to producers, product markets, and government? Are all the necessary legal, institutional, and technical enabling ready? During the study, authorities of Industry and Trade Ministry has met, qualified storing law and its system, function, benefits, world samples information were given by using literatures, then action of the qualified storing system in Turkey and its possible problems were discussed.

KEYWORDS: Licensed warehousing, agriculture, food produce, food trade

Introduction

45 % of Turkey population lives in rural areas and this segment constitutes 13 % of the total production. Therefore, agriculture in Turkey and the related food sector has a high socioeconomic importance (Başer, 2002:2). During the integration process with European Union, improvement of product markets and related with this, enabling has to be built to support and complete all the phases from production to consumption. Licensed warehouse system is an important constitutive enabling that facilitates agriculture-based trading, expands market range, contributes to product market expansion and price consistency in these markets and facilitates raw material supply to industrial manufacturer. A common and effective licensed warehouse system in developed countries is running by private sector. Turkey's food distribution system is still dominated by small vendors. Today's consumers want more quality, value and convenience, and the Turkish food distribution sector must continue to adjust to these demands. The quality of agri-food products is a strategic task for agriculture and rural economic development. The food marketing and distribution sector is the critical final link in the Turkish agri-food chain between food processors and agricultural producers and consumers. In Turkey, storing activities are performed under unsuitable conditions for the companies or people's individual needs and capacities and without audition. There is no other constitution apart from Turkish Grain Board that licensed warehouse of agricultural products.

Law numbered 5300, "Licensed Warehouse", was accepted on 10.02.2005, which facilitates the sale of storable and standardized agricultural products such as grain, pulse, cotton, tobacco, hazelnut, oily seeds, and sugar, provides agricultural producers' products

storage under hygienic conditions without any loss in their quality (Official Paper, 2005). In this manner, business trade of standardized agricultural products will increase.

1. Turkey's Portion In World Agricultural Trading

Turkey is a significant producer and exporter of agricultural products in the world. (Food and Agricultural Association, 2004). Turkey's GDP growth rate was 5.8% in 2003, 8.9% in 2004 and 5% in 2005. Agriculture contributes to 12% of the GDP and employs 30% of the population. Turkey ranks fifth and ninth in the world vegetable and fruit production. About half of Turkey's area of some 79 million hectares is devoted to agriculture, which is roughly in line with the EU27 average (48%). Turkish accession would therefore add about 39 million hectares to the EU's agricultural area. As a consequence of economic development, the share of agricultural products in total exports fell from 57% in 1980 to 16% in 1995. Since 1980, Turkish government has taken series of agricultural policy reforms and legislative steps for the harmonization of its law with that of the EU. As a result, the food sector is becoming very attractive for suppliers and foreign investors.

When our export's sectoral structure is analyzed, it can be seen that pre 1980 agricultural products based export is substituted with mainly industrial based products (Table 1). In 2005, 85,4 % of our export was industrial products, 12,5 % was agricultural products, and 2,1 % was mining products (IGM 2005). Even if the decline in agriculture portion in nation income can be undertaken as an indicator of country development, the decline in sector's portion in foreign commerce draws attention. Moreover, this case is an indication of lack of a serious agricultural policy in order to pass over the agricultural potential to food industry, correct the manufacturing, marketing, and organization problems.

EU has approximately 60% of our total agricultural export shares. EU countries also have 50% of our import share. Agricultural commodity export cannot show continuity because of some structural problems. Until 1996, agricultural commodities share was 19-20 % of our total export to EU, beginning from 1996 the ratio started to decline to 16 %, then, 14 %, and 1,8 % at end of 2003 (Seki 2005). Recently, due to the increase in industrial commodities export, agricultural sector export share declines in total export. In the future, continuity in this trend is expected. Reasons of the decline in agricultural commodities in our exportation are; the characteristics of agricultural enterprises in Turkey is small and uncompetitive enterprises, not be able to use new technology, insufficient producers association, no policies in production, consumption, prices, subsidy system, and foreign trade, not any evident policy in new product development, being under world standards in terms of product quality and standards (www.dtm.gov.tr). The main Turkish agriculture issue between Turkey and EU relationships is the cohesion of Turkey's agricultural policy with the Common Agricultural Policy (CAP). Turkey's agricultural structure shows significant differences from EU countries in terms of agricultural population, enterprise size, organization of producers, agricultural subsidies, enterprise organization, technology usage, productivity, plant and animal health conditions, and product quality and standards (Bayraç, Yenilmez, 2004). Cohesion of Turkish agriculture to CAP is expected to happen progressively. Change actions that minimize the governmental intervention and encourages private sector participation has started.

Several differences between Turkey and EU countries are shown in table 2 in terms of principal indicators of agriculture's importance in economy (Olgun, Işın, 1999:76).

2. Difficulties In Marketing Agricultural Commodities

Agricultural marketing is a system containing all the steps of the product delivery from the producer to the customer. This system is categorized as collection, distribution, processing, harvesting, classification, standardization, quality control, packaging, and labeling, price formation, sales, forming demand, taking the risks. European Union put food safety law into force that has high standards in terms of food manufacturing, delivery, and storage at

New Year. Necessary measures have to be taken while launching the EU banned import commodities, because of their low health level, to home market. In this context, operators should fulfill HACCP standards and take the compulsory controls. Briefly, our country's agricultural commodities marketing problems are following (<http://tarimsurasi.tarim.gov.tr/6.komisyon.pdf>).

- 1) Could not be able to break the conventional storing habit,
- 2) Could not be able to generalize the usage of warehouse receipt, which provides easy and cost-effective transfer of goods,
- 3) Generally, the enterprises that perform in agriculture have mainly limited marketing possibilities.
- 4) Performing the commodity trade at local level, could not be able to expand to foreign markets.
- 5) No common standards in some commodities, insufficient laboratory system that tests quality standards.
- 6) As a result of subsidy policies, assuming the inventory cost by government and producer organizations.
- 7) There are major problems arise from lack of information, legal enabling, and actions in standardization, packaging, labeling, quality management systems, and HACCP of agricultural commodities marketing.

Besides agricultural manufacturing, their storage also creates problems in Turkey. For example, Turkey's yearly grain production is 31 million tones where 21 million tones of this is wheat production. However, storage capacity is not more than 13 million tones in Turkey. Turkish Grain Board's capacity is around 5 million tones and is not adequate (www.kobifinans.com.tr/seyktor/011303/9852). This is resulted with leaving the product under the soil. In this study, licensed warehouse system is suggested as a solution to the agricultural commodities producers' and exporters' mentioned problems.

3. Main Person, Institution, And Cooperation In Licensed Warehouse System

Public warehouse is a storage facility operated by an independent warehouse company on its premises. Public warehousing and storage includes establishments engaged in the warehousing and storage of farm products. The standard way of starting a public warehouse company is either by buying, building or leasing a warehouse and then looking for customers who require storage of products to fill it. Licensed warehouse system consists of following institution and organizations.

1-Producers/Merchants:

2-Licensed Warehouses: Facilities where the agricultural commodities will be kept under healthy conditions. Company that will perform as a licensed warehouse should be approved by Industry and Trade Ministry for a certain fee, own a storage to be able keep the commodities under healthy conditions, insure the stored commodities, and legally has a joint stock company structure that is set up with minimum one million YTL paid-in capital. Its storage capacity for grains should be minimum 40.000 tones, and 15.000 tones for cotton and hazelnut, should have sufficient ventilation, fire fighting system, dust absorption, depending on the product's characteristics sifting, drying, foreign materials sorting machines, also should contain tool, equipment, and instruments to meet with side services. In order to functioning of the system, mentioned sized warehouses have either to be built or hired. The ones, who can perform as licensed warehouses, are the big-sized enterprises (Official paper: 17 Şubat 2005).

3-Commodity exchanges: Wheat, grain kind of agricultural commodities have to be traded in futures markets. Product, commodity exchanges are commodity exchanges where authorized by ministry to trade or product specialized stock markets where warehouse receipts, which are arranged by licensed warehouse enterprise by an agreement, are quoted

trading is controlled and monitored. Product Specialized Stock Exchange's proper operation is very important for the functioning of the licensed warehouse system. Setting up a SME's Stock Exchange is under process.

4-Banks: Banking system do not grant a loan on commodity bill to agricultural commodities. In the application it is expected that private banks grant loan (Uras 2006).

5-Insurance Companies: Licensed warehouses have to insure the related facilities and stored commodities against risks.

6-Ministry : Licensed warehouses should be authorized by Industry and Trade Ministry with a license valid for two years in order to perform.

4. Research Methodology

In this research, the licensed warehousing system is evaluated from the point of view of industrial and agriculture officials. A senior executive is usually a suitable respondent, in view of his involvement in the implementation and use of warehousing system and his perspective of the performance of warehousing system. This study based on primary and secondary sources of information. With the use of deep interviewing and the previous studies made in this area, it was investigated the roles of warehousing system for Turkish food producers and exporters, warehousing system examples in some countries. The interview topics include the objectives of using warehousing, necessary structures of system, functioning of licensed warehouse system, benefits of licensed warehouse. The interviewee was given the opportunity to talk freely about events and beliefs in relation to the topic area. For the validation of the research, the opinions of other researches that had worked in this area were taken into account. For reliability the officials word were quoted exactly and presented to the reader without making any comments.

4.1. Functioning Of Licensed Warehouse System

When we look at the properly functioning licensed warehouse systems in the world; it can be seen that they set on factors as developed and generally accepted commodity standards, laboratory organizations, proper information communication network between system tools, reliable licensed warehouses, commodity exchanges where trading and enabling are complete and free of VAT trading. Moreover, presence a consistent foreign trading regime of export and import of agricultural products and formation of agricultural products prices in a free market without any governmental intervention come into picture as supportive factors.

At first step, warehousing is planned to perform on wheat, cotton, and hazelnut. Producers receives product bill that shows the possession, type, amount, breed, kind, and quality for each of the agricultural commodity. Warehouse receipts are documents issued by warehouse operators as evidence that specified commodities of stated quantity and quality, have been deposited at particular locations by named depositors. The depositor may be a producer, farmer group, trader, exporter, processor and indeed any individual or body corporate. The warehouse operator holds the stored commodity by way of safe custody; implying he is legally liable to make good any value lost through theft or damage by fire and other catastrophes but has no legal or beneficial interest in it. The receipts may be transferable, allowing transfer to a new holder- a lender (where the stored commodity is pledged as security for a loan) or a trade counter-party which entitles the holder to take delivery of the commodity upon presentation of the WR at the warehouse (Coulter, Onumah 2002:323).

Warehouse receipt is given during the delivery of the products and is a document that enables the producer to contract loan by pledge his products in the warehouse as collateral, sell his products while they are in the warehouse or taking his products back as they were given to the warehouse. In laboratory, quality classification of the product will be made and a bill will be given that shows the quality, quantity, and amount of the product. If the

producer cannot pay his debt, then the bank will be able to arrest the goods in the warehouse in order to pull in cash. Producer will be able to endorse this bill to someone else, the one, who owns the bill will be able to collect the products from warehouse. Therefore, the sale of the product in the warehouse will be performed on paper. Moreover, since the quality, amount, and approximate value of the product is known, it will be able to insure. When licensed warehouse is delivering the products to the producer this means the cancellation of the bill. If the producer does not take the delivery of products on the stated term in the agreement, then the licensed warehouse will be able to sell the products. Firstly, the warehouse receipts should be quoted to stock markets in order to control and sell the product bills safely. The agreement between licensed warehouse and commodity exchanges enables the commodity exchanges to investigate the products when it is needed and provides information communication between two sides. Each producer, who is suitable for storing and do not affect other products and health can be benefit from the licensed warehouse service. The system is secured by the control of Industry and Trade Ministry over the licensed warehouses and specialized commodity exchanges.

4. 2.Benefits Of Licensed Warehouse

4.2.1. According To Producers

- 1) Safe, insured, and healthy storing conditions will be provided to the product owners. Warehousing system can provide increased productivity, better space utilization, reduced errors (Faber, Koster, 2002:382).
- 2) Producer will be able to put his products into licensed warehouses at the harvest time where the prices are low.
- 3) If the producer wants, he can attach his product bill that was given in consideration for his products, to a finance institution in order to take up a loan, therefore provide funding to him that he needs.
- 4) Standards of agricultural products will be determined. During the product marketing, since the quality of the products is not determined objectively, it is not reflecting to the prices and quality production cannot be encouraged. Produced goods quality will be determined at objective laboratories and price demand will be based on quality factors.
- 5) The one who has warehouse receipt will be able take delivery from the nearest licensed warehouse to their factory and enterprise, therefore unnecessary product transportation will be minimized and transportation costs will be lowered.
- 6) Since the warehouse receipt will be able to trade in commodity exchanges, product will be able sell to many buyer rather than one two merchants, markets other than the local ones will be benefited too. Requested amount, type, and quality of product will be obtained safely and electronically in short time.
- 7) Producer will be able focus on his specialized activities.
- 8) The warehouse operator is able to provide information on inventories available and on demand from major buyers at little or no cost. He also quarantees delivery commodities matching stated and against date contracts. Smallholders able to participate in a modern and efficient commodity market because the system encourages them to comply with commodity standards, which will also curtail cheating on weights and quality (Coulter, Onumah, 2002:326) .
- 9) The use of warehousing system will allow transparent trade in agricultural commodities to develop between producers and large traders or processors thereby reducing the length of the marketing chain and narrowing distribution margins. Increased storage by participants in the commodity system will moderate seasonal price variability and reduce trade margins for the benefit of both producers and consumers (Coulter, Onumah, 2002:326) .

4.2.2. According To Commodity Exchanges

- 1) There will be increase in registration income by warehouse receipt trading.
- 2) With this system, buyer and seller of the product will be brought to a bigger platform to contribute formation of real price; will be an increase in trading volume.
- 3) E-Trade will develop to generalize product trading, turning of commodity exchanges to their main interest, gaining of modern structure will be provided.
- 4) Besides having a strong and modern commodity exchanges structure in order to marketing of the products in our country, there will be a possibility to market the other countries' products locating in the same geographical region with us and of having a bigger trading share.
- 5) The weak, ineffective trading stock markets in country will be encouraged to unity and transform into product specialized commodity exchanges.

4.2.3. According To The Government

- 1) It is aimed to avoid governmental purchase, and provide more active private sector in product marketing by Product Specialized Commodity Exchange Development Project and Licensed Warehouse system parallel with the ongoing Agriculture Reform Implementation Project (ARIP).
- 2) Product marketing problems arise from clearing off the institutions like TGB, unions, TEKEL from governmental purchases will contribute to solve the problems.
- 3) Governmental purchase and storage costs will decrease in some products.
- 4) More precise data regarding our country's agricultural production volume and quality will be collected and agricultural policies will be able to manipulate.
- 5) Agricultural product trading will be registered because of the system's advantages, tax exile will decline.
- 6) There will be a tendency in our country towards quality products, since the quality factors and standards were determined objectively resulted with valuable products.
- 7) Small portion of the agricultural products including wheat and cotton are traded in stock market sale halls, and big portion of it are subjected to unregistered trading. Unregistered trading will be prevented.
- 8) There will be contributions to the new employment and business fields in banking and insurance sector by the new born licensed warehouse and laboratory system.

4.2.4. Other Benefits

- 1) Through warehouse receipt, an alternative investment vehicle is provided to investors such as share, foreign exchange, gold, interest.
- 2) Enabling of transition to futures market is set up by the standardized product and licensed warehouse system. Many standards have been set by TSE (Turkish Standards Institution) related with agricultural and food products, packaging, labeling, sampling, and experience methods.
- 3) A big potential is created for e-trade.
- 4) Because of the product analyze, storage, insurance, and credit usage, new income and business fields will be brought in the sector.
- 5) By opening branches of licensed warehouses, and product specialized stock markets domestically and internationally will facilitate product marketing and delivery activities also enabling operations.

5. Warehousing Around The World

Warehouses in Europe, especially in Germany and France are shaped by the relatively high labor costs and inflexibility of the work force. In the past, the economies of Europe were separate. More recently the economies are integrating into a common market, which will

create economies of scale, which will likely lead to larger warehouses. However, urban areas, many of which have grown out of ancient towns, will still present challenges to the efficient flow of product. Warehouses in North America are generally built in the countryside surrounding major metropolitan areas, so that land is cheap but there is still ready access to large markets. Warehouses in North America are coordinated by increasingly sophisticated warehouse management systems and so very rich data sets are available. Warehouses in India distribute mainly to the local economy and so supply a market that is not wealthy. Despite cheap labor, China does have some capital intensive warehouses with the latest information technology and storage equipment (Bartholdi, Hackman 2006).

6. Licensed Warehouse Applications In Turkey

Hazelnut Licensed Warehouse Regulation has put into effect on 2 August 2006. Agricultural Sales Co-operative and TGB has increased their capacities, a project has executed in order to integrate these institutions into the licensed warehouse system. With the leadership of TOBB (Turkish Union of Chambers and Stock Exchanges), enterprises have been initiated in order to build effective and widespread operating licensed warehouse institution to meet with sector's needs (www.sanayi.gov.tr). In this way, hazelnut as the foremost, the necessary enabling has completed to build licensed warehouse enterprises in many products and have efficient operations of Derivatives Exchange and product specialized stock markets.

The ones, who are willing to become a licensed warehouse enterprise, have completed their feasibility study in order to determine their activity product and applications to Industry and Trade Ministry. The successful applicants will be able get their license by do their investment which 50 % of the investment cost will be covered by World Bank. TGB and TOBB (Turkish Union of Chambers and Stock Exchanges) warehouses either will be rebuilt or will be equipped in order to meet with the new technological needs and reaching the licensed warehouse statute. Turkish Unions of Chambers and Stock Exchanges will be able to operate in storage business in their related and specialized fields. For example, Fiskobirlik related with hazelnut, Taris Cotton Union, TGB storing business related with wheat, and Cukobirlik storing business related with cotton operations are planned.

7. Result

Countries, which set up licensed warehouse system, will increase their agricultural commodities share in trading. In addition to this, in order to functioning of the system there is need of several licensed warehouses, however there is none in our country. In banking system, granting loan in consideration of product bill has not become operative yet. Regulations of licensed warehouse system are not enough, in order to set up licensed warehouse system and function it successfully. It is necessary to perform supportive arrangements in other regulatory, which tax regulatory comes first, consisting enabling of stock market and modern agricultural commodities trading.

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TABLES

Table 1: Agricultural Products Share In Total Export (Million Dollar)

	1970	1983	1990	2000	2001	2002	2003	2004(1-10)
AGRICULTURE	487	2,550	3,288	3,619	4,071	3,752	4,845	4,609
TOTAL	588	5,728	12,959	27,775	31,334	36,059	47,068	50,568
SHARE (%)	83	45	25	13	13	10,4	10,3	9,1

Table 2: Comparison of Several Agricultural Indicator in Turkey and EU (2001)

INDICATORS	TURKEY	EUROPEAN UNION
Total Agricultural Field (1000 Ha.)	27.000	134.261
Total Enterprise Number (1000 Unit)	4.106	7.370
Total Population (Million)	68	377
Agricultural Population (Million)	20	15,6
Employment in Agriculture (Million)	9,4	7,4
Agricultural Share In Total Employment (%)	45	5
Agricultural Share In GNP(%)	14	1,9
Agricultural Share In Export (%)	7,83	7,5
Agricultural Share In Import (%)	4,18	10,5

Source:<http://www.tarim.gov.tr/arayuz/1/icerik.asp?fl=uretim/istatistikler/istatistikler.htm>
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Factors Determining IRAN'S Share in World Agricultural Markets

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Summary

This study concentrates on identifying the main influential factors on Iran's share in world pistachios and raisins, as two main agricultural export products, markets. To do so different econometric models are estimated using panel data for the period 1980-2002. The main findings indicate that relative prices (domestic to world) and exchange rate explain the majority of Iran's market share variations. Also volatility of prices has negative effect on market share implying that importer countries are sensitive to price variations.

1. Introduction

Non-oil exports is one of the most important issues in Iranian economy and government tries to diminish dependency of public budget on oil revenue. In this regard agriculture plays a vital role and its exports earnings is considered as a core political variable. On the other hand within the agriculture sector, pistachios and raisins (dried grape) provide over 50 percent of total exports income. Also Iran is identified as a dominant player in the world markets of these products. According to the FAO statistics in 2003, Iran was among the three top producers and exporters of pistachios and raisins (p&r) in the world. Of course during the last three decades the Iran's share has experienced some declining trend. Decreased Iran market shares may be associated with increased sales by the competing suppliers. This study examines the main factors in the Iran market shares variation. Specifically, we analyze the effects of the following variables: 1) Iran p&r prices and their volatility 2) Iran rial values and their volatility 3) competition between the p&r exporting countries.

In order to incorporate the effects of competition between exporting countries, product prices, exchange rates, and their volatilities are formatted as relative values: the Iran variables are divided by corresponding US and Turkey (as two main competitors) variables. Using the relative form helps to incorporate, in a parsimonious way, the third country effect into an import demand model. This helps to minimize specification errors that arise from the fact that trade flows depend on the costs of purchasing products not only from an exporting country but also from competitors of the exporting country. On the other hand using FAO statistics, three countries as main importing markets are selected for each product. As a result Canada, China, and Saudi Arabia for pistachios and Canada, Australia, and Saudi Arabia for raisins considered as destination markets.

Estimation results show that relative export prices and their volatilities are important factors affecting the Iran market shares, while the relative volatility of currency values are not statistically significant. This suggests that importing countries are sensitive to changes in p&r prices and their volatilities, but not sensitive to volatility of exchange rate. Increased Iran export prices and appreciation of the Iran rial had negative effects on the Iran export performances in the markets, suggesting that US and Turkey could take advantage of a situation when Iran p&r prices were relatively higher or when the Iran rial appreciated against the currencies of its competitors.

The remainder of the paper is organized as follows. A model for Iran market share analysis is specified in the second section. The third section details data used in the study, The fourth

section presents the procedure of empirical analysis and shows estimation results. A summary and conclusion follows in the last section.

2. Model specification

A standard long-run relationship model is specified, following Cushman(1983); Kenen and Rodrik(1986); Asseery and peel(1991); and Chowdhury(1993). The relationship can be derived as a long-run solution of behavioral demand and supply functions for a product trade. The dependent variable is the level of market shares held by Iran p&r in three countries. The explanatory variables are Iran p&r prices relative to US and Turkey prices; relative volatility of prices; Iran rial values relative to US and Turkey currencies in three destination markets; and relative volatility of the rial values. The equation is written as follows:

$$x_{it} = \alpha_0 + \beta_1 \cdot (p_{tu})_t + \beta_2 \cdot (p_{us})_t + \beta_3 \cdot v(p_{tu})_t + \beta_4 \cdot v(p_{us})_t + \beta_5 \cdot (r_{tu})_{it} + \beta_6 \cdot (r_{us})_{it} + \beta_7 \cdot v(r_{tu})_{it} + \beta_8 \cdot v(r_{us})_{it} + e_{it}$$

where x denotes Iran market shares in the destination markets; p_{tu} and p_{us} are Iran p&r prices divided by Turkey and US prices, respectively; r_{tu} and r_{us} represent Iran rial values divided by Turkey and US currencies, respectively, in destination markets; $v(\cdot)$ denotes the volatility of US or Turkey prices or currency values; e is an error term; and α_0 and β_i are unknown parameters. Price variables are time-variant but cross-sectional invariant. All other variables are both time and cross-sectional variant (panel data). The subscript i denotes cross-sectional changes for three importing countries (for each product). The subscript t represents time changes from 1980 to 2002 by fiscal year.

A rise in Iran p&r prices would reduce the demand for Iran p&r, thus reducing its market share, while an increase in competitors' p&r prices might encourage the importers to purchase more from Iran. Thus expected signs of the coefficients of price variables are negative. If the Iran rial value rises, holding US and Turkey currencies constant, then p&r import prices from Iran increase, resulting in comparatively higher purchasing costs for Iran p&r and, therefore, reduced demand. Thus, expected signs of the coefficients of exchange rate variables are negative. If the volatility of an exporting country's p&r price or currency value increases, the importers would reduce p&r purchase from the country and switch to other exporters to avoid the risk. Higher volatility implies greater risk for the importers. So expected signs of relative risk variables of prices and exchange rates are also negative.

An import demand model usually includes a variable that captures the effects of the importing country's income level changes, if the dependent variable is the quantity imported. However, since the dependent variable is market share rather than quantity imported, a variable representing importing countries' income is not included in equation (1), under the assumption that changes in income level in an importing country will not affect the market shares of an exporting country unless consumers' preferences for p&r in the importing countries significantly change in favor of an exporting country's p&r over other competitive countries' p&r as the income level change.

3. Data

The data consist of Iran p&r market shares in three destination countries (Canada, China, and Saudi Arabia for pistachios, Canada, Australia, and Saudi Arabia for raisins). Data also includes average p&r export prices of Iran, US, and Turkey, and real exchange rates between destination and three exporting countries. The data are annual and range from 1980 to 2002 by fiscal year.

The data used in this study are acquired from FAO, central bank of Iran (CBI), and some statistical databases such as: International Financial Statistics (IFS) and Trade Analysis and Information System (TRAINS).

Presence of a unit root process makes the panel data nonstationary, which has the potential to lead to serious errors in inferences and cointegration between nonstationary variables. Therefore I performed a panel unit root test devised by Maddala and Wu (1999). Test results indicate that observations follow stationary processes.

4. Procedure of empirical analysis

Each set of real exchange rate panel data is normalized to make each time series equivalent in magnitude. Note that there are three panel exchange rate data, i.e., r_{ir} , r_{us} and r_{tu} and that in each data there are three time series. A sample average was calculated for each time series and each observation is divided by the sample average and multiplied by 100 to rescale the observation. The variances of p&r prices and exchange rates were obtained using moving sample standard deviation of changes that has been used extensively in literature. The volatility measure is calculated as follows:

$$V_t = \sqrt{k^{-1} \sum (r_{t+i-1} - r_{t+i-2})^2}$$

Where V_t is the volatility and k is the order of moving average. In this study, k is specified to be one.

5. Empirical results

The results from the panel estimation of equation (1) are presented in tables 1 and 2. The model is estimated using three estimation methods, namely: Ordinary Least Squares (OLS), Generalized Least Squares (GLS) and Seemingly Unrelated Regression (SURE). Finally model with best results is selected. Also variables are included in natural logarithm.

Table 1. Estimation Results for Pistachios

Variables	Expected Sign	Coefficient	t-Statistic
α_0	-	21.388	2.473*
Lp_{tu}	Negative	-0.803	-2.536*
Lp_{us}	Negative	-0.563	-0.989
$Lv(p_{us})$	Negative	-3.263	-1.562***
$Lv(p_{tu})$	Negative	-5.588	-1.948**
$L(r_{tu})$	Negative	-0.021	0.312
$L(r_{us})$	Negative	-0.007	-0.113
		$R^2 = 0.60$	$D.W = 2.149$

Notes: The symbols *, **, *** denote statistical significance at 1, 5 and 10 percent levels, respectively.

Table 2. Estimation Results for Raisins

Variables	Expected Sign	Coefficient	t-Statistic
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Lp_{tu}	Negative	-0.126	-0.536
Lp_{us}	Negative	0.309	1.383***
$Lv(p_{us})$	Negative	-2.662	-2.229*
$Lv(p_{tu})$	Negative	2.563	2.047*
$L(r_{tu})$	Negative	-0.001	-0.025
$L(r_{us})$	Negative	-0.309	-3.505*
		$R^2 = 0.986$	D.W=2.174

Notes: The symbols *, **, *** denote statistical significance at 1, 5 and 10 percent levels, respectively.

In table(1) the price variables have negative signs, as expected in the model specification but only Lp_{tu} is statistically significant at 5 percent level. The results imply that Iran pistachios export price relative to Turkey export price is important variable affecting Iran market shares in destination markets. Also the price volatility variables have negative effect on market shares which is consistent to theoretical expectations. The exchange rate variables have also negative sign but surprisingly insignificant.

In table(2) the price variables have expected signs but only Lp_{us} is statistically significant at 10 percent level. It means that Iran market share in raisins destination market is sensitive to Iran export price relative to US price. That's because US is more important competitor than Turkey. On the other hand both of the price volatility variables are significant at 5 percent level but $Lv(p_{tu})$ is surprisingly positive.

6. Summary and conclusion

The objective of this paper is to examine factors affecting the Iran p&r market shares in 6 destination markets (3 market for each product). I included competition effects between p&r exporting countries in the markets in addition to prices, exchange rates and their volatilities. The results show that relative p&r export prices (mostly) are important factors affecting Iran market shares. The variables of relative volatility of p&r prices are statistically significant implying that importing countries are sensitive to price risk. So according to this study the Iran p&r exporters and policy makers need to give additional consideration to relative prices and their volatilities compared to the competing suppliers.

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Internationalization options for agri-food cooperatives: the case of Veronese Wine Growers' Cooperatives

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1. Background

The growth of economies, the opening of markets, the trend of demand and the entrance of new producer countries are the main factors which have built the bases of development of the international trade of wine since 1990s. According to the FAO data, in 2004, 77 million hectoliters of wine were exported (almost 30% of world wine production), for a value of 20 billion US\$. From 1990 to 2005, the growth of value has been higher (150%) than that of quantity (80%). That can be caused by the evolution of economic, social and cultural variables that have influenced the demand. Few countries control most trades: the top four countries (France, Italy, Australia and Spain) concentrate less than two-thirds of quantity, but more than 70% of value. In 2004, Italy supplied about one-fifth (in value and quantity) of the world wine export, but if it is closed to France in quantity (approximately 14 million of hectoliters), it is far from it in value (3,6 billion US\$ for Italy against about 7 billion US\$ for France).

In Italy, few regions have a relevant role in the international background. Veneto is the most active region. In 2005¹ it was able to generate the 28% of the value of Italian wine exports, followed by Piemonte (20%) and Toscana (16%).

Verona concentrates more than one-third of Veneto wine production and shows the highest export propensity, with an exportation higher than 500 million euros and about two-thirds of regional wine export. But these trades are concentrated on the hands of private companies, which export by tradition. The relationships with foreign markets are a new phenomenon for the cooperatives, stimulated by the foreign consumer's increasing attention towards Italian wines.

A lot of cooperatives have some problems in internationalize themselves. These troubles come from inadequate strategic management capability. In a lot of cases they aren't able to plain effective projects aiming to business growth through innovation, marketing and the ability to attract capitals (Garzoni, 2003). The cooperatives have to set off the "cooperative nexus" between members, board of directors and management, and to develop members' cultural bases to create transparency, consciousness and goal sharing.

There are different causes which carry a firm to internationalize itself: internal growth objectives, the development of an international image, problems in the domestic country, attractive factors of foreign market, imitation or competition mechanisms, following suppliers' or customers' development (Majocchi, 1997; Calvelli, 1998). The development of world trades makes internationalization patterns even more complex and firms have to build a set of organizational, managerial, economic, financial, informational and relational instruments (De Chiara and Minguzzi, 2002; Hassel *et al.*, 2003; Kalantaridis, 2004).

2. Objective and methodology

The objective of this research was to inquire into internationalization level of wine growers' cooperatives from Verona and into their awareness and capability in building relationships with foreign markets.

The choice of operate in a foreign market is a critical decision for a firm, not only because of the considerable investment, but also because it could be a hardly reversible choice in the short term. The exportation is the most used internationalization form by cooperatives because of the indissoluble bond of the production with the territory and their members.

The survey has been led in 2006 through direct interviews to the managers of the seven most active Veronese cooperatives abroad.

In order to obtain a wide and homogeneous set of information, a questionnaire composed by three parts has been elaborated. The first part regards the structural and strategic features of the cooperatives; the second part involves internationalization patterns through a set of widening questions for every foreign market. Finally, the third part concerns the business competitive orientation in the international market (Prospect 1).

¹ According to ISTAT data, Italy exported 3 billion euros in 2005.

Prospect 1 – Scheme of the questionnaire used for the interviews

Sections of the questionnaire	Collected information
1) Structural and strategic characteristics	<ul style="list-style-type: none"> - Size (members' number, vineyard surface, members' deliveries) - Organization chart - Production identity - Relationships with members - Products portfolio - Commercial choices (channels and markets)
2) Internationalization patterns in every foreign market	<ul style="list-style-type: none"> - Year of entrance and occasions of first touches - Typologies of exported wine - Distribution channels - Sources of information - Straights - Weaknesses - Necessary services - Main competitors and their strategies
3) Business competitive orientation in the international market	<ul style="list-style-type: none"> - Supply differentiation strategies - Communication strategies - Interorganizational strategies - Views of future development

3. Results

3.1 Structure, organization and main strategic choices of wine growers' cooperatives

The main structural, organizational and strategic characteristics of interviewed wine growers' cooperatives are:

- they have a heterogeneous size, through which they can realize an effective supply concentration. In fact, three cooperatives have less than 300 members, but other wineries have 900 members and the biggest one has 1.500 members. The total extension of the member's vineyard is bigger than 1.000 hectares for more than a half of the cooperatives. The biggest has 4.200 hectares of vineyard. The majority of the cooperatives processes 10.000 tons of grapes, but the biggest achieves about 60.000 tons;
- the most widespread business organization is the hierarchic-functional one, with a general manager who is the oenologist too. He is not only responsible for production process, but also for the other business functions (marketing, administration, supplying, quality control). In some cases he is helped by collaborators, who have specific functions (like accountancy and technical services to the members);
- the prices of grapes are fixed by the most classic parameters (for example, altitude, production area, variety, appellation of origin, sugar contents), but, recently, some innovative parameters have been introduced, like organic growing and, more frequently, the adhesion to quality projects for the appellations of origin. These are elements which involve the problematic themes of the relationships with members and the trend of the cooperatives to looking for new integration forms with members, in order to place the products range at a higher level. This repositioning must be based on the management of the vineyard which aims at underline the "terroir" peculiarities, the protection of landscape and environment and the consumer's wealth;
- in every cooperative there is at least a viticultural expert, who provides a systematic extension service to the members and who is often helped by external consultants, especially in grape harvest period. Moreover, the cooperatives send newsletters and organize periodical seminars

(exclusively on technical themes) to try to involve members in corporate choices, but they still can't make aware members on economic and strategic choices;

- the products portfolio is limited and specialized on wines that belongs to the area of the appellation of origin, even if, in last years, the cooperatives purchase grapes or bulk wine from other firms to differentiate and complete their product range;
- production is mainly oriented on appellation of origin wine, to the detriment of table wine, especially for red wine;
- cooperatives still mainly sell bulk wine (more than 70% of sold quantity), although the sale of bottled wine is increasing. In this way the wine growers' cooperatives focus themselves in market segments where the supply is often very crowded and dominated by price competition and where the product appears undifferentiated and not recognizable. The sale proceeds of almost all cooperatives have been increasing in last five-year period. This fact shows that they can follow the incessant market evolutions, from an economic point of view too;
- the most used distribution channel on domestic market for bottled wine is the short one, through direct contacts with the modern distribution system, through HO.RE.CA. and through their own points of sale. The most widespread long channel turns to agents.

3.2 Internationalization patterns

Internationalization is a new strategy for the wine growers' cooperatives from Verona, which traditionally operate on domestic and, more frequently, on local markets. The majority of them still considers exportation as a marginal strategy in their business life. In fact, in 2005 foreign market absorbed 30% of wine in quantity. However, there is a different export propensity: the export share goes from 7% to 60%. Territorial connection has a basic role in foreign supply: two-thirds of exported wine are appellation of origin wines, and the other third regards table wine with geographical indication. More than a half of exported wine is bottled and in almost all cooperatives there is the trend to increase this share to augment the added value and to keep the corporate and territorial identity of wine.

Almost all cooperatives have a countries portfolio sparsely differentiate. In these years they are trying to penetrate in new markets, even if they continue to export in countries which with they have well-established commercial relationships.

The market risk seems to be particularly high: 91% of exports is concentrate on only two countries and, in 2005, Germany absorbed more than two-thirds of the exports (Figure 1). Only one wine growers' cooperative seems to pay attention to this problem and has a wider countries portfolio, where Germany has a share of only 16%.

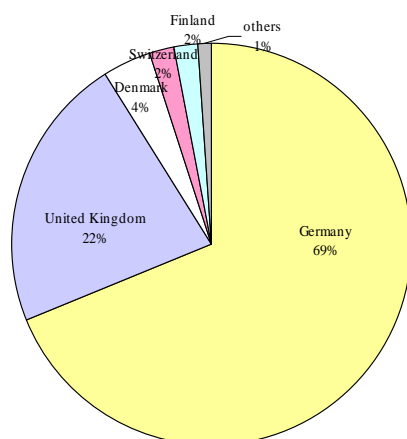
Considering the features of target countries from the demand and from the competition point of views, three different patterns of internationalization management have been identified: a) consolidation strategies; b) growth strategies; c) penetration strategies.

a) consolidation strategies

They concern two main foreign markets of the cooperatives from Verona: Germany and United Kingdom. There are long term commercial relationships with these markets; some cooperatives started to trade in 1960-70 with them, but they must renewed their strategies to defend their position.

German consumer is moving his preferences from beer to wine, but he reveals a high saving propensity. New competitors from East Europe and New World drive the cooperatives to characterize their wine with original sensory profile linked with the origin area and the corporate image, and to offer a good value for money. There are some difficulties in competition for appellation of origin wines, which are sometimes replaced by the varietal table wines with geographic indication. Moreover, the sales of bulk wine to importers-bottlers are preferred, because of complexity in managing the network marketing for bottled wine. Nevertheless, historical commercial relationships with German distribution channel and the affection of German consumer for wines from Verona, known during trips, help in maintaining stable and lasting commercial relationships.

Fig. 1 – Top 5 export countries for the interviewed cooperatives



The cooperatives seem to be less hopeful in their capability in defence of English market. The increasing achievement of wines from New World, the rapid evolution of consumer's preferences, who are always looking for new sensory experiences, and who are relegating the Italian production toward a middle-low level, the exigent claims of the modern distribution system from a packaging and a labeling point of view, request pressing reaction of Veronese cooperatives. It's important to persist in this market, because it is exigent and in the forefront. In this way, the cooperatives can effectively learn to manage the other foreign markets too. But, in the same time, it request strong managerial and financial capability in promotion, both in a corporate level and in an institutional level, product innovation, relationship skills, especially with the modern distribution system and big importers, in addition to a more flexible regulation.

b) growth strategies

These strategies are developed in countries like Denmark, Finland and Switzerland, where the cooperatives started to export in the 1990s. Potentially, in these markets, there still are interesting possibilities of growth.

The competition strategy is based on the original quality of appellation of origin wines, recognized by consumers. In fact, the exports in Denmark have increased more than six times from 2000 to 2006 because of the growing demand of appellation of origin red wine from Verona.

Nevertheless, a critical point consists in the supply fragmentation and in the weak coordination between firms, that interferes with an effective and timely procurement of these markets, and sometimes it provokes a price speculation, and a gap in joint promotion activities of the appellation of origin.

Moreover, the relational and contractual capability towards the modern distribution system and the state monopoly is indispensable.

c) penetration strategies

These strategies support the recent entry, occurs from 2000, in new international markets, such as Holland, Belgium, United States, Japan, Canada, Sweden and Norway, whose consumptions have favourable forecasts of growth.

In spite of the strong competition of the traditional producer countries, first of all France, and of the New World, particularly United States, Australia and South Africa, the wine growers' cooperatives are conscious of the competitive capability of products range which is very appreciated by consumers. In fact, their typical productions are recognizable and have a good value for money. Particularly in the markets of North and Center Europe, the increasing tourist fluxes toward Italy favour the direct knowledge to consumers about the local production and the cooperatives.

The main difficulty for the cooperatives is the lack of experience in the management of these markets, which are often distant and different from a cultural point of view (for example Japan). For this fact, new forms of information and communication are request. Moreover, there are bureaucratic problems (United States), barriers in entrance created by big importer companies (United States), by state monopoly (Canada, Sweden and Norway) or by the modern distribution system, which imposes his own private

labels (Belgium). The lack of specialized human resources who operate with foreign markets is an additional problem.

3.3 Critical factors in international markets

The internationalization patterns showed how the wine growers' cooperatives from Verona are unavoidably involved from international dynamics which condition the wine sector.

Some cooperatives seem to suffer them passively, but the others are conscious of the changes in progress and they are even more orienting their sales towards international markets.

The critical factors which are faced by the cooperatives in foreign markets are:

- a business organization not much export oriented, insufficient specialized dedicated human resources, troubles in relations in foreign languages and lacking experience in operating with foreign countries;
- lacking contractual and communication power with commercial intermediaries and the modern distribution system;
- troubles in management of specific problems of every destination market (for example, state monopoly in Canada or Norway, administrative and normative problems in USA);
- production identity loss for bulk wine or if the modern distribution system imposes its private label;
- strong product, price and service competition by big international wineries and beverage companies;
- lack of coordination in production, promotion and information retrieval between wineries of a same appellation of origin; this obstruct an unique image of territory through the distribution channel, until the consumer;
- a sometimes contradictory and not much dynamic public support in services providing and from a normative and administrative point of view.

4. Conclusions

The entrance in foreign markets by the interviewed wine growers' cooperatives seems to be always linked with fortuitous events. It doesn't come from a previous market survey. In this way, the cooperatives often operate in situation not fully consciousness, and they are dominated by market mechanisms, which deprives them of contractual power. The cooperatives ask a better synergy with public institution for training and professional updating activities, marketing information supplying and a higher normative flexibility to facilitate foreign trades.

Some cooperatives use the aggregation instrument to surmount these troubles. They involve other wine growers' cooperatives or trading companies with a better experience abroad. Business aggregation is an efficient penetration instrument in foreign markets, which can solve normative problems and satisfy commercial intermediaries and consumer too, by supplying a larger products range.

Finally, the promotion of the link tourism-typical products from firms, private and public institutions can be another instrument to build foreign consumer's trust.

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Literature review on the perception of agro-foods quality cues in the international environment

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Summary

Consumers look for the highest affordable food quality, given their household budgets and perceptions of product quality. Such perception is however strictly related to culturally linked variables, and the importance attached to each component of the overall quality vary greatly among countries. Different perceptions lead to different purchase decisions. This concept is even clearer for the aspects of quality that can't be tested directly.

Consumer goods may be divided into search, experience and credence goods, depending on when the consumer is capable of assessing their quality (before buying, after consuming or in the very long term). Most quality agro-food products, such as food with geographical indications (GIs) and low input food (LIFs), fall into the credence good category.

The aim of this paper is to point out how much attention is currently paid in literature (both scientific and popular: articles, papers, reports, marketing studies etc.) to the evaluation of the perceived value of such credence goods attributes for the quality food sector, and which relationships are mainly explored.

A special attention will be paid to the situation in China.

KEYWORDS: quality, agro-food, perception

1. Introduction

Labels are used as quality cues, to the extent they are understood by consumers. Universal labels, such as national organic certifications, reduce search costs. Easy identification of quality makes price comparison and choice easier (Lohr, 2000). Understanding the relationship between quality attributes is important in order to clarify which factors influence the purchasing decisions with regard to quality food.

- Zanolli et al. (2002) pointed out that certification standards and taste are perceived by the distribution channel members as the most important purchasing factor, followed by visual and smell components, and production methodology. Consumers share the same vision, but they focus less on geographical indications and guarantees of origin.
- According to Steenkamp (1997) the most important evaluative criteria are product quality, price, brand name/reputation, freshness and guarantees. The last factor, guarantees, makes it easier to interpret and process information in presence of hidden quality attributes.

According to a quality cue related criterion, quality agro-food products may be grouped into various groups.

This literature review will take into consideration two groups 1) food with geographical indications (GIs) and 2) low input foods (LIFs), that is to say foods produced according to systems that relies on sustainability and the use of low chemicals (integrated pest management system, organic, green foods etc.), aiming at comparing the consumer's

attitude towards such labeled and towards standard products, as well as the relationship between the two groups. Consumer's attitude towards GIs and LIFs have been in fact widely analyzed in literature, but very few papers have examined the associations between the two groups, or studied the potentials that GI and LIF labels could express if combined or presented jointly.

This paper is meant to provide the basis for further studies aimed at comparing or combining the effectiveness of the two abovementioned labeling systems.

2. Background

Quality is a multidimensional concept: intrinsic data relating to the product itself are combined with more symbolic data, and each country or social group has its own set of evaluation criteria. According to Cazes-Valette (2001), seven distinct facets could be distinguished to define quality:

- Nutritional quality: the food's overall contribution to a balanced diet.
- Hygienic quality: when the food contains no harmful or toxic substance and is therefore supposedly good for your health.
- Functional quality: if the product is practical to purchase, handle, transport, prepare and use
- Organoleptic quality: the sensory pleasure that the product procures when it is purchased or eaten.
- Social quality: according to how the food position ourselves in terms of belonging to a group or in relation to a reference group.
- Symbolic quality: acceptability by the consumer's cultural background.
- Humanistic quality: if it's grown using environmentally friendly practices or providing farmers a fair price

The reason why imported goods are often perceived as being of lower quality is because of the different importance attached to each component of the overall quality of the good. (e.g. many United States consumers mainly identify quality with food safety, while Europeans tend to define with the same term perhaps less "sterilized" products but embedded with more cultural and environmental attributes). Moreover there is no single international regulation, so even the premises for a united vision of "quality" are lacking.

Quality may also be both identified with sensory capacities (taste, practicality of the product) or just claimed due to the impossibility to check (organic, traditional, local produce, animal welfare, traceable). In this case quality is underpinned by trust in predetermined organic criteria and other information. Therefore consumer goods may be divided into search, experience and credence goods (Nelson, 1970; Darby & Karni, 1973). A good is a search good when the consumer is capable of assessing its quality before buying it, an experience good when the consumer discovers the quality only after consuming it, and a credence good when the consumer never discovers the quality of the good (or does so only in the very long term). Many agro-food goods fall into the "credence" category (Bureau et al., 1999).

Many consumers, especially European, consider that the soil, climate and traditional know-how that exist in a region have a decisive influence on product quality. In the EU three systems of identification have been implemented:

- PDO (Protected designation of origin): food is produced, processed and prepared in a given geographical area using recognized know-how, when the origin determines the quality of the product
- PGI (Protected geographical indication): the geographical link must occur in at least one of the stages of production, processing or preparation
- TSG (Traditional specialty guaranteed): does not refer to the origin but highlights traditional character, either in the composition or means of production

Unlike the EU, the US does not have legislation specifically geared towards GI in general (wines are an exception). The US provides property rights protection for GIs through its trademarks legislation. More specifically, GIs like Roquefort cheese and Colombian coffee are protected in the US as certification marks, according to the US trademark Act. The certification mark concept encompasses GIs, but is much broader and, by design, it cannot be used to control supply. Therefore the establishment of farmer owned brands in the US is not widespread, and only very few groups are aware of its potentials. This stands in sharp contrast with the regulatory environment for GIs in the EU (Hayes et al., 2005).

LIFs on the other hand are distinguished from non-LIFs by the methods used in their production and processing, rather than by observable or testable characteristics. Although there is no single international production regulation, all generally accepted LIF rules reduce or, in some cases, prohibit use of synthetic fertilizers, pesticides, growth regulators, and livestock feed additives, encourage long-term soil management, emphasize animal welfare and extensive record keeping and planning. Intermediate categories of LIFs, such as certified Integrated Pest Management (IPM) in the United States, Low-Chemical foods in Japan, and some classes of Green Food in China, fall short of the strict requirements of organic certification (Lohr, 2000).

Currently, there are numerous systems that growers can adopt to ensure safe food production, which include amongst others Good Agricultural Practices (GAP), Good Manufacturing Practices (GMP), Hazard Analysis Critical Control Points (HACCP), Good Hygiene Practices etc.

One of the GAP systems that have taken off within the European community is EurepGAP. EUREPGAP was established in 1997 by the Euro-Retailer Produce Working Group (Eurep) with the aim of setting standard and procedures for the development of GAP, and represents the most accredited agricultural practices system worldwide.

3. Objectives

This review will explore and clarify the following relationships between agro-food quality product cue related attributes:

1. Distance from the region of origin – attitude towards GIs
2. Region of origin versus brand
3. Willingness to pay
4. Distance from the region of origin – certification demand
5. Associations for organic products
6. Attitude – country of Origin (for China)

4. Data and methodology

The analysis will focus on consumer's perception towards quality agro-food products and investigate the causes that determine such attitude. This review will therefore array bibliographic materials according to consumer's evaluation factors (such as WTP), country or regional information, and quality cues (organic/green or geographically linked foods). The search for the material to review will rely on the literature available on scientific community databases.

Distance from the region of origin - attitude towards GI

Designations of origin are often indicated as distinctive quality signals, but this is true only under particular conditions. The role of origin information is to serve as a quality indicator for undetectable attributes, making product differentiation easier. This requires that a sufficiently precise quality level must be attached by the user to origin information: if the consumer is not able to detect these differences, then origin is not perceived as a signal of

higher quality and therefore the product is not chosen (new and foreign consumers fit this description).

Differentiating a product by means of a region of origin guarantee is generally more difficult because the association of a particular quality level with a restricted geographic region is usually limited to those subjects with a sufficient knowledge both of the product and of the area. The higher the physical and psychological distance between the individuals and the product, the lower is the goodness of quality perception from designations of origin, which is not interpreted as a quality cue "per se". It is the case of foreign consumers facing imported product, both the lack of consumption experience, which makes difficult to perceive the relevant attributes, and the lack of familiarity with the regional origin (PDO, PGI), usually lead to lower appreciation. Producers may not therefore be able to sell a domestically well established new product on a foreign market if foreign consumers cannot observe its true quality or if they do not put value on the quality characteristics whose level is higher with respect to similar products (Boccaletti, 1999).

- Scarpa and Del Giudice (2004) showed a sizeable diversity of taste across three representative Italian cities. Differences are marked especially for the intensity of taste for certified origin. The proportion of residents in Milan (North) who find certified Southern olive oil unattractive is much larger than in Rome (Centre) and Naples (South). Similarly, the proportion of residents in Naples and Rome not attracted by certified oil from the Centre-North is higher than those in Milan. These findings support the existence of home-bias as found in other studies (Scarpa et al. 2001). The intensity of preference for organic is lower as we move from North to South, with preference intensity for PDO/PGI always dominating the organic nature of the product in all towns.
- Regional differences were identified also by Gil et al. (2000). In general terms, consumers were willing to pay a higher premium for organic products in the producing region (Navarra) than in the consuming region (Madrid).
- Location of production does seem to play some role in terms of proximity to consumption, promoting trust, perceptions of freshness and traditional quality, and it can also serve to improve local economic self-reliance (Midmore et al.2004).
- Interest in supporting regional producers is strong among regular buyers of organic foods (Richter et al., 2000). Many consumers are also troubled by the long distances that food has to travel from farm to table. Organic fruits and vegetables are in demand partly because they are perceived as fresher than conventionally grown foods. With longer distances between producer and consumer, this advantage declines (Lohr, 2000).
- Another study (Darby et al. 2006) suggests that consumers are willing to pay more for locally produced foods. In the case of fresh strawberries, customers intercepted in grocery stores would pay an average of 64 cents more per quart, while those intercepted at direct markets would pay nearly \$1.17 more per carton of strawberries that was grown locally rather than berries identified simply as "produced in the U.S."

Region of origins versus Brand

- Besides the country of origin also the brand plays an important role. A strong image may reduce it if the reputation built by producers with strong intangible investments is high enough to move consumer's quality perception of that product to the top of her preference list (Boccaletti, 1999).
- Han and Terpstra (1988) found that both country of origin and brand affect consumer quality perceptions and that origin is more important than brand name.

WTP

Willingness to pay is one of the methods used to measure the value consumers place on a product with a certain or a combination of attributes. WTP is defined as consumer surplus derived from a Hicksian demand curve, where quantity demanded is a function of prices and the utility level and where income adjusts to maintain the utility level (Golan and Kuchler, 1999).

- A study by Dickerson and Bailey (2002) measures consumers' WTP for meat traceability, transparency, and extra assurances (for meat). Traceability was defined as the ability to trace meat back to the farm, transparency as knowing the meat was produced without added growth hormones or knowing the animal was humanely treated, and extra assurances as extra meat safety assurances. Average WTP to upgrade beef and pork sandwiches to a TTA sandwich is about 33% of the price.
- The WTP for products carrying Organic and eco-friendly labels have also been analyzed (apples). An eco-label identifies environmentally preferable products based on an environmental impact assessment of the product compared to other products in the same category (Loureiro et al., 2001). Many consumers who would be favourably disposed toward purchasing eco-labelled apples consider organic apples to be an even safer and more environmentally friendly alternative, and thus will buy organic if products are offered at equal prices. Statistical evidence supports the conjuncture that eco-labelled apples are an intermediate choice between organic and regular apples with respect to certain consumer characteristics (having presence of children, strong environmental and safety concerns usually as deciding factors)
- Research by Umberger et al. (2003) quantitatively and qualitatively evaluates U.S. consumers' preferences for Country of Origin of beef products. Their study shows that the majority of surveyed consumers in Chicago and Denver (73%) were willing to pay a premium of 11% and 24% for Country of origin labelled of steak and hamburgers, respectively. Consumers in the auction study were willing to pay a premium of 19% for steak labelled "USA Guaranteed: Born and Raised in the US." The results also indicated that those who were willing to pay the most for the label believed the label signified increased food safety and quality.
- A survey was made in 2003 in the continental USA indicate that consumers are in general very concerned about food safety issues, viewing US meat as the safest among the selection of countries considered. Nevertheless, consumer willingness to pay for Certified US products is relatively small, although above the expected implementation costs associated with a mandatory labelling program. This finding coincides with the fact that only 36% of the sample favoured consumers paying directly for the costs related to a mandatory country of origin labelling program (Loureiro et al. 2003)
- A study by Gil et al. (2000) found no differences between consumers and likely consumers for organic products in terms of WTP, indicating a similar premium for all products. In both segments, the WTP ranges from 15% to 25% over the price of conventional products. Consumers were also willing to pay a higher premium for meat, fruits, and vegetables, suggesting that for them the organic attributes are more important in fresh and perishable products, or at least it is easier to identify them in such products. In the case of the meat, the higher premium could be partly explained by food scares (BSE, dioxins, etc.).
- A study across Europe found out that the price premium, expressed as the percentage by which the price of the organic product is above the price of a similar conventional product, can be expressed as follows:

Table 1. % by which the price of the organic product is above the price of conventional product

Country	% WTP
Austria	25 – 30
Denmark	20 – 30
France	25 – 35
Italy	35 – 100
Germany	20 – 50
The Netherlands	15 – 20
Sweden	20 – 40
Switzerland	10 – 40
UK	30 – 50
Japan	10 – 20
USA	10 – 30

Source: FAS GAIN reports, 1999 and 2000;

- Richter et al. (2000) determine why frequency of purchase is not higher among occasional buyers: they found that buyers are more price conscious and mistrust organic labels and enforcement more than regular purchasers. Non buyers are most influenced by price.
- According to Henneberry (2004), while consumers in some developed countries are very concerned and willing to pay a premium for products that have certain desired process-based characteristics such as free of GMOs, consumers in other countries (especially if less developed) may not be willing to pay that premium. The more urgent needs in terms of food availability, nutritional intake, trust in government, positive perceptions of science, and positive media influences are among factors that differentiate consumers' attitudes towards and willingness to pay for food credence characteristics across the globe.

Distance from the region of origin - Certification demand

- One more consideration concerns the relationship between the demand for certifications and the degree of urbanization of the environment where consumers dwell. Those who live further from the production site have a higher demand for certification, while those who live close to the farms care more about the farm environment and have a lower demand for certification (Bureau and Valceschini, 2002)

Associations for organic products

Organic and green foods are mostly perceived as having benefits associated with a combination of interrelated values focused around health, safety and environmental soundness; as 'pure' or natural food, free from artificial additives, fertilizers, pesticides and growth hormones produced without the use of genetically modified technology. Ethical issues related to organic food quality include aspects of environmental conservation and fair trade (workers rights, social equity, animal welfare etc.). There are also positive associations with the home country, and links with origin-labelling and regional imagery. Organic quality is perceived as a symbol of sustainable agriculture and healthy living. Such perception is interwoven with confidence in production processes (process-related quality), and in the particular use of safe or natural raw materials (health-related quality).

- Studies supports the hypothesis that the belief that organic products are healthier lead consumers to believe that they taste better, in terms of the common perceptions of organic taste as 'real' or 'genuine'.

- There are clear reasons why organic foods should cost more than conventional, although value for money emerged from the focus groups as being of greater significance to consumers than absolute price.
- The perceptions of organic foods, in terms of the benefits sought by consumers and the values that underpin them, are neither stable nor permanent.
- According to Lohr (2000), European retailers emphasize food safety and health aspects of organic foods, with this theme dominating retail messages in 12 countries (Michelsen et al., 1999). Environmental protection is the second most important argument presented by retailers in Europe, although consumers do not consistently select food products according to the environmental impact of the production and processing systems. Whilst there are environmental motives for buying organic food in most European countries, they are less strong than the more individual values, associated with own health issues or food as enjoyment (Midmore et al., 2005). Taste and freshness are not important parts of retailer's message in Europe, although consumers rate organics higher in this regard (Michelsen et al., 1999).
- Japanese retailers focus promotions on food safety issues, touting perceived advantages of organic foods, which corresponds to the greatest concerns of their clientele (FAS, 2000). Japanese consumers also are very concerned about freshness, which is believed to be linked to the nutritional content and functional value of foods (MAFF, 1996). Overall, Japanese retailers appear to be more attuned to their consumer interests than European retailers.
- Conflicting data on nutritional, environmental, and human safety qualities of organic foods, coupled with strict truth-in-advertising regulations in the United States, have limited the ability to promote organics on these grounds.

Attitude – Country of Origin (for China)

Country image is also a multi-dimensional construct that reflects: (1) beliefs about the country's level of industrial and technological development; (2) consumers' emotional response towards people of that country; and (3) a motivational and volitional component, reflecting consumers' desired level of interaction with that country (Laroche et al., 2005)

- Evidence showed that consumers indicate a willingness to pay a premium for manufactured products sourced from more industrialized countries. (Knight and Gao, 2005)
- The country of origin serves directly as a status symbol" (Heslop and Papadopoulos, 1993). This aspect seems potentially highly relevant to the Chinese market in view of the importance of status and prestige in Chinese culture and the symbolic value inherent in foreign products (Wei, 1997, Zhou and Hui, 2003).
- Products from developed countries are however seen as being safer and of higher quality than those from less developed countries, but if there's no price advantage this differential appears weak. (Knight and Gao, 2005). Among distribution members taste is mentioned as being the key determinant, price is perceived as a major determinant in purchasing decision (except for wine, where a strong price quality relationship is perceived), while brand is important in conveying status and quality.

5. Results

What emerges from the literature review is that the shorter the distance between producer and consumer (geographically and culturally speaking), the higher the effectiveness of local geographical indications. Such effectiveness decreases drastically from regions of the same country to different countries, where local geographical indications have almost no appeal

due to information lack. Unlike Country of origin indications on the other hand refer to a different set of culturally linked variables, such as the country development or its international reputation, therefore “quality” per se it is not necessarily the most relevant purchasing factor.

As far as brand is concerned, it affects consumer quality perceptions less than the country/region of origin, but it is much more flexible and likely to meet the consumers requirements.

WTP still remains the most widespread method used to evaluate consumer’s perception towards specific quality cues. The appreciation of geographical indications or eco labels varies a lot between countries: the upgrades of conventional foods to GI or ECO systems ranges from 10-30% and 10-50% (up to +100%) respectively. Eco-labelled products are considered an intermediate choice between organic and regular products. The deciding factor for such an increase in the WTP mostly relies on a perceived increase in food safety and quality, especially for fresh and perishable products.

It also emerged that regular buyers have the presence of children or strong environmental and safety concerns as principal deciding factors, while other categories (occasional and non buyers) are most influenced by price.

As far as it concerns China, the country of origin plays an important role in quality perception (products from developed countries are perceived as of higher quality than the local ones), but if there’s no price advantage this differential still appears weak.

6. Final remarks

On GIs

The designation of origin policy showed some limitations, as Bureau and Valceschini (2002) pointed out:

- It is unlikely that non EU-countries recognize, and let alone adopt, the EU system where a quality label is linked to the geographical origin of a product. It is however possible that countries like the US will move in that direction due to the GIs potentials, but it will take a change in the property rights regulations before the political pendulum changes (Hayes et al., 2005).
- Large scale industries are able to offer high quality products that emphasize other attributes than authenticity or origin, which are more likely to be accepted by consumers, since the "authenticity" is not always a quality attribute that drives purchasing decisions.
- New criteria that are seen as relevant as quality attributes are emerging (protection of landscape, natural resources, animal welfare), as well as food safety. The official labels such as the PDO/PGI account for some of these characteristics, but they are not central in terms of focus.

On GF

Despite attempts to harmonize organic regulations within the EU, there is substantial variability in ease of import entry. Even with a common minimum standard, stricter rules are permitted in individual countries and may give rise to protectionism to ensure integrity of domestic standards (Michelsen et al., 1999). Based on an unpublished telephone interview of importers and exporters, Belgium, Denmark, the Netherlands, Sweden, and the United Kingdom were considered to be relatively easy markets to enter. France is considered very difficult to enter, 2001 (FAS, 2000b), while Germany’s consumers are considered the most discriminating in the world with respect to organic credentials (Lohr, 2000).

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Multi-level marketing of quality beekeeping products

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Summary

This paper goes through and analyses an example of one Russian beekeeping company which having chosen an unusual way of marketing its quality food products succeeded and now is coming to the European market.

KEYWORDS: Russian company, beekeeping, multi-level marketing

1. Introduction

The Tentorium Apicompany was started as a small agricultural enterprise in 1988. To provide for the family, the company's founder and his wife had acquired a single bee colony to pollinate cucumbers. By 1990 the company turned into a scientific and production enterprise specializing in developing and manufacturing organic apiphytoproducts using beehive supplies. Now it is a dynamically developing holding comprising 7 units, including a number of modern multibranch production facilities and research centres. The headquarter of the company is in Perm, Russia.

Despite its brilliant past, beekeeping in Russia in the 20th century went through a series of major changes, following the October Revolution and World War II. Rich beekeeping traditions were undermined by the lack of stability in the society. The Tentorium apicompany is the first beekeeping company in Russia which started bringing back rich beekeeping traditions in Perm Region in particular and in Russia as a whole.

2. Quality beekeeping products

Tentorium is the major enterprise in the country and the world's only company processing all known hive products. The company encourages training and retraining of specialists in beekeeping, introduces and promotes new beekeeping and breeding technologies in northern climatic conditions, ways to process beehive products, to use bees for pollination. The firm assists beekeeping research activities at institutes of higher education in Perm, at experimental and teaching apiaries. The Tentorium apicompany has its own Apicentre. Apicentre apitherapists use apiphytoproducts and bee venom to treat such disorders as orthopedic injuries, diseases of nervous, cardio-vascular, respiratory, digestive, urogenital systems, skin problems and eye disorders.

Today Tentorium is one of the world's renowned companies manufacturing wellness products based on hive products and herbal extracts. Its products and activities have been presented with honorable Russian and international awards, including a Eurostandard prize, a Gold medal of the Society for Encouraging and Supporting Industry (France), 3 Gold, 1 Silver and 2 Bronze medals of Apimondia, International Apicultural Congress. Tentorium produces over 60 different brand names and use them effectively in apitherapy. Tentorium product range includes wellness dragee, honeys and honey confectionery, balms, skin care, face care, hair care, foot care, hand and nail care, bath care and body care products, which are known as the "Big Health Package". The company introduces new technologies in production processes and test the quality of raw materials and finished goods, thus ensuring unique properties, large-scale application opportunities and total

health safety of the products. One of the key factors which make Tentorium products unique is clean water which it introduces in all production processes. The company uses ecologically purified silver-ionized artesian well water, "Rodnik Prikamya" (Perm Region Spring). The total water mineralization is 260 mg per liter. It uses only clean water to manufacture in order to ensure its products are friendly to the environment on the whole and to clean water use in particular.

Here there are some concrete examples of the brand-new technologies which Tentorium uses to manufacture its products. To produce the high-quality Honeys, it applies cryogenic method of honey treatment, thus ensuring that active properties of honey are preserved. Ultrasonic homogenization contributes to the increased quality of the honey (diastase number not less than 18 units). To avoid oxidation each finished product is sealed with a vacuum membrane.

The Wellness Dragee products consist of pollen covered with a microspheric coating of natural beeswax, which helps reduce unwanted pollen hydrophily (increased moisture absorption). This coating contributes to longer expiry dates and helps to preserve full biological value of the products.

Tentorium introduced a new kind of propolis in form of Product no.1 Balm, liquid extract, pure native propolis concentrate, to manufacture which it uses the leading edge know-how such as maximum reduction of alcohol content, as the main solvent it introduces silver-ionized water instead. Additionally, the firm applies a special technology of apiary propolis purification to avoid mechanical waste.

Another product - ApiHit Balm - is manufactured by means of a method called CO₂ extraction. It is also used to produce Apicream, where this method helps extract maximum useful properties from pollen to ensure DNA-reducing nucleases provide anti-aging effect widely applied in the Cosmeceutic Collection of company.

3. System of multi-level marketing

Tentorium distributes its products using an effective marketing plan based on direct sales marketing strategy.

The system of the multi-level marketing (or direct marketing or network marketing) was invented in the USA and it assumes that the products are distributed not through the usual commercial channels but through independent entrepreneurs (or distributors) who have a contract with the company and personally present company and its goods to customers. The explicit rules of relationships between a firm and its distributors and customers vary from company to company and are registered in a main corporate document named a marketing plan.

According to the marketing plan of Tentorium, each person, who wants to lead a healthy lifestyle, to improve own health or to start his own business, could build his cooperation with the company in three possible ways:

- 1) to be an ordinary customer and to buy products at the retail prices for personal use from the company's distributors;
- 2) to become a permanent client by purchasing a particular starting set of goods and making a contract which will allow to buy products with a discount of 40% and to get a corporate premium on reaching and exceeding a particular purchase amount per month (5-10% of the purchase volume);
- 3) to become an active distributor by selling the production of the company and attracting new permanent customers and distributors (in proper terminology, building the own network) that gives an opportunity in addition to 40% of retail prices and the corporate premium for an own purchase amount to get a corporate premium for the development of the network which is a percent of purchase volumes of the attracted people.

The structure of this marketing plan could be presented in the following exhibit.

Table 1. Structure of Tentorium Marketing Plan

	Contract with the company	Discount of 40% from a retail price	Corporate premium of 5-10% for an own purchase amount	Corporate premium of 3-8% for a purchase volume of network
1. Ordinary customer	-	-	-	-
2. Permanent client	Yes	Yes	Yes	-
3. Active distributor	Yes	Yes	Yes	Yes

In such a system each active distributor can increase his personal income without limit by developing his network and so increasing its total purchase volume. On reaching a given purchase amount he could open his own warehouse or office which could be used by other distributors to buy the products and conduct corporate events. Usually the method of the distributor's work supposes the organization of presentations of the company which could be hold in the office, at working place of potential clients, at home and etc. The distinctive features of such a business:

- - creativity;
- - independence;
- - unlimited growth of income.

For the Tentorium Apicompany the choice of such a marketing system could be caused by an uniqueness of the products that are required personal approach and explanation. The accuracy of this choice was proved by the successful development and growth of the company and the range of producing products. Currently the enlargement is continuing: the company is constructing a new factory in Russia to meet increasing demand resulting from the fact that Tentorium is coming to the European market.

This year in October the Tentorium Apicompany got the certificates for the production to have a right to sell it in the European countries and since the first of November the company opened an office in Dresden, Germany. In the nearest plans of the firm to launch the work on the multi-level marketing base in Europe as well. But by now the process of legal adjustment with European law agencies is not over. European laws are different from Russian ones and law organizations are strict and suspicious concerning all network marketing companies especially coming not from the USA or Europe itself.

4. References

In this article I used materials from the official sites of the company (www.tentoriumapi.com , www.tentorium.ru) and personal experience of working as a distributor of this company.

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Prospects of development of quality olive oil for Italian farms: first indications in a case of study on a *focus group*

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Summary

This analysis has examined the consumption of certified quality agricultural productions in the European and Italian markets; this short poster paper has observed, in particular, the perspectives of growth in some agricultural productive sectors, as for example the olive oil industry. In the second part of this research, it is showed the strategic importance of what quality represents for the consumers, as an element able to influence the consumers' choices for certified quality olive products. Having compared the results of a case of study carried out on a focus group, with the help of 50 interviewed people, with those obtained by other studies, they pointed out the critical states that certified quality food productions might have for the consumers, the market, and even the farms.

The results emerged in the present analysis have confirmed as the agro-industrial products Dop and organic are preferred from the interviewed subjects because able to guarantee the quality and the food healthiness, confirming the results showed in a precedent research about typical products and about the market capability to guarantee the food quality.

KEYWORDS: focus group, organic food, food quality, extra virgin olive oil.

1. Introduction

The Italian agricultural production has shown, in these last years, in comparison to the general agricultural production in the European union, a important growth, recovering some productive decreases, imputable to contingent variations, verified in 2003 (Figure 1); particularly, Italian agro-industrial enterprises have increased their productive ability to other European States (Figure 2).

The variable macroeconomic, according to the forecasts formulated by the European Committee, in the next years, seem to confirm a stability in the growth of the resident population, with considerable increases of Gross Domestic Product in the European Countries, even if 10 States members that have joined from 2004 to the European Union seem to show the best performances of increase (Table 1). All of this will have some very interesting consequences; in fact, an increase of income can be tied up to an increase of the food consumptions and, accordingly, to an increase of the exports from the Italian agro-industrial farms and enterprises. The macroeconomic forecasts, edited by the Committee agriculture of the European Union, in the agricultural sector, underline a reduction of annual growth for the next three years, connected, nevertheless, to a constant and slow growth of the general expansion, hauled by the new countries that belong to the European Union (Figure 3)

In European Union the comparisons carried out in different years about percentage variation of the assistant value in the primary sector seem to confirm an immobility in the last five-year period 2000-2004, in comparison to a very strong growth reported in the preceding five-year period 1995-1999; Spain, France and Germany have made to record significant rates of growth, even if very contained in comparison to those surveyed in the preceding period; however, Italy maintains, an interesting levels enough of growth even if in strong reduction in comparison to the preceding years (Graph 1).

The Italian agro-industrial sector in these last years has made to register a notable increase of his own export capability, even if agro-industrial deficit is elevated, more than six thousand million of Euro, in line with a tendency of growth pointed out in Europe (Ismea, 2006); nevertheless, the appreciation of the Euro on the dollar has not supported the exports and it has reduced the competitiveness of the Italian enterprises in comparison to other European competitors (Spain, Germany); Italian agricultural exports didn't diverge from European middle value (Figures 4-5).

Figure 1. Process of agricultural production in a middle period constant with value in Italy (-----) and in European Union (—) (Source: Ismea, 2005)

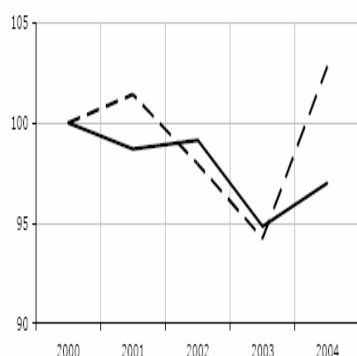


Figure 2. Seasonally adjusted index of manufacture production in Italy (-----) and in European Union (—) (Source: Ismea 2005)

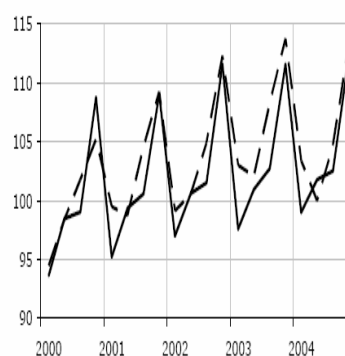


Table 1- Middle term outlook of some macroeconomic variable (Source: European Commission Directorate General for agriculture)

	2007	2008	2009	2010	2011
Population growth EU 25(%)	0.2	0.2	0.2	0.2	0.2
GDP Growth EU 25 (%)	2.5	2.5	2.5	2.5	2.5
GDP Growth EU 15 (%)	2.4	2.4	2.4	2.4	2.4
GDP Growth EU 10 (%)	4.3	4.3	4.3	4.3	4.3
Inflation EU 25 (%)	1.9	1.9	1.9	1.9	1.9

Figure 3. Outlook of growth evolution in the primary sector in a long term in European Union (Source: European Commission Directorate General for agriculture)

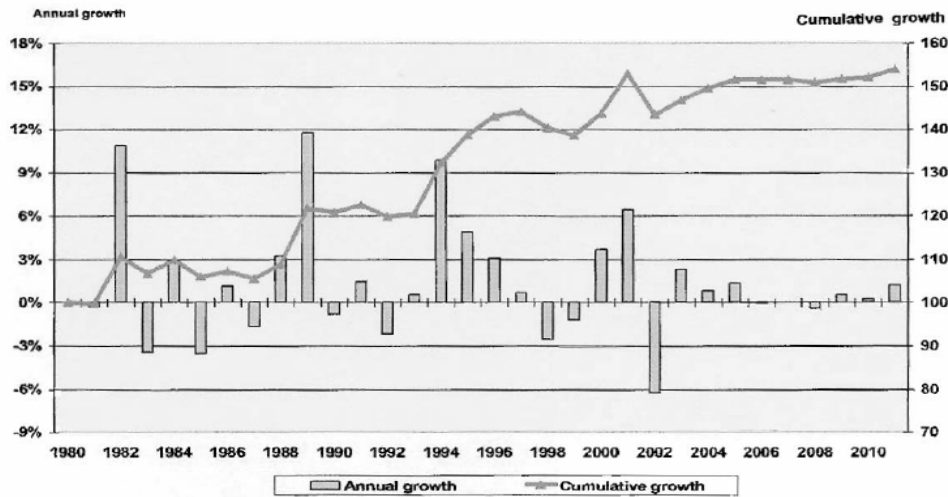


Figure 4. Main export countries of agricultural products in the World (Source: Ismea, 2006)

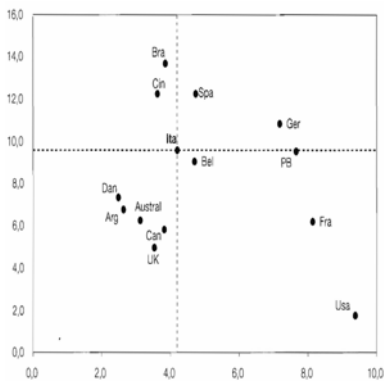


Figure 5. Food export quota in different countries of European Union (Source: Ismea, 2006)

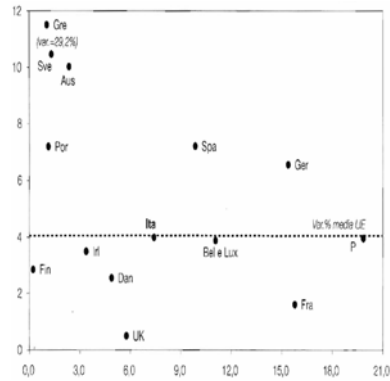


Table 2. Italian certified food export in current value (Source: Ismea, 2006)

	Export (million of €)	Variation % 2004-2003	Variation % 2004-2003	Annual average variation % 2000-2004
Food quality product Dop/Igp	1.282	6.6	5.8	3.9

2. Background

The modern consumer has a changed his attitude to the food sector; accordingly, agro-industrial sector have to be able to offer some certified quality products that can find a fit position on the market. The Italian agricultural farms take their place in a dominant position since they are able to offer productions of certified quality, recognized by the marks Dop and Igp; these certified products are well appreciated and valorized by European union consumers. In fact, the Italian export of products of certified quality, about 37% of the general European certified quality production, have been, last year, equal to 3.440 million of Euro (Source Ismea/ACNielsen). The provide statistical data seem to confirm a constant increase of food certified consumptions equivalent to 6,7% annual with good chance for the agricultural quality production to increase in value, mostly, on the foreign markets and not on the national markets, that are, now, in stagnation phase. The farms that produce extra virgin olive oil Dop and Igp during the five-year period 2000-2004 have increased the business volume of about 35,7% retrieving the decrease, very consistent, verified in the 2003 (Ismea, 2006).

The forecasts of middle period of Sace-Oxford economic forecastings foresee an increase of export capability of the Italian agricultural firms, that will place over the 30 million of Euro in 2010, despite the decrease of Italian exports to Germany, of 7% annual against a 2,8, pointed out in the past years; dynamic markets, as Romania and other countries, entered last years in the European Union, are again able to absorb in the next years 3,1% of Italian exportation in comparison to 2,9% actual of Italian export; in the next five years, it foresees in India, in Chile, in Turkey and in the U.S.A, a less meaningful growth (Ferri, 2006).

The olive farms able to sell certified productions, during the last years, have not suffered the interference from the great commercial and distributive structures; these last, in fact, has acquired a lot of great dimensions olive enterprises and olive farms with affirmed brands, giving origin to a very intense process of internazionalization, through the control of the block of shares, from foreign agri-industrial groups, concluding the operations of control, or "internazionalization in entrance", initiated in Italian agribusiness at the beginning of eighties (Banterle, 1997).

The interchange relationships among different countries could give origin to the phenomenons of instability, understood capability to influence and to determine some considerable effects during the commercial exchanges; the Italian agricultural farms have suffered phenomenons of instability from some countries as Greece, Spain and Portugal, characterized by agricultural food productions similar to those Italian (Arcuri, 1997).

Figure 5. Domestic buying of Italian agri-industrial (000 t)
(Source: Ismea, 2005)

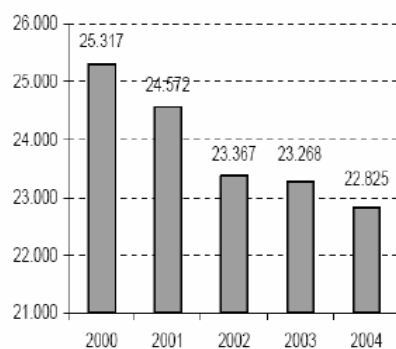
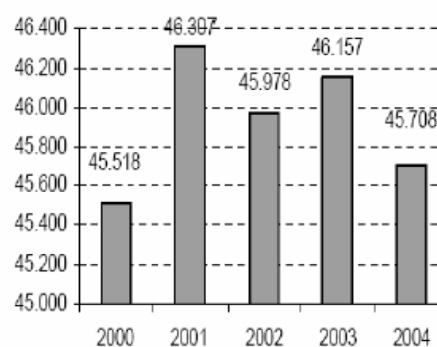
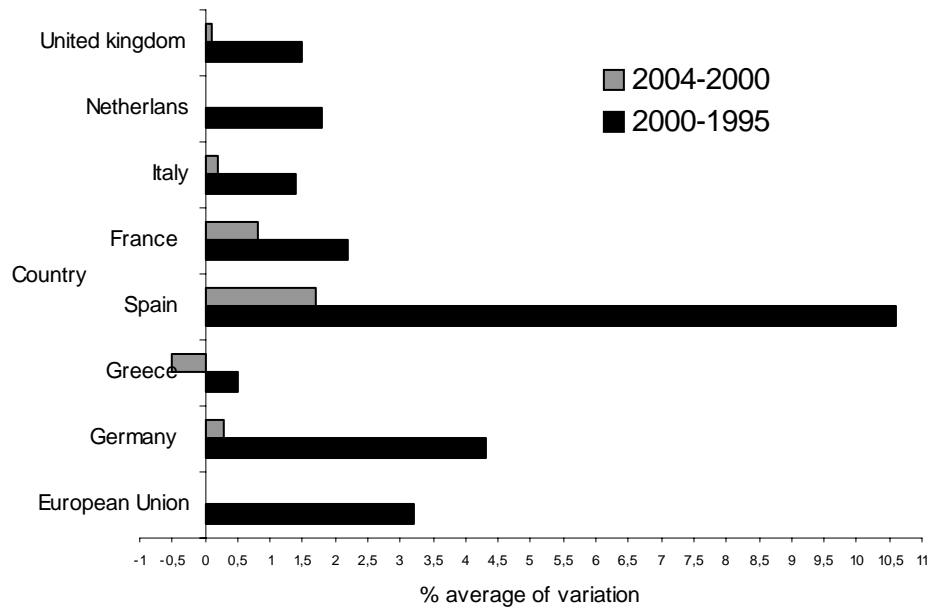


Figure 6. Domestic buying in Italy (mln €)
(Source: Ismea, 2005)

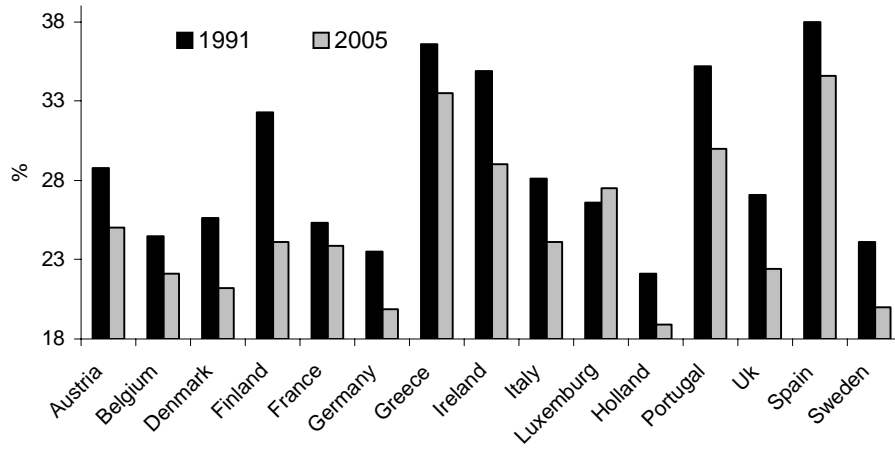


Graph 1. Annual average variation of agricultural value added, to base prices, in different European countries (Source: Ismea, 2005)

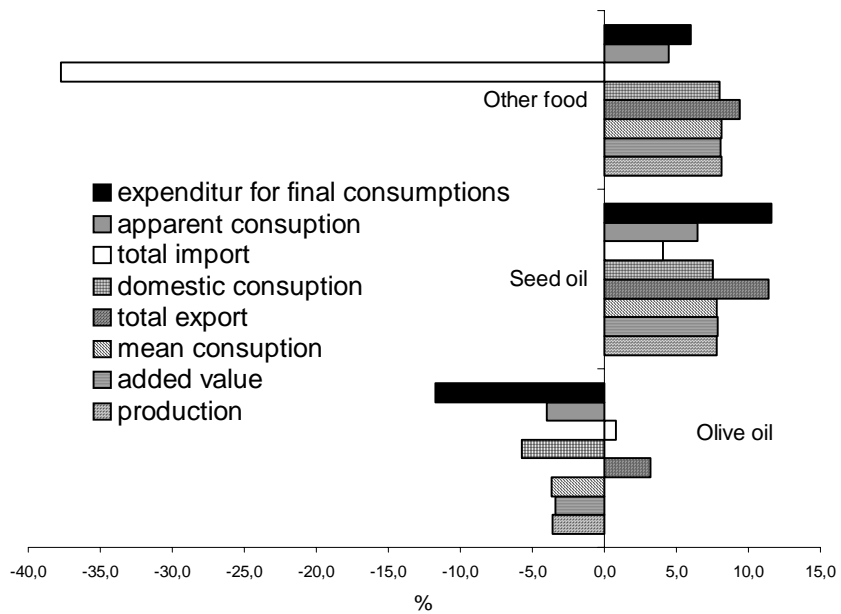


The increase in value of Italian agricultural productions, also in consideration of the multiplicity of offered products, cannot leave out of consideration the development of the territory and the certified productive specificities, equal to 6% of Italian agricultural production value (Deserti, 2000); the improvement of the product must not be considered as a limitation and a reduction of manipulation in the production process but as a complex trial that allows the basic commodities used to be easily individualized in the origin and in the place of production, and that have a lot of elements compulsory to guarantee an easy distinction and individuality (Casati, 2006), turning its own state from agricultural commodity to utility (food with high quality).

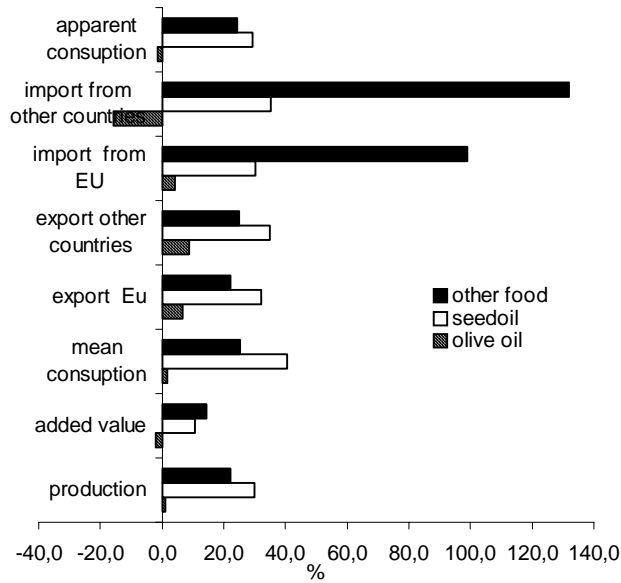
Graph 2. Food buying trend in different countries of European Union (Source: elaboration on Ismea data year 2005)



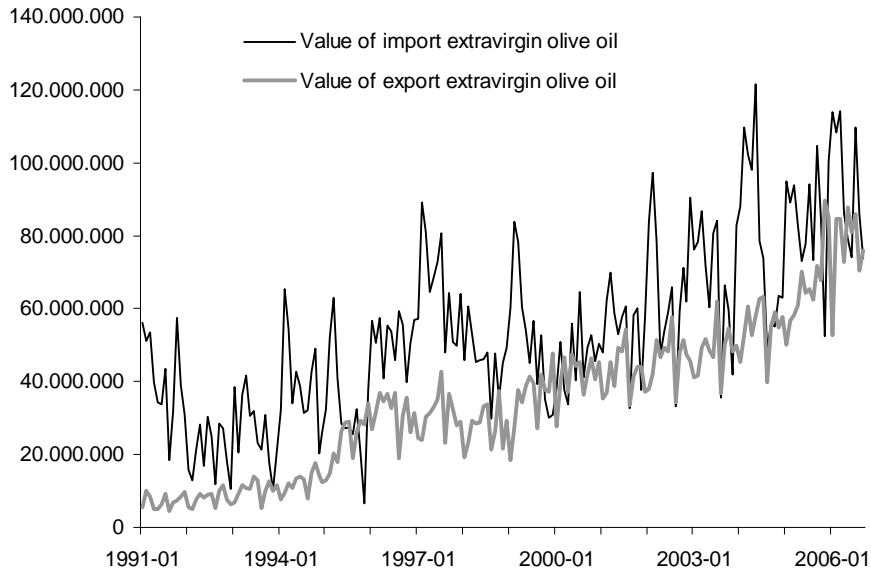
Graph 3. Olive and agri-industrial outlook in Italy (Source: Ismea)



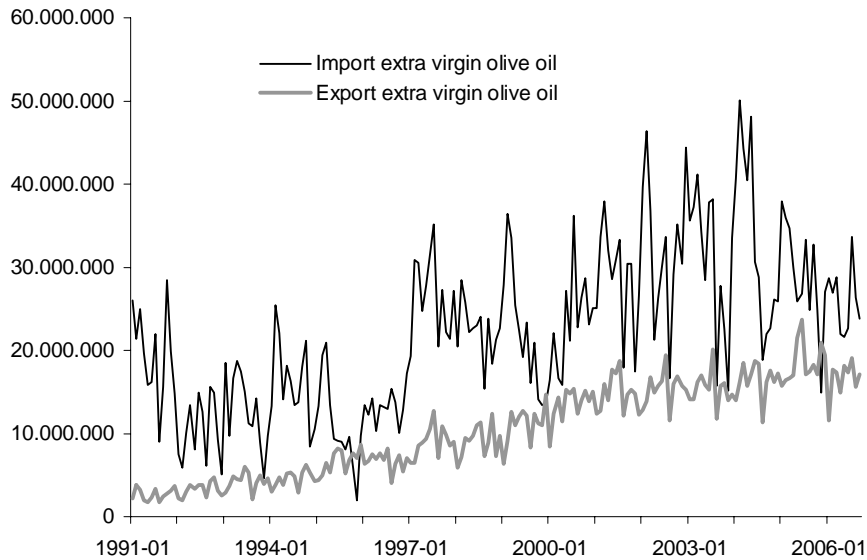
Graph 4. Italian export and performance outlook of olive substances (Source: Ismea)



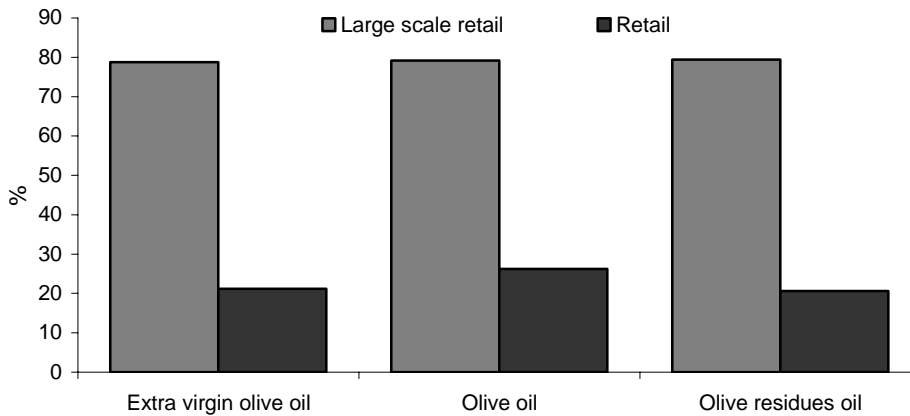
Graph 5. Time series of Italian virgin olive oil export in value (€) to the world (Source: elaboration on data Istat)



Graph 6. Time series of Italian virgin olive oil export in quantity (kg) to the world
 (Source: elaboration on data Istat)



Graph 7. Buying percentage of sale in different Italian distribution channels (Source: Assitol, 2006)



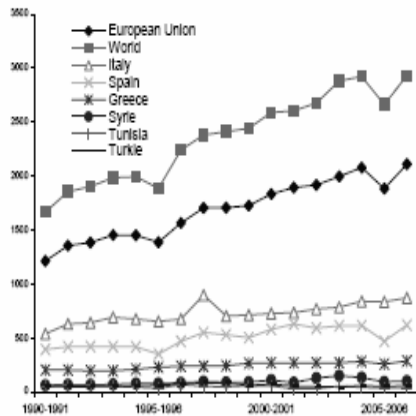
3. Objectives

This analysis has examined the consumption of certified quality agricultural productions in the European and Italian markets; this short poster paper has observed, in particular, the perspectives of growth in some agricultural productive sectors, as for example the olive oil industry. This analysis has made a comparison with a forecast proposed by the European Union about food consumption in the market, and the perspectives of growth in the Italian market as well.

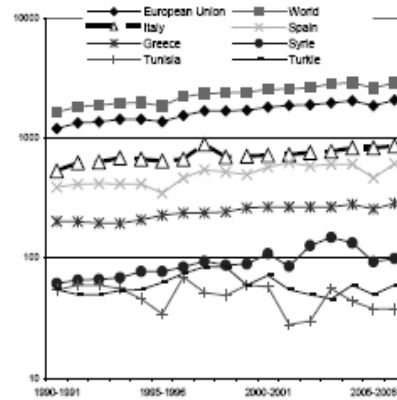
In this brief research there are illustrated the changes that have occurred, in the long period, in Italian families' food consumption. Using some statistic interpolations, comparing the transformations in the society, with those related to food consumption, and underlining the role of food quality certification, it is verified the importance of supporting economically the agri-business (Galluzzo, 2006b).

In the second part of this research, it is showed the strategic importance of what quality represents for the consumers, as an element able to influence the consumers' choices for certified quality olive products. Having compared the results of a case of study carried out on a focus group, with the help of 50 interviewed people, with those obtained by other studies, they pointed out the critical states that certified quality food productions might have for the consumers, the market, and even the farms.

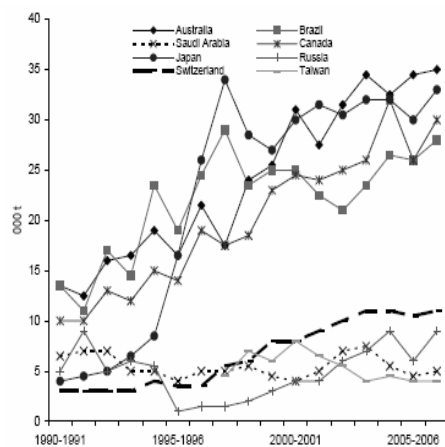
Graph 8. Olive oil consumption (t) in different countries (Source: elaboration on data Coi, 2006)



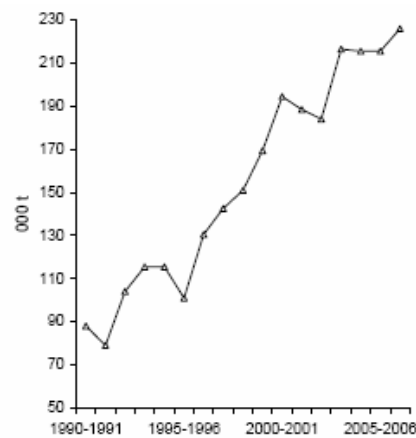
Graph 9. Standardized trend of olive oil consumption in different countries (Source: elaboration on data Coi, 2006)



Graph 10. Olive oil consumption (t) in some international market (Source: elaboration on data Coi, 2006)



Graph 11. Olive oil consumption in United States in tonnes (Source: elaboration on data Coi, 2006)



4. Results

The evolution of Italian food consumption, due to substantial changes, economically significant, of family incomes, has determined a radical change in consumers choices. In fact, they have preferred to address their choices to certified quality productions of (Ismea, 2005). Italian farms, consequently, have changed their business strategies in order to face this new challenge. In particular, after the changes, and the challenges brought by the new international agricultural policy, which has a fundamental goal in order to guarantee the safeguard of rural environment and the defence of the rural communities, so confirming the agricultural productive specialization of some territories (Galluzzo, 2006a).

In the last years European consumers has increased his/her own consumption propensity, even if the values are very inferior to those pointed out in the nineties and they are in slow increase; nevertheless, the research has shown that Italy, Germany and Holland have underlined, in the four-year period 2001-2004, a worsening of the rates of variation about real consumptions, losing positions in the classification of the European countries for per capita food consumption (Bella, 2004). The available statistical data related to expense percentage rate destined to the feeding expenditure on families general expense confirm a strong reduction of food expenditures, comparing the statistical data of year 1991 with those of year 2005, equal to a 58%, and in strong e very sustained decrease in particular in France, Luxemburg and Belgium; in North European countries seems confirmed, unlike what found in Greece and Spain, a percentage reduction of the income used for feeding expenditures in comparison to other expenses as freetime buying or purchase of luxury goods (Graph 2).

The analysis on the consumptions in Italy confirmed the decrease in families domestic purchases, in line with some indications appeared during other researches carried out by an Italian institute of research as Prometeia; analysis has, however confirmed a tendency to buy consolidated and structured enough, able to repay certified quality foods or/and organic foods (Figures. 5-6)

Middle period forecasts, carried out in Italy by Ismea has confirmed a strong increase of the consumptions and the Italian olive oil exports to north Europe countries (Norway, England, Germany) and Extra-European countries as States united (+21%) and Canada (+41%); in these countries Italian olive farms are clean exporters and they have edged up, in the considered periods, a very important and considerable increase of olive oil exportations (12.554 tons in June 2006 against the 13.653 tons surveyed in June 2005, Source Assitol) in comparison to statistical data pointed out last year, with a strong decrease of the importations (Graph 3-4).

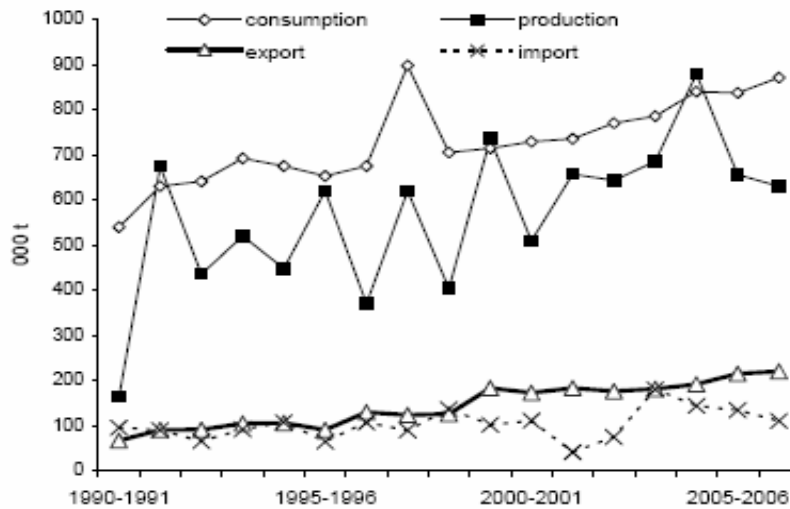
To margin of this research it is important to underline the strategic role of olive certified quality productions for the Italian farms, and in particular for all of them, in the next future, that they will know how to relate themselves with the Extra European countries and with some countries that overlook Mediterranean sea, as Turkey and Syria (Graph 8); in fact, an analysis of the consumptions of extra virgin olive oil (Coi, 2006), using standardized and normalized statistical data with logarithms, it has confirmed an increase of world olive oil consumptions, especially in new rising countries, while in the European union, and in Italy, particularly, the growth of olive oil consumptions is steady (Graph 9). On a international scale, the most greater increases in olive oil consumptions have been pointed out in Australia, Japan, Brazil, Saudi Arabia and Taiwan (Graph 10). The American market has confirmed a growth trend of Italian olive oil importations and with interesting perspectives of increase of total food consumptions (Graph 11).

In the long period, in Italy, the correlation among some quantitative variable, represented by the commercial flows (import/export) and by olive oil consumption and production levels (Graph 12), it has confirmed a direct and meaningful relationship between consumption and production and among production and olive oil exportation, while there are not e don't exist some notable relationships between Italian productions and

importations of olive oil with correlation values very low and without any statistical significances.

Graph 12. Italian olive oil market and consumption in the middle period

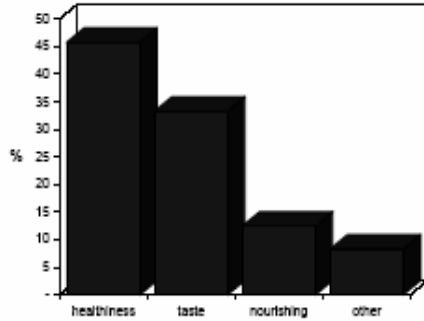
(Source: elaboration on data Coi, 2006)



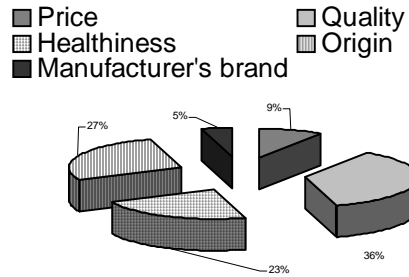
The present research pointed out the perspectives of growth of certified quality olive oil productions in the following years. It is very interesting for the Italian farms, and their extra-European markets. It is important to intervene with some specific marketing strategies that guarantee olive oil's traceableness and health aspects. The main problem for the Italian olive farms has always been to find new trade markets, and specifically understand what kind of marketing strategy it is important to carry out, for example, in two countries as Germany and Sweden. In these two countries some empirical experiences, carried out by some opinion polls on small groups of consumers and buyers of commercial distribution, through project initiatives financed by European Union, that have involved olive farms from different countries as Corsica, Italy and Slovenia, able to produce some quality olive oils, even if these farms don't belong to any consortium of quality olive oil production Dop or Igp, they have underlined the strategic importance of the business information (techniques of production, characteristics of productive areas) to increase the sales and the availability from the consumer to pay (willing to pay) something in more to buy an olive oil produced with organic methodologies and able to safeguard the environmental.

Other analysis have confirmed how much brought by other studies or rather a very remarkable change of the attitude of the consumer, even if the question toward innovative foods and/or of niche (biological, typical, etc.) it is enough interesting and tightly correlated with the partner-economic evolution of the territory (Casati, 2006), with the sour-alimentary specificities and with the cultural traditions as in the case of the De.C.O (Denomination of municipal origin), that a very limited and integrated value assumes on the territory; the De.C.O. they have the assignment to valorize the territory, the product and the historical and cultural traditions of the context, in ample sense, and to tie the territory and his/her cultural traditions to the product, with the purpose to create a connected substratum and shared with the market (Galluzzo, 2006c).

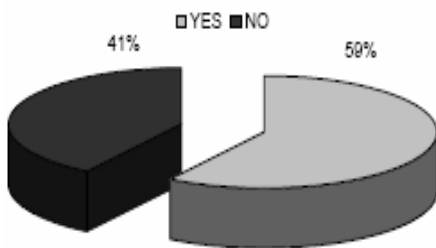
Graph 13. Motivations of consumption of focus group



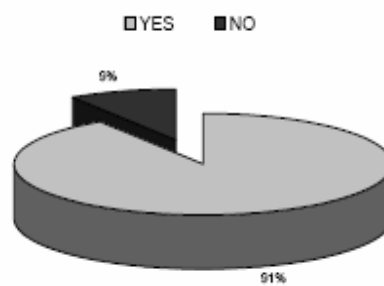
Graph 14. Elements that influence during buying phase



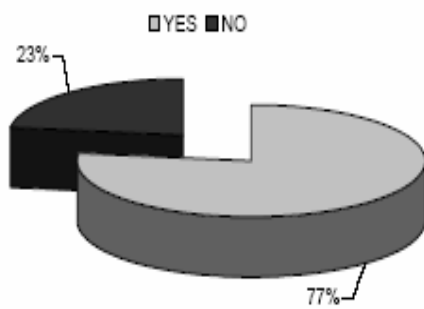
Graph 15. Capability of commercial brand to influence buying behaviours



Graph 16. Is the price an element able to influence the choices of the focus group?



Graph 17. Availability to pay a premium price for a certified olive oil



Graph 18. Which certified oil of olive would you choose in the buying phase?

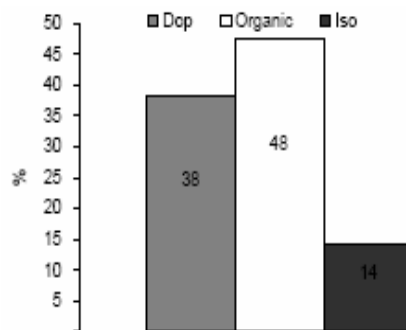
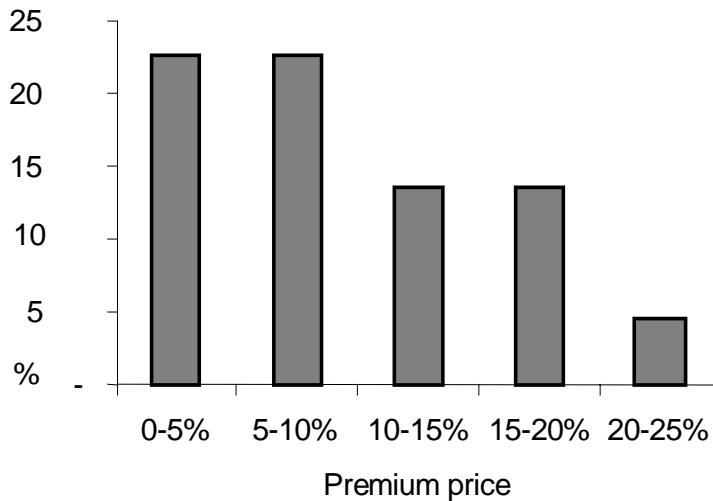
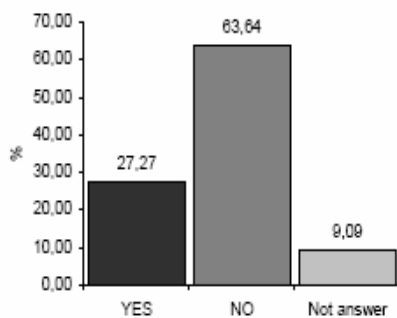


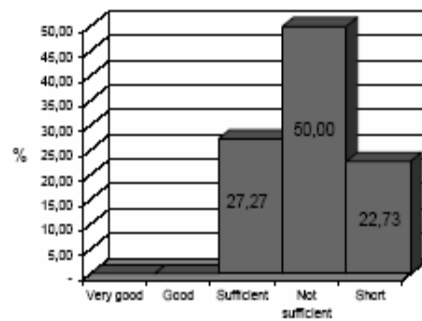
Figure 7. Incidence percentage of premium price to be paid for products of certified quality observed during the search in the focus group. On the abscissa axis the percentage of payable premium price and in ordinate axis the percentage of focus group



Graph 19. Level of knowledge among the different kind of olive oil certification (Dop, Organic, Iso)



Graph 20. Satisfaction level of communication from the institutions on the food quality



This research on the focus group has confirmed that food and sanitation (health and origin of food) aspects are very important (Graph 13). It has a greater effect considering the guarantee of quality, which is represented by the brand (Graph 14). It remains an important element, able to address and to influence the consumers' habits. In fact, during this research the focus group had to choose between two options: the aspect of health-quality and the origin of products (place of production). Food quality seems to manifest a certain strong influence and a meaningful effect on consumers' shopping.

In fact, during the focus group in which it was pointed out by a questionnaire with open answers, what can really influence the consumers' choices. In a meaningful way, it is the brand and the price of goods (Graph 15-16). These two aspects are linked together and may represent an element able to influence the consumers' willing to pay a higher price (premium price) for certified quality products (e.g. Igp, Dop) (Graph 17).

The focus group has assigned a greater trust to the production of an organic olive oil, able to safeguard the environment and the consumer's health; therefore, the choice of purchase among a Dop olive oil, an organic olive oil and a certified Iso olive oil would be direct towards organic and Dop productions, while an oil produced from a certified Iso firm has not been held able to influence the choice motivations during the purchase (Graph 18). This research has emerged as the most greater part of the focus group didn't know the difference that is among a certified olive oil Dop and a certified Iso olive oil (Graph 19). During this research the parameter that has appeared interesting, meaningful and able to operate as an important strategic incentive for the consumer, has been the price. The entity of premium price which can be paid, concerning the statistic example, (Figure 7) never overcame, though, the 25% more than the normal price paid for a certified Italian extra virgin olive oil; this willing to pay a premium price, as shown in the interviews, it is not able to cover the necessary costs of certification, necessary to guarantee and assure food quality, in order to confirm the results of other authors (Gay 2006, Cicia-Perla 2000).

5. Final remarks

This research has confirmed the consumer's modification of life and food consumption styles. All is addressed towards food able to protect ones health, and food recalling local traditions. The economic expectations for certified quality Italian olive oil are interesting but some problem occurred during the focus group test. It has been confirmed by other studies and investigations carried out by Ismea (difficulties understanding differences between certified quality food and non-certified quality food; problems occurred with the institutions unable to promote the quality and the differences of quality food).

The quality, although is not perceived in its specific and distinctive characteristic, it influences shopping habits. The interviews demonstrates how the farms and the politicians should advertise and promote the quality of goods (Graph. 20). The consumer has to perceive the differences and the specificities, which exist among different kinds of food, and among different types of quality (Dop, Igp, Iso, Organic). This analysis has, in fact, confirmed that there is not a complete knowledge of the differences that they exist among the different typologies of products of quality proposed, imputable to a short ability of the institutions to promote, with specific advertising campaigns, the food quality.

In particular, some empirical evidences have confirmed that in some European countries (Germany and Sweden) the perception of quality food and the information about olive farms and its productions is seen as essential by the consumers. This means a big effort for olive farms to be competitive in different European markets. Undoubtedly, the focus group is more interested in a guaranteed quality of the product, coded with a hallmark as Dop, Igp and more interested if it is an agricultural product, even if the price is still the main element, able to influence the consumers' choices. In this present research, it is shown how the consumer pays more money for healthier products. The premium price can pay back the cost overpaid by the olive farms to certify their own productions, and therefore support their market, their environment and a meaningful economic profitability for their own rural communities as well. There are expectations for a meaningful and innovative economic growth for Italian olive farms, which produce certified olive oil productions. There is also a positive and a correct, sustainable economic growth, which consolidates the development of agriculture, for example, a higher employment rate in olive farms, of which many mainly situated in central Italy and near the Apennine hillside. E-commerce is the instrument, which can guarantee more possibilities to increase the sales and the business dealing for organic and certified food. (Galluzzo, 2006d).

The results emerged in the present analysis have confirmed as the agro-industrial products Dop and organic are preferred from the interviewed subjects because able to guarantee the quality and the food healthiness, confirming the results showed in a precedent research about typical products and about the market capability to guarantee the food quality,

reported in a research of Nomisma about an Investigation on typical food in 2000. The role of the information is strategic to control and to direct the choices of the middle-low sector (class!?) (Nomisma, 2003) but, as shown in this research on the focus group, and in other empirical investigations carried out on extra virgin olive oil of quality on German and Swedish buyers, also a large and varied class/group of consumers with middle-tall culture and income levels, with the purpose to buy with a just price an olive oil able to satisfy the food safety demand.

The olive farms that produce certified quality oil have to put into practice some collaborative/cooperative strategies with the Large-scale retail trade with the aim to be an active subjects during commercial exchange, establishing some prices able to remunerate the olive productions of quality and to valorize the food quality. This research, despite Italy has a quite good specialization and a fair competitiveness in the olive oil exportations, has pointed out a lot of critical states as:

- 1) short strategic importance assigned by the olive farms and olive firms to the promotion, that is a main element for the export in Extra-European markets (Italy contributes for 65% on the extra virgin olive oil of the European union);
- 2) non strategic role assigned to the olive label and to the image of the olive farm; in particular the farmers don't realize the food quality role to valorise olive oil, the farm and the territory. The food quality is not exploited from olive farms to valorise their productions;
- 3) necessity to change the strategy of the Italian organic olive productions in the world;
- 4) reduced percentage incidence, less than 5%, among the olive certified production Dop sold on the market and the general olive quantity produced in the olive quality certified areas;
- 5) short affirmation of other olive certified productions of the central and southern of Italy in a perspective of increase in value and integrated of Italian food-quality;
- 6) the organic olive productions are located and are increased, primarily, in the olive areas where there are and are produced many food quality products (Tuscany, Umbria); all this showed a direct correlation between quality of the product and safeguard of the territory, realizable through the organic cultivation.

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Quality food products sector development in the NMS: The supply and demand aspect from Slovenia

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KEYWORDS: Food quality labels, Consumer attitudes, Production, Barriers to entry, Slovenia

After the accession to the European union in May 2004, Slovenia has intensified activities related to the promotion of quality food products. Already during the late nineties the system of national identifications of different categories was established. With the pre-accession policy harmonization, however, Slovenia has fully adopted the concept the European system of signs and marks of quality and origin of food and agricultural products (Reg. EEC 2081/92).

It is believed that also in Slovenia consumers are paying a growing attention to the qualities of agri-food products, due to greater concern about food safety related aspects and also the need of re-discovering the true values of food, agriculture and heritage. At the same time quality labels are considered as an important promotion tool for producers in order to increase their added value and market power. At the policy maker level quality labels represent a mean to stimulate rural economy, remunerate locked-in economic resources in rural Slovenia.

There are already a number of food products that have been awarded the national “precursor” of the European quality labels and there are even more possible candidates to be considered.

It is therefore believed that there are potentials for development and prosperity of the segment, however up until now there is very limited market presence of this products.

Slovenia lacks detailed studies which could give better acquaintance with the potentials of quality labelled agricultural and food products. There are some studies, however mainly related to technological aspects of the products.

This study therefore tries to mitigate above revealed deficiencies and to present a better insight into both sides of the market for quality identifies food products in Slovenia.

We have gained fundamental information regarding the consumers’ knowledge, attitude and perceptions of quality identified foods and the factors influencing the formation of such perceptions and attitudes. Methods applied are mainly qualitative (focus groups with consumers and in-depth interviews with producers).

Participants in the focus groups expressed that the main benefits of the specialty food certification are:

- assured premium product with superior organoleptic characteristics;
- guarantee for traditional production methods and product authenticity and
- assured food safety and animal welfare.

On the other side interviews with the quality signs holders in Slovenia (associations and food producers) showed that only limited growth in the market share after the certification has been experienced. Limited effects might be attributed to insignificant promotional activities at the national level. In general, producers indicated that the main barrier to success is lack of promotion by the government. Most of the certified product report a price premium, however not always sufficient to compensate for additional production costs. Generally, the premium depends on the marketing channel, where it seems that the direct

selling assures the highest price premium. Created additional value added is usually absorbed at the retail-distributor level. Most of the producer associations report about weak group dynamics issues and governance problems. Where the organisation is involved in broader activities than only managing the quality scheme it seems that the effectiveness of the body is better and members are more satisfied with the organisation.

The key future challenge for the Slovenian quality food sector is to improve market orientation of the producers and to strengthen the coordination, both at the individual organisation level, but also at the intra-organisational level. Certain synergy might be expected also from the cooperation with different actors at the regional level especially promotion of tourism sector.

The study was clearly exploratory in manner, however results gave opportunities for more efficient formulation of public policies (Rural development plan 2007-2013), but also to support marketing activities of producers.

It is also among the few studies related to quality identified foods in new EU member states, and therefore gives a first evaluation of the concept of EU quality marks acceptability for post - transition food consumer.

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Success Factors in the Development of Farm Vacation Tourism

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1. Problem statement and objectives

A high level of uncertainty has for many years characterized the world agricultural market. In this unpredictable environment rural tourism remains one of the few viable economic options for rural communities (Fesenmaier et al., 1995). Although in some cases the generated profit is only a small-side income (Oppermann, 1996) the social value of farm tourism displays a variety of qualitative benefits both for farmers and for guests. As a mutual learning experience (Ingram, 2002), farmers have the possibility to share their abilities with guests and affirming, in this way, their role as loyal partners in the food chain; at the same time customers recall their memory of the past (a past of more genuine food and of forgotten tastes) and also rediscover their food traditions.

Despite the fact that a wide body of literature in rural and agri-tourism already exists, there is a need for organized research on a particular form of it namely farm vacation tourism². Our main effort was to apply an analysis of success factors to the panorama of German farm tourism in order to extrapolate the key components that have helped rural entrepreneurs to successfully develop this type of tourism.

2. Current research in farm tourism

A great deal of interest has been focused on the area of motivations of farm tourism hosts and guests. On the demand side customers often choose this type of tourism as a means to escape from the city (Putzel, 1984; Nickerson et al. 2001) and because of the satisfaction of learning from farm activities (Ingram, 2002). On the supply side there is a plethora of literature (Nickerson et al., 2001; Wilson et al., 2001; McGehee/Kim, 2004) describing not only the economic reasons, such as additional income, but also the social ones, such as to educate the consumers, which might motivate farmers to enter into this business (Nickerson et al., 2001; Wilson et al., 2001; Ingram, G., 2002; McGehee/Kim, 2004).

3. Procedures

Since our purpose is to discover the key factors for the success of farm tourism we carried out an empirical analysis. As a conceptual framework we chose the study of Wilson et al. (2001). This analysis adopts a qualitative method (in-depth interviews with focus groups) and has a community approach, which means that farm tourism is considered within its local economic context. The implication for policy makers is to support the whole community around the farm facility in order to generate multiple effects and positive externalities (e.g. the preservation of regional traditions and local food variety). In the study of Wilson et al. many indicators of success were taken into consideration in order to

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² In this study we use the definition of McGehee/Kim (2004): „Farm vacation tourism is a segment within the realm of agri-tourism including only the accommodations sector of tourism, whereas agri-tourism can include various types of overnight accommodations but it also encompasses day visits to on-farm attractions like festivals and educational events (Weaver and Fennell, 1997 in McGehee/Kim, 2004). In following we use the abbreviation farm tourism.

represent the multidimensionality of this type of tourism. Nevertheless tourism entrepreneurs and their role in fostering these components have been left out. In our analysis of success factors however we do include the entrepreneurs' skills and we use both qualitative and quantitative indicators for success within a quantitative-confirmative approach.

We conducted an on-line survey in the region of Lower Saxony, in the north Midwest of Germany, which has approximately 8 millions inhabitants. The majority of farmhouse owners are located in the Lüneburger Heide (34 %) and are full-time farmers (67 %).

We developed a questionnaire, which looked at both quantitative (e.g. number of beds) and qualitative (e.g. self judgment of success; planned investments) variables. The questionnaire was filled in by 103 companies with a response rate of 23.6 %.

For the data analysis we adopted a principal components factor analysis in order to differentiate among very successful and less successful companies and to segment them into three clusters. By means of a variance analysis of passive factors we interpreted them.

4. Results

The respondents of the first group judge themselves as very successful. This self estimation was confirmed by the number of beds occupied daily each year. The respondents of group one performed well with 204 daily occupied beds each year whereas group three only had 77 daily occupied beds (group two: 135 beds/day each year). When asked if they would invest further in farm tourism, the respondents of the first group mainly agreed (mean = 1.25) compared to group two (mean = 0.41) and group three (mean = 0.21).

Farms in group one are generally bigger with 25 beds ($\alpha = 0.001$) against the 16 beds of group two and the 15 beds of group three. Group one also displays the highest amount of regular guests with a clear 38 % attendance whilst group two reported 32 % and group three 28 %.

We conducted a variance analysis on the three clusters according to our research hypothesis. Respondents of group one believe that their success is especially due to their personal skills (see table one). Other factors expressed by the respondents, such as the high quality of the hospitality (especially comfort and cleanliness) and the power of attraction of the farm (e.g. large variety of animals), were also partially confirmed by the variance analysis.

Table 1: Mean comparison among passive factors for success

What are the main reasons of your success? ¹	Group 1	Group 2	Group 3
Personal skills of the farm entrepreneur***	1.59 ($\sigma = 0.56$)	1.24 ($\sigma = 0.58$)	1.06 ($\sigma = 0.64$)
Quality of the hospitality**	1.85 ($\sigma = 0.36$)	1.63 ($\sigma = 0.49$)	1.36 ($\sigma = 0.70$)
Power of attracting of the farm*	1.39 ($\sigma = 0.93$)	0.57 ($\sigma = 1.28$)	1.09 ($\sigma = 1.04$)
¹ scale from +2 = totally agree to -2 = totally disagree; *** = $p < 0.001$, ** = $p < 0.01$, * = $p < 0.05$; σ = standard deviation			

Source: Authors' representation

5. Conclusions

Our investigation puts in evidence two main aspects: on the one hand the majority of the successful farmers judge their personal skills as one of the most important factor for success; on the other hand we stated that the dimension of the company does matter which demonstrates the importance of economies of scale in the sector. This leads to the conclusion that many farmers of group one, who have started farm tourism for sake of diversification (additional income) or just like a hobby, have eventually chosen -or are going to choose- to develop it as their main economic activity. It is therefore of the utmost importance to establish a coherent dialogue with the main personnel of local government (chambers of commerce and agriculture, schools, business consultancies). This is consistent with previous investigations, which have highlighted the importance of the community approach to tourism development, as tourism is a place-oriented (Wilson et al., 2001) social business (Nickerson et al., 2001). Nevertheless the scope of our research is reduced to the German panorama of farm tourism. Further studies, also within a cross-country's approach, could highlight chances and differences of this type of tourism.

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International Marketing and Trade of Protected Designation of Origin Products

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Summary

This poster paper analyses the international marketing and trade strategies implemented by Italian quality food producers with special attention to the export and trade aspects for some important Italian PDO products: Prosciutto di Parma PDO and Parmigiano Reggiano PDO. Discussing the international marketing and trade strategies, according to the traditional 4P approach, the poster paper will report examples of the strategies of the exporters and would focus on the rapid change in trading and distribution channel. The future of PDO products is not only connected to their positioning, to their promotion and international protection but also to the strategies of the retail leaders and to the overall strategy of the producers, that range from small companies to international companies. The latter is more and more present in these markets of “typical products” which represent a diversification and a good investment to improve market positioning.

KEYWORDS: PDO products; international marketing; Parmigiano Reggiano Cheese; Parma ham; consolidation in traditional food sector

1. Background

The PDO/PGI product sector today accounts for about 8% of national consumption of food products. Cheese and prepared meats account for 95% of the value of PDO/PGI. In terms of export, these products are above the national average of the food industry; 18% of output value compared to 13% average. Many products that are frequently exported are of high value; they include PGI Tuscan olive oil (67% product exported), PDO Pecorino Romano cheese (63%) or niche products such as Terre di Siena PDO olive oil (55%), PDO Garda oil (50%) and balsamic vinegars (45%) (Source: Osservatorio Prodotti Tipici, Nomisma, 2004). The proportion of export within a product segment, for example cheeses, shows big differences (Table 1).

Table 1. Output and Export of some Italian PDO cheeses (2005, tonnes)

	Output	Export	Share export / output
Grana Padano PDO	159607	32718	20.5
Parmigiano Reggiano PDO	118979	17617	14.8
Gorgonzola PDO	48480	14027	28.9
Asiago PDO	23621	1444	6.11
Provolone Valpadana PDO	12745	3911	30.7

Note: Figures for Pecorino are not shown and its output is fast declining. In 2000 under 34000 tonnes were produced. This decline in output is explained by pessimistic low forecasts for export, partly due to the cheese being uncompetitive on the US market because of the unfavourable exchange rate euro/dollar.

Source: ISTAT and Consorzi di Tutela

Overall, cheese accounted for two thirds of export, at 650 million euro, followed by cured pork at 270 million euro (2005). 70% PDO/PGI products were sent to EU markets.

Analysis of agri-food exports to European markets shows that the most fragmented segments (cheese, sausage and wine) are “weaker” in terms of volume compared to products bearing strong brand labels rather than protection of origin labels (tomato conserves, pasta and olive oil.) The same is true of the USA; 70% of imported olive oil is “Italian”, 35% of pasta, 28% wine, cheese 23%, tomato products 17%, while the percentage for sausage is 3%.

As known, the image of Italian products is positive, as proved by the way they are cloned in all corners of the earth. A recent survey by Indicod-Ecr and Nomisma (May 2002 – April 2003) showed that sales of Italian sounding products on the USA market accounted for ten times the retail value of “real” Italian products and that this level is rising¹.

2. Objectives

The poster paper analyses the international marketing and trade strategies implemented by Italian quality food exporters with special attention to the export and trade aspects for some important Italian PDOs products.

Discussing the international marketing and trade strategies, the paper will report some examples of the strategies of the quality food exporters. The rapid change in trading and distribution channel will affect the export of quality food in several ways.

Italy has increasing difficulties in unravelling the knot of international market competition, due to the size of the export companies which, on the whole, is inadequate as regards to global market standards and due to Italy’s distribution system which has failed to expand abroad, leaving the advantage to the foreign chains to take, preferentially, their national products to the countries they set up.

But, important consolidation rapidly change the competitive arena for main PDO products.

3. Data and methodology

First of all, the paper will analyse the classic components of marketing, the Four Ps: the selection and development of the *product*, the determination of *price*, the selection and design of distribution channels (*placement*), and all aspects of generating or enhancing demand for the product, including advertising (*promotion*).

Data comes from internal data of institutional Consortium, firm data (producers and retailers), ISTAT data on trade movements and other quoted sources.

This section analyses the marketing of Italian speciality products using the four Ps.

3.1 The selection and development of the product

By international product policy we mean the whole set of decisions relating to selecting a product for export. Speciality products themselves are already extremely differentiated by their very nature and thus enjoy competitive advantage, and price positioning absorbs transport costs and potential import barriers.

Competitive pressure may appear between one typical product and another, or as is often the case for Italian products, between an origin guaranteed product and an imitation. The extent of this depends on how correctly consumers perceive the product.

Through prism or amplification effect, products with guaranteed origin are usually perceived overseas to be at a higher level than they are in the country of origin.

One of the causes of the “prism” is the country of origin effect, or consumers’ previous experience of a country’s products and country attributes. This may be direct experience as

¹ It would be interesting to analyse in more detail the phenomenon of imitation, taking into account that place and legal ownership of intellectual property rights may not be the only factors.

an immigrant or tourist, or it may stem from interpersonal information or mass communications, or generalised opinions about the country..

It is not by chance that the top exported products (PGI Tuscan olive oil, Pecorino Romano PDO cheese and Terre di Siena PDO olive oil) come from Tuscany which is one of the regions most popular with tourists or from the area of Lake Garda (Garda PDO olive oil²). The main consumption areas overseas are traditionally those with a large proportion of Italian immigrants. But today global wide competition means that the country of origin effect is not enough; new requirements of the international consumer have to be taken into account, even for speciality products. In China for example, extra virgin olive oil is promoted as a gastronomic speciality, but operators say that its success depends on its nutritional and health characteristics.

In the eyes of East Asian consumers, Italy represents biodiversity. The most active regions, Emilia Romagna and Lombardy carry out local marketing which means promoting an image of the country, not just organising a stand with regional finance. The two main consortia of Emilia Romagna (Parmigiano Reggiano and Prosciutto di Parma) decided to focus on this country image when in 2005 they halted EU financed joint promotions of speciality products, in this case a French cheese, to focus on "Parma" products.

The importance of the cue "country of origin" is the justification for the EU to make "country of origin" a reliable claim through regulation of traceability and labelling.

3.1.1 Adaptation and communication of product

The requirements of different overseas markets has led consortia of various products, in their institutional function of speciality product promotion, to modify product image or rather enhance the country of origin effect for the culture or environment of the new market. Important or desirable features in one country are not necessarily effective in another³.

Given that intrinsically a speciality product is not easy to adapt, it is the service content rather than the product itself that has to be modified.

International promotion of speciality products having a real or potential overseas market has mainly been institutional and carried out by bodies such as producer consortia. It has strengthened the country of origin effect by playing on the geographic origins of the product. Only recently has there been commercial publicity aiming to improve the relationship with clients. Institutions tend to communicate publicly through publications, cultural initiatives etc.. Commercial advertising by institutions takes cultural differences into account in adapting to the message, as well as the channel to cultural differences. It thus depends on finance being available and local regulations on advertising. The EU makes available funding for international promotion of speciality products, either directly controlled by the EU or financing business or institutions⁴. Another important method of communication overseas are specialised trade fairs, which can be opportunities for sales or method of direct communication to potentially interested operators. They are an efficacious form of communication.

In 2006 Italian companies spent about 7000 million euro on information, promotion, publicity and support for PDO and PGI products, trade fairs and export in general. The money came from the EU, government, regional authorities, Istituto per il Commercio estero, Buonitalia and Chambers of commerce.

² The denomination of origin "Garda" is further specified as "Bresciano", "Orientale" or "Trentino" and is applied only to extra virgin olive oil meeting required standards (Ministerial Decree 17 September 1998 - GURI n. 234 7 October 1998).

³ Market research is expensive especially on new and distant markets, so that international and local support is essential to overcome the language barrier and other difficulties.

⁴ Recent press advertising campaigns in the USA by the Consortia of Prosciutto di Parma ham and Parmigiano Reggiano cheese focus on product imitation and use pictures showing "photocopies" or the "DNA" of the products. The EU has spent 4 million euro over three years for this press advertising.

There have also been recent initiatives by big Italian firms to strengthen market position overseas. An example is “Italia del Gusto -Taste of Italy.” “Taste of Italy (Great Food Good Living)” is a consortium comprising of important Italian firms with high quality products in the food sector. Members are: Amica Chips, Auricchio, Barilla, Conserve Italia, Cremonini, Granarolo, Illy Caffè, Italia Zuccheri, Noberasco, Orogel, Parmacotto, Parmalat, Parmareggio Unigrana, Pastificio Rana, Regnoli, Riso Gallo, Salov, Sammontana, Acqua San Benedetto e Aia (Gruppo Veronesi).

The consortium undertakes activities in marketing, promotions and communications on international markets to assist in the development of international sales for its member firms. It also develops trade marketing and initiatives in distribution and the ho.re.ca. sector.

“Taste of Italy” also carries out public relations with the media and other institutions. In particular it can provide advice and opinions in the areas of marketing and global communications, research, events and sales promotions. It also participates in international trade fairs, and it can help create commercial and logistical synergies and partnerships amongst its members, as well as planning publicity campaigns and media strategy. The aim is to spread the taste and the Italian way of eating all over the world with the products of consortium companies.

3.1.2 Intellectual property rights

International product policy involves ascertaining the legal system of intellectual property rights, which in some countries may give grounds for uncertainty. This is particularly important for definition, communication and promotion of speciality products, which tend to be more complex because the ownership of is collective. It is usually a consortium which guarantees protection of the label, and they or producer members are unlikely to register brands or patents overseas.

The Agreement on TRIPs (Trade-Related Aspects of Intellectual Property Rights) was approved as part of the Final Act of the Uruguay Round. It lays down minimum standards of protection for several categories of intellectual property but the negotiating process has not as yet achieved the hoped-for results. The situation within the EU is of course different; it is governed by Regulations EU 510/2006 and EU 509/2006. Details can be found in the ample literature on the subject.

The experience of the Consorzio del Prosciutto di Parma on the USA market is an example of intellectual property rights problems. The brand was purchased on the USA market, and on Canadian, Japanese and Mexican markets trade marks registered by foreign firms contain the name Parma. Italian companies may not therefore sell prosciutto di Parma ham under the name “prosciutto di Parma” in Canada. The geographical indications are not guaranteed in spite of Art. 22 of TRIP. In Japan the trademark Parma was accepted for a Canadian company but not for Prosciutto di Parma, because it was considered generic. Mexico does not accept the registration of Prosciutto di Parma as a trademark because Parma is already a registered trademark. But the authorities allow both products to be sold on the market.

In practice, promotion is carried out on markets where there are imitation products only where there is legal protection. Where there is legal protection, it is possible to carry out promotion and communication. Institutions thus take action only where there is legal protection; where it is absent or pending only brands are protected and promoted.

3.2 Price policy

Price has critical role in defining in international marketing policy. Numerous variables prevent producers from formulating a true pricing policy for speciality products, especially in the chain long and fragmented. The increasing number of channels, the changing role of intermediaries and modern distribution leaves little margin for manoeuvre by producers.

The more fragmented is the production and the more distant from end markets, the more critical these aspects become.

An analysis of Parmigiano Reggiano cheese shows that retail price trends are not correlated so much with production costs, but with more important factors such as distribution. And on overseas markets, the exchange rates as well as potential import duties and taxes affect end prices too. The growth of large scale modern distribution will further reduce producers' control over the price variable. Supermarket price policies will probably make product positioning more transparent than it is today, and the product will be positioned and perceived in the same way as it is the country of manufacture.

On the other hand, in order to reduce the effects of product imitation, producers and their associations are trying to maintain high levels of differentiation and retain "traditional" distribution channels such as high class restaurants, delicatessens etc. which sell higher priced products.

3.3 Placement: selection and design of international distribution channels

A recent survey of 800 firms accounting for 15% of total turnover in the food industry (Nomisma, 2003) reveals that different channels are used for overseas markets and a firm * often has multichannel distribution.

Table 2. Channels to overseas markets

	First answer (%)	Multiple reply (%)
Foreign importers	45.6	60.8
Foreign distributors	14.0	38.5
Import-export companies	4.0	14.5
Trading companies	2.9	5.5
Other traders	5.0	12.1
Branches	2.4	5.5
Own sales network overseas	12.3	21.1
Direct sales to overseas supermarkets	5.9	15.7
E-commerce	1.2	2.4
Total	100.0	

Source: Nomisma, 2003

The most frequent channels are importers, overseas distributors and a sales network overseas. Next there is direct sale to overseas supermarket chains (one sixth of respondents) and traditional import-export companies.

A quarter of respondents (Multiple reply questions) intend to strengthen the channel of direct selling to overseas supermarkets.

Importers are the most frequent channel on US and northern European markets for the export of Protected Designation of Origin Products.

New York is the capital of the USA market because of its geographical and cultural vicinity to Italy and because it has an average higher standard of living compared to the rest of the US. But the main reason for its pre-eminence is that the main importers are located along the East coast. And although the situation is changing, importers are the only way of penetrating the US market, which has the strictest rules in the world.

Traditionally export started with an importer who distributes the product to quality restaurant outlets. It then moved to specialised retail and subsequently, today it goes through modern distribution. This process is typical of niche products with smaller

producers or on new markets. And on new markets large chains too often approach local importers, for language and other reasons.

On consolidated or larger markets, producers tend to set up overseas branches or invest directly in local production⁵. They may also have direct contact with the supermarkets, although established importers may have strong competitive advantage over the producers. Choosing suppliers, translation and often merchandising are services supplied by the importer, who in this way lowers transaction costs and commercial and quality risks of the product for the distributor, at least in the initial stages.

Italian speciality products show a wide range of operational solutions.

For hard grana cheese, only Zanetti (22% of total export) have direct export agencies in USA, Germany and France. The other exporters have foreign agents.

Auricchio, leader in provolone cheese exports to 50 countries worldwide, historically to countries with a large number of Italian emigrants and their descendents. Exports account for 20% of turnover which was 104 million euro in 2004. The most important destination is North America; Auricchio has an exclusive distributor The Ambriola Company with a network covering all channels in USA and Canada.

Another example is the company IGOR. IGOR s.r.l. of Novara in 2004 accounted for more than 30% of the national market for Gorgonzola, of which 35% was destined for export especially modern retail (2005 turnover was 66 million euro). International clients include the chains Carrefour, Auchan, Metro, Marks & Spencer, Wal Mart, Aldi, Lidl, Rewe, Penny Mark, Netto and Kaufland⁶.

According to National Association for the Speciality Food Trade, New York, the key factors in overseas supermarket buyer decisions are in order of importance: standardized product quality, consumer demand for product category, newness, (certified) reliability of producer, price, ethnic characteristics of shoppers, investment in promotions and advertising, exclusive rights. Trade marketing and very different action from entering and staying in traditional channels is essential for firms selling to overseas supermarkets.

Direct investment and trading agreements in agriculture are very low (2% of the Italian total in 2005) although there have been recent promising developments in the cured pork sector on Asian markets⁷.

Due to the production rules of PDO/PGI, international investment cover traditional products not covered by protection regulations; in fact direct overseas investment is frequent in the cured pork sector and in packaging outside the EU.

Grandi Salumifici Italiani for example accounted for 15% of the total export of cured pork in 2005. It is present in China in a joint venture with an important Chinese company (third largest world player) and control Shanghai Yihua Food Co. With four factories in China for production and curing of traditional Italian products (uncooked ham, smoked uncooked ham, salami, mortadella sausage, cooked ham, frankfurter sausage etc.). GSI also has a trading company as a sales and distribution platform in the main chains across Asia.

GSI has also made direct investment in Brazil and produces products under quality brands Casa Modena and Senfter as well as a more competitive brand, Sino Sul.

4. Trends in international large scale distribution

PDO international distribution is more complicated than simple product placement. Current trends in international distribution, and their impact on speciality producers and selection and design of distribution channels (place) are summarised below.

⁵ These traditional Italian products not covered by specific regulations rather than PDO / PGI. There are for example many direct investments overseas outside the EU in the sectors of cured pork and packaging.

⁶ Strategic assets of these companies range from great attention to health and hygiene standards, high levels of product standardisation and process and product innovation leading to variety and completeness of product range.

⁷ By "typical" products we mean those with a strong link to an area. "Speciality products" has a wider meaning and may include for example those manufactured by Barilla in its USA factory.

1. Segmentation of supply of own brands

In 2001 in the UK own brands accounted overall for 45% of the market, in Belgium 38%, in Germany 33%, in France 22%, in Holland and Spain 20%, and in Italy about 12%.

The degree of market penetration of European supermarket chains shows the following percentages: Carrefour (24.5%), Intermarchè (29.2%), Auchan (15.5%), Leclerc (17.9%), Casino (26.6%), Metro (45.0), Sainsbury (54%) and Asda (44.1%).

2. Internationalisation of own brand management

Distribution companies operating on different international markets tend to select co-packers on a world-wide basis and stipulate transversal supply contracts for own brand products for all markets. Today this is starting to happen for those speciality products where the firm has critical mass. There are often “category management” projects involving fancy food or gourmet with these suppliers. This lowers transaction costs and improves quality standards etc.⁸.

3. Internationalisation of distribution

Many large companies of course carry out a large share of their business in food and non-food outside their country of origin (cross-border distribution).

4.1 Effect on PDO products

All these factors have important effects on national and international end markets for PDO products.

Internationalisation of distribution

The internationalisation of distribution is interesting for export lines made in Italy, which present long term in overseas ranges or promoted as “Italian” or “typical.” This can enlarge end markets and also affect “product transparency.”

An example of this is Carrefour, where the “vision” includes enhancement of local tradition and develops own brand lines of regional products of small and medium enterprises. In Italy Carrefour promotes the brand “Terre d’Italia”, in France “Souvenirs du Terroir”, “Reflets de France”, Destination Saveurs⁹ etc. in its different channels and in Spain “De Nuestra Tierra”. In Switzerland and other countries “national” product lines enrich other own brand lines particularly “Filiere Qualità Carrefour” (Filiere Qualité¹⁰) present in all countries. In this way Italian products are exported to Japan, Switzerland, Belgium, Argentina and Columbia and, with special promotions, to France, and Spain. These are analysed below.

Internationalisation of own brand management

Today, co-packers range from specialised multinationals to local producers for particularly local lines. The relative absence of brands in PDO business has helped supermarket chains to develop autonomously own brand speciality products. The absence of strong interlocutors in the sector and brands sometimes leads supermarkets to create upwards vertical integration of marketing of speciality products, which give the company leadership in the channel. For Carrefour, for example, buyers of own brand speciality products for supermarkets in France bypassed traditional intermediaries and from the start of the line there was direct contact between producers and supermarket. In other countries however products were bought through the more traditional channels of importers, wholesalers and trading companies. The management of speciality products for own brands does not as yet

⁸ This trend is leading many producers to adopt BRC or IFS certification. This is a further barrier to entry on the market for some types of company and leads to exporter companies becoming more specialised.

⁹ This line was recently replaced by Traiteur Charcuterie.

¹⁰ Values associated are: taste, food safety, continuity (development lasting over time) authenticity (enhancement of local products) price : quality ratio. For example in Switzerland, Gorgonzola, Parmigiano Reggiano and Prosciutto Crudo di Parma are sold in the FQC line. In Italy Pecorino Sardo cheese is also regulated by a supply chain agreement.

appear to be internationalised as far as producers are concerned as specified before. There is however horizontal partnership with cooperation agreements such as the agreement between Conad and Leclerc. This commits Conad to sharing its know-how in selecting producers of Italian products, particularly speciality.

Segmentation of own brand supply

International large scale retailers have felt the need to escape from this pressure by adding their own brand name to the assortment of products offered. Today's fourth generation own brands correspond to the development of a different own brand for each segment, from lowest to premium price. Intense horizontal competition has led to modern distribution chains attempting to gain the competitive edge by means of two strategies:

- -by providing products able to generate higher profitability compared to the leading brand names;
- -by generating consumer loyalty to the point of sale.

The large scale retailers have recently developed their own umbrella labels for a range of products including fresh food (fruit, vegetable and beef) with a specific quality and safety content, and for typical and organic products.

In some cases, the retailer acts in a vertically cooperative way, by cooperating with the other players along the food-chain (in particular industry), but also horizontally, cooperating with other retailers (competitors), acting in Europe or on global markets. Examples of horizontal cooperation are the development of food safety standards and, more recently, integrated traceability systems, with the example of the international "Cies" and the national action of Indicod-ECR under the GIS umbrella.

Other vertical cooperative strategies carried out along the chain (with agricultural producers, processors, transporters, and so on) have been developed to ensure retailers a greater market strength, through the creation of filiere or chain.

The main examples are the sub-brands for typical products (premium price products), for organic foods, for baby food, for allergen free line, etc. and for voluntary beef labelling.

These are quality chains which confirm the high positioning of private label in consumer perception, increasing profit and market share.

For commercial brand products this all translates into increased competitiveness and excessive use of promotions. But for "typical products," the general absence of commercial brands means there is less competition, while it does not halt the serious erosion of producers' contractual power.

Carrefour's "Terre d'Italia" initiative, a product line from Italian regions, was in 2000 the first scheme for the enhancement of speciality products. The initiative was imitated by other supermarket chains. Their initiatives included Esselunga's "region of the week" gastronomic routes, Coop's "Travelling round the flavours of Italy" in 2000 or MDO with "Discover the flavour of Italy". After this, the largest supermarkets then adopted strategies like Carrefour, with lines based on typical regional products. In this way the supermarket name appears alongside the Consorzio di Tutela of the product guaranteeing production standards and complete consumer protection and partnership in this initiative.

There are two categories of retailer strategies in Italy:

- -Mono-branding Strategies (usually, only retailer's brand name)
- -Multi-branding Strategies (products are offered across different private labels differently positioned in terms of price).

We can distinguish different kinds of private label on the Italian retail market:

- - The Retailer's Brand Name (Coop, GS, Sisa, Conad, Sma, Despar, etc.)
- - Premium Brand (typical, organic, other). Typical: Terre d'Italia, Saponi e Dintorni. Organic: Esselunga Bio, Si ! Naturalmente. Other: Essere Coop, Soluzioni Coop, Fior Fiore Coop and also Solidal Coop.
- - Other Brands (Fantasy brands: Fior di spesa, Quality line, etc.)

- - The Low Price Private Label (Numero 1, Clever, Fidel, Il meno caro, etc.)
- Some chains have created very wide ranges of speciality products and other chains have inserted speciality products among premium products. Other chains have not yet developed a range.

Table 3. Speciality product lines in Italy

Chain	Line	Description
SMA Auchan Gruppo Rinascente		Original and quality regional speciality products at accessible prices. Packaging shows name of supplier, method and place of production for purposes of transparency. More than 120 products.
Carrefour ¹¹		Introduced in 2000 and present in all Carrefour stores in Italy. More than 160 products, authenticity deriving from suppliers selected from different regions of Italy and regional typical foods, some of which are PDO / PGI standard.
Conad		Sapori & Dintorni Conad offers a wide range of speciality products (over 100) based on strong gastronomic traditions; cheeses, preserves, pasta, biscuits and cakes, sausage and oil. Constant development of line.
Coop		128 speciality products representing the best of Italian gastronomic tradition in taste, originality flavour and typicality. PDO cheeses in the line include Parmigiano-Reggiano PDO Fior Fiore Coop ripened for 30 months).
CRAI		Products obtained through typical local and artisan methods protected by product and consumer guarantees such as PDO and PGI etc.. Cheeses include PDO Parmigiano-Reggiano "Selezione di Montagna".
SISA		Brand line with regional typical connotations and imaginative names is being developed. Today there exists "I sapori dell'antica locanda" (Old Inn flavours) for sauces and a range from CEDI Sisa Sardo called "Antiche bontà di Sardegna" (Traditional goodness from Sardinia).
Esselunga		Naturama is a chain controlled by Esselunga and includes various cured pork products including Prosciutto di Parma. Key benefits are traceability codes, Animal Welfare provision, conformity to PDO guidelines and further inspection by Esselunga veterinary inspectors, careful processing of pork in selected curing houses. This all guarantees food safety and quality, slice by slice. The Esselunga Bio product range includes Parmigiano Reggiano produced from organically farmed milk in the area supervised by the Consorzio Parmigiano Reggiano.

Source: our research, 2007

How internationalised is distribution in Italy? Italy is facing increasing difficulties in international market competition, not only due to the size of the export companies which, on the whole, are inadequate as regards global market standards. Italy's distribution system has failed to expand abroad, giving advantage to foreign chains and their national products. The leading Italian retailer is COOP Italia, reaching a turnover much lower than its European competitors. COOP Italia is a consortium of consumer's cooperatives with more than 4,7 million members. The Associates are, in turn, cooperatives that manage approx. 1,265 points of sale, very varied as regards size, structure, management, logistics etc.: hypermarkets, supermarkets and minimarkets. Average retailer concentration: the top 5 retailers in Italy represent 54% of the total turnover. In France the top 5 represent 90%, in

¹¹ Prosciutto di Parma is sold Carrefour supermarkets and hypermarkets in France in the Agir range, in fixed weight sachets, labelled with the number of slices and Origine Italie Jambon de Parme at the price of 3.34 euro per 70 grammes). * Carrefour also sells Jambon sec italien (2.51 euro per 100 grammes, 6 slices). The label says *Doux et fruité*.

Spain 57%, in UK 70% and in Germany 76%. Only recently has Italian distribution started to internationalise. Coopernic was the first attempt at a European level cooperative joined Conad, Leclerc, hypermarket leader in France; Coop Suisse, the second Swiss group; Rewe, number two in Germany and Colruyt, third in Belgium. Coopernic is thus overall the largest European distributor with over 90 billion euros total sales in 17 countries. One of its aims is to have more contractual power in order to stipulate Europe wide purchasing contracts, and another is to develop private label products. Early declarations by members say that each partner will retain its own logo and private labels, but will also become leading seller for some product categories. Conad in its international alliance with Leclerc has thus created a centre for synergic product management. An example is Conad's range of speciality products, "Sapori e Dintorni" which number about 130 in Italy. The line accounts overall for about 10% of the portfolio of own brands, with a constantly increasing turnover since its launch in 2001 (Cristini, 2006). Private label accounts for about 17% of Conad's overall turnover. In France in Leclerc supermarkets about 54 Conad label products are sold. And the last three years have seen promotions entitled "Vive l'Italie" involving mainly the line "Sapori & Dintorni Conad". In 2004, Conad signed another agreement with Rewe, the German cooperative group present in Italy under the names Billa and Standa. This will offer new opportunities for Italian producers. Smaller but dynamic chains have recently started internationalising. One example is SISA, which offers Italian and other foreign speciality products, especially Greek. Overseas SISA Hellas and Sisa Malta supermarkets sell SISA products that are made in Italy.

Co-marketing and Co-promotion

Retailers' strategy of developing brands in order to achieve competitive differentiation may also lead to lower transaction costs and long term advantages with producers and Consorzi di tutela. This happens in particular for communications when co-marketing takes place with Consortia and for price and product policy with producer and trading companies. This is cooperative or co-marketing. PDO and PGI Consorzi di Tutela consider certain types of intervention particularly important. These are institutional promotion and communication of the labels, protection of denominations on international markets, chain agreements and sales contracts with supermarkets and with catering firms and restaurants. An example of this are the promotions run by the Consorzio del Parmigiano Reggiano across Spain in 2005 in 75 supermarkets of El Cortes Inglés and Hipercor hypermarkets of the same chain and 125 Carrefour stores. At the same time the consortium also supported Italian restaurants belonging to the association Arris Gourmet of Barcellona. Other more specific initiatives for catering and restaurants have been taken in Poland and the UK. Viceversa, Conad in developing the line "Sapori e Dintorni" is cooperating closely with suppliers to maximise the efficacy of often joint marketing. Through the supplier, Conad contacts the Consorzio di tutela which may be involved in order to sell out a particular local product.

And in 2006 many joint promotions were made on the Russian market by Consorzi di Tutela of Prosciutto di Parma ham, and Parmigiano Reggiano cheese with international chains such as Auchan and Metro as well as local chains.

5. Case studies: Products and Players

In this part of the poster paper we will focus on the supply chain structure and export channel and actors for selected PDO products.

Indeed, given the internal market difficulties perceived in the last few years, export has become more and more important for these products and it is believed to be even more important in the next future. However export depends on different factors such as hygienic and sanitary regulations, trade marks rules, tariff and quota existence and general market conditions (exchange rate, country risk, financial availability, ecc.).

5.1 Parmigiano Reggiano PDO

The production structure of PR cheese is based on a networks of farms located in the production area (National Law of 10 April 1954, n.125).

Table 4. Parmigiano-Reggiano in Figures (2006)

12 months of minimum ageing
16 litres to make 1kg
20-24 average ageing of the wheels (in months)
38 average weight of a wheel (in kg)
461 number of dairies
600 litres to make one wheel
4.750 producers of milk
251.000 cows
3,089,837 number of wheels produced in the 2006
800 mln valore all'origine 2006

Source: PR cheese Consortium

The origin of milk for the production of PR covers the provinces of Parma, Reggio Emilia, Modena and parts of Bologna and Mantova; the first four provinces are in Emilia Romagna, while Mantova is in Lombardy. Thus, the link between the production zone of PR and the source of raw material is very strong in Emilia Romagna; about 80% of the milk produced in Emilia Romagna is processed into PR; in the mentioned four provinces (representing 80% of the farms and the cows of the region) almost the whole dairy production is directed to PR. Recent studies pointed out remarkable processes of reorganisation, with a progressive concentration of cows in the largest farms especially in plain areas.

The overall number of dairies in the last fifty years has diminished by 28.5% passing from 733 in 1993 to 524 in 2003 and to 461 in 2006.

Without taking new producers into consideration, the concentration rate of facilities over this period of time, expressed by the closing down of dairies or their incorporation into existing units, has been at least 20 dairies/year. This decrease has affected both dairies in the plains and those in the mountains in a very similar way, but the most remarkable concentration, over 36%, has involved cooperative dairies, the number of which diminished to 384 units in 2003 with respect to the 606 that existed ten years prior¹².

For decades cooperatives have been the fundamental organisational structure on which the production of Parmigiano-Reggiano was based and today the cooperative model still prevails with respect to privately owned dairies. This link between cattle breeding farm and cheese dairy is one of the most particular aspects of the productive filière and has both advantages and disadvantages.

In the private cheese dairy the farmer buys the milk and processes it, with all the risks this entails. The co-operative cheese dairy, which is the most common in the area, processes milk of its members (breeders); the cheese dairy has an average of 35 member-breeders supplying milk.

However, the trends inside the production chain are determining a progressive erosion of the production share of cooperative dairies and an increase in private production. The dynamics of the dairy sector in recent years have in fact shown that the rationalisation process of the production system has not only led to a higher concentration of dairies, but it

¹² Source: CRPA - Research Centre on Animal Production data.

has also reduced the importance of cooperative dairies on the total output of Parmigiano-Reggiano cheese.

The average productivity per dairy expressed in tons of processed milk moved from 699 tons of milk in 1970, to 2,713 in 1998 and to 3,824 tons of milk in 2005.

If we consider the strategies of the cheese dairies up to now, their main efforts have been the reorganisation to a bigger scale; the most common dimension is still small, especially if compared to the producers of Grana Padano cheese.

Despite the great decrease in the number of dairies recorded, the PR production increased according to a constantly growing trend.

After the stages of milk processing and the connected operations, the cheese needs a long process of maturing, afterwards continued in adjoining store rooms. This aspect of the production process has particular importance for product quality and needs heavy financial investment for the equipment of the storehouses, where the product must remain for the ripening period (18-20 months). It also needs a large amounts of capital because of the time lapse between production and selling.

So, from a technological point of view the maturing is a very important stage of the production process, while, from an economic point of view, it is the farthest stage from breeding and processing and differs from them both in dimensions and operative strategies. 70% of the cheese dairies have installation that are not large enough to contain their own output for maturing.

The most part of PR is distributed through a 'long channel'; with the intermediation of the wholesaler-seasoner between cheese dairy and distribution channel (retailers or traditional shops). A small quota is sold in farm shops annexed to the cheese dairies (direct channel). In this way, the ripening stage of a great part of the production is mostly entrusted to farms external to the processing and of quite different types. They range from wholesalers who ripen the product directly before selling it to the complex structures of consortia, that collected co-operatives. These represent an important aspect because they connect production to ripening and avoid (or reduce) the speculations, that cause the cyclical crises typical of PR. In 1995 80% of the production of PR was seasoned in private structures, while today cooperative system present the most important seasoning and trading enterprise, as S.p.a., acting on the market. This phenomenon represent an example of vertical integration.

Private farms, as said before, is spread among many different subjects: there are more than 200 wholesalers, but 90% of the market is controlled by 1/4 of them.

The seasoners role is important because they have a strong market power that could frustrate the attempts of the producers to control the market fluctuations: for instance, because it could nullify the supply autoregulation policies that have been realised, with many difficulties, in order to stabilise market and prices.

On the other hand, the wholesaler-seasoners are the ones who take the risk of the ripening (in terms of final quality of the product) and the problems of tied up capital.

One of the biggest problems in the management of the wholesale-ripening farm is the fraction of the ageing and marketing costs, that vary considerably according to the dimension of the farm.

In 2006 the export of Parmigiano Reggiano (and those of the main competitor, Grana Padano) has increased by 4.5% compared to the last year. The growth within the EU was less important compared to the rest of the world (respectively 2.2% and 7.7%). The exports decrease in the two main outlet markets, France (-9.1%) and Germany (-3.1%), has been more than compensated by the increase in the other EU countries such as United Kingdom, Austria and Greece. On the other way, exports are increasing rapidly towards the other extra-UE destinations, especially in North America (+11% in the United States and +4.5% in Canada).

Table 5. Export Parmigiano-Reggiano and Grana Padano¹³ on aggregate data (2001-2005)

	2001	2002	2003	2004	2005
Volume*	35444	38736	43594	46423	50335
Value**	276,712	301,037	348,941	388,063	385,083
EUROPE	24513	26733	30174	32207	34876
France	3503	4189	5510	4366	5030
Belgium, Luxemburg	1314	1562	1818	1764	1604
Germany	5754	6604	7229	8205	9688
United Kingdom	2808	2916	2942	3675	4026
Danmark	442	492	588	764	856
Sweden	403	531	639	677	774
Switzerland	6550	5600	6141	5753	5298
Austria	976	1268	1432	1428	1438
Spain	938	1288	1385	1976	2017
Greece	748	943	947	1281	1379
AFRICA	98	119	94	161	210
U.S.A.	6128	6600	8328	8232	9164
Canada	1547	1779	1647	1727	2102
Brasil	147	198	69	108	95
ASIA	1594	1812	1997	2354	2297
Japan	1346	1477	1595	1857	1617
Australia	973	1076	892	1146	1195

*Tons – **Millions Euro

Source: Consorzio Formaggio Parmigiano-Reggiano

The main channel is represented by agents or importing societies in consolidated market, or trading companies or importer and broker in new and far market.

The old way to open a new market passed from contact with restaurants, gourmet shops and after retailer (usually large scale ones). Now the strategies changed and for new market the contact with restaurant and international retailer is simultaneous.

The first important thing to point out is that the two hard cheese are increasingly marketed together because wholesalers are widening their product portfolio and diversifying their supply in order to offer retailers a product mix of the two Grana Cheeses as well as other Italian cheeses.

They implemented also a set of product differentiation strategies (different ages, improving packaging, snacks, grated, etc.). They implement specific retail strategies, selling differentiated product in different retail channels, regions and countries.

The packed products is normally branded (in total 40% of the production) and the quota of private label is increasingly high.

The main players are private companies or cooperative groups. On the one hand, the process has been characterized by the enlargement of the corporate structure and vertical integration in the great cooperative groups in both cases of PR and GP while, on the other hand, the growth by horizontal integration (with partial diversification) and vertical integration (in particular for seasoning and packaging) has been applied by the big

¹³ Grana Padano turnover at the production stage amounts at 946 millions euros, while at the consumption stage arises at 1.865 millions euros.

companies of Grana Padano which, as known, are characterized by a less fragmented and more commercial oriented industrial structure.

Table 6. Turnover (million euros, 2005 data) and export of Grana Padano, Parmigiano Reggiano and other grana cheese (cow milk) in value (mil. Euro) and quantity (tons), 2004 data.

Firm	Turnover	Export in value	%	Export in quantity	%
Zanetti SpA	217	98.0	19.6	15,200	22.4
Agriform	76*	25.5	5.1	3,482	5.1
Consorzio Latterie Virgilio	335	19.9	4.0	2,350	3.5
Colla	135	17.4	3.5	2,042	3.0
Unigrana ¹⁴		16.2	3.2	1,859	2.7
Saviola		14.2	2.8	2,100	3.1
Ambrosi	152	14.0	2.8	2,000	2.9
Parmareggio		13.3	2.7	1,080	1.6
Casearia Brazzale		12.5	2.5	2,196	3.2
Nuova Sala ¹⁵		12.3	2.5	2,000	2.9
Zarpellon		10.5	2.1	1,470	2.2
Others		247.4	49.4	31,292	46.1
Totale		501.2	100.0	67,850	100.0

*: 2004 data

Source: Firms data and EUROPEAN COMMISSION, DIRECTORATE-GENERAL JRC (2006).

The first ten exporters of Grana Padano, Parmigiano Reggiano and grated grana cheese count less than 50% of the overall figure. The data are aggregated (GP and PR), but it has to be considered that the first two players, Zanetti and Agriform, are specialized in Grana Padano PDO, while Consorzio Latterie Virgilio associates dairies facilities producing both GP and PR, Colla produces GP and commercializes PR with its own brand or with retailer and catering brands. The first player specialized in Parmigiano Reggiano is Unigrana.

Zanetti S.p.A. is specialized in the production of GP and maturing of GP, PR and other typical Italian cheeses. It sells its products on the domestic market and abroad, both in wheels, pre-packed portions and grated. With more than 50% of external trade turnover, Zanetti represents the biggest exporter. It produces every year about 130.000 wheels seasons 410.000 wheels of Grana Padano. It's a very diversified and innovative firm, with facilities for portioning and grating. It exports in Europe, Japan, USA, Australia, Canada, China and South Africa.

In association with ten member cooperative dairies, Agriform has been producing, maturing and selling typical cheeses since 1980. In 2004 Agriform had a turnover of over 76 million Euro, 35% of which was abroad. The main destination countries are Germany, USA, Australia, Canada, France and United Kingdom. About 75% of the overall turnover is made up of Grana Padano. In 2004, 300,000 cheeses were sold. With more than 1.500 breeders associates, overall production reaches every year about 220,000 cheeses produced, making Agriform the largest producers within the Grana Padano Consortium.

¹⁴ Unigrana S.p.A. and Parmareggio are companies belonged by the Granterre Group.

¹⁵ This company, for instance, is certificated according the international standard BRC, that means it operates strictly connected with British retailers.

The company "Consorzio Latterie Sociali Mantovane Virgilio" is a second degree cooperative founded in 1966 and there were 110 associated companies (producers manufacturing both Grana Padano PDO and Parmigiano Reggiano PDO) grouping together over 2.500 breeders. The company works in the dairy - cheese and meat sectors. In cheese sector the product are milk, butter, cooking cream, mascarpone cream cheese and cheese such as Parmigiano Reggiano PDO, Grana Padano PDO and Provolone¹⁶. Virgilio belongs to the group Virgilio-Ghinzelli which controls Bertana SpA, Brendolan Prosciutti SpA and Castelcarni SpA too. The overall turnover in 2006 is 340 million euros, and the whole group 620 milioni di euro. The company is the head of a group which includes facilities in the pork meat sector. The vertical integration of cutters in companies within the group, leads to the marketing of meat and the most prestigious PDO production in the Italian cured meat sector. The group is the leader in Italy in the pork slaughter sector, as regards the number of animals slaughtered: approximately 20% of the national production of heavy pork, aimed at the cured meat sector as well as for the new PDO meat "Gran Suino Padano". The group works in the cured meat sector with a company that is part of Brendolan spa, with four PDOs: "Prosciutto di San Daniele", "Prosciutto di Parma", "Prosciutto di Carpegna", "Prosciutto Veneto".

The Granterre Consortium was founded in 1959. They guarantee full control over the supply chain, from livestock to market. The Group's industrial and commercial core is Parmareggio S.p.A. 170.000 ql of milk for processing to make Parmigiano Reggiano, 3.600 heads of livestock divided into four farms and 76 cheese factories represent approximately 1,600 farms. Unigrana started its activity in 1991 as a trading company of the Granterre Union (Co-operative). Unigrana holds the leadership in Europe in the Parmigiano Reggiano market and is among the first operators non manufacturers for Grana Padano. Other industrial activities are butter production, pig breeding, warehousing, ripening and packaging of cheese.

Among the other important companies, Dalter has to be mentioned, with over the 50% of turnover made abroad (exports). Some companies (i.e. Ambrosi and Boni) have branches in UE countries such as France, or are connected with local importers.

5.2 Prosciutto di Parma PDO

The cured ham market, as well known, includes the seven recognized PDO hams and the unbranded product, for which the raw material can be both Italian or foreign. The Prosciutto di Parma is the most important production in this market: it represents the 40% of the overall ham production in Italy and 75% of the PDO ham production. As regards Prosciutto di Parma, about 82% of the entire production is sold in the Italian market (7.7 millions hams, total value at the consumption stage 1.8 billion euros), while the remaining quota (18%), is exported (1.6 millions hams).

¹⁶ This is the second company with regards to total sale of Grana Padano PDO and the 8th company with regards to total sale of Parmigiano Reggiano PDO (Italy + Export) in value.

Table 7. Prosciutto di Parma in Figures (2006)

Production: 171 companies producing Parma Ham
9,839,000 Prosciutto di Parma produced in 2005
5,386 pig breeding farms in 10 region of Italy
139 Slaughterhouses
3000 workers directly involved in the production
500 workers indirectly involved
885 millions euro the market value wholesaler
1,800 millions euros at consumer level
Market share: Italy 82%; foreign 18%
1,800,000 Prosciutto di Parma hams exported in 2005 (+ 8.2% compared to 2004)
8.6 million pre-sliced Prosciutto di Parma packets (173,000 hams) sold in Italy (+19.5% from 2004)
23.1 million pre-sliced Prosciutto di Parma packets (463,000 hams) sold abroad (+15.7% from 2004)

Source: Prosciutto di Parma Consortium

The factories producing Prosciutto di Parma amounted to 201 in 1993 and 171 in 2005, according to Consortium data. It's important to point out that 60% are joint-stock companies (S.p.A and S.r.l.), while the remaining are partnerships. Supposing that business names can be considered in some way as indicators of corporate sizes, we can assert that the considerable incidence of partnerships attests that many firms are still today of small dimensions. According to the Consortium data, the Prosciutto di Parma is exported in over 60 countries, with more than 1.8 million hams exported from Parma each year. The European Union is the principal market, accounting for approximately 74% of the total exports. The three leading non-EU consumers of Prosciutto di Parma PDO are the United States, Japan and Canada. The Consortium has recently opened new markets in Singapore, New Zealand, Lithuania, South Korea and Australia. The pre-sliced Prosciutto di Parma is the packaging format with the best growing rate; it almost doubled its export quota in the last five years, representing now the 20% of total exports (20 million packets).

In 2006, for example, the sliced Parma ham registered +33.2% in Italy and +27.6% abroad. Normally on the whole 170 firms, only 70 are exporters, of which 40 habitual exporter, the others una-tantum exporters (data from different sources, interview, conference, etc.). There are 15 laboratory of slicing and packing of pork products.

The Italian sector of cold cuts (charcuteries) is once again characterised by a substantial fragmentation that embraces both production, where a multitude of small and medium local firms are set up against the few big multi-specialist national groups, and distribution, where the traditional channel still retains the upper hand. The market conditions have forced leading companies to diversified in typical products and technological innovation, targeting products with a high service content.

All big producers are exporter, mainly direct to big retailer; between the medium-sized firm, some medium producers are specialised exporters. The big group are completed vertically integrated from rearing to cutting and slicing.

All the leaders of the pig meat market are among the big groups operating in the Prosciutto di Parma district. These groups have in their product mix many typical products as well as substitute products of Prosciutto di Parma, such as unbranded ham or other pig meat products.

In the case of deli meat market the growth process is complex. On the one hand there is a strong chain integration process from slaughterhouses merging processing/seasoning

plants¹⁷, on the other hand an horizontal integration and diversification from companies operating in other food sectors¹⁸.

At the moment there are strong interests from large industrial groups for local production firms and a growing interest of foreign capital for Italian leading brands.

In ham market operate “brand industries” which account for 1/3 of the total market (PDO and not), are multi-specialist, have foreign branches, direct investments and joint ventures with local leaders in Europe and overseas (USA, Japan, China). They are specialized on convenience foods and supply international retailers.

The situation in 2005 for deli products is shown in the table below. Unfortunately it was not possible to consider only PDO cured ham market share or export data. Apart from Galbani, all the reported companies operate in the production as well as national and international commercialization of Prosciutto di Parma and other important PDO products.

Table 8. Player in the deli products segment, in volumes

Company	Turnover 2005 (millions euros)	Deli products market share (estimation on volume, 2005)
Grandi Salumifici Italiani	434	6
Cesare Fiorucci	375 (consolidated)	5.1
Gruppo Galbani SpA	1,125 (consolidated)	3.3
Fratelli Beretta	335	3.3
Rovagnati	200	2.7
Ferrarini	250	2.4
Gruppo Veronesi	1,700 (consolidated, deli products 570)	3.6
Citterio	350	1.4

Source: our elaboration

Recent market operations modified the competitive arena. In 2005, the leader has become “Grandi Salumifici Italiani Spa”, including Unibon Salumi (brand Casa Modena and Unibon) and Senfter. The group incorporates the characters of a big cooperative pig meat plant controlling all the supply chain, and the ones of a company specialized in the typical deli products¹⁹.

Fiorucci remain the leader brand of Italian deli products in the world market. It operates mostly with the retail and food service sector. The turnover made abroad is one fourth of the total. It has eight plants, seven of which in Italy and one in the USA. The 55% of its capital is owned by the fund Vestar Capital Partners. Fiorucci family owns 25% of the company capital.

The Beretta Group is third in the Italian deli products market, but leader in the take away deli products at the retailers stage. It has 13 plants in Italy and one in the New Jersey (USA) specialized in deli productions and used as the company’s logistic centre for the North America.

Rovagnati was founded in 1941 as a food distribution company; in 1967, it began producing cooked hams, the sector it would lead in the 90’s. In 1994, Rovagnati continued

¹⁷ An example is given by the “Industrie di Macellazione Marino Ghinzelli Spa” which has controlling interests in Brendolan Prosciutti, Macellerie Bertana S.p.A and Castelcarni S.p.A. (a firm specialized in the processed meat products, generally sold to large scale retailers). Brendolan operates in the Prosciutto di Parma PDO market, Prosciutto di San Daniele PDO markets and Prosciutto Veneto-Berico Euganeo PDO market. It has the only plant producing Prosciutto di Carpegna PDO. It is a leader in the Italian PDO ham market with a production of about seven million kilograms produced in its six production sites.

¹⁸ The Cremonini Group, leader of the beef market, is also operating in the deli products market using the brand “Montana”. Its 2005 turnover was 153.3 million euros, with 16% made abroad.

¹⁹ The paragraph on direct foreign investments will deeply analyse the multinational strategy of the Grandi Salumifici Italiani Spa.

its industrial growth with the acquisition of a Romagna-based company with a long tradition and specialization in the production of Mortadella di Bologna PGI. In addition to the construction of new production plant, recently entered in the Prosciutto di Parma PDO production.

The agro-industrial group Ferrarini is very diversified one. Indeed, it includes Ferrarini Spa, specialized in the Prosciutto di Parma PDO production, Fattorie Ferrarini Srl, specialized in the Parmigiano Reggiano PDO cheese and wine production, and Vismara Spa operating in other deli products segment.

The Veronesi Group is the fourth Italian agro-food group, with a turnover of 1.7 billions euro (2006), 94 millions euro of turnover made abroad. AIA-Veronesi Group has recently rationalized its activity transferring to Negroni Spa the management of the most important deli products brands, representing 300 millions euro turnover: Negroni, Montorsi, Fini Salumi and Daniel. The Group has more than 1.000 employees, six plants in Italy and several sales offices in France, Germany, Switzerland and USA.

Citterio, has eight plants in Italy plus a facility in the United States. In Europe, apart from Italy, it operates in Switzerland and France with sales offices and a direct sales organization. It is also present in other countries with area managers, key accounts and distributors.

7. Final remarks

The future of PDO products is not only connected to their positioning, to their promotion and international protection but also to the strategies of the retail leaders and to the overall strategy of the brand industry. The latter is more and more present in these markets of “typical products” which represent a diversification and a good investment to improve market positioning. The supply chains are now consolidating in groups integrated both vertically and horizontally (to reduce transaction costs and guaranty better quality), where the diversification aims to complete the product portfolio, to optimize purchasing costs, to benefit from economies of scale and scope and from promotion and distribution advantages. Following the aggressive marketing promotion strategies and the increasing power of private label products, the prices of the main typical products shows a declining tendency in Italy; this caused a widening of the gap between production and consumption prices. The value-added chain, thus, is now moving through the retail stage, even because the large scale retailers interest caused a strong competition among small-medium producers and a standardization costs increase. On the other side, big producers in order to obtain larger sales volume, allowed risky operation of price cut and promotion.

What will happen in the future? If the international retailers will be really interested in Italian typical products export channels will change, exporters will change and our national products will find solid foreign market outlets, but prices will decline and maybe product image will be negatively affected and quality and variety will decrease.

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