The Economics of Geographically Differentiated Agri-Food Products

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Theoretical Considerations and Empirical Evidence

Kumulative Dissertation

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vorgelegt von

Ramona Teuber
geb. in Bielefeld

1. Gutachter: Prof. Dr. Roland Herrmann
2. Gutachter: Prof. Dr. P. Michael Schmitz

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List of abbrevations

CM	Certification Mark
CTM	Common Trademark
COE	Cup of Excellence
COOL	Country of Origin Labeling
DO	Denominacion de Origen
EFA	Explorative Factor Analysis
EIPO	Ethopian Intellectual Property Office
GDAFP	Geographically Differentiated Agri-Food Product
g.g.A.	geschützte geografische Angabe
GI	Geographical Indication
g.U.	geschützte Ursprungsbezeichnung
OLS	Ordinary Least Squares
PDO	Protected Designation of Origin
PGI	Protected Geographical Indication
ROO	Region of Origin
SCAA	Specialty Coffee Association
SQS	Sensory Quality Score
TM	Trademark
TRIPS	Trade-Related Aspects of Intellectual Property Rights
WIPO	World Intellectual Property Organization
WTB	Willingness to buy
WTO	World Trade Organization
WTP	Willingness to pay
WTPP	Willingness to pay a premium

1 Introduction

1.1 Problem Statement and Research Objectives

Collective geographical names for agri-food products are not a phenomenon of modern times. In fact, the practice of naming products after their geographical origin has got a long history and is widespread (BÉRARD and MARCHENAY 2006). Geographical names were already used in ancient Greece, where Thasian wine, i.e. wine from the island of Thasos, is said to be sold at a significant price premium compared to wine from other regions (EUROPEAN COMMISSION 2004). However, geographical names for agri-food products and particularly the legal protection of those names are discussed more than ever. The reasons for the recent interest in this rather ancient product differentiation tool are manifold.

First, an increasing consumer segment is concerned about food safety and food quality issues and thus wants to know where the food they eat comes from. This development is reinforced by the increasing globalization of food markets with international brands. Local and geographically differentiated foods are considered a countertrend to this convergence in products reflecting consumers' desire for authenticity and individuality. Consumer ethnocentrism, which refers to the preference of domestic products over foreign products, and an increasing environmental awareness are further issues in this context (HENSELEIT, KUBITZKI and TEUBER 2009).

Second, from a policy point of view it is assumed that the protection and promotion of geographically differentiated agri-food products (GDAFPs) can foster rural development. This rural development aspect is especially relevant for less-developed and less-favoured regions. The underlying idea is that such regions cannot compete with other regions in terms of productivity and efficiency but in terms of tradition, authenticity and high-quality production. The European commission even states that geographical indications (GIs) constitute one main pillar of the EU's agricultural quality policy besides organic and other food quality certification schemes such as for example EurepGAP.[1] It is expected that geographically differentiated agri-food products can, at least partly, contribute to the survival of small-scale farmers by facilitating the production of high-quality products (EUROPEAN COMMISSION 2004).

Third, given the increasing globalization in terms of growing international trade volumes, intellectual property rights have become more important than ever. Counterfeiting and free-riding problems are also of relevance in the agri-food sector. While imitation

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[1] The terms geographical indications (GIs) and geographically differentiated agri-food products (GDAFPs) will be used interchangeably. For a definition of these terms see HERRMANN and TEUBER (2010) in Section I.

products which can erode established reputations are well-known for wine and sparkling wine with Champagner a prominent case in point, they can also be observed for other products such as Feta cheese, Parmigiano-Reggiano or Darjeeling tea. Geographical indications, by which origin-based names can be legally protected, offer the possibility to overcome these free-riding and misuse problems which arise from information asymmetry. Information asymmetry to the disadvantage of consumers and high-quality producers occurs on the market due to the fact that origin is an experience or credence attribute.[2] As Akerlof (1970) has shown in his famous Lemon example, information asymmetry of that kind can result in market failure in that sense that high-quality goods are crowded out by low-quality goods. It is well-known in economics that under such circumstances, labels and certification schemes can be used to transform credence into search attributes. In the case of geographically differentiated products, the origin label or more specifically the GI label enables consumers to identify the original product which remedies the market failure and enhances total social welfare.

In order to tackle these well-known problems that arise from information asymmetry, in 1992 the European Commision implemented regulation (EC) No. 2081/92, a *suis generis* system[3] for the EU-wide registration of *protected designations of origin* (PDOs) and *protected geographical indications* (PGIs). These two instruments differ in the strength of the origin-quality link. In the case of a PDO, the entire production process must take place in the defined geographical area. In the case of a PGI, it is sufficient that one stage of the production process, i.e. production, processing or preparation, is carried out in the defined and delimited area. If a product is registered and protected within this regulation, the geographical product name cannot be used by any other producer who is not located inside the specific region and produces according to the registered product specifications. On the other hand, any producer located in the specific area and whose products comply with the defined product standards cannot be excluded from using the label. Moreover, a product cannot be registered as a PDO or a PGI, if the term has become generic. A term or name has become generic, if consumers no longer expect that the product originates from the specific region the name still refers to. A prominent example is Gouda cheese. Though initially the name Gouda indicated that this cheese was produced in the Dutch town Gouda, nowadays hardly any consumer does expect that a Gouda cheese is produced in Gouda. In fact, the term Gouda refers to a certain type of cheese that can be produced all over the world. However, deciding whether a term has

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[2] If a quality-origin link is assumed, it can be argued that origin is an experience attribute, since consumers can detect the real quality during consumption. However, if the quality-origin link does not result in a special taste or cannot be experienced during consumption, origin is a credence attribute.
[3] *Sui generis* is Latin and means unique.

become generic or not is not always straightforward as the prominent dispute about the registration of the term feta illustrates (ROVAMO 2006).[4] In 2005, the existing regulation (EC) No. 2081/92 was amended with the new regulation (EC) No. 510/2006. Besiders several minor changes, one major change refers to the access and use of this regulation for Non-EU producers. The new regulation guarantees the same access to the EU-wide protection of geographical indications to non-EU producers as to EU producers (MARETTE, CLEMENS and BABCOCK 2008).

Furthermore, the EU Commission promotes geographical indications as a successful intellectual property tool particularly for developing countries. It is assumed that product differentiation via geographical indications can protect cultural heritage and biodiversity, while at the same time agricultural producers are enabled to "decommodify" their products. "Decommodification" of products implies that products move up the value-added scale by incorporating a greater degree of customization, or a significant reputation component (D'HAESE, VANNOPPEN and VAN HUYLENBROECK 2006). Hence, engaging in the production and trade of "decommodified products" is considered a successful strategy in order to escape the commodity trap which is characterized by low prices and low incomes. Basmati rice and Café de Colombia are frequently cited examples in this regard. The FAO shares this view and launched a program on quality products linked to geographical origin in 2007. This programme pursues the objective "to assist member countries and stakeholders in implementing both local and institutional-level systems regarding origin-linked specific quality that are appropriate to their economic, social and cultural contexts and contribute to rural development through the preservation and promotion of products of origin-linked quality and associated local resources (FAO 2010)".

All these developments suggest that policy makers assess geographical indications as clearly beneficial policy instruments. Yet in academics there seems to be no clear consensus whether geographically differentiated products and the legal protection of their geographical names can really fulfil the tasks they are supposed to. The scientific literature on GDAFPs is diverse and covers a wide range of different aspects. From a judicial point of view, the question of different legal approaches towards protecting and registering geographically differentiated products in Europe and the US and possible consequences for international trade have been addressed (e.g. JOSLING 2006; EVANS and BLAKENEY 2006). Another aspect examined is whether geographical indications can be used as protectionist tool in international

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[4] After several years of litigations the European Court of Justice ruled that the term "feta" is not generic but refers exclusively to sheep milk cheese produced in Greece. Since 2005 feta is registered as a PDO and all other feta producers outside of Greece selling feta in the EU market had to rename their products.

trade (e.g. JOSLING 2006; MARETTE, CLEMENS and BABCOCK 2008). Empirical economic analyses are predominantely carried out for Mediterranean countries, namely Italy, France, Spain and Greece, where geographical indications have been a central element in agricultural policy for decades and most consumers are rather familiar with this type of labelling. These studies cover issues such as the price formation and revenue distribution in the supply chain (JRC-IPTS 2006; DE ROEST and MENGHI 2000), consumers' attitudes and willingness to pay for PDO and PGI products (VAN DER LANS et al. 2001; VAN ITTERSUM et al 2007; SCARPA et al. 2005), as well as rural development impacts of geographically differentiated products (DE ROEST and MENGHI 2000; TREGEAR et al. 2007). This array of different aspects addressed in the economic and socioeconomic analysis of GDAFPs makes the overlapping analysis of this agricultural policy and intellectual property tool a challenging task.

Against this background, the present dissertation pursues the following research objectives. First, it aims at providing a comprehensive research framework for analyzing GDAFPs. This shall be achieved in a two-step procedure. In the first instance, the different theories and methodologies applied in the economic analysis of geographically differentiated products will be identified by reviewing the existing scientific literature. Hereafter, the obtained results are synthesized, evaluated and associated with each other in order to draw-out policy-relevant conclusions as well as implications for future research.

The second objective is to provide empirical evidence on the importance of origin as a product cue in consumers' purchase decisions and on collective reputation effects based on geographical origin in a non-Mediterranean context. This objective is a direct result from the observation that in recent years an increasing number of non-Mediterranean producers has started to differentiate their products based on the geographical origin. However, empirical evidence for these emerging markets is limited. There is particulary a lack of information on consumers' attitudes and perceptions towards PDO and PGI labels in non-Mediterranen countries and the importance of origin effects in the price formation of agri-food products other than wine.

Consequently, this dissertation aims at providing a comprehensive picture of the economic aspects of geographically differentiated agri-food products in general, while at the same time presenting very specific results for certain products and markets. Such an approach has not been applied on geographically differentiated agri-food products so far, since former studies did either focus on (i) a specific product in a specific region, (ii) one side of the market or (iii) the theoretical analysis of GDAFPs with rather strict assumptions that do not necessarily hold in real market settings.

1.2   Structure of the Dissertation

The dissertation consists of eight articles, which are allocated into three sections due to their contribution to the research objectives cited above. Section I is entitled *Theoretical Considerations* and comprises two articles. Article (1) provides an introduction into the topic and article (2) offers a comprehensive review, synthesis and evaluation of methodological approaches employed in the analysis of geographically differentiated agri-food products. Sections II and III provide empirical evidence for specific markets and specific products. Section II, entitled *Empirical Evidence – Consumer Studies,* focuses on German consumers and their attitude towards regional products in general (Article (3)) and geographical indications and Hessian apple wine in particular (Article (4)). Section III, *Empirical Evidence – Price Analyses*, provides empirical evidence for the single-origin coffee market focusing on price formation issues. It especially investigates and quantifies origin-based reputation effects.

Table 1 provides an overview about all included articles and their allocation to one of the three section. Within each section the order of contributions is chronological due to their date of making which is not necessarily reflected in their date of publication. This is especially true for the first article in section III (Article (5)), which was already accepted for publication in the beginning of 2008 but will be only published this year. The contributions in sections I and II were developed more or less separately from each other, whereas all articles in section III are closely connected with each other reflecting a development over time in terms of research questions and applied methodologies. Though all articles of section III rely on the hedonic pricing methodology, a clear development towards more sophisticated estimation approaches is recognizable. In section II, limited dependent variables models are applied. Some additional background information on these types of models is provided in Annex 4.1.

Table 1:   List of Articles Included in the Dissertation Thesis

Section	Authors	Title	published in
I *Article (1)*	R. Herrmann T. Marauhn R. Teuber (2008)	Der Schutz geographischer Herkunftsangaben: Heraus-forderungen für agrarökono-mische, rechtswissenschaftliche und interdisziplinäre Forschung	*German Journal of Agricultural Economics (Agrarwirtschaft),* Vol. 57 (7): 321-324.
I *Article (2)*	R. Herrmann R. Teuber (2010)	Geographically Differentiated Products	J. Lusk, S. Fox and J. Roosen (eds.)*, The (Oxford) Handbook on Food Consumption and Policy,* forthcoming
II *Article (3)*	M. Henseleit S. Kubitzki R. Teuber (2009)	Determinants of Consumer Preferences for Regional Food Products	Canavari et al. (eds.), *International Marketing and Trade of Quality Food Products.* Wageningen Academic Publishers: 263-278.
II *Article(4)*	R. Teuber (2010a)	Consumers' and Producers' Expectations towards Geographical Indications – Empirical Evidence for a German Case Study	*British Food Journal,* forthcoming
III *Article (5)*	R. Teuber (2010b)	Geographical Indications of Origin as a Tool of Product Differentiation – The Case of Coffee	*Journal of International Food and Agribusiness Marketing*, Vol. 22 (3&4), in press
III *Article (6)*	R. Teuber (2009)	Café de Marcala - Honduras' GI Approach to Achieving Reputation in the Coffee Market	*Estey Centre Journal of International Law and Trade Policy*, Vol. 10 (1): 131- 148
III *Article (7)*	R. Teuber (2010c)	Estimating the Demand for Characteristics via Hedonic Models – Theoretical Considera-tions and an Empirical Application to Specialty Coffee	*German Journal of Agricultural Economics (Agrarwirtschaft),* forthcoming
III *Article (8)*	R. Teuber (2010d)	Investigating Direct and Indirect Origin Effects – Do Direct Origin Effects Differ Across Market Segments?	Not submitted so far

Source: Own presentation.

Figure 1:   Classification of Articles Based on Their Contribution to The Research Objectives

Theoretical Considerations	Specific Empirical Evidence	
	Consumer Studies	**Price Analyses**
Herrmann, Marauhn und Teuber (2008) • Editorial about geographical indications • Introduction into the topic and relevant research questions		
Herrmann and Teuber (2010) • Overview and review of the status quo of academic research on GDAFPs • Synthesis and evaluation of the available theoretical and empirical literature on GDAFPs in order to provide an analytical framework for socioeconomic research on these products		
	Henseleit, Kubitzki and Teuber (2009) • Analyses consumers' preferences and WTP for regional foods in Germany • Survey data; N = 1000	**Teuber (2010b)** • Provides an overview about GIs for coffee; • Hedonic price analyses in order to investigate country- and region-of-origin effects for single-origin coffee
		Teuber (2009) • Case study on Honduras' GI approach for Café de Marcala • Hedonic price analysis to investigate price premiums at the regional level
	Teuber (2010a) • Analyses consumers' knowledge and expectations towards PDO/PGI products and a protected Hessian apple wine • Survey data; N=741	**Teuber (2010c)** • Theoretical considerations of two-stage hedonic models for agri-food products • Empirical application on data for single-origin coffees
		Teuber (2010d) • Recursive two-stage model to identify direct and indirect origin effects • Analyses whether direct origin effects differ across market segments

Source: Own presentation.

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1.3   Synthesis of Results

In the following, the main research results and the contribution of each article to the existing literature and the research objectives of this dissertation are summarized and presented.

Section I   Theoretical Considerations

Article (1) is an editorial which introduces and highlights the main research questions surrounding geographical indications. Thus, it provides a general overview and introduction into the topic. It is noteworthy that this paper combines research questions from two different disciplines, namely agricultural economics and jurisprudence, in order to stress the importance of interdisciplinary research in the field of legally protected geographical indications. This is an important contribution to the existing literature, since former papers did only focus on legal or economic aspects of geographical indications.

Article (2) provides a comprehensive review and assessment of the economic analysis of geographically differentiated agri-food products (GDAFPs). The contribution of this paper is twofold. First, it reviews the existing literature on geographically differentiated products covering both theoretical as well as empirical studies. This review stresses the large number of different aspects addressed, ranging from price- and income-effect studies over willingness-to-pay studies to studies focusing on biodiversity and genetic resource protection. Second, the paper does not only review the existing literature but also synthesises and evaluates the different research approaches, the standard assumptions being employed, their relevance and ramifications in order to offer a comprehensive research framework for GDAFPs. A major result derived in article (2) is that besides the generic commodity promotion literature, the economic theory of vertical and horizontal product differentiation, the theory of trademarks and reputation and the literature on consumer decision theory are all highly relevant in the context of GDAFPs. However, the results suggest that these different research branches are, at least in some cases, not well-connected with each other.

Another result derived is that a crucial aspect in economic studies on geographically differentiated products is the definition and modelling of an appropriate counterfactual scenario. This point can be illustrated by the following example. While analysing price and income effects of GDAFPs several researchers have compared the production of the geographically differentiated product with the production of a generic one, i.e. the chosen reference scenario is the production of a generic product (e.g. Comté vs. Emmentaler). In other studies the situations before and after the protection has been implemented are confronted by comparing markets prices at different points in time. This last approach is

problematic, since other factors change over time, too. If these factors are not held constant, the impact of the protection itself cannot be precisely measured. Contrarily, a consistent approach is often applied in the generic promotion literature in which the counterfactual scenario is modelled by holding all other factor constant in order to be able to derive the impact of regulation or promotion *ceteris paribus.*

By investigating the available empirical evidence on the impacts caused by GDAFPs, it is shown that the majority of studies analyses European products due to the long history of this labelling scheme in Southern Europe. Looking specifically at the empirical results derived in consumer studies, no clear picture does emerge. The results with respect to consumers' perceptions, attitudes and willingness-to-pay (WTP) for GDAFPs differ between products and origins. However, one aspect found to be relevant in all studies is ethnocentrism. Ethnocentrism means that consumers prefer domestic products over foreign products. Though the studies point out that the product origin is an important product cue in consumers' purchase decisions, it is just one cue besides a number of others such as brand and price. This makes is necessary to conduct multiple cue studies to derive plausible results with respect to the relative importance of the origin cue.

The theoretical as well as the empirical results presented in (2) suggest that GDAFPs can contribute to the targeted objectives of higher incomes in rural areas, protection of consumers against misleading and the protection of biodiversity and cultural heritage. However, these products are not by their very nature a successful instrument. They must be established, managed and promoted like any other brand in order to achieve the targeted objectives.

Summarizing, both articles in section I contribute to the first research goal of providing a comprehensive framework for the economic analysis of GDAFPs.

Section II   Empirical Evidence – Consumer Studies

Section II consists of two articles providing empirical evidence with respect to consumers' attitudes and perceptions towards regional food products in general and geographical indications in particular.

Article (3) by HENSELEIT, KUBITZKI and TEUBER (2009) addresses German consumers' preferences towards regional foods and their willingness to pay a premium (WTPP) for these foods. A dataset from a survey carried out by the Official Marketing Board of the German Agricultural and Food Industry (CMA) in October/November 2002 covering 3,000 German consumers was used. The dataset is representative for the German population in terms of location of residence, age and gender. Based on this data, binary logit models are estimated in order to explain the preference for regional food products and the willingness to pay a premium for such foods. The results highlight that most of the economic and socioeconomic variables do influence neither the preference nor the WTPP significantly. The only socioeconomic variable that is significant in both models is age, whereby elderly people tend to have a higher preference for local food than younger people. The most important determinants of a preference and WTPP for local food products seem to be psychographic factors as well as consumption and shopping habits. In terms of psychographic factors, cognitive and normative factors seem to be most important, i.e. the preference and WTPP is mainly driven by consumers' beliefs that these foods are fresher, more environment-friendly and that local farmers can be supported by purchasing these foods.

A similar research approach is chosen in Article (4) on Hessian apple wine. In order to investigate consumers' knowledge and perceptions of products that are protected as a geographical indication and the importance of this protection in the context of Hessian apple wine, an online survey with over 700 Hessian consumers was carried out in November 2008. The questionnaire was constructed by me, whereas the online survey was conducted by an external market research institute. One of the driving forces for this research was the application of the Hessian apple wine association for registration of Hessian apple wine as a protected geographical indication (PGI) in 2006. The survey results highlight that the protection granted by regulation EC No. 510/2006 and the corresponding labels, i.e. "Protected Designation of Origin" (PDO) and "Protected Geographical Indication" (PGI) are nearly unknown among Hessian consumers. However, this does not imply that consumers are not familiar with the concept of geographical indications per se. The results indicate that most consumers have at least a vague association with this term. With respect to Hessian apple wine, most consumers claim that the use of Hessian apples and traditional production methods

is important for them. Moreover, the majority of respondents assumes that by buying regional specialty products such as Hessian apple wine they can contribute to the survival of small-scale farmers and support the local economy. Rather analogue to (3), a binary logit model with the objective to analyze the determinants of a willingness to pay a premium for a protected apple wine was estimated. Again the results highlight the low explanatory power of sociodemographic and socioeconomic variables and the importance of psychographics factors. Despite the available monthly-income none of the included socioeconomic variables has got a significant impact on the probability that a consumer is willing to pay a premium for a protected apple wine. Again the main determinants are psychographic factors, especially the perception to support local small-scale producers by purchasing a protected apple wine. With respect to the producer side and their motivation to apply for registration under regulation EC No. 510/2006 the following results are noteworthy. It was hypothesised that the Hessian producer organization applied for protection in order to use the EU label in their promotional activites. This could not be proven by the empirical results from an in-depth expert interview. The primary motivation is to protect the quality of Hessian apple wine by preventing free-riding on the established reputation.

Both articles in this section provide empirical evidence on consumers' attitudes towards regional food in general and geographical indications in particular. Moreover, Article (4) adds empirical findings on producers' motivation to apply for registration under regulation EU No. 510/2006 in a Non-Mediteranean context. Consequently, section II contributes to the second research goal of providing empirical evidence for individual markets and products. Specifically, (3) extends the existing literature on regional foods in Germany by providing a causal analysis including a large range of possible determinants. The majority of previous studies did only carry out correlation analyses, relied on small sample sizes or included only a limited number of possible determinants. The same contributions apply to (4). Whereas previous studies on GI products in Germany were mainly descriptive (e.g. THIEDIG 2003) or focused on Bavarian products (e.g. PROFETA 2003), the study on Hessian apple wine offers a quantitative analysis based on a large consumer sample.

Section III   Empirical Evidence – Price Analyses

Section III provides empirical evidence with respect to the importance of country- and region-of-origin effects in the price formation of single-origin coffees. All four articles in this section are linked with each other by analyzing reputation effects in terms of price premia for high-quality coffees sold in internet auctions.

Several studies have investigated reputation price premia for different agricultural products, in particular for wine, showing that in most cases significant price premia can be due to the region of production (i.a. LANDON and SMITH 1998, SCHAMEL and ANDERSON 2003). Despite this rather comprehensive literature on wine, empirical evidence for collective reputation effects in the coffee market are nearly nonexistent. However, given the observable increasing product differentiation based on origin in the coffee market, empirical evidence for existing country- and region-of-origin effects seems to be very valuable with respect to evaluating the possible success of recently established or future geographical indications. Hence, all four articles add new empirical evidence on the importance of origin effects in the coffee market. The methodological approach chosen is the hedonic pricing analysis. This econometric tool enables the researcher to calculate implicit prices for product characteristics. The used dataset was compiled from Cup of Excellence (COE) auctions. The COE program combines a cupping competition and a subsequent internet auction for which all data with respect to auction prices, sold quantities and detailed information on product and producer characteristics are freely available. The procedure of COE auctions is illustrated in Figure 2. In the first place, coffee growers submit coffee samples which are then pre-screened by an expert jury, mainly by visual inspection. There are no regulations or requirements concerning who can submit coffee samples. Every coffee grower located in the country the COE is carried out can submit a coffee sample to take part in the competition. After the pre-screening the coffees are cupped and tasted by an expert jury. Each coffee is evaluated on a rating scale from 0 to 100. The overall rating, represented by the sensory quality score (SQS), is the sum of eight different sensory characteristics such as sweetness, acidity, flavor, balance and aftertaste. All coffees achieving a score of 84 points and above are awarded the Cup of Excellence and are offered in an online auction, a one-time event. International roasters and importers can bid on these coffees. After the auction is finished, the auction manager takes care of the payment and shipping process.

Figure 2 : **Cup of Excellence Procedure**
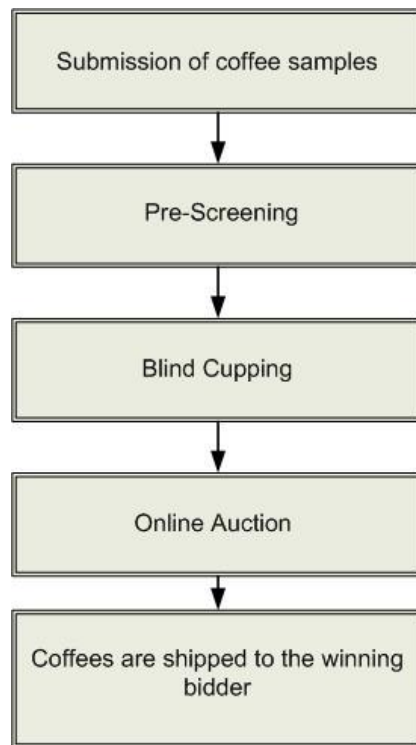
Source: Own presentation.

The first article in this section (Article (5)) was the first of all articles contained in this dissertation.[5] It investigates the importance of already legally protected geographical indications in the coffee market, a topic not addressed in previous research. The importance and interest in GIs for coffee is reflected in the fact that this paper has also been translated into Spanish in order to be published in the *Ensayos sobre Economia Cafetera,* a journal published by the Colombian Coffee Grower Federation (TEUBER 2007). This journal aims at publishing current research that is highly relevant for coffee growers in Colombia. The primary objective pursued in this article is the analysis of the current interest in origin-labels, particularly the use of legally protected geographical indications for coffee. A main result is that the interest in differentiating coffees based on their geographical origin in order to enter new lucrative niche markets can be found across all coffee-producing countries and is not limited to Colombia or Guatemala, two coffee-producing countries which are well-known for producing high-quality coffee. It can also be observed for countries usually not considered to be producers of high-quality coffee such as Honduras and Nicaragua. The econometric results in (5), however, document that coffees from origins without any established reputation in the marketplace are discounted even after having controlled for sensory quality differences by

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[5] Although it was the first paper written, it will be one of the last-published ones due to a long delay in the publication process.

incorporating the sensory quality score a coffee achieved in the cupping competition. Hence, even after controlling for quality differences in terms of the SQS coffees from Guatemala can achieve higher prices in the subsequent internet auctions. These significant origin effects can be interpreted as collective reputation effects, a phenomenon well known for wine.

Article (6) focuses on Honduran coffee and the legal protection of the term *Café de Marcala* as a geographical indication. Whereas article (5) analysed collective reputation effects primarily at the country level, article (6) adds empircal evidence on collective reputation effects at the regional level. Honduras was a chosen as a case study for the following reasons. The results derived in (5) highlighted that Honduran coffee is discounted compared to all other coffee origins. However, in 2005 Honduras established a geographical indication for Café de Marcala, the first legally protected GI in Honduras ever. These developments led to the research question whether coffees from the region Marcala can already achive higher prices than coffees from other Honduran growing regions due to this legal protection. The statistical results indicate that coffees originating in the region Marcala possess on average a higher sensory quality than coffees from other regions, reflected in higher sensory quality scores. Consequently, coffees from Marcala can achieve higher prices due to their higher quality. Though, no statistically significant effect could be found for the region itself. This indicates that the GI has not been able to build up a reputation yet, which would result in a significant region-of-origin effect even after controlling for quality differences. These results imply that the legal protection itself is not a guarantee for commercial success. Commercial success depends on many factors and as in the case of brands promotion and advertising are important. This is especially true for products targeting at export markets.

Articles (7) and (8) expand the analyses carried out in articles (5) and (6) primarily from a methodological point of view. In (7), a theoretical two-stage hedonic model consisting of hedonic price functions and an inverse demand function for the SQS is proposed and tested empirically. Data for the years 2003-2009 were used to estimate non-linear hedonic bid functions at the first stage in order to derive marginal implicit prices for the SQS. The first-stage results show that implict prices of the SQS differ significantly across auctions. This variance is then explained at the second-stage by estimating an inverse demand model. The major results derived in this article can be summarized as follows. First, if auction data is available and the assumption of totally inelastic supply of characteristics does hold, a complete hedonic model consists of nonlinear hedonic bid functions at stage one and inverse demand functions at stage two. Second, if implicit prices for certain characteristics such as the

SQS are assumed to vary across different markets, pooled hedonic price functions can just provide an accurate picture, if interaction effects are included. Third, the empirical results indicate that for coffees from origins with an established reputation for high quality the SQS is significantly less important than for countries with no established reputation in the coffee market so far.

A further refinement of investigating country-of-origin effects is proposed and tested in Article (8). In this article, a recursive two-stage model is estimated in order to test for direct and indirect origin effects. Moreover, it takes up the point of market segmentation that only very few hedonic studies on agri-food products have addressed so far. The motivation to estimate a recursive model consisting of a score and price regression is based on the idea that certain variables such as coffee variety and origin have got a direct impact on the auction price but also an indirect one via the score. Hence, it assumed that the score itself is a function of variables such as altitude, coffee variety and origin, reflecting the so-called *terroir* concept. Direct and indirect origin effects are often mentioned in consumer studies applying discrete choice or other stated preference approaches. However, to the best of my knowledge indirect and direct origin effects in a hedonic pricing model context have just been derived by SZOLNOKI (2007) for wine so far. The results for the coffee dataset indicate that the available variables can only explain a small extent of the score variance. Nevertheless, the results provide some interesting findings. First, a negative quanity-quality relationship could be proven for the score and the price regression stressing the value of scarcity and exclusiveness. Second, though significant origin effects are found in both regressions direct effects clearly dominate. Third, the market segmentation results indicate that distinct consumer markets for specialty coffee exist reflected in the different valuation of certain coffee characteristics. Especially direct origin effects, i.e. collective reputation effects, the importance of the SQS and the valuation of the first three ranks differ across consumer markets. These are important findings for coffee producers who want to differentiate their coffees based on origin.

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2   Publications

2.1 Section I: Theoretical Considerations

1. HERRMANN, R., T. MARAUHN and R. TEUBER (2008), Der Schutz geographischer Herkunftsangaben: Herausforderungen für agrarökonomische, rechtswissenschaftliche und interdisziplinäre Forschung. *Agrarwirtschaft*, Vol. 57 (7): 321-324.

2. HERRMANN, R. and R. TEUBER (2010), Geographically Differentiated Products. In: Lusk, J., J. Roosen and S. Fox (eds.), *The (Oxford) Handbook on the Economics of Food Consumption and Policy*. Oxford University Press, UK, forthcoming.

Der Schutz geographischer Herkunftsangaben:

Herausforderungen für agrarökonomische, rechtswissenschaftliche und interdisziplinäre Forschung

von

Roland Herrmann, Thilo Marauhn und Ramona Teuber

Justus-Liebig-Universität Gießen

Immer mehr geographische Herkunftsangaben für Agrarprodukte erhalten einen rechtlichen Schutz: Prosciutto di Parma, Lübecker Marzipan oder Roquefort sind nur einige besonders bekannte Beispiele. Damit ist der Schutz geographischer Herkunftsangaben auch ein wichtiges Thema für die internationale Handelspolitik geworden, denn diese können prinzipiell ein Instrument des Protektionismus darstellen. Auch in der ökonomischen, insbesondere agrarökonomischen, sowie der rechtswissenschaftlichen Diskussion ist das Thema verstärkt anzutreffen. Für die zunehmende Zahl an geschützten Herkunftsangaben gibt es einige wesentliche Gründe. Im Zusammenhang mit der wachsenden Globalisierung des Handels steigt die Qualitätsunsicherheit der Verbraucher, und Qualitätssignale wie die regionale Herkunft der Produkte gewinnen an Bedeutung. Im Zuge von Globalisierungsprozessen steigen typischerweise auch die Marktanteile von international bekannten und beworbenen Markenprodukten. Diesem Trend der Produktvereinheitlichung steht vielfach das Bedürfnis der Verbraucher nach Produktvielfalt und Individualität entgegen, so dass unter dem Einfluss der Globalisierung ebenso regionalen Produkten eine zunehmende Wertschätzung zukommt. Weil Verbraucher der regionalen Herkunft von Lebensmitteln einen Wert beimessen, ist es das weitergehende Ziel von Unternehmen und Regionen, mit geschützten geographischen Herkunftsangaben Märkte höherwertiger Agrarprodukte oder auch Nischenmärkte zu erschließen, um so einen Preissteigerungseffekt und eine höhere Wertschöpfung zu realisieren (PERI and GAETA 1999). In der Europäischen Union (EU) wird dieses Anliegen gewichtiger, da mit dem Abbau traditioneller Instrumente der Agrarpreispolitik und der stärkeren Liberalisierung der Märkte das Einkommen in der Agrar- und Ernährungswirtschaft zunehmend auf freien Märkten erwirtschaftet werden muss. Aber

auch in Entwicklungsländern wird die Produktion von sog. High-Value-Commodities für den Agrarexport oder für große heimische Nahrungsmittelmärkte mehr und mehr zu einer entwicklungspolitischen Grundsatzfrage (SWINNEN and MARTENS 2006). Mit der größeren Bedeutung von regionalen Herkunftsangaben für Verbraucherentscheidungen bei Lebensmitteln werden außerdem Fragen nach dem angemessenen rechtlichen Schutz wichtiger. So wächst mit der Globalisierung auch der Bedarf von Unternehmen und deren Heimatstaaten, ihre Produkte vor Nachahmung zu schützen und über rechtliche Regelungen einen Schutz des geistigen Eigentums zu erhalten.

Ob und unter welchen Bedingungen mit dem Schutz geographischer Herkunftsangaben tatsächlich ein zusätzlicher Einkommensbeitrag geleistet werden kann, wirft eine ganze Reihe von neuen Fragen für die agrarökonomische, die rechtswissenschaftliche und die interdisziplinäre Forschung auf. Einige wichtige Fragen dieser Art werden im Folgenden herausgearbeitet. Zunächst ist es jedoch notwendig, sich einige Grundbegriffe und Rahmenbedingungen der Regulierung geographischer Herkunftsangaben klarzumachen.

Geistige Eigentumsrechte sind ein zentrales Element der ökonomischen, politischen und rechtlichen Gestaltung von Globalisierungsprozessen. Dem trägt das 1994 im Rahmen der WTO vereinbarte Übereinkommen über handelsbezogene Aspekte der Rechte des geistigen Eigentums, das sog. TRIPS-Übereinkommen, Rechnung. Es verpflichtet alle WTO-Mitgliedsstaaten zur Einhaltung von Mindeststandards für sämtliche im Übereinkommen aufgeführten Arten geistigen Eigentums. Das TRIPS-Übereinkommen ist neben dem Madrider Abkommen von 1891 „über die Unterdrückung falscher oder irreführender Herkunftsangaben" und der Pariser Verbandsübereinkunft von 1983 zum Schutz des gewerblichen Eigentums die wichtigste multilaterale Vereinbarung, die sich ausdrücklich mit geographischen Angaben befasst, diese definiert und ein integriertes globales Schutzsystem für geographische Angaben etabliert (BUSCHE and STOLL 2007). Dabei legt Artikel 22 des TRIPS-Übereinkommens fest: „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 characteristic of the good is essentially attributable to its geographical origin". Aus dieser Definition wird deutlich, dass geographische Angaben besondere Bedeutung für landwirtschaftliche Produkte haben, wo naturräumliche Standortbedingungen wie Bodenqualität und Klima, aber auch traditionelles Wissen zu herkunftsspezifischen Produktionsverfahren und Produkten führen. Der Zusammenhang zwischen Herkunft und Qualität wird insbesondere im Weinbau betont, wobei das Beispiel

der Terroirdebatte verdeutlicht, dass der Zusammenhang zwischen Herkunft und Qualität durchaus kontrovers diskutiert wird (LÖHNERTZ 2008).

Neben der multilateralen Schutzregelung für geographische Herkunftsangaben bestehen sehr unterschiedliche regionale, nationale und insbesondere supranationale Schutzsysteme. Einen besonderen Schutz erfahren geographische Herkunftsangaben im Recht der Europäischen Gemeinschaft, wenn ein nachweisbarer Zusammenhang zwischen dem geographischen Ursprung und den qualitätsbestimmenden Eigenschaften besteht. Eine Eintragung der Herkunftsangabe ist nach Verordnung (EG) Nr. 510/2006 des Rates vom 20. März 2006 zum Schutz von geografischen Angaben und Ursprungsbezeichnungen für Agrarerzeugnisse und Lebensmittel, mit der die Verordnung (EWG) Nr. 2081/92 des Rates vom 14. Juli 1992 zum Schutz von geographischen Angaben und Ursprungsbezeichnungen für Agrarerzeugnisse und Lebensmittel abgelöst wurde, als „geschützte Ursprungsbezeichnung" (g.U.) oder abgeschwächt als „geschützte geographische Angabe" (g.g.A.) möglich, in englischer Sprache „protected designations of origin" (PDO) oder „protected geographical indications" (PGI). Die Eintragung einer geschützten Ursprungsbezeichnung ist möglich, wenn ein Erzeugnis „seine Güte oder Eigenschaften überwiegend oder ausschließlich den geografischen Verhältnissen einschließlich der natürlichen und menschlichen Einflüsse verdankt und … in dem abgegrenzten geografischen Gebiet erzeugt, verarbeitet und hergestellt wurde" (Art. 2 Abs. 1 lit. a VO 510/2006). Eine geschützte geographische Angabe kann bei einem Produkt eingetragen werden, bei dem sich „eine bestimmte Qualität, das Ansehen oder eine andere Eigenschaft aus diesem geografischen Ursprung ergibt und das in dem abgegrenzten geografischen Gebiet erzeugt und/oder verarbeitet und/oder hergestellt wurde" (Art. 2 Abs. 1 lit. b VO 510/2006). Damit müssen bei einer geschützten Ursprungsbezeichnung alle Produktionsschritte in der entsprechenden Region erfolgen, während bei der geschützten geographischen Angabe nur eine der Produktionsstufen in der Region stattfinden muss. Alternativ kann nach Verordnung (EG) Nr. 509/2006 des Rates vom 20. März 2006 über die garantiert traditionellen Spezialitäten bei Agrarerzeugnissen und Lebensmitteln eine „garantierte traditionelle Spezialität" eingetragen werden. Diese bezieht sich nicht auf eine bestimmte geographische Region. Vielmehr wird eine bestimmte Zusammensetzung bzw. ein traditionelles Herstellungs- oder Verarbeitungsverfahren geschützt.

Die agrarökonomische Forschung hat sich der Analyse von Schutzmaßnahmen für geographische Herkunftsangaben nicht mit der gleichen Intensität gewidmet wie z.B. staatlichen Instrumenten der Agrarpreispolitik. Allerdings liegen Beiträge vor zur Frage, inwieweit der Staat einen rechtlichen Schutz für geographische Herkunftsangaben

gewährleisten sollte und ob eine Absatzförderung von Produkten mit geographischen Herkunftsangaben aus gesamtwirtschaftlicher Sicht erwünscht ist (BECKER 2000). Es ist auch bekannt, dass eine Tradition des Schutzes von geographischen Ursprungsbezeichnungen und geschützten geographischen Angaben vor allem in Frankreich und Italien besteht. Neuere ländervergleichende Arbeiten zeigen überdies, dass verschiedene EU-Länder ganz unterschiedliche Schwerpunkte in der Qualitätspolitik bei Lebensmitteln setzen: Während in südlichen Ländern der Schutz geographischer Herkunftsangaben dominiert, setzen andere EU-Länder mehr auf die Förderung des ökologischen Landbaus oder die Einführung von Qualitätssicherungssystemen (IBIDEM). Anhand von Fallstudien wird in der marketingorientierten Literatur untersucht, welche Anforderungen an das Marketing bei einer erfolgreichen Förderung von Agrarprodukten durch den Schutz geographischer Herkunftsangaben zu stellen sind (z.B. THIEDIG 2003). In der Verbraucherforschung findet sich außerdem ein relativ breiter Befund dazu, wie regionale Herkunftsangaben das Verbraucherverhalten bei Lebensmitteln beeinflussen (u.a PROFETA 2006; VAN DER LANS et al. 2001; VERBEKE and ROOSEN 2009).

Fasst man verschiedene Wirkungsanalysen zusammen, kann man durchaus von einem zusätzlichen Einkommenspotenzial durch geschützte Herkunftsangaben für die Agrar- und Ernährungswirtschaft ausgehen und auch von einer möglichen Steigerung des Wohlstands, wenn die geschützten Herkunftsangaben Qualitätsunsicherheit und Suchkosten vermindern (HAYES et al. 2004; LENCE et al. 2007). Allerdings fehlen modellbasierte, quantitative Studien über die Effekte geschützter Herkunftsangaben noch sehr weitgehend. In solchen Studien wäre z.B. zu berücksichtigen, dass im Rahmen des Europäischen Schutzsystems zusätzliche Kosten durch Registrierung und Implementierung des Herkunftsschutzes einschließlich zusätzlicher Kosten der Qualitätssicherung entstehen. Informationen über die Grenzkosten des Herkunftsschutzes und der Qualitätssicherung im Rahmen von geschützten Herkunftsangaben fehlen weitgehend, sind aber für die Wirkungen des Herkunftsschutzes von entscheidender Bedeutung. Analoges gilt für Werbe- und Kreuzwerbeelastizitäten, die den Erfolg der Werbung für Produkte mit geschützten Herkunftsangaben bestimmen. An dieser Stelle könnte aber die zukünftige Forschung an Ergebnissen der breiten Literatur zur Ökonomik von Gemeinschaftswerbung anknüpfen, die zu wesentlichen Parametern wie Werbeelastizitäten, Nutzen-Kosten-Relationen etc. in vielen Fällen relativ einheitliche Ergebnisse aufgezeigt hat (u.a. KAISER et al. 2005). Vielfach wurde dort die Annahme unvollkommener Märkte in Modelle des gesamten Vermarktungskanals eingeführt, und Modelle dieser Art wären auch

sehr relevant, um die Allokations- und Verteilungswirkungen von geschützten Herkunftsangaben aus der Sicht von Landwirten, Verarbeitern und Handel zu ermitteln.

Des Weiteren finden sich bisher nur wenige agrarökonomische Beiträge, die sich der Beurteilung unterschiedlicher Schutzsysteme aus der Sicht der Verbraucher oder Produzenten gewidmet haben. Selbst wenn es auf der Verbraucherseite eine ähnliche Wahrnehmung von geschützten Ursprungsangaben und geschützten geographischen Angaben nach VO Nr. 510/2006 geben sollte, so ist doch deren Anforderungsniveau auf der Angebotsseite sehr unterschiedlich. Die Grenzkosten der Antragstellung und der Implementierung einer g.U. werden in den meisten Fällen höher sein als bei einer Anerkennung als g.g.A.. Es stellen sich daher viele, bisher noch unbeantwortete Fragen zu den ökonomischen Anreizen, die Teilnehmer an einem solchen Schutzsystem veranlassen, sich für das eine oder andere System zu entscheiden. Es stellt sich auch die polit-ökonomische Frage, warum die Politikstrategien in der Qualitätssicherungspolitik zwischen EU-Ländern so unterschiedlich ausfallen und warum der Schutz geographischer Herkunftsangaben so verschieden große Bedeutung erfährt.

Auch Entwicklungsländer haben in jüngster Zeit einige Erfolge bei geschützten Herkunftsangaben vorzuweisen, so z.B. die Zulassung von Café de Colombia als g.g.A. im europäischen Gemeinschaftsrecht (Verordnung (EG) Nr. 1050/2007 der Kommission vom 12. September 2007). Weitere interessante Fallstudien werden in der Literatur vorgestellt. So befasste sich eine von der EU-Kommission geförderte international besetzte Forschergruppe im Rahmen des SINER-GI (Strengthening International Research on Geographical Indications)-Projektes mit den rechtlichen und ökonomischen Aspekten von geographischen Herkunftsangaben. Im Rahmen dieses Projekt wurden auch mehrere Fallstudien zu geographischen Angaben in Entwicklungsländern durchgeführt, z.B. in Mexiko zu Cotija-Käse (Website: http://www.origin-food.org). In einer umfassenden Studie von BRAMLEY and KIRSTEN (2007) wurde zunächst eine Bestandsaufnahme zum Potenzial geschützter geographischer Herkunftsangaben für Entwicklungsländer erstellt und ein methodisches Konzept zu deren Analyse und Bewertung vorgeschlagen. Interessant ist, dass eine Reihe von Studien mit der hedonischen Analyse der Frage nachgehen, wovon bei Märkten mit Produktdifferenzierung Preisaufschläge für Entwicklungsländer ausgehen und inwieweit die Herkunft zu einem Mehrpreis führt (TEUBER 2009; DONNET, WEATHERSPOON and HOEHN 2008). Vielversprechend wäre, die Ergebnisse hedonischer Analysen weiterzuentwickeln bei der Frage, inwieweit die höhere Zahlungsbereitschaft für eine geschützte Herkunftsbezeichnung zur dauerhaften Steigerung der Einkommen und einer Förderung des ländlichen Raums in Entwicklungsländern genutzt werden kann. Studien dieser Art fehlen

noch weitgehend und trotz dieser ersten Ansätze sind die Forschungslücken bei geographischen Herkunftsangaben für Produkte aus Entwicklungsländern noch recht groß.

In der rechtswissenschaftlichen Literatur gibt es ausführliche Arbeiten zu den Schutzstandards für geographische Angaben auf internationaler Ebene (CORTÉS MARTÍN 2004; EVANS and BLAKENEY 2006) und auf nationaler Ebene (AHUJA 2004; ASLAND 2005), wobei die Ziele der Schutzsysteme und die (beabsichtigten und unbeabsichtigten) Wirkungen der Schutzsysteme im Vordergrund stehen. Eine systematische rechtsvergleichende Analyse gibt es bislang nicht, auch wenn erste Teilstudien in diese Richtung unternommen worden sind (O'CONNOR 2003). Rechtsvergleichende Arbeiten beschäftigen sich vor allem mit den unterschiedlichen Regelungsansätzen. So integriert das US-amerikanische Recht den Schutz geographischer Angaben weitgehend in das bestehende Marken(schutz)recht, während das europäische Gemeinschaftsrecht einen Sondertatbestand zum Schutz geographischer Herkunftsangaben geschaffen hat (ROSE 2007; IBELE 2009). Offene Fragen betreffen darüber hinaus die Abstimmung der universellen und regionalen Schutzsysteme aufeinander (SCHÜSSLER 2009), um zumindest im Hinblick auf die Regelungsziele ein in sich schlüssiges Mehrebenensystem zu entwickeln. Darüber hinaus wird die Bedeutung des Streitbeilegungsverfahrens im Rahmen der WTO in Anbetracht des Panel-Berichts aus dem Jahre 2005 zu durchleuchten sein (WTO 2005). Schließlich stellt sich die Frage, ob und inwieweit den Interessen der Entwicklungsländer mit einer im Rahmen der Doha-Runde diskutierten Verschärfung der TRIPS-Standards gedient ist (MARAUHN 2006).

In mehreren Konferenzen, deren Ergebnisse in Kürze publiziert werden, hat sich herauskristallisiert, dass eine interdisziplinäre Kooperation zu geschützten geographischen Herkunftsangaben zwischen Agrarökonomie und Rechtswissenschaften erfolgsversprechend und notwendig ist (HERRMANN and MARAUHN 2009; WIPO 2008). So führen unterschiedliche Schutzsysteme zu unterschiedlichen Allokations- und Verteilungswirkungen. Die vergleichende ökonomische Analyse kann damit einen wesentlichen Beitrag zur Entwicklung des optimalen rechtlichen Schutzrahmens leisten. Umgekehrt kann die aus rechtswissenschaftlicher Sicht betriebene vergleichende Analyse unterschiedlicher rechtlicher Rahmenbedingungen auf nationaler oder regionaler Ebene ebenso wie die Entwicklung von Modellgesetzen die Gestaltung ökonomischer Wirkungsanalysen und insbesondere die Wahl geeigneter Politikszenarien beeinflussen und anregen.

Es bieten sich aber auch weitere interdisziplinäre Kooperationen an, insbesondere zu den Naturwissenschaften, die aus unserer Sicht nicht ansatzweise genutzt sind. So wird beispielsweise beim Schutz geographischer Herkunftsbezeichnungen immer wieder der

Zusammenhang zwischen Produktqualität und Herkunft betont. Während im Rahmen des TRIPS-Übereinkommens die Unterscheidbarkeit des geschützten Produktes im Sinne einer horizontalen Produktdifferenzierung im Vordergrund steht, betont das europäische Gemeinschaftsrecht eher die höherwertige Qualität eines geschützten Produkts, d.h. es wird von einer vertikalen Produktdifferenzierung ausgegangen. Naturwissenschaftler verfügen über Methoden, wie die Multikomponentenanalyse (DÜRING 2008) oder stabile Isotopen, um die Besonderheiten einer regionalen Herkunft bei bestimmten Lebensmitteln objektiv zu messen. Dies könnte bei der Frage, ob die regionale Herkunft tatsächlich ein Qualitätsmerkmal bei bestimmten Lebensmitteln und damit schützenswert ist, erheblich weiterhelfen. Genau diese Frage ist sowohl in ökonomischen wie rechtswissenschaftlichen normativen Analysen zum geographischen Herkunftsschutz von großer Bedeutung.

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Kontaktautor

PROF. DR. ROLAND HERRMANN
Institut für Agrarpolitik und Marktforschung der Justus-Liebig-Universität Gießen
Senckenbergstr. 3
35390 Gießen
Tel.: 0641-99-37020; Fax: 0641-99-37029
E-Mail: Roland.Herrmann@agrar.uni-giessen.de

Chapter 36

Geographically Differentiated Products

by Roland Herrmann and Ramona Teuber

Institute of Agricultural Policy and Market Research,

Justus-Liebig-University Giessen, Germany

1 Introduction

Origin-based marketing strategies for foods and agricultural products have got a long history and some of the most renowned agri-food products in the world have built up their reputation based on their geographical origin. Prominent examples are Parmigiano-Reggiano and Champagne. However, product differentiation based on the geographical origin has gained markedly in importance in recent years. This is reflected in the steadily growing number of foods marketed with an origin-linked quality label. The increasing interest in origin labelling is not restricted to European countries: a growing number of geographically differentiated products can also be observed for Non-European countries as the examples of Washington apples, Darjeeling tea or Café de Colombia illustrate (FINK and MASKUS 2006). Moreover, product differentiation based on origin can be observed across all product categories, and even in markets traditionally considered to be homogenous, "decommodification" has evolved as a strategy. This development is especially apparent in international agricultural trade, where trade in differentiated high-value agri-food products is becoming increasingly important (WORLD BANK 2007).

The reasons for this surge of origin-labelled products are manifold. Firstly, due to rising income, increasing concerns about food quality and food safety issues and a growing desire for variety, consumers' demand for high quality and regional specialty products has risen (BRAMLEY, BIÉNABE and KIRSTEN 2009). A growing number of consumers place value on the traceability of the foods they eat and, in addition, origin-labelled foods are considered to be a countermovement gainst the increasing globalisation of food chains with international brands (BROUDE 2005). Authenticity and cultural heritage have become important product characteristics in food demand, at least for certain consumer segments. Secondly, the gradually changing pattern in governmental agricultural policy from direct commodity support to support of farmers through payments that are coupled to food safety and food quality standards has fuelled the interest in geographical indications for agricultural products. Particularly in the European Union, high-quality products with a strong link to a certain geographical region are considered useful tools in rising farmers' income and fostering rural development, especially in less-favoured production areas (JOSLING 2006).

However, geographical indications (GIs) are not without controversy.[1] This is mainly due to the fact that geographical indications are both an agricultural policy instrument as well as an intellectual property right (VAN CAENEGEM 2004). In general, GIs are protected at the

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[1] In this chapter the term geographically differentiated products will be used to refer to all products that are differentiated based on their geographical origin, whereas the term geographical indication is used to refer to products that possess a certain quality/origin link (see section 2 for more details).

level of national jurisdictions and these jurisdictions differ quite remarkably across countries. Countries with a more lenient approach to protect GIs, such as the United States or Australia, fear that countries with a rather strict approach, particularly the EU, could use GIs as non-tariff trade barriers at the international level (FINK and MASKUS 2006). The debate on GIs is not just a debate on differing laws and regulations. To some extent it is a difference in paradigms with respect to which functions geographical indications should fulfil in the marketplace.

Given this background, the economics of geographically differentiated products will be summarised and surveyed in this chapter. The rationale for regulation will be presented and the likely economic implications of regulation on geographical indications will be elaborated by use of various theoretical approaches. Furthermore, we will survey and assess the broad empirical literature on consumer preferences for geographically differentiated products and on the socioeconomic impacts of geographical indications. The chapter is organised as follows. Section 2 will define the concepts of geographically differentiated products and geographical indications and outline briefly the different legal regulations in force. Thereafter, the economic rationale for establishing and protecting GIs as well as the different paradigms prevailing in the EU and the US are presented and discussed in Section 3. Moreover, economic impacts of protecting and promoting GIs are analysed theoretically. Section 4 reviews and synthesises the available empirical evidence on consumers´ willingness to pay for origin labels and the socioeconomic impacts of GIs. The analyses comprise a large number of different approaches and case studies reflecting the array of research questions caused by geographically differentiated products. Section 5 concludes and provides an outlook on future research.

2   Geographically Differentiated Products – Definitions and Regulations

In fact, the term geographically differentiated products is rather self-explanatory. It refers to products which are differentiated from other products based on their origin. However, looking at this term in more detail, it turns out that there is no single widely accepted definition of geographically differentiated products. In the literature we find numerous terms for these products that are used more or less interchangeably: origin-labelled products, origin-based products, country brands, geographical indications, regional specialities, regionally differentiated products, regionally denominated products. Another closely related term is local foods. Local foods are mostly marketed and promoted by their geographical origin and, thus, can be classified as geographically differentiated products. Geographically differentiated

products, however, are not necessarily local foods. Café de Colombia and Parma ham are definitely geographically differentiated products but given the large export share of these products they will not be perceived as local foods by consumers.

If we apply a broad definition of geographically differentiated products, all products that are differentiated based on their origin are covered by this term. Such a broad definition encompasses all labelling and branding schemes referring to the geographical origin like the well-known "Made in…" –labels. These labels do usually not require any specific link between the geographical origin and the product's quality. However, there are examples where country-of-origin labels are used to create country brands like in the case of New Zealand lamb (CLEMENS and BABCOCK 2004). A country brand as any other brand tries to signal a constant and high quality to consumers and it is therefore often coupled to certain quality standards. Consequently, a quality-origin link is established. This is much in line with the definition of geographical indications in the agreement on Trade-Related Aspects of Intellectual Property Rights (TRIPS)[2], which came into force in 1995. Article 22 of TRIPS defines geographical indications (GIs) as follows: *"Geographical indications are indications which identify a good originating in the territory of a Member, or a region or locality in that territory, where a given quality, reputation or other characteristic of the good is essentially attributable to its geographical origin."* Accordingly, products labelled with a GI have one important feature in common; there must be a specific link between the place of production and the product´s quality, characteristics or reputation. This quality-origin nexus is sometimes referred to with the French term *terroir.* The *terroir* concept is based on the idea that special geographical microclimates yield food products with a unique flavour profile that cannot be replicated elsewhere (BARHAM 2003; RAUSTIALA and MUNZER 2007). In a narrow sense, *terroir* refers to a physical environment including soil, elevation, climate and related factors only. In a broader sense, it also includes the human environment, that is traditional knowledge, local skills and processing practices (BROUDE 2005).

Although the TRIPS agreement provides a general framework for the protection of geographical indications, it does not provide details on how each member country should implement its GI system. Essentially, two alternative regulation approaches can be observed across countries. The first one protects GIs within the common trademark law, whereas the second one provides protection through a *sui generis* system, which is a system especially designed for protecting geographical indications (LOVENWORTH and SHINER 2008; BRAMLEY, BIÉNABE and KIRSTEN 2009).

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[2] The TRIPS agreement is not the first international agreement on GIs, but the most important one. For an overview about the historical development of GI protection see Mosoti and Gobena (2007), Chapter 5.

In most countries that follow the first approach, for example the United States, Canada, Australia and South Africa, geographic terms are protected as certification marks and less frequently as collective marks or trademarks. A certification mark refers to a 'word, symbol, name or device' used by someone other than the owner of the certification mark to certify certain product characteristics, such as the geographical origin or certain processing practices. Certification marks are typically owned by governmental institutions.

Sui generis systems were originally developed in Roman law countries (i.e., France, Italy, and Spain) and are currently in force in the European Union (EU regulation No. 510/2006) and in several Asian and Latin American countries (WIPO 2007).[3] The registration of a product under a *sui generis* system requires that a specific link between the product's quality and its geographical origin must be proven, accompanied by a code of practice which specifies the way the product has to be produced. Once the product name is protected, it cannot be used by any other producer who is not located inside the specific region and who does not produce according to the registered product specification. On the other hand, any producer located in the specific area and whose products comply with the defined product standards cannot be excluded from using the label.

However, national regulations do not offer protection against fraud in foreign markets. In order to protect a GI in foreign markets, producer groups have to apply for registration and protection in each export market separately. In some cases, bilateral and multilateral agreements are in force covering the protection of certain geographical names (WTO 2004).[4]

The interrelation between the different concepts we will cover in this chapter is illustrated in Figure 1. The broadest concept is geographically differentiated products. A sub-group are GI products, which are products that possess a certain quality-origin nexus, and among these products we speak of protected GI products if these products are protected through one of the above presented legal systems.

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[3] For example Vietnam, Mongolia, Colombia, and Costa Rica.
[4] One prominent example is the bilateral agreement between the European Commission and Australia on trade in wine in which both countries agreed to protect each other's geographical indications. Consequently, Australian producers had to stop using terms such as Burgundy, Champagne and Port for their wines.

Figure 1:   Taxonomy and Interrelation between Different Types of Products Linked to the Geographical Origin
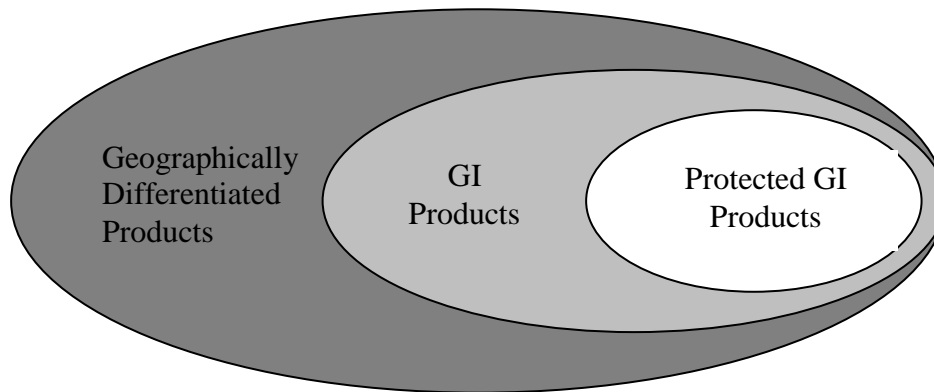
Source: Own presentation.

In reality the classification of a product either as a geographically differentiated product or a geographical indication is not always as straightforward and clear-cut as in theory. The definition of GIs and the underlying *terroir* concept has been questioned by several researchers and it is still a widely debated topic (i.a. GERGAUD and GINSBURGH 2008; RAUSTIALA and MUNZER 2007; TEIL 2009). The discussion centres on the question whether natural conditions or whether human skills and established quality standards that are transferable to other regions are the important factors in determining product quality. Moreover, in this context subjective quality, that is perceived quality by consumers, is a major point. Even if there is no detectable quality-origin link from an expert's point of view, consumers can still perceive the product as a higher quality product due to its geographical origin.[5]

3   Policies Towards Geographically Differentiated Products: Rationale, Options, Impacts

3.1   Rationale for Regulation

How can it be justified that geographic names are given legal protection? The main economic rationale is that consumers may suffer from quality uncertainty in an unregulated market. Consumers are typically less informed about the quality of a product than producers and, thus, asymmetric information on product quality arises. In an unregulated market, high and low qualities are often indistinguishable for consumers and may sell at the same price. AKERLOF (1970) has shown in his "lemon" example that under such circumstances high qualities may be crowded out by low qualities.

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[5] We will elaborate on this point in sections 3.3.3 and 4.1.2 where we present the theoretical framework and empirical evidence with respect to consumers' preferences for geographically differentiated products.

If a higher quality of a good is due to its geographical origin, the legal protection of the geographical indication as a distinctive sign may avoid this market failure. Consumers of the high-quality good may gain from regulation: By legal protection and an associated label, the geographical origin turns from a credence characteristic into a search characteristic. Consequently, the protection of geographical-origin labels will reduce consumers' search costs and may raise consumers´ welfare.

This argument is also taken up in the EU regulation on GIs where it is stated that "in view of the wide variety of products marketed and 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" (EUROPEAN COMMISSION 2006, L 93/12,). As far as quality information for consumers raises demand for high-quality foods, prices will increase and producer welfare will improve as well.

Apart from these primary effects of better information for consumers, producers of the high-quality good will benefit from the intellectual property right that is introduced to protect the origin-quality link against misuse by non-original producers (FINK and MASKUS 2006). Producers´ collective reputation is secured against counterfeiting and it may be avoided that high quality is crowded out by low quality in the sense of Akerlof. Due to the intellectual property right, demand for the high-quality food is kept above the level of a hypothetical, unregulated market on which low-quality imitations would erode the price premium and the average product quality would fall. In the EU, additional agricultural and rural policy objectives are attributed to these medium-run implications of GI regulation. The preamble of the EU regulation on geographical indications states that "the promotion of products having certain characteristics could be of considerable benefit to the rural economy, particularly to less-favoured and remote areas, by improving the incomes of farmers and by retaining the rural population in these areas" (EUROPEAN COMMISSION 2006, L 93/12).

Further policy goals pursued by the protection of geographical indications are the conservation of biodiversity, which includes the protection of animal breeds, plant varieties, and landscapes, and cultural diversity, which refers to traditional knowledge, skills and practices (BROUDE 2005; BERARD and MARCHENAY 2006). The policy objectives of protecting diversity and fostering rural development are considered to be especially relevant for developing countries. In these countries biological and cultural diversity is assumed to be endangered by globalisation processes and small-scale farmers often lack the resources to establish other distinctive signs to differentiate and promote their products (ADDOR, THUMM and GRAZIOLI 2003).

3.2 Different Paradigms on Regulation

Very different paradigms on regulation do exist, with the European and the American positions being most controversial. The different paradigms on policies towards geographical indications have been discussed extensively from an economic point of view (BECKER 2009; BUREAU and VALCESCHINI 2005; JOSLING 2006) and from an international law point of view (IBELE 2009; GEUZE 2009).

In Europe, especially in the Mediterranean countries, small-scale production is still common and there is a strong identification between foods and the place of production. In these countries geographical indications are considered to protect traditional production methods and support rural economies while at the same time ensuring high-quality production. Thus, in the European Union the protection of GI products is viewed as a means of providing credible quality information to consumers in increasingly globalized markets on the one hand and support high-quality producers for whom the geographical origin is the key to the quality of the product on the other hand. Consequently, the regulation on GIs has become a major pillar of the EU's food quality policies besides organic certification and food quality assurance systems (BECKER 2009). The US position is quite different. Geographical indications are not considered as a special class of intellectual property rights and protection is granted within the existing trademark law. Trademarks are seen as an effective and sufficient instrument to protect intellectual property rights for geographic names.

The "war on terroir", as JOSLING (2006) puts it, is consistent with differential views towards agriculture and agricultural policy in the U.S. and in Europe. JOSLING (2002) distinguished four different agricultural policy paradigms in industrialised countries: (i) the dependent agriculture paradigm; (ii) the competitive agriculture paradigm; (iii) the multifunctional agriculture paradigm, and (iv) the global agriculture paradigm. Moreover, he identified shifts away from the dependent agriculture paradigm, according to which structural disadvantages of agriculture compared to the nonfarm sector had been stressed as well as the need for political support to agriculture. The U.S. moved towards the competitive agriculture paradigm claiming that agriculture is and should be able to compete on unregulated markets without governmental support. Consequently, the U.S. point of view on GIs is fully consistent with this orientation. In the EU, however, the multifunctional agriculture paradigm came to the fore. Within a more differentiated view on policy, agriculture is supposed to provide public goods for the society, like preservation of the countryside, rural development and social and economic cohesion. This development explains why the protection of GIs has become a central part of EU's food quality policy.

3.3 Impacts of Regulation: Theoretical Approaches and Results

Geographically differentiated products have been analysed within a rather large number of different disciplines such as law, sociology, marketing and economics. For an economic assessment of policies towards these products, three methodological approaches and branches of the literature are particularly relevant: (i) price and welfare analyses based on market models of origin-labelled products; (ii) welfare analyses of GI regulations within models of vertical product differentiation; (iii) consumer studies on attitudes towards geographically differentiated products.

3.3.1 *Market, Price and Welfare Effects of Regulation*

It is straightforward to think about economic implications of regulations on geographical indications in terms of their price, market and welfare impacts. Consequently, quite a number of studies like those on the economics of commodity promotion (KAISER et al. 2005; ALSTON, FREEBAIRN and JAMES 2003; ALSTON et al. 2005) have utilised the standard supply-and-demand and welfare framework. In studies on labelling and quality information policy (FOSTER and JUST 1989; JUST, HUETH and SCHMITZ 2007, Chapter 11; KAISER 2010), this framework has been extended by findings from the economics of advertising and information (DIXIT and NORMAN 1970; NELSON 1974; BECKER and STIGLER 1977; BECKER and MURPHY 1993; ACKERBERG 2001) when analysing policy impacts on consumer welfare and consumer preferences. Relevant is also the literature on the economics of trademarks and intellectual property rights (LANDES and POSNER 1987; BARNES 2006), the economics of labelling (DRICHOUTIS, NAYGA and LAZARIDIS 2010; MARETTE and ROOSEN 2010) and the literature on reputation (SHAPIRO 1983; GROSSMAN and SHAPIRO 1988; TIROLE 1996; WINFREE and MCCLUSKEY 2005).

Figure 2 illustrates market and welfare impacts of a regional-origin label that provides credible information to consumers on the origin-quality link. A competitive market is posited for the GI product.

Figure 2: **Price and Welfare Implications of Labelling and Protection of a Geographical Indication**
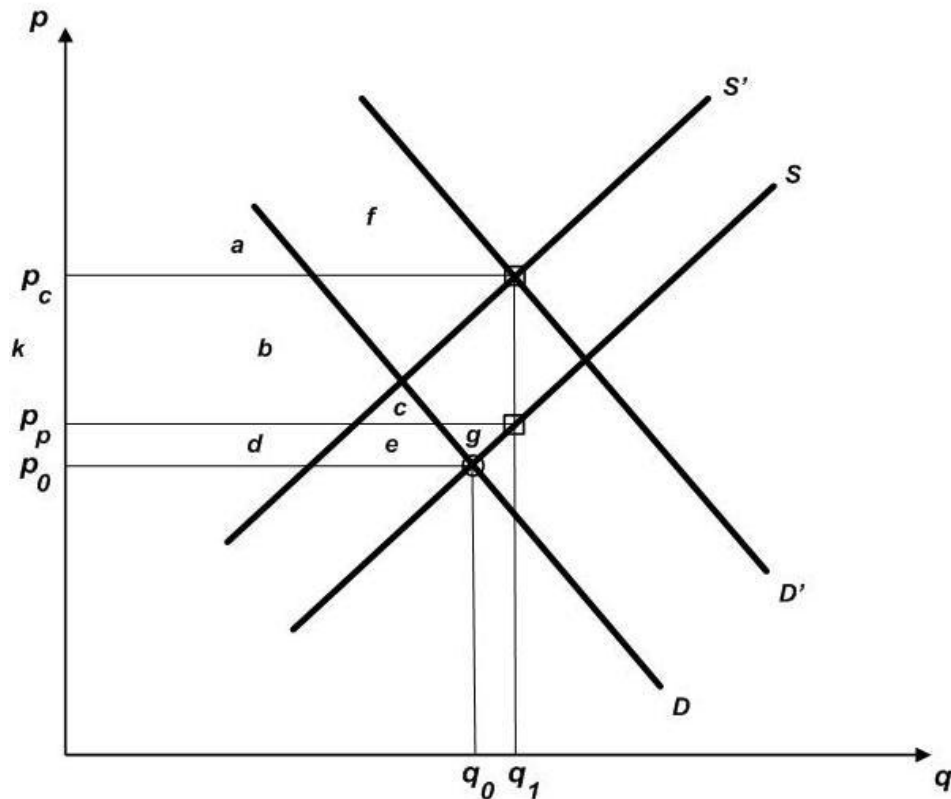
Source: Own presentation.

Suppose that a GI product faces a demand curve *D* in the initial situation without regulation. The supply curve for the GI product is *S* and the equilibrium price and equilibrium quantity are p_0 and q_0, respectively. Now the geographical indication is protected by either of the legal means presented in section 2. We posit further that the club of producers supports the label by informative advertising, which is financed by the club in the form of a check-off system. The demand curve for the GI product shifts from D to D´ if protection and promotion are effective. At the same time, the costs of GI producers rise due to compliance with quality standards as well as additional certification and promotion costs. Hence, the supply curve shifts from *S* to *S´*. In the new market equilibrium, the *S´* curve and the *D´* curve intersect at a new price p_c and a new quantity q_1. The price p_c is the consumer price of the protected GI product. The producer price p_p is the net price that ranges by the marginal costs of participating in the collective production and marketing of the GI product, i.e. *k*, below the consumer price p_c.

Figure 2 reveals first the price premium arising from GI regulation. This is a key concept for deriving the consequential welfare impacts. It can be seen that the shift of the demand curve exceeds the shift of the supply curve. This is a necessary condition for the producer club to gain from the protection and promotion of the geographical origin. Given the

assumptions of credible quality information for consumers and a competitive market, the price premium due to GI regulation is (p_p - p_0). It is based on the comparison of producer prices with and without regulation.

It should be noted here that the concept outlined above has rarely been applied consistently in the empirical literature on GI products. In most cases, the observed situation with GI regulation was not compared with a hypothetical and modelled situation without GI regulation. Other, more pragmatic benchmark situations have typically been used and results have to be interpreted with care. Sometimes, the situations before and after GI registration were compared. In the before–after approach, the ceteris-paribus condition is typically not fulfilled as other price determinants apart from regulation will have changed over time, too. In other cases, a price premium was derived by contrasting the price of the origin-labelled good with that of its generic counterpart. Although such comparisons have been categorised as with-and-without approaches (REVIRON 2009), they are not. Observed prices for two different markets, namely the regulated and the unregulated markets, are utilised when computing the price premium rather than prices in one market with and without regulation. The computed price premium in such pragmatic approaches may be very different from that outlined in Figure 2. They also suffer from the fact that GI regulation will typically affect the price ratio between the origin-labelled and the generic product (ANDERS, THOMPSON and HERRMANN 2009).

Apart from the price premium, welfare impacts of the described GI regulation on the market of the high-quality product may be derived. The implications of quality information on consumer welfare in particular are nontrivial. It has been shown in the economics of information that welfare impacts of quality information on consumers depend on whether (i) the information provided is true or false; (ii) consumers´ perceptions on quality were true or false prior to the information provided; (iii) preferences change due to quality information or not (JUST, HUETH and SCHMITZ 2004, Chapter 11).

If the provided information on the origin-quality link is fully credible and quality uncertainty is present in the situation without this information, it can be posited that GI regulation shifts demand for the GI product from D to $D´$. $D´$ represents planned demand if correct information is provided by the GI regulation. The following welfare effects for consumers will arise. At any price, consumers would have been at a suboptimal level of consumption without the quality information: i.e. on D rather than $D´$. With the move from the old to the new equilibrium, quality information raises consumption to the optimum level, that means from q_0 to q_1. Given Marshallean demand functions, the net welfare effect on

consumers can be derived if consumer surplus with protected geographical indications, *(a + f)*, is compared with consumer surplus in the situation without regulation, *(a + b + c + d + e)*. The change in consumer surplus is *(f - b - c - d - e)*. There are two components of the net welfare effect on consumers. Firstly, there is a welfare gain by raising consumption at the new price p_c to the optimal level. This additional consumer surplus illustrated by area *f* is the value of quality information for consumers at the new equilibrium price. It can also be interpreted as consumers' welfare gain due to a reduction in search costs. Secondly, as the price rises from p_0 to p_c, a price-induced loss of consumer surplus by *(b + c + d + e)* arises. Consequently, consumers can experience a net gain if the reduction in search costs overcompensates the loss due to the price increase, that is if *f > (b + c + d + e)*.

The impact of quality information on producer welfare is a function of the price premium producers receive. Producers will gain area *(d + e + g)* in Figure 2 as their net price increases due to protection and promotion of the geographical indication. As far as the supply shift, that is the additional costs of participating in the labelling system, is lower than the demand shift, the welfare effect on producers will remain positive.

If we aggregate welfare impacts on consumers and producers, the welfare impact of a GI regulation is *(f + g − b − c)*. This aggregate welfare impact will be positive, as *f > (b + c)* under the assumptions given. If the supply shift exceeds the demand shift and a negative price premium arises, the aggregate welfare impact will turn negative. Real-world protection may now deviate from the benchmark scenario presented in Figure 2 in many ways and in some cases to a significant extent:

(i) Quality information may become persuasive rather than informative. In this case, additional rents for producers arise but aggregate welfare impacts of GI regulation may become more negative since consumption will exceed the socially optimal level.

(ii) Protection of geographical indications may occur on a market segment where the producer club already exerts market power or the regulation leads to market power in an otherwise competitive market. The price premium as well as the redistributive and allocative implications of regulations would then differ from the competitive case.

(iii) There is a major discussion in the economics of information whether consumer preferences will actually change due to additional information (Becker and Stigler 1977). If they do, the welfare consequences of GI regulation will be different from those in Figure 2. It is necessary then to evaluate the welfare implications for

consumers either on the basis of ex-ante or ex-post preferences (Dixit and Norman, 1970). With true information, a change in preferences as outlined by the shift from D to D´, and on the basis of ex-post preferences, implications for consumer and aggregate welfare will deteriorate compared to the benchmark situation above.

(iv)   The market and welfare effects in Figure 2 still exclude the linkages between the market segment of the GI product and its substitutes. The analysis needs to be extended in order to take Akerlof´s lemon case fully into account. In a partially eroded market, where the high-quality good has in part been crowded out by a low-quality good and both goods sell at a uniform price, producers and consumers of the high- and low-quality good have to be distinguished in order to derive comprehensive results on welfare and redistributive effects of GI regulation. This distinction is also crucial for the analysis of trade impacts by GI regulation.

It is particularly the last point that has been addressed in the theoretical literature on GIs applying models of vertical product differentiation to which we turn next.

3.3.2   Welfare Analysis of GI Regulation in Vertically Differentiated Markets

An increasing number of studies has addressed GIs from an economic welfare perspective by using models of vertical product differentiation of the Mussa-Rosen type[6] (Zago and Pick 2004; Lence et al. 2007; Langinier and Babcock 2008; Moschini, Menapace and Pick 2008). This methodological framework makes it possible to account for the existence of heterogeneous consumers and to analyse different institutional arrangements of GI regulation on the supply side. It has been used to study equilibrium prices and quantities, market shares and the welfare of the interest groups involved under alternative market structures. In all contributions two quality levels are modelled: the GI product as the high-quality good and the generic one as the low-quality good. There are *N* consumers in the market and each consumer buys either one or zero units of the good. Consumers derive utility according to

$$U = \theta q - p(q)$$

where $q \in \Re^{+}$ represents the quality of the product, $\theta \in \Re^{+}$ indexes consumer types and $p \in \Re^{++}$ is the price of the good of quality *q*. The parameter θ can be interpreted either as a measure of consumers' intensity of preference for quality or the inverse marginal rate of substitution between income and quality for consumers who have an identical intensity of preferences for quality but differ in terms of income. Hence, the willingness to pay (WTP) for

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[6] For a detailed analysis of these models see GIANNAKAS (2010).

the quality attribute varies across consumers. Figure 3 illustrates the market equilibria in the situations with and without regulation in force.

Figure 3: **Consumer Welfare in the Situations with and without Regulation**
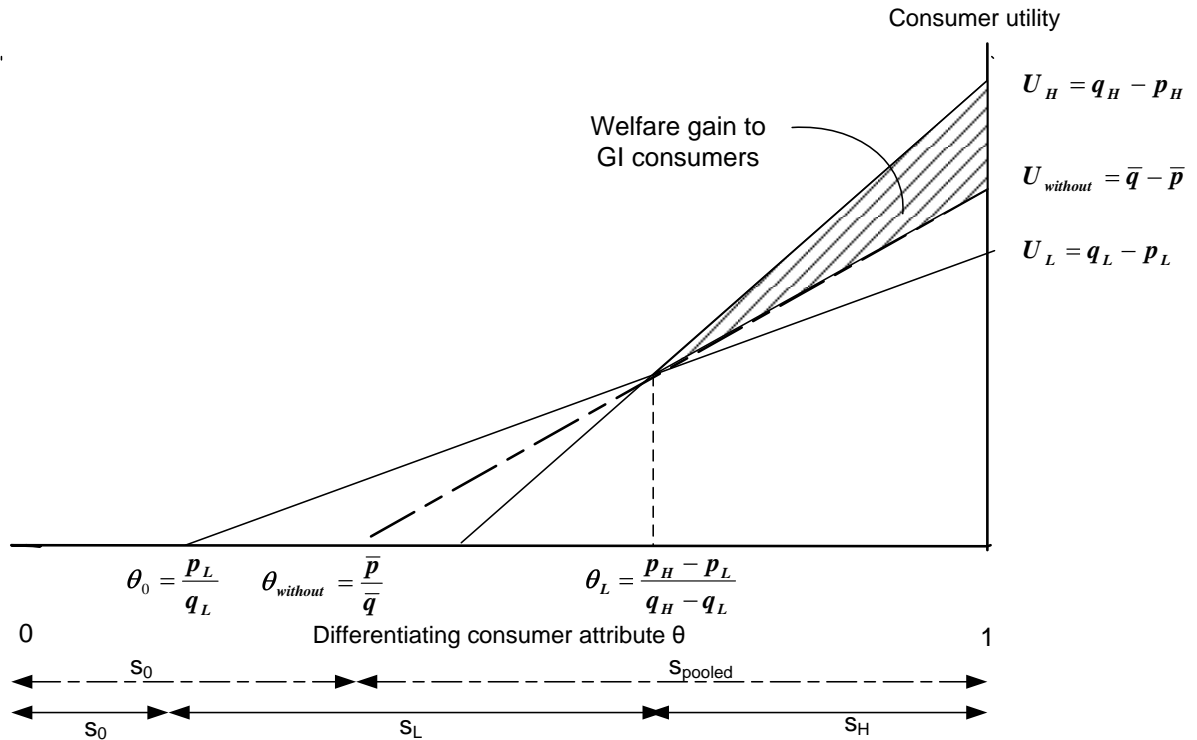
Source: Own presentation.

Without regulation products are differentiated but consumers are not able to distinguish between the different qualities. Hence, a pooled equilibrium with an expected quality level of $\bar{q}$ sold at $\bar{p}$ will evolve. The net utility consumers derive in such a situation is $U_{without}$. If a credible GI regulation is implemented, consumers are able to distinguish between the low- and the high-quality product. Since it is assumed that it is costlier to produce the GI product than the generic counterpart because of stricter production standards, the GI product must sell at higher prices (i.e., $p_H > p_L$).[7]

The greater is θ, the more a consumer values quality differences and the greater is his willingness to pay for this quality difference. This is depicted in Figure 3, where the utility of purchasing quality q at price p is a function of θ, which is normalised to the interval [0, 1]. The consumer who is indifferent between buying the low-quality good at price p_L and purchasing the high-quality good at price p_H is denoted by θ_L. Thus, consumers with a strong

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[7] Whereas price formation is typically modelled in the commodity-promotion literature, this is not the case in most studies on GI products, where the price difference is just stated but not quantified.

preference for quality or high income (i.e., consumers with $\theta \in (\theta_L, 1)$) purchase the high-quality good, whereas consumer with $\theta \in (\theta_0, \theta_L)$ purchase the low-quality good and consumers with $\theta \in (0, \theta_0)$ purchase nothing at all. The indifferent consumers determine the market demand, whereby s_0 represents the share of consumers not buying anything, and s_L (s_H) is the share of consumers purchasing the low-quality (high-quality) good. Without regulation in force there is only one indifferent consumer, $\theta_{without,}$ who is indifferent between buying the good of expected quality $\bar{q}$ and buying nothing at all.

Despite these similarities, the available studies on GI regulation differ in some important points. ZAGO and PICK (2004) and LANGINIER and BABCOCK (2006) assume that the supply of the quality attribute is exogenous. This implies that product quality is determined by "terroir" and producers are e*x ante* identified as either high- or low-quality producers. On the other hand, MOSCHINI, MENAPACE and PICK (2008) assume that entry into the high-quality market is endogenous, that is producers are free to produce either the low- or the high-quality good. Based on these assumptions the studies derive the following welfare effects of implementing a credible GI regulation. ZAGO and PICK (2004) conclude that high-quality consumers gain, whereas low-quality consumers lose due to the fact that these consumers benefitted from a higher average quality sold in the unregulated market. In the scenario chosen by MOSCHINI, MENAPACE and PICK (2008) without regulation only the low quality is produced and sold. Accordingly, low-quality consumers are unaffected by the regulation. However, all studies conclude that the main beneficiaries of the regulation are consumers of the GI good. This welfare gain is also illustrated in Figure 3, whereby its size depends on cost and quality differences between the low- and the high-quality good and on the distribution of θ. Welfare gains to GI consumers are higher, the higher are quality differences, the lower are cost differences and the more the distribution of θ is skewed towards 1.

With respect to welfare effects on producers and implications for governmental intervention, the study results do also differ. However, they all share the conclusion that under some circumstances government intervention policies, either by subsidizing certification or allowing collusion among producers, are welfare-enhancing. LENCE et al. (2007) argue that allowing producers to collude can be welfare-enhancing if fixed costs of developing the geographically differentiated high-quality product, typically certification costs, are too high to be developed under perfect competition. Consequently, even if the intervention policy itself induces welfare losses, total social welfare can increase due to the welfare gains that arise from the consumption of the high-quality product that would have been non-existent in the

market without government intervention. ZAGO and PICK (2004) elaborate further that besides producers' ability to exercise market power (e.g., via land restrictions), the level of administrative costs and quality differences determine total welfare effects. If administrative costs of regulation are high and quality differences are low, the effect on total welfare may be negative. Hence, a GI regulation will not always have the positive welfare impacts which, e.g., the EU stresses in its food quality policy.

One important limitation of the available theoretical literature is that only two different quality levels are considered and a vertically differentiated demand structure is assumed. It could be argued that the GI product and the non-labelled product are not vertically but horizontally or even both vertically and horizontally differentiated. This seems to be highly relevant for product markets with a high density of GI products such as the wine or cheese market. Although it has been demonstrated that models of horizontal and vertical product differentiation are closely connected, they do not yield the same theoretical results in any given case (CREMER and THISSE 1991). Moreover, these models are all one-dimensional models of unit-demand, this means that the characteristics space is one-dimensional (high vs. low quality) and consumers buy only one unit of the product. Real purchase decisions, in which consumers face a large number of product cues, differ clearly from such a scenario. Therefore, understanding which factors determine consumers' purchase decisions is of great importance. The next section will cover the theoretical background on the determinants of consumers' purchase decision with respect to geographically differentiated products.

3.3.3 Consumer Preferences for Geographically Differentiated Products – Theoretical Considerations

As discussed above, it is crucial for the determination of price and welfare effects how strongly demand shifts due to GI regulation, which means how consumers react to additional information on the geographical origin of a product. Without explicitly stressing this link to the economic theory of GIs, numerous studies have investigated consumer perceptions and the willingness to buy (WTB) and the willingness to pay (WTP) for certain products. Most of these studies are embedded in marketing research.

There is a large body of literature on consumers' perceptions of country-of-origin labels (for a meta-analysis of the country-of-origin literature, see VERLEGH and STEENKAMP 1999). Main conclusions that can be drawn from this literature are that consumers use the information on product origin as an extrinsic quality cue and that this cue influences

consumers' purchase decisions in multiple ways.[8] In general, the geographical origin is assumed to influence consumers' perceptions of the products' quality via two different ways. Firstly, if the consumer connects a special image with the production region this image can be used to form a quality evaluation of the product. This effect can be either positive or negative. Secondly, the origin label can be used during repeat purchases to re-identify a product. If the consumer was satisfied with the product the first time, it is likely that he will buy the same product again or at least another product from that specific region (GRUNERT 2005). Besides this cognitive mechanism of an origin label, that is origin as a cue for product quality, the origin can also have an effect on consumer demand through affective and normative mechanisms. In the former case consumer demand is influenced by symbolic and emotional associations evoked by the product origin, in the latter case a certain origin is preferred because of social and personal norms (VERLEGH and STEENKAMP 1999).

VAN ITTERSUM et al. (2003) point out that region-of-origin labels differ from country-of-origin labels in some important aspects. A more consistent image is attributed to region-of-origin compared to country-of-origin labels, since regions are far more homogenous than countries, for example in terms of natural conditions. Moreover, region-of-origin labels offer the opportunity to differentiate the product both from foreign and domestic competitors. The proposed theoretical model to capture the effect of a regional image on product preferences is presented in Figure 4.

Figure 4: Theoretical Model of the Effect of the Region-of-origin Cue on the Preference for a Product
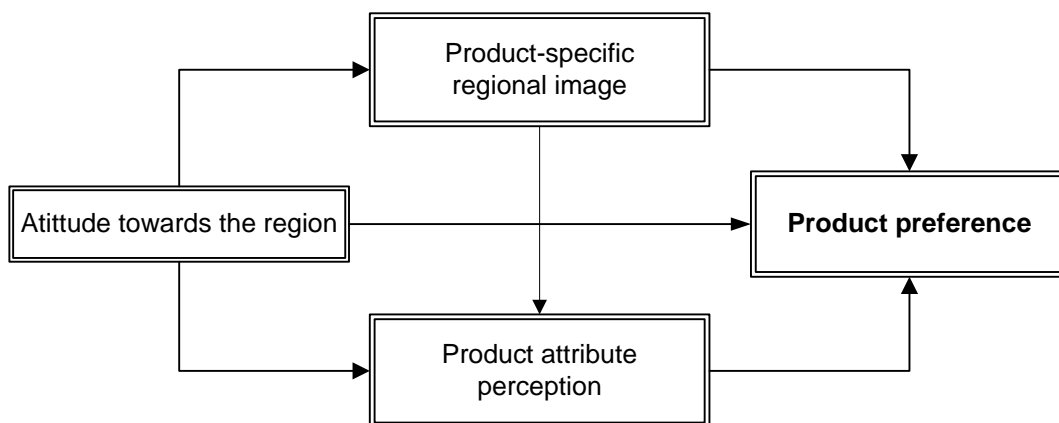
Source: Modified presentation on the basis of VAN ITTERSUM et al. (2003).

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[8] A product cue is classified as extrinsic if variations in the product cue do not alter the physical state of the product.

The model states that differences in product preference for regionally differentiated products can be explained by differences in *product-attribute perception, attitude towards the region* and *product-specific regional image*. The attitude towards the region captures the general image consumers relate to the specific region. This general image of a region influences the product preference directly and indirectly via influencing both the product-specific regional image and the product attribute perception. The authors stress that one important success factor is the positive product-specific regional image. This implies that empirical research should always deal with a specific product-region combination, since a positive or negative image of a region is always closely connected with a certain product. Parma is perceived by consumers as a region well-suited for producing high-quality ham. However, this does not mean that producers located in Parma starting to produce wine would also benefit from a positive product-specific regional image. Results from several focus group discussions indicate that a product-specific regional image consists of two dimensions, a human and a natural environment factor (VAN ITTERSUM et al. 2003). The human factor refers to the expertise present in the region to produce a certain good and the natural environment factor refers to agro-ecological conditions. These two dimensions reflect the already mentioned *terroir* concept.

The model presented in Figure 4 does not capture the effect of an origin label itself. An augmented model used by VAN ITTERSUM et al. (2007) on regional certification labels integrates this aspect. It is presented in Figure 5.

Figure 5: **Conceptual Model of the Influence of Regional Certification Labels on Consumers' Willingness to Buy and Willingness to Pay for a Protected Regional Product**
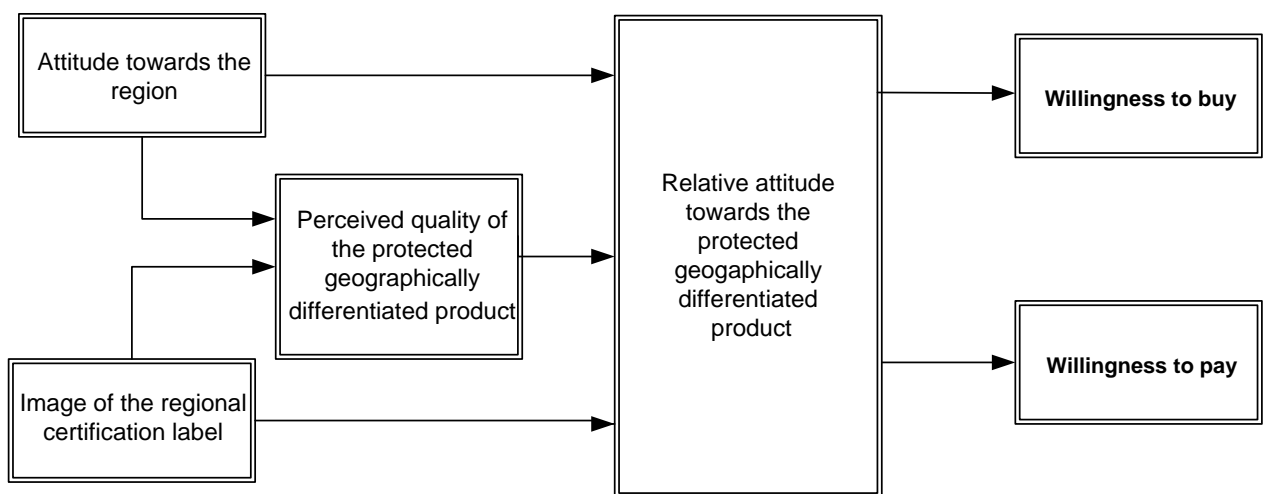
Source: Modified presentation on the basis of VAN ITTERSUM et al. (2007).

In studies dealing with the influence of regional labels on consumers' product evaluation it is necessary to distinguish between the effect of the region-of-origin cue and the certification label itself. The region-of-origin cue provides consumers with information about the quality of the product. The certification label guarantees the consumer that the product is the authentic one and not an imitation. Again, a regional certification label is assumed to influence consumers in their purchasing behaviour through two different dimensions. The first one is the *quality warranty dimension*, which represents consumers' trust in the ability of the label to guarantee a higher quality level. This dimension captures the indirect way a label influences consumers' attitudes. The second dimension is the *economic support dimension*, which indicates consumers' trust in whether and to which extent the label can support the economy in that region (VAN DER LANS et al. 2001; VAN ITTERSUM et al. 2007). This dimension is responsible for the direct effect of a certification label on consumers' attitudes. The first dimension is relevant for all consumers of the product, the second one predominantly for consumers located inside the production area.

4 Empirical Evidence on Consumer Attitudes towards Origin Labels and the Impacts of Geographical Indications

Empirical studies analysing geographically differentiated products cover a wide range of different research questions and applied methodologies. The following section will review the main empirical findings by highlighting the chosen approaches and discussing the obtained results. The findings will be synthesised in order to draw some general conclusions and to point out which questions need to be addressed in future research. Given the different paradigms towards geographical indications and the various policy approaches towards these products, it is no surprise that most of the empirical evidence comes from Europe.

4.1 Consumer Studies

4.1.1 *Consumer Awareness, Knowledge and Perceptions of GI Certification Schemes*

One of the earliest studies focusing explicitly on consumer perceptions and awareness of protected regional foods was carried out by TREGEAR et al. (1998). Its main finding is that perceived authenticity is the essential determinant of whether a food is considered as being truly regional. Perceived authenticity in turn depends on a range of factors including personal factors (e.g., knowledge), product-related factors (e.g., label or packaging) and situational factors (e.g., retail outlet). Furthermore, the study highlights that most consumers are not

aware of the official EU certification scheme on geographical indications. A low level of awareness and knowledge of the European regulation EC No. 510/2006 was also found in more recent studies, in which less than 10 % of the respondents claimed to know the labelling scheme (FOTOPOULOS and KRYSTALLIS 2000; TEUBER 2009).

Nevertheless, consumers are aware of traditional products or products protected under the regulation. The products are most often well-known, at least in the region of production. However, most consumers do not recognize the official EU logos and have got no or just very limited knowledge concerning the requirements involved.

4.1.2 Willingness-to-Buy and Willingness-to-Pay Results

As stated in section 3.3, a crucial assumption in all theoretical models on geographically differentiated products is the presence of a consumer segment valuing the origin attribute. The following research questions are typically addressed in empirical consumer studies: Firstly, are there consumers in the marketplace who are willing to pay a premium for the differentiated product? Secondly, how large is their willingness to pay for the GI attribute? Thirdly, is it possible to classify consumer segments according to their WTP based on sociodemographic or psychographic factors?

Willingness-to-buy (WTB) and willingness–to-pay (WTP) studies can be based both on revealed-preference and on stated-preference data. In the latter case, methods such as contingent valuation, experimental auctions and conjoint analysis are used to collect data (GRUNERT 2005). In the former case, most often the hedonic pricing methodology is applied.[9] This method has been used quite frequently for analysing price differences and reputation effects in the wine market. Results for wine indicate that regions having established a collective reputation can achieve higher prices even after controlling for current quality differences (LANDON and SMITH 1997, ANGULO et al. 2000; SCHAMEL 2006). Similar results were found for the high-quality coffee market, where certain countries and regions can realise higher prices due to reputational effects (DONNET et al. 2008, TEUBER 2010). The origin cue seems to be an important price determinant in these markets. Consumers were found to pay higher prices for wine and coffee from countries or regions they perceive as very suitable for producing these products.

However, the underlying factors that motivate consumers to buy products from a certain origin cannot be elaborated within hedonic analyses. This research question is

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[9] For more detailed information on these methodologies see the chapters by ADAMOWICZ and SWAIT (2010), ALFNES and RICKERTSEN (2010) CARLSSON (2010), and COSTANIGRO, MCCLUSKEY and SHREAY (2010) in this handbook.

typically addressed in consumer studies using methods like contingent valuation or discrete choice modelling. There is a large body of literature on consumers' attitudes towards country-of-origin labelling (COOL) and PHARR (2005) even concludes that COOL is the most widely researched aspect in marketing and consumer behaviour. Although most of the studies deal with manufactured products, there are also several studies investigating country-of-origin label effects for foods (i.a. JURIC and WORSLEY 1998; HOFFMANN 2000; LOUREIRO and UMBERGER 2003, 2005, and 2007; EHMKE, LUSK and TYNER 2008).

Besides the COOL literature there is also a growing empirical literature on consumer attitudes towards regional certification labels. The most comprehensive study is the one by VAN ITTERSUM et al. (2007), to which we already referred to in section 3.3.3. The theoretical framework presented in section 3.3.3 was tested in a study with 1200 consumers from three different European countries. The obtained results confirm that consumers' perceptions of regional certification labels consist of two dimensions, the quality warranty and the economic support dimension. The quality warranty dimension was found to influence the WTB and WTP indirectly through the perceived quality of the protected product, whereas the economic support dimension directly affects the relative attitude towards the protected product. Most important among all determinants in consumers' WTB and WTP and therefore the main factor of success for an origin-based differentiation strategy is the perceived higher quality. This finding is consistent with other consumer studies in the field of origin-labelling and certification (MCCLUSKEY and LOUREIRO 2003).

Table 1 summarises results on the WTP and WTP for geographically differentiated foods, on the role of psychographic and sociodemographic factors and possible interactions between different product attributes. The latter aspect captures how regional certification labels interact with other labels and brands and is especially interesting given the background of a steadily increasing label proliferation.

Table 1:   **Willingness to Buy (WTB) and Willingness to Pay (WTP) for Geographically Differentiated Products**

Author/ Year	Product	Data and Methodology	Results
Influence of psychographic and sociodemographic characteristics			
FOTOPOULOS and KRYSTALLIS (2000)	Zagora apples (Greece)	Consumer survey, SP, Conjoint analysis	GI label seems to be important for only 1/3 of the buyers; WTP of ~20% of product value; Cluster "indication of origin fans": mainly female, close proximity to the producing region, higher income.
SKURAS and VAKROU (2002)	Moschofilero wine (Greece)	Consumer survey, SP, CVM	Higher educated consumers and consumers that are stronger associated with the region of origin exhibit a higher WTP.
SCARPA and DEL GUIDICE (2004)	Olive oil (Italy)	Consumer survey, SP, Ranked choice experiment	Home bias is found in all three samples; preference intensity for the GI attribute is always dominating the one for organic production.
SCARPA et al. (2005)	Oranges, Table grapes, Olive oil (Italy)	Consumer survey, SP, Conjoint analysis	Home bias is prevalent for all three products, but most dominant in the case of olive oil. Only limited evidence of national preference heterogeneity conditional on socioeconomic characteristics.
Interaction with brands			
BONNET and SIMIONI (2001)	Camembert cheese (France)	Scanner data, RP, MMNL	Brand appears to be more important than the GI label; most consumers attach a negative value to the GI label.
LOUREIRO and MCCLUSKEY (2000)	Galician veal (Spain)	Spanish HH data, RP, Hedonic analysis	GI label leads to a significantly positive effect on the price for intermediate quality meat, the label is not significant for either quality extreme.
HASSAN and MONIER-DILHAN (2006)	Camembert cheese (France) Dry cured ham (France)	French HH data, RP, Hedonic analysis	GI label yields a significant by positive effect on the price. Interaction effect with strong brands is negative, but with weak brands it is positive. Weak brands extract more value from the GI label.
PROFETA et al. (2008)	Bavarian Beer (Germany)	Consumer survey, SP, Conjoint analysis	Weak beer brands benefit more from region-of-origin label than strong beer brands.
Interaction with other product attributes			
LOUREIRO and UMBERGER (2007)	Beef	Consumer survey, SP, Choice experiment	Food safety certification is the most important product attribute, followed by the country-of-origin label, a traceability cue and guaranteed tenderness.
EHMKE, LUSK and TYNER (2008)	Onions	Consumer survey, SP, Conjoint analysis	Consumers in all four countries prefer domestic food. Origin is less important to consumers than the attributes GMO- and pesticide-free.

Notes: CVM = Contingent Valuation Method, MMNL = Mixed Multinomial Logit Model; RP = Revealed-Preference Data, SP = Stated-Preference Data.

Source: Own presentation.

The results provide no uniform pattern on how certain psychographic and sociodemographic characteristics affect attitudes towards geographically differentiated products. There is one hypothesis, however, which was confirmed in all studies and that is a clear ethnocentric behaviour among consumers. Ethnocentric behaviour, also known as home bias in the trade literature, refers to the fact that consumers with a close proximity to the producing region exhibit a higher WTB and WTP than consumers not located in the region of origin (SCARPA et al. 2005).

The results with respect to the interaction effects of region-of-origin cues and brands suggest that weak brands seem to benefit relatively more from a region-of-origin label than strong brands (HASSAN and MONIER-DILHAN 2006; PROFETA et al. 2008).[10] In other words, the label itself is more favourable for producers who have not yet established a strong reputation in the marketplace. Another important aspect is the relative importance of the country-of-origin cue compared to other product cues such as price, brand, or a certain production process. EHMKE, LUSK and TYNER (2008) conducted conjoint experiments in four different countries, namely China, France, Niger, and the United States to investigate the relative importance of the origin cue compared to the product attributes GMO- and pesticide-free. The results indicate that the origin was in most cases the least important attribute among the three investigated.

Generally, the results document that in the analysis of origin labels it is indispensable to rely on multiple-cue study designs. Such a study design makes it possible to incorporate interaction effects among product attributes that can alter results from single-cue studies substantially. The results concerning preference heterogeneity are mixed and provide no clear pattern in terms of consumer segmentation. Moreover, all studies investigated the WTP of domestic consumers. It is most likely that results will differ for foreign consumers, since the economic support dimension was in most cases a strong WTP determinant for domestic consumers. Foreign consumers' preferences are of special importance for GIs in less developed countries, since products such as coffee, tea or cocoa are typically exported.

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[10] This is in line with findings by Crespi and Marette (2002) and Crespi (2007) on the effects of generic advertising on individual producers. They point out that if generic advertising diminishes product differentiation, it is possible that low-quality producers can increase their market shares at the expense of high-quality producers.

4.2   Price and Welfare Impacts of Geographically Differentiated Products

4.2.1   Cost-Benefit Analyses

One of the most comprehensive studies in this field was conducted within an EU-financed pilot project on the economics of food quality assurance and certification schemes. Within this project, four different GI products were analyzed with respect to their economic performance (ETEPS 2006). The following points were addressed in detail: farmer participation, market shares and their evolution over time, costs and benefits for all actors involved, and price formation, i.e. price premia and price differentials. The investigated production systems were Parmigiano-Reggiano (PR) cheese, Comté cheese, Dehesa de Extremadura ham, and Bahea olive oil.

The findings with respect to costs and benefits can be summarised as follows. Direct costs such as certification costs, membership fees and control costs do usually not exceed 1-3 % of total costs. In most cases indirect costs are much more important. Indirect costs are costs that arise from specific production and processing requirements such as restrictions on animal feed, herd density or processing technologies. Table 2 presents a short overview of the direct and indirect costs identified for each case study.

Table 2:   Costs in Four GI Supply Chains

Case study	Costs	
	Direct Costs	**Indirect Costs**
Baena Olive Oil (Spain)	Farmers: fee equivalent to 0.3 % of the average production value/ha Milling industry: tax of 1.25 % of its sales price Bottling industry: tax for labelling	Only local varieties can be used; Higher labour costs due to prescribed period of harvesting (less flexibility to spread harvesting through time)
Comté cheese (France)	Production quota fee of 10 cents per kg Comté cheese. Fee of 2 €/kg for production above set quota. In addition, a contribution of 3 €/ton cheese to INAO, which controls the Comté GI.	Restrictions on animal feed, breed, and herd density; transportation of milk is limited
Dehesa de Extremadura ham (Spain)	Frequent controls at all stages of the production and processing process. Registered farms pay a fee to the Ruling Council of 5 €/pig. In addition, the processing industry pays a fee that is calculated according to the number of hams and shoulders sent to the market. No precise figure given.	Very extensive pig raising based on acorns only. No additional feeding allowed. Processing according to strict rules. Processing industries are required to specialize in Dehesa de Extremadura ham.
Parmigiano-Reggiano cheese (Italy)	€ 6.00 per wheel of cheese at the time of certification after 12 months, or 17-18 cents per kg of PR cheese sold.	Restrictions on animal feed, breed, herd density, transportation of milk, processing of the milk

Source: ETEPS (2006), p. 25.

Stringent production requirements exist in all analysed production chains. In the case of Dehesa de Extremadura ham, for example, the pigs must be fed solely with acorns. Such strict production rules are assumed to have a much higher cost impact compared to the direct costs of certification. However, quantifying these indirect costs is a difficult task. The additional costs due to the product and process restrictions established within the certification scheme have to be disentangled from production costs in the absence of certification. Hence, quantitative estimations of the cost impact of product and process requirements are not presented in the EU study.

On the other hand, higher prices paid by processors were identified as the main benefit for producers. It was analysed from the individual producer's point of view whether it is more favourable to produce the GI product compared to the non-GI product, that is a close substitute in production. Table 3 presents the main results with respect to market structure, reference products and achieved price differentials for three analysed GI products.

Table 3: Market Structure and Price Differentials for Three GI Products[a)]

	Baena Olive Oil (Spain)	Comté cheese (France)	Dehesa de Extremadura ham (Spain)
Market structure	PC	MC / Oligopoly	Oligopoly
Market share	2.3 % of Spanish olive oil production 1.4 % of Spanish consumption	4 % of French cheese production	3 % of Spanish ham production 2 % of national consumption
Reference Product	Olive oil without a GI	French Emmental	Iberian ham without a GI
Price Differences Farm-level	No difference	+ 26%	+ 29%
Processing stage	No difference + 9 % / +30 %[b)]	+ 22 %	+ 21 %
Retail-level	+ 22 %	+ 41 %	+ 6 %

[a)] Notes: MC= Monopolistic Competition, PC=Perfect Competition. [b)] No price difference at the pressing stage, but considerable price differences at the bottling stage (bulk and bottled).

Source: ETEPS (2006).

Nearly in all cases the GI product achieves a higher price compared to the non-GI product. Only in the case of Baena olive oil, olive growers receive an undifferentiated price. The price differentiation takes place further downstream, at the bottling stage. However, since the processing stage is dominated by farmer cooperatives, it is argued that the price differential achieved at the bottling stage is passed on to farmers through a higher undifferentiated price for crude olives (ETEPS 2006).

These findings are confirmed by a study on the French Brie cheese industry. BOUAMRA-MECHEMACHE and CHAABAN (2010) investigated the cost and production structure of Brie de Meaux and Brie de Melun, two French cheeses protected as a GI, and compared

these with non-GI Brie producers. Their results point out that the GI technology results on average in 40 % higher variable production costs due to strict production requirements, especially the use of unpasteurized milk and labour-intensive techniques. However, this cost disadvantage is compensated by higher retail prices.

Other studies point out that benefits to producers can accrue to the lowering of transaction costs, increasing turnover in existing marketing channels and the ability to enter new marketing channels (BARJOLLE and CHAPPUIS 2000; BELLETTI et al. 2009). CANADA and VAZQUEZ (2005) found that in the case of Spanish olive oil protected as a GI, the GI label serves as a quality assurance system for distributors, especially for the retailing industry located outside Spain. This argument is also put forward in a study by BELLETTI et al. (2009) on the roles of GIs in the internationalisation process of agri-food products. Based on a survey carried out on four products from Tuscany (Italy) they conclude that the GI label acts as quality standard, especially for professional operators, enabling small and medium enterprises to enter new distribution channels. However, they also highlight the importance of collective promotional activities for entering successfully new markets.

It was also found that higher prices do not necessarily lead to an agricultural income which is above average. In the case of Comté cheese, producing milk is costlier than in other parts of France because of difficult agro-ecological conditions.[11] Indeed, due to a lower labour efficiency in this region, the income per family worker is even lower than in other milk-producing regions in France. Therefore, the higher prices paid for milk used for Comté production compensate for higher production costs. These findings suggest that the production system of Comté is a positive example in terms of the explicitly stated goal of regulation EC No. 510/2006 to support less-favoured regions.

The presented results for European products indicate that pursuing an origin-based differentiation strategy was in most cases favourable for the actors involved, but there are differences in the degree of success quantified in price differentials and income effects. One of the major success factors seems to be a well-established reputation in the marketplace as the cases of Comté and Parmigiano-Reggiano cheese illustrate. However, reputation is not built overnight; both products have been in the marketplace for decades and can be considered mature systems.[12] Another crucial success factor seems to be promotional activity. The ETEPS (2006) study states that in the cases of Comté and Parmigiano-Reggiano considerable sums are spent on advertising and promotion. These are important points to be considered

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[11] The Comté area is located for the most part in mountainous areas.
[12] The tradition of Parmigiano-Reggiano production dates back to the 13th century (de Roest and Menghi 2000).

while analysing recently established geographical indications that target mainly at export markets.

It should be noted that the presented case studies concentrate on the likely costs of and benefits for producers supplying the geographically differentiated product. They do not cover a comprehensive cost-benefit analysis as suggested in Section 3.3.1. The price impacts of GI regulation are not modelled explicitly and there is no aggregate welfare analysis covering all producers and consumers of the product, and its major substitutes.

4.2.2   Coordination and Competition

In order to establish a geographically differentiated product the actors in the supply chain are required to cooperate, either horizontally, vertically or both. This collective action, which is one of the main features of geographical indications, raises concerns about possible anti-competitive practices, particularly the risk of monopolistic cartels and unjustified barriers to entry (LUCATELLI 2000). On the other hand, collective action at upstream stages of the marketing chain can also be seen as an attempt to countervail the increasing market power by downstream actors such as retailers. Additionally, as argued by one strand of the theoretical literature (see section 3.3.2), supply control can be a necessary precondition for the creation of the differentiated product if fixed costs of the implementation are high.

Questions with respect to possible welfare losses due to collective action and market power were addressed in several studies in more or less detail (CARTER, KRISSOFF and ZWANE 2006; ETEPS 2006; HAYES, LENCE and STOPPA 2004; LUCATELLI 2000; MÉREL 2009).

The study by LUCATELLI (2000) lists up several antitrust cases against European GI products. The cases presented comprise French and Italian products for which producer groups or consortia had implemented measures to control total supply. One of the main arguments put forward for these arrangements was that supply control is essential for quality control. For each product an antitrust case was enforced but with different outcomes. In the case of Parma ham and San Daniele ham, the argumentation to implement a quota system in order to secure the high quality of the product was temporarily accepted, whereas for Parmigiano-Reggiano and Grana Padano cheese this line of argument was rejected. It is interesting to note that in neither of the case studies the area limitation itself is restricting total output. However, in most cases it is assumed that the strict production standards limit total output (ETEPS 2006).

More advanced market power studies in the context of geographically differentiated products are rare. One exemption is the study by MÉREL (2009) on Comté cheese. In this

study a new empirical industrial organization approach is applied to investigate econometrically whether the vertically integrated Comté production sector is able to exercise market power. The estimate of the market-power coefficient is small and statistically insignificant leading to the conclusion that the supply control scheme has got no significant effect on consumer prices and, thus, social welfare is not harmed by the supply control scheme in place. According to the author, a possible explanation for this result could be the fact that the production plan must be approved yearly by governmental agencies preventing the vertically integrated producer association of Comté to restrict supply far from competitive levels. Another aspect not taken up by the studies presented so far is that most GI products face a large number of substitutes limiting the ability to exercise market power (MAHÉ and ORLAO-MAGNÉ 2001). This point is of great importance while analyzing the welfare impacts of GIs. It is true that geographical indications grant a legal name monopoly. However, this name monopoly does not necessarily lead to an economic monopoly.

To sum up, all these findings support the statement by BUREAU and VALCESCHINI (2003, p. 74) that "there is a fine line between the organized cartelization in the public interest and undue barriers to entry set by a small group of producers." Hence, the question whether regulations on geographical indications can lead to negative welfare effects due to legally granted market power needs to be addressed with a case-by-case approach.

4.3   Social and Environmental Impacts

Certification schemes for geographical indications are often designed with the aim to maintain or promote rural development. GIs are assumed to incorporate and valorise many local assets with special or immobile characteristics linked to the area (TREGEAR et al. 2007). BARJOLLE and SYLVANDER (1999) call the expected impacts of GIs on the rural economy the social success.

TREGEAR et al. (2007) investigated the impacts of the European GI scheme on rural development by analysing three different case studies. The findings point out that even under the same certification scheme, in this case EC Regulation No. 510/2006, very distinct socio-economic outcomes can be observed. The involvement and motivations of the supply chain actors as well as the strategy pursued differed remarkably. Given the obtained mixed results, the authors point out that collective action, the degree of economic and cultural significance of the product for the whole region and the access to and visibility of the product in the region are major determinants of the rural development impact of a regional certification strategy.

Other case studies report very mixed results, too. Whereas DE ROEST and MENGHI (2000) find very positive impacts on rural development in the production system of Parmigiano-Reggiano (PR), the results by BOWEN and VALENZUELA (2009) for the production system of Tequila are negative. In the case study on PR the main benefits in terms of rural development are higher levels of employment both in agriculture and in upstream and downstream activities. These higher employment effects are due to the traditional and, hence, more labour-intensive techniques used at all stages of the production process.[13] The results obtained by BOWEN and VALENZUELA (2009) indicate the opposite. The authors claim that the establishment of a geographical indication for Tequila has largely failed to benefit the local population. This is noteworthy given the economic success of this GI. Tequila, a protected GI since 1974, is considered to be the oldest Non-European GI. Its reputation and market share has grown substantially over the last 15 years and the quality level could be improved significantly (BOWEN 2009). Based on these developments Tequila is often recognized as one of the most successful GIs outside of Europe. Nevertheless, BOWEN and VALENZUELA (2009) argue that the social success is quite different. Traditional agave cultivation techniques have been replaced by more mechanized, chemically-intensive systems leading to negative environmental effects and a marginalisation of small farmers. The authors attribute this development to the missing link between the *terroir* and the product. Despite the fact that the Mexican legislation on GIs explicitly requires this link, it is not enforced in practice.

The empirical evidence suggests that the rural development impact of a regional certification scheme does strongly depend on the design and enforcement of the national regulation in place and the ability of the different actors in the supply chain to co-operate and set up a coherent strategy of collective action. Moreover, as the results for Tequila and other products highlight, many GI products are no longer as artisanal and traditional as their image suggests (BROUDE 2004).[14]

5. Concluding Remarks

The number of geographically differentiated products is steadily increasing as is the number of foods with a protected geographical origin. Consequently, the success of origin-labelled foods and market regulation for geographical indications has gained strong and increasing

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[13] The benchmark scenario is the industrial dairy system in the PR region, since this is the alternative market for liquid milk in that area (DE ROEST and MENGHI 2000).

[14] RICCHERI et al. (2006) conducted a comprehensive study for eight different GI products on the environmental impacts of GI protection. The results indicate in most cases a positive impact on biodiversity conservation and maintenance of cultural landscapes. However, they did also observe intensification processes with negative environmental impacts leading to the conclusion that GIs have got a more or less neutral impact on the environment.

interest in the theoretical and empirical literature. This chapter has shown that a wide variety of empirical results have been elaborated with very different methodological approaches. Some questions can be answered unambiguously, but many queries remain with regard to the role of public policy and the impacts of regulation for consumers, producers and the society as a whole.

Geographically differentiated products can create economic value if the origin is valued by consumers. Empirical studies clearly confirm that there are consumers who appreciate information on the geographical origin of foods: (i) as a quality cue, and (ii) because of ethnocentric tendencies. Therefore, there are incentives for private firms to differentiate their products in terms of origin. However, the empirical evidence has also highlighted that geographically differentiated products are by no means a self runner. The most successful GI products such as Parmigiano-Reggiano or Parma ham are managed like international brands and advertising and promotion play a crucial role.

Origin labelling, however, is susceptible to imitation and market failure may occur due to quality uncertainty by consumers. A case for market regulation, information, policy and protected geographical indications can be made. It is exactly this point where many questions remain unanswered in the literature. In the large number of empirical case studies, the welfare impacts of regulation on consumers have typically been excluded. Most often, the impacts of protected geographical indications on prices, overall welfare for producers as well as the redistributive consequences in the marketing chain have also not been modelled. Studies are needed that apply theoretical cost-benefit approaches encompassing all affected groups to empirical case studies of GI regulation. It is also important to integrate more findings from consumer studies and welfare economics, in the analysis of geographically differentiated products. If ethnocentrism is important, as consumer studies claim, new policy implications might arise with regard to the trade and welfare impacts of GI regulation. It could be much more difficult than previously expected to correct for market failure arising from quality uncertainty in the sense of Akerlof. If consumers do not only react to origin labels as they provide a quality cue but also for ethnocentric motivations, a targeted policy to correct for market imperfections may overshoot and raise demand for the geographically differentiated product above the socially optimal level. The home bias of domestic consumers may then cause trade distortions even if GI regulation aims at the correction of market failure alone.

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2.2 Section II: Empirical Evidence – Consumer Studies

3. HENSELEIT, M., S. KUBITZKI and R. TEUBER (2009), Determinants of Consumer Preferences for Regional Food Products. In: Canavari, M., N. Cantore, A. Castellini, E. Pignatti and R. Spadoni (eds.)*, International Marketing and Trade of Quality Food Products*. Wageningen Academic Publishers: 263-278.

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Determinants of Consumer Preferences towards Regional Food Products

by Meike Henseleit, Sabine Kubitzki and Ramona Teuber

Institute of Agricultural Policy and Market Research,
Justus-Liebig-University Giessen, Germany

Abstract

Over the last years there has been increasing interest in regional food, in Germany as well as 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. 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 towards locally grown food. Therefore, a theoretical framework is proposed and tested empirically using a binary logit model. The results indicate that cognitive and normative factors are the most important determinants, whereas affective and sociodemographic variables do not have a big impact on the preference towards local food products. If consumers are of the opinion that originating from the surrounding region is an extrinsic cue for food quality and safety, they will show a strong preference for locally grown food. The same is true for the idea to support the domestic agriculture by purchasing locally grown food. No significant influence could be examined for most of the sociodemographic variables, like gender, education, presence of children in the household and degree of urbanisation.

1   Introduction

Regional food is defined as food, which is grown in the surrounding region, and, which is usually unprocessed (DORANDT 2005)[1]. In Germany most of the consumers define their home federal state as their home region (ZMP 2003: 9ff.).

Over the last years there has been an increasing interest in regional food, in Germany as well as in other European countries. Several studies have already been carried out on this phenomenon. However, in most surveys either the study region is relatively small or the sample size is rather limited. Consequently, the results are seldom statistically representative. In addition, only few researchers applied causal analytic methods like regression analyses to investigate the so-called region-of-origin (ROO) effect. Thus, the level of knowledge about the underlying reasons and the magnitude of preferences for regional food is still quite low.

In Germany as well as in many other European countries, regional cooperatives have been established to promote the sale of regional food. It is important for them to understand determinants of preferences for locally produced food in order to promote regional products successfully. The aim of our research is to provide empirical evidence on the factors that drive a preference for regional food. Based on a German-wide data set we quantify determinants by means of a binary logit model.

The paper is structured as follows. Section two provides a literature review of studies investigating the preference towards regional food by applying regression analyses. In section three we explain the theoretical framework of our research and in section four the data set used is described. A summary of our empirical results is given in section five and the last section contains our conclusions and recommendations for further research.

2   Literature Review

Many researchers have already tried to characterise a consumer segment with strong preferences for food from their home area (e.g., DORANDT 2005, SCHROEDER et al. 2005). However, only a few studies have applied advanced econometric methods to estimate the determinants of preferences towards local food. Most of these studies have been conducted in the United States and the majority focuses on either psychographic or sociodemographic factors. Only few studies have considered a broad range of possible determinants. The following section presents an overview of the available empirical evidence so far.

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[1] Local food and locally grown food are used as synonyms for regional food products.

2.1   Psychographic Determinants of a Preference for Local Food

Table 1 presents a review of studies considering psychographic indicators.[2] It is quite difficult to compare studies because of differences in research subjects like location and kind of product as well as in methodological aspects like the choice of measures.[3] Previous studies examined either (i) impact factors linked to quality and food safety, (ii) social norms that should be accomplished, or (iii) emotional aspects of pride and regional identity.

The majority of studies surveyed whether consumers perceive the regional product origin as a cue for product quality, food safety and health. There seems to be a common theme in that consumers' perceive regional food to be linked to higher food safety as well as to higher quality and therefore local food is preferred to other products. The indicator *quality* is significant in six out of nine studies (e.g., JEKANOWSKI 2000, VAN ITTERSUM et al. 2003, LOBB et al. 2006), and the indicator *food safety* in seven out of nine studies (e.g., SCHUPP et al. 2001, ROOSEN et al. 2003, and MABISO et al. 2005), respectively.

Only two studies (WIRTHGEN et al. 1999 and WIRTHGEN 2003) consider social norms. In both of them, e*nvironmental concerns* and the willingness to *support the local economy* are the main determinants of the preference towards regional food. However, it has to be mentioned that both studies did not include characteristics of quality in their estimations. Emotional aspects had been identified as impact factors of attitudes and purchasing behaviour in a number of studies (e.g., VAN ITTERSUM 1999, WIRTHGEN 2003, SCHROEDER 2005). But the estimated impacts could be biased due to the fact that no quality indicator was included in the regression analysis. According to Table 1 it can be concluded that, so far, no survey has been conducted that includes all the mentioned psychographic factors. Moreover, since each study considered only some aspects in the regression models, a quantitative comparison of the determinants of preferences towards regional food was not possible.

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[2] Of course, there are more consumer country (region)-of-origin (C(R)OO) studies related to food. However, we selected the mentioned studies according to our primary focus which refers to investigations that fulfil three requirements. Firstly, they have to apply advanced econometric estimation techniques. Secondly, they have to deal with own COO/ROO and, thirdly they have to focus on the explanation of the determining factors instead of simply measuring the extent of the preference towards, or willingness-to-pay for, C(R)OO.
[3] A detailed description of the design of the studies is available upon request.

Table 1:   Psychographic Determinants of the Preference towards Regional Food - Review of Empirical Studies[a]

Author (Year)	Cognitive				Normative		Affective
	Quality In General	Quality Freshness	Food Safety	Health, Nutrition	Environment-Friendliness	Support of Economy	Sympathy, Image
VAN ITTERSUM (1999)							+/+
WIRTHGEN et al. (1999)						+	+
JEKANOWSKI et al. (2000)	+						
SCHUPP et al. (2001)	n.s.		+				
LOUREIRO and HINE (2002)		n.s.		+			
LOUREIRO and UMBERGER (2003)			+/n.s.				
WIRTHGEN (2003)			n.s.	+	+	+	+
VAN ITTERSUM et al. (2003)	+/+						n.s./+
ROOSEN et al. (2003)			+				
UMBERGER et al. (2003)		+	+				
LOUREIRO and UMBERGER (2003)			n.s./n.s./+				
SCHROEDER et al. (2005)	n.s.	n.s.	+		n.s.		n.s.
MABISO et al. (2005)[b]	+		n.s.				
MABISO et al. (2005)[c]	+		+				
LOBB et al. (2006)[c]	+	+				+	

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] A description of the study designs is available upon request; [b] Probit Model; [c] Logit Model; [d] Ordered Probit Model.

Source: Own compilation.

2.2   Sociodemographic Determinants of Preferences for Local Food

Table 2 presents an overview of studies considering sociodemographic indicators. *Age, sex, income, education* and the *number of children per household* are the most frequently surveyed factors. Both the impact of the time the respondent has been a resident of the region (*lifetime*) and the degree of urbanisation (*urban* versus rural areas) have not been considered as factors of preference in most of the studies.

Correlation analyses and non-parametric methods have shown significant relationships between sociodemographic variables and preferences for food products from their home region (e.g., WIRTHGEN et al. 1999, DORANDT 2005). However, causal analyses have rarely shown statistically significant impacts. Furthermore, there is no consistency among causal analyses regarding the direction of influence of *age*, *income*, *education,* and the *number of children* on preferences. There are only consistent results with regard to the influence of *sex* on the preference towards locally grown food: women have been shown to have a higher preference for regional food than men do. All in all, the results concerning the influence of sociodemographic factors on the preference for regional food are not consistent across different studies. Moreover, the results confirm observations of MABISO et al. (2005), that sociodemographic factors have only a marginal effect on the preference towards regional food.

Table 2: Sociodemographic Determinants of the Preference towards Regional Food – Review of Empirical Studies

Author (Year)	Age	Lifetime	Women	Income	Education	HH	Kids	Urban
Patterson et al. (1999)	n.s.	n.s.	n.s.	n.s.	n.s.		+	
Jekanowski et al. (2000)		+	+	+	-	n.s.		n.s.
Schupp et al. (2001)	-		+	n.s.	n.s.	-[a]	-	-
Loureiro and Hine (2002)	n.s.		n.s.				n.s.	
Wirthgen [b] (2003)	+	n.s.		n.s.		n.s.		
Loureiro and 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 and Umberger (2005)	-/n.s./n.s.		+/+/+	+/+/n.s.	-/-/n.s.		n.s./n.s./-	
Lobb et al. (2006)[e]	+							
Lobb et al. (2006)[f]	+/+		n.s./n.s.	+/+	n.s./-		+/n.s.	-/n.s.

Notes: Lifetime= lifetime in the local region; HH= household size; Kids= presence of children in the household; **(+; -)** 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] 1 = Single Household Head; 0 = Otherwise.
[b] WIRTHGEN (2003) also estimates product specific models besides the general regression. In some regressions the variable "lifetime in the region" instead of "age" is significant. Both factors are strongly correlated.
[c] Probit Model. [d] Tobit Model. [e] Ordered Probit Model. [f] Conditional Logit Model.

Source: Own compilation.

3 Theoretical Framework

As mentioned above, the studies presented in the former section do not consider the full range of possible determinants for consumer preference for regional food in their causal analyses. OBERMILLER and SPANGENBERG (1989: 456ff) proposed a theoretical framework, which offers an overview of the plurality of factors that influence the effects of country-of-origin labels on consumer behaviour. VON ALVENSLEBEN (2000a: 6ff.) applied this concept to the region-of-origin-effect and grouped the determinants into cognitive, normative and affective

processes. Figure 1 presents the theoretical framework of the psychographic determinants of the preference towards regional food.

a) Cognitive factors

Consumers who are unsure about the quality of a product might use the geographical origin as a quality cue. This effect may result from two processes. First, the region of origin is a "signal" for the general product quality (VERLEGH et al. 1999: 523). Based on this, there might be a positive bias in the consumer's perception of other attributes that are not necessarily linked to the region-of-origin. Second, locally grown food is perceived to be fresher, healthier and more environment-friendly (DARBY et al. 2006: 2ff.).

b) Normative factors

Regional food can also be preferred due to norms and values. Both societal and personal norms, resulting from environmental values, patriotism and the aim to support local businesses, may influence the demand for regional food. Norms can cause a purchase decision independently of cognitive and affective processes. VAN ITTERSUM (1999: 46ff.) specifies this theory by the assumption that the demand for regional food is influenced by 'consumer ethnocentrism' which is defined as the beliefs consumers hold about the moral appropriateness to favour domestic products (SHIM and SHARMA 1987: 280ff.). Consequently, consumers feel constrained to support the local economy by their selective purchase decision.

c) Affective factors

In addition to norms and values emotional aspects might influence the demand for regional food as they are interconnected in some way with ethnocentric and patriotic issues. Emotions like pride and sympathy towards the own region may be transferred directly to the product. VON ALVENSLEBEN (2000a) assumes that sympathy to the region leads to a positive bias in the perception of the product and its attributes. The contact-affect-phenomenon is discussed as the cause of this positive image transfer from the region to the product. The mere contact to an object leads to familiarity and finally to sympathy to the object (VON ALVENSLEBEN 2000b: 401).

Figure 1:   Theoretical Framework of the Psychographic Determinants of the Preference towards Regional Food
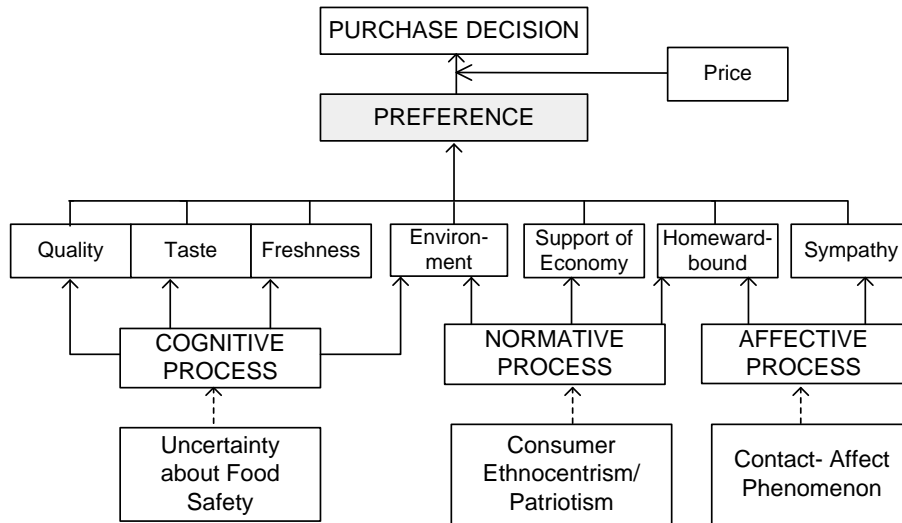
Source: Own presentation.

The three described processes can hardly be regarded as separate constructs, since they overlap and interact with each other. They are affected by the individual perception of quality indicators, personal confidence in the source of the information and by situational conditions like the heterogeneity of products and the general availability of other information (OBERMILLER and SPANGENBERG 1989: 455ff.). Furthermore, there is a strong interdependence with demographic factors.

There seems to be no consensus about the influence of sociodemographic factors on the preference towards local food so far (see section 2b). Therefore, in the following paragraph the influences of different sociodemographic factors on the preference towards regional food are derived theoretically.

Age may have a positive impact on the preference. On the one hand, elderly consumers usually tend to be more closely connected to their home region (DORANDT 2005), have more time for purchasing and preparing food, and are more concerned about health issues. Furthermore, age is often correlated with time spent in the home region, which in turn encourages emotional ties to the region (WIRTHGEN 2003). On the other hand, elderly consumers tend to be less flexible in the food items they accept (SCHUPP et al. 2001: 38) and usually they are less concerned about environmental issues and the impact of pesticides on food (LOUREIRO and HINE 2002: 484). The latter considerations give reason to expect a negative impact of age on the preference for local food.

Males are considered to be less interested in nutrition and health issues than females (PATTERSON et al 1999; SCHUPP et al. 2001). This leads to the hypothesis that women tend to prefer food from the own region more strongly than men do.

Consumers with high income tend to desire a larger variety of food in the marketplace, whereas regional products can enhance the variety (SCHUPP et al. 2001: 38ff). However, some authors like UMBERGER et al. (2003: 111ff.) found a significant negative sign for the income coefficient. It is assumed that wealthier consumers usually buy more expensive food since they normally expect it to be of higher quality. In this case, the price is more important as a quality cue than the origin of the product. Moreover, wealthier consumers buy foreign delicacies more often, and, therefore products from the home region are not always their first choice.

Consumers with higher levels of education are expected to evaluate products rather by personal experience and by the price, rather than by brand names or labels of origin. Thus, a negative impact of education on the preference for regional food is expected. Opposite to this, higher education could lead to an increased awareness of the external effects of food consumption, which could positively influence the demand for regional products.

The presence of children in a household can have both positive and negative effects on the preference for local food products. On the one hand, parents are concerned about the safety and quality of food for their children, and thus they are more interested in food quality and safety (PATTERSON et al. 1999: 187). On the other hand, families have to deal with time and budgetary constraints. This could reduce the efforts to buy locally produced food (SCHUPP et al. 2001: 38).

Further, the geographical location and the degree of urbanisation are supposed 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 local agriculture. Moreover, the supply of locally grown food is more constrained in urban than in rural areas (LOBB et al. 2006). Consumers in rural areas may be more appreciative of locally produced food (JEKANOWSKI et al. 2000: 47ff.). It is hypothesised that the degree of urbanisation has a negative impact on the preference for regional food. Additionally, we assume that consumers in the southern and eastern states of Germany have a higher preference for regional food than consumers in other parts of Germany. This assumption is based on two 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 southern Germany more fruits and vegetables are produced, which can be sold without further

steps of processing. Thus, they are usually sold close to the production area. In the north of Germany, there are comparatively more arable farms which are more industrialised. Third, a return to local products, which have been popular in the former German Democratic Republic, can be observed in eastern Germany (AHBE 2005).

4   Data and Methodology

The Official Marketing Board of the German Agricultural and Food Industry funded a German-wide consumer survey which was conducted in October/November 2002.[1] The sampling frame is households with telephone services. The respondent should be the person in charge of food purchasing and the survey was carried out via a telephone interview. Respondents were selected using a random stratified sampling strategy. The population was sub-divided according to the federal state the respondents live in, and separate random samples were drawn from each state using random-digit dialing procedures. Small states were over-sampled, but the cases were weighted to reflect the actual population in the federal states. 3,000 questionnaires were completed. During the data collection the sample was controlled automatically in terms of the representative distribution of the parameters, i.e. location of residence, age, and gender.

The questionnaire consisted of two parts; the first part aimed at identifying the determinants of preferences towards local food, whereas the second part focused on specialty food products. We used the data of the first part, which contained questions about

- the respondents' personal understanding of the meaning of the term "home region";
- the respondents' sympathy towards the own region of residence;
- the respondents' purchasing habits of food in general and locally grown food products in particular;
- the respondents' motives and barriers of purchasing locally grown food products.

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[1] The Official Marketing Board reported descriptive results of the survey in 2003 (ZMP 2003) and provided the data set for advanced scientific purposes.

Table 3:   **Descriptive Statistics of the Demographics of the Sample (N=3,000)**

Category	Percent	
	Sample [a]	**German Population**
Sex		
Female	78.4	51.1
Male	21.6	48.9
Age		
< 20	1.3	4.2
20 – 39	34.4	32.9
40 – 59	37.3	33.3
60 – 79	25.5	24.9
≥ 80	1.4	4.6
Household size		
1	17.4	36.7
≥ 2	82.6	63.3
Children		
No children	44.4	43.4
Children	55.6	56.6
Education		
No formal education	0.3	7.9
Lower secondary school I (age 14-16)	27.6	45.3
Lower secondary school II (age 15-16)	40.7	26.7
Higher secondary school (age 18-20)	22.6	20.1
University degree	8.8	11.2
Employment status		
Employed full time and part time	56.5	46.0
Unemployed (incl. economically inactive population)	43.5	54.0
Household Income		
≤ 3,000 €/month	66.3	42.4 [b]
> 3,000 €/month	8.6	53.1 [b]
refused	25.1	4.6 [b]

[a] The data are weighted according to the regional distribution of the population in the federal states of Germany. [b] Data are related to year 2000.

Source: Own presentation.

As shown in Table 3, the actual sample is somewhat biased towards female, middle-educated, and employed categories of the German population. The gender imbalance exists because the respondent was the person responsible for carrying out food purchasing. Single person households are substantial underrepresented in the sample. The same is true for households with a monthly income of 3,000 € and more.[2] There is no bias in the age categories and in the presence of children in the household. The level of higher-educated respondents is also approximately equal to the level in the German population.

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[2] One-quarter of the respondents refused to answer the income question.

4.1   Measuring the Preference for Local Food Products

Within the interviews, the preference for locally grown food products was taken by a seven-point Likert scale ranging from *"I completely disagree"* (1) to "I *completely agree"* (7) for two alternative statements. The first statement *"If possible, I try to buy local products"* was coded as Preference 1 (P1) and the second statement as Preference 2 (P2): *"I am willing to pay a price premium for local products"*. Figure 2 presents the frequencies in the response categories of the two statements. The dispersion of the responses in the categories is quite uneven, because the majority of respondents (P1: 88 %, P2: 80 %) rather agreed with the statements. The hypothetical formulation of the statements without any real consequences for the respondent seems to cause a significant 'warm-glow' effect. 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 of being a good citizen rather than due to the matter itself (HENSELEIT 2006: 41). Social desirability bias is the inclination to present oneself in a manner that will be viewed favourably by others. We decided to transform the statements expressing the preference for regional food into binary variables coding the first two values (top-two-values) of the Likert scale as 1 and the remaining values as 0. This transformation should separate respondents with strong preference for locally grown food from the remainder.

Figure 2:   Response Frequencies towards Preference 1 and 2
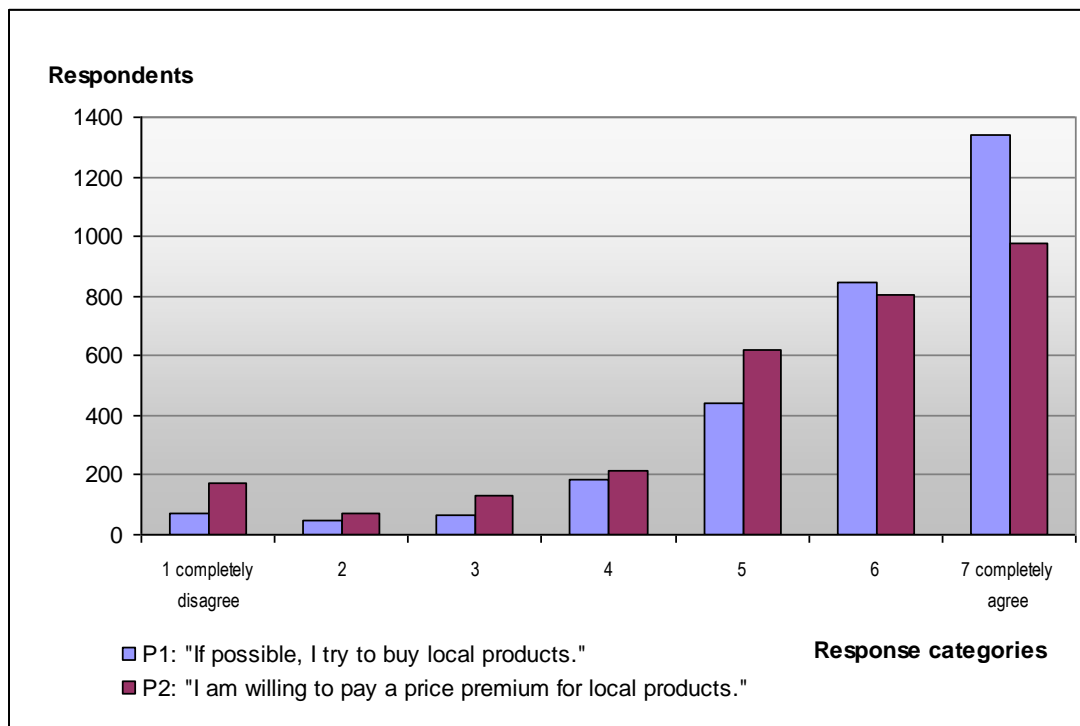
Source: Own presentation.

Since the dependent variable is dichotomous, standard multiple regression is not applicable. Therefore, we applied binary logit regression analysis as an appropriate technique to handle the dichotomous nature of the dependent variable. Table 4 presents descriptive statistics of the items measuring the preference for local food products.

4.2 Estimating Parameters of the Preference for Local Food

Psychographic (Cognitive, Normative and Affective) Factors

Based on cognitive processes consumers may use the products' origin as a quality indicator. Thus, several items expressing the perception of product attributes and food safety were included to represent cognitive factors. Further on, affective processes can influence consumers' product evaluation. Sympathy to the own region is directly transferred to the food product. In our analysis, items, which express the sympathy to the own region and to the local food supply, are defined as affective factors. Normative aspects can also influence the preference for local food products. Statements, which express the environmental friendliness and the support of the local economy by purchasing local food, were used to define normative factors. Descriptive statistics of the items measuring the psychographic determinants of the preference for local food are presented in Table 4. The statements were measured on a seven-point Likert scale. In the logit analysis we transformed the scale into binary dummy variables as we did for the preference items.

Table 4: Descriptive Statistics of Variables Included in the Binary Logit Analysis (N = 3,000)

Variables		Code	Mean	Median	Std. Dev.	Top-Two-Respondents
Preference towards local food products						
If possible, I try to buy local products.		P1	5.93	6	1.37	72.0 %
I am willing to pay a premium for local products.		P2	5.46	6	1.66	59.4 %
Psychographic factors						
Cognitive	Local food is fresher.	Local_Fresh	6.31	7	1.02	84.0 %
	Local food is of higher quality.	Local_Quality	5.66	6	1.25	60.0 %
	Local food is tastier.	Local_Taste	5.78	6	1.25	65.0 %
	Local food is healthier.	Local_Health	5.36	6	1.43	49.3 %
	Legal requirements are stronger for local foods.	Local_Law	5.61	6	1.39	57.3 %
	Caused by the food scares in the last years I lost confidence in products from supermarkets.	Scare	4.59	5	1.77	31.3 %
	Quality is much more important for me than the price when I buy food.	Quality	5.61	6	1.36	59.0 %
	Food, which I buy directly from the farmer, is free of any pollutants.	Pollutants	4.87	5	1.57	35.9 %
	I spend a lot of time eating healthy.	Time	5.07	5	1.64	43.0 %
Affective	Individual sympathy to the home region	Sympathy	6.24	7	1.18	80.8 %
	Individual assessment of food supply of the home region	Supply	5.68	6	1.09	63.2 %
Normative	Local products have short transportation ways.	Transport	6.62	7	0.88	92.9 %
	Local products are naturally and eco-friendly produced.	Nature	5.45	6	1.40	50.4 %
	I support local farmers when I buy local food.	Support	6.43	7	1.05	87.0 %
Consumption and shopping habits						
Taste is more important than the origin of food.		H.taste	4.70	5	1.78	35.6 %
I prefer food, which is quickly prepared.		H.quick	4.64	5	1.84	35.8 %
I prefer supermarkets, because I can buy everything at a single blow.		H.shop	5.09	5	1.72	46.3 %
Shopping frequency of organic food	"regular and occasional" reference: "seldom and never"	H.organic	./.	./.	./.	54.4 % 45.6 %
Demographics		**Code**		**Percent**		
Geographical location of residence						
Northern states of Germany		North		16.2		
Southern states of Germany		South		27.0		
States in the middle of Germany		Middle		35.4		
Eastern states of Germany		East		21.3		
Higher secondary school and university degree		High Education		31.6		
Residence in rural area		Rural		42.1		
Household Income above 3,000 €/month		High Income		9.2		
Employed full time and part time		Employed		56.5		

Source: Own calculations.

Consumption and Shopping Habits

Besides psychographic factors, purchasing habits might influence the preference towards local food products. It is hypothesised that organic shoppers also prefer locally grown food products due to environmental and health reasons. The shopping frequency of organic food, formulated as a dummy variable, is included in the analysis. Furthermore, consumers who prefer convenience (ready-to-eat) products may not buy regional food, because it is usually non-processed, and therefore needs more time for preparation. Thus, we also considered statements that express shopping habits related to organic and convenience food products in our analysis. Items regarding the preference of supermarkets versus other kinds of shopping places were included for the same reason. It is hypothesised that consumers who usually buy in supermarkets because of convenience aspects do not have a strong preference for local food products. The same is expected for consumers, who classify taste as far more important than the origin of food. Descriptive statistics of the statements measuring the consumption and shopping habits are presented in Table 4. In all cases the seven-point Likert scale was used for measuring the shopping habits, except for the shopping frequency of organic food. For the same reasons given for the transformation of the dependent variables we transformed the agreement to the above mentioned items into binary dummy variables.

Sociodemographic Factors

Several variables control for demographics. We include dummy variables for *gender* and the level of *education* as described in Table 3. Other variables include *household income* (0 = less than 3,000 €/month, 1= 3,000 €/month and more), and respondents' *age* (0 = younger than average, 1 = older than average). A binary indicator controls for the employment status of the respondent (0 = unemployed, 1 = employed), whereas 0 also includes persons who are not engaged in economic activity (e.g. pensioners, students). Furthermore, respondents were asked to characterise the area they live in. We apply a dummy variable with 1 = rural and 0 = provincial and metropolitan area. Finally, we include the geographical location of respondents' home by aggregating the sixteen federal states of Germany into four dummy variables. The former states of the GDR in the eastern part of Germany are the reference category. Descriptive statistics of the demographic variables included in the model are presented in Table 4.

5 Empirical Results

The binary character of the preference variables requires the application of a nonlinear model analyzing the relationship between psychographic and sociodemographic indicators and the preference for local food products. Logit analysis calculates the probability of belonging 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 odds[3] 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 (MENARD 1995: 6, 12f, 49f).

The model is estimated by the stepwise forward logistic regression analysis using the maximum likelihood function in the SPSS package. We already mentioned the interdependences between psychographic and sociodemographic factors in section 3. Hence, multicollinearity has to be considered in the modelling strategy and estimations of the correlation between the independent variables were carried out. The highest Pearson correlation coefficient is 0.54 between the statements "*Local food is of higher quality*" and "*Local food is tastier*". This coefficient lies under the magnitude 0.7, mentioned by BRYMAN and CRAMER (1994) to be critical regarding multicollinearity problems in regression analysis. Moreover, several model specifications were estimated in order to test for coefficient stability and reliability. The regression coefficients were stable across all model specifications.

Two models were estimated for which results are presented in Table 5. The first model describes the relationship between P 1 "*If possible I try to buy local products*" and both psychographic and sociodemographic variables, respectively. The second model includes the alternative preference statement 2 "*I am willing to pay a price premium for local products*" as dependent variable.

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[3] $Odds(Y = 1) = \dfrac{P(Y = 1)}{1 - P(Y = 1)}$

Table 5:   Effect Coefficients of the Binary Logit Models (N=3,000)

		Model 1			Model 2		
Constant		0.21	***	(29.89)	0.05	***	(108.22)
Sociodemographic Factors	Germany (ref. East)						
	North	0.47	***	(20.88)	1.23		(1.83)
	South	0.58	**	(11.84)	1.15		(1.08)
	Middle	0.42	***	(36.87)	1.00		(0.00)
	Male	1.02		(0.02)	1,20		(2.69)
	Age (ref. <mean)	1.67	***	(22.99)	1.79	***	(34.21)
	High Education	1.12		(1.04)	0.99		(0.01)
	Rural	1.16		(2.08)	1.11		(1.14)
	High Income	1.52	*	(5.55)	0.90		(0.47)
	Employed	0.85		(2.43)	1.14		(1.75)
Shopping Habits	H.shop	0.59	***	(27.57)	0.68	***	(16.74)
	H.taste	0.68	***	(14.06)	0.75	**	(8.36)
	H.organic (ref. rarely/never)	1.17		(2.26)	1.50	***	(18.06)
Cognitive Factors	Local_Quality	1.75	***	(23.38)	1.30	*	(5.58)
	Local_Taste	1.50	***	(12.52)	1.57	***	(17.08)
	Local_Health	1.62	***	(17.29)	1.29	**	(5.94)
	Local_Law	1.00		(0.00)	1.21	*	(3.92)
	Scare	1.42	**	(9.21)	1.53	***	(16.90)
	Quality	1.44	***	(12.65)	3.48	***	(181.05)
	Pollutants	1.36	*	(6.63)	1.57	***	(18.60)
	Time	1.58	***	(16.81)	1.59	***	(22.08)
Affective	Sympathy	1.50	**	(11.95)	0.88		(1.27)
	Supply	1.54	***	(18.48)	1.08		(0.62)
Normative	Transport	1.57	*	(6.54)	1.24		(1.39)
	Nature	1.36	**	(7.30)	1.43	***	(12.13)
	Support	2.60	***	(49.90)	2.38	***	(35.40)
R^2		0.36			0.39		
Correct prediction		0.79			0.75		

Wald statistics are presented in parentheses.

*, **, *** denote statistical significance at the 10 %, 5 % and 1 % level, respectively.

Source: Own calculations.

The R-squared values indicate that a remarkable part of the variance of the preference variables can be predicted by the independent variables. All included explanatory variables show the expected signs. Hence, the results confirm the theoretical framework of impact factors. Not surprisingly, there are more significant variables in Model 1 than in Model 2. The

effect of "yeah-saying" seems to be higher for P1 (*"If possible, I try to buy local products"*) than for P2 (*"I'm willing to pay a premium for local products"*) due to the less binding character of the first statement. While in Model 1 the location dummies are significant, there is no significant difference between regions in Model 2. The same is true for the income dummy that shows that the respondents, who belong to the highest class of income are more likely to buy local products. *Age* of the respondent appears to be the only relevant sociodemographic variable in determining the preference towards locally grown food in both models. Elderly people tend to show a higher preference for regional food than younger people. This may be a result of having a closer emotional connection to the home region, and having more time to purchase and prepare unprocessed food products.

Respondents, who agreed to the statements that they prefer shopping in supermarkets and that taste is more important to them than origin, show a significantly lower preference for regional food. Not surprisingly, there is a significant positive relationship between the frequency of buying organic products and the preference for local food. As expected, the statements indicating *cognitive factors* show in nearly all cases a positive influence in both models. Especially the remarkable effect coefficient of 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 preference for regional food. *Affective aspects* determine the preference for local food significantly only in Model 1. Emotional processes do not affect the statement "*I am willing to pay a price premium for local products*". Both logit models indicate an obvious impact of *normative indicators* on the preference variables. The two most important normative aspects are the support of local farmers and environmental considerations. By evaluating the importance of normative indicators, it is essential to consider the *warm glow effect* in interviews and surveys of this type. The true importance of the desire to support local farmers might be smaller than the observed and estimated levels in the models.

In comparison to the results of the studies described in section 2, our estimations confirm the importance of cognitive factors determining consumers' preference for locally grown food. However, if normative aspects are not considered at the same time, an overestimation of the coefficients of cognitive factors can occur. Affective indicators play only a marginal role when cognitive and normative processes are also included. Consequently, the German studies by WIRTHGEN et al. (1999) and WIRTHGEN (2003) seem to overvalue emotional factors in their estimations.

6 Final Remarks

The results of the present study indicate that cognitive and normative processes are the most important factors in determining the preference for regional food in Germany. Sociodemographic factors and affective processes are not satisfactory in explaining the variance in the preference for locally grown food. From the consumer's point of view, the origin of food is an important indicator of quality and safety. Further important factors are social norms, especially the desire to support the local economy by the purchase of local food. However, in comparing our results with other consumer country (region)-of-origin studies the results indicate that in former studies affective aspects were partly overvalued and normative processes mostly neglected. Future research on the product specific nature of the effect of products' origin on consumers' food evaluation may provide further relevant results (see also VAN ITTERSUM et al. 2003). Representative studies need to clarify impact differences according to different food products. Furthermore, cross-national studies should be undertaken in order to examine cross-cultural differences regarding the preference for regional food.

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Consumers' and Producers' Expectations towards Geographical Indications

Empirical Evidence for a German Case Study

by Ramona Teuber

Abstract

Purpose: The paper's objective is to investigate consumers' and producers' expectations towards geographical indications (GIs) in a German context, where this certification scheme is not widely used so far.

Methodology/Design/Approach: Data for the consumer side were obtained by a structured questionnaire. 741 consumers were asked online with respect to their knowledge and expectations towards geographical indications in general and Hessian apple wine in particular. The collected data were analysed by an explorative factor analysis and a binary logit model. Additionally, data for the producer side were collected via an in-depth interview with one major producer of Hessian apple wine.

Findings: The consumer side results indicate that Hessian consumers' awareness and knowledge about GIs is very limited. Moreover, it is found that the quality warranty dimension is not as important as the economic support dimension and perceived authenticity of the product. A hypothetical willingness to pay for protection is mainly driven by consumer perceptions and expectations towards the positive impacts of geographical indications on the local economy. The producer side results highlight that the most important motivation to apply for a PGI is to secure the established reputation against misuse by competing producers in order to ensure the quality level of Hessian apple wine.

Practical Implications: The findings point out that a protected geographical indication is by no means a self-runner. The positive impacts of this certification scheme have to be communicated to consumers in order to be successful.

Originality/Value: Empirical evidence with respect to consumers' knowledge and expectations towards geographical indications in a non-Mediterranean context is limited. The present paper contributes to the existing literature by providing empirical evidence for a German case study.

Keywords: Geographical Indications, Cider, Germany, Consumer Perceptions, Marketing Strategy

1   Introduction

In recent years a steadily increasing demand for regional and local foods can be observed worldwide. From the consumers' point of view, this growing demand for local and regional foods can be considered a countertrend against the globalisation of trade in foods with international brands and converging demand patterns (PARROTT *et al.*, 2002). A growing consumer segment is concerned about food safety and food quality issues and values the origin as a useful quality cue. These ongoing developments are reflected in the growing number of products registered under regulation EC No. 510/2006 and the efforts at national and international level to foster the registration of products either as a *protected geographical indication* (PGI) or a *protected designation of origin* (PDO)[1]. This is also true for Germany, where this certification scheme has not been widely-used so far. However, several attempts have been made to promote this scheme and to encourage German producers to apply for the EU-wide protection. Some prominent examples of German PDO/PGI products are Schwarzwaelder Schinken (PGI since 1997) and Spreewaelder Gurken (PGI since 1999).

Most scientific studies on geographical indications (GIs) have been carried out in a Mediterranean context, since origin labelling has got a long tradition in countries such as France, Italy and Greece (e.g. LOUREIRO and MCCLUSKEY, 2000; SCARPA *et al.*, 2005). Contrarily, empirical evidence with respect to the use of PDO and PGI in a non-Mediterranean context is limited due to the rather low number of registered products originating in non-Mediterranean countries. This has changed to some extent in recent years. A growing number of agricultural producers from non-Mediterranean countries apply for registration of their products under regulation EC No. 510/2006 (BECKER, 2009). However, the majority of products registered either as PDO or PGI still originate in Mediterranean countries. BECKER (2009) explains this north-south divide by different policy approaches towards enhancing food quality. Whereas in Mediterranean countries the *terroir* concept is well-established and used extensively by agricultural producers, northern European countries have focused on other food quality assurance schemes (FQASs) and organic production instead. A similar reasoning is put forward by PARROTT *et al.* (2002). They argue that the apparent differences between 'northern' and 'southern' European countries in terms of PDO/PGI-use result from notable differences in their food culture and agricultural systems.

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[1] The main difference between these two instruments is the extent of the quality-origin link. In case of a PDO, all stages of production must take place in the defined region. In case of a PGI, the products' characteristics need only to be attributable to the defined area and it is sufficient that at least one production stage takes place in the defined area

They characterize the 'northern' culture as functional and commodity-driven, whereas the 'southern' one is based on locality and artisanal production.

Given this background, studies investigating the establishment of geographical indications in non-Mediterranean parts of Europe are rare. Detailed knowledge about consumers' attitudes and producers' expectations towards this certification scheme is particularly limited for German consumers and producers. The present paper wants to fill this research gap by presenting empirical results for a German case study, Hessian apple wine.

Two main objectives are pursued. First, the paper addresses the awareness and perceptions of, and attitudes towards the PDO and PGI labels among Hessian consumers. This is of considerable importance, if producers want to use these labels as a successful marketing tool. Second, the paper investigates consumers' attitudes towards the product Hessian apple wine and the evaluation of a regional certification label for this specific product. Additionally, the supply side will be briefly explored by presenting findings concerning producers' motivation to apply for registration of the term "Hessischer Apfelwein" as a PGI. The expectations driving the decision to apply for a registration under regulation EC No. 510/2006 as well as possible obstacles the producer group faced during the application process shall be identified. Possible obstacles can be endogenous such as conflicts finding a consensus on the product specification or exogenous such as administrative burdens.

The paper is structured as follows. The next section highlights the main features of the cider and apple wine industry. Thereafter, a brief overview about previous empirical studies in the context of PDO and PGI products is provided, followed by a presentation of the empirical results with respect to Hessian apple wine. The last section discusses the obtained results and concludes.

2 The Cider Market

As in the case of wine, taste, appearance and alcohol content of cider varies across countries and regions.[2] The French cidre is known for its relatively low alcohol content (3 % by volume), whereas the British or Irish cider normally has got an alcohol content of over 10 % by volume. The UK and Ireland are the main producing and consuming countries of cider. Other countries with a tradition of producing cider and possessing an established cider

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[2] Cider is defined as an alcoholic beverage produced by the fermentation of the juices of apples without adding distilled alcohol. Synonyms are cidre, fermente de pomme, sidra, applecider, Apfelwein, äpplecider and siider (AICV 2009). In the following cider is used to refer to the global market, whereas apple wine is used for the German resp. Hessian market.

industry are Belgium, Finland, France, Germany and Spain. The per-capita consumption of cider across countries is presented in Figure 1.

The highest per-capita consumption of cider can be found in Ireland, Great Britain, and Finland with 17, 13.3 and 11 litres per annum, respectively. In all other countries, the consumption is rather low (i.e., beneath 5 litres per year). For comparison Figure 1 does also present the per-capita consumption of beer and wine.

Figure 1:   Annual per-capita consumption of cider, wine and beer in selected European countries, 2004 and 2005
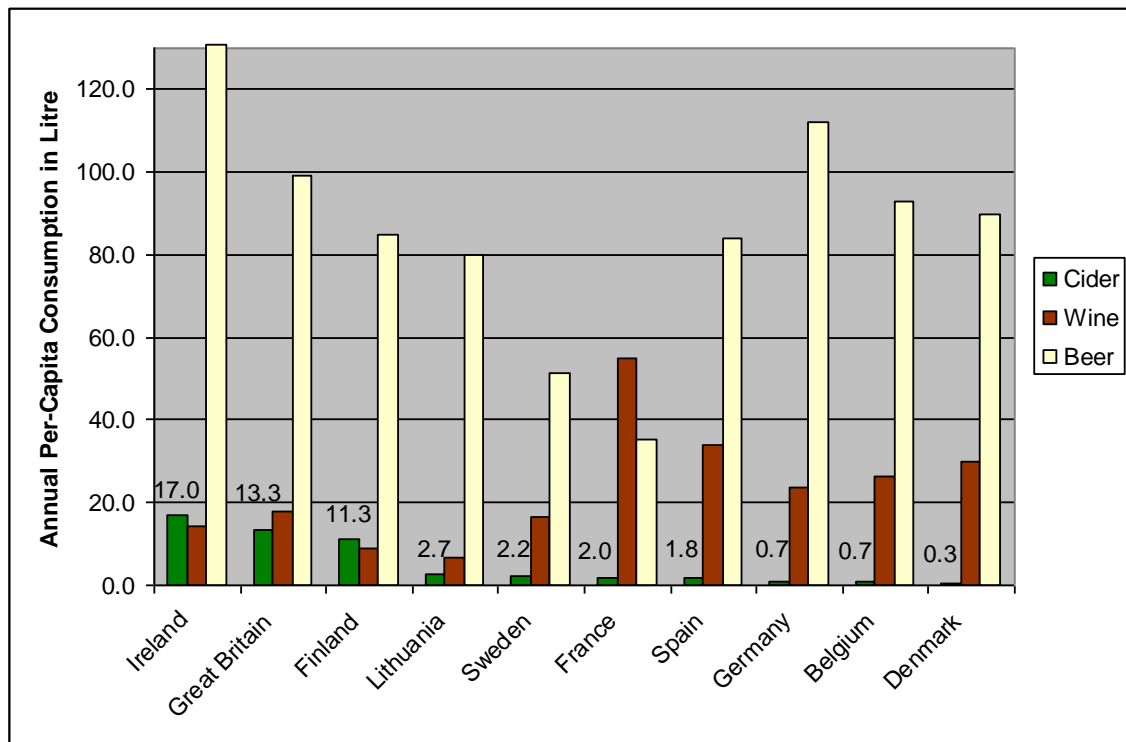
Source: Own presentation based on data from the VdFw, Deutsches Weininstitut and FAOStat**.**

Although the cider market is much smaller than the beer and wine market, it has experienced the highest growth rates among alcoholic beverages in some European countries in recent years. One example is the UK, where sales of cider grew by 23 % in 2006. According to the National Association of Cider Makers (NACM), cider is abandoning its "cheap alcohol" image and a growing share of consumers perceives cider as a quality drink (National Association of Cider Makers, 2009). A renewed interest in cider can also be observed in other European countries with a long history of cider production and consumption such as Brittany and Normandy in France and Northern Spain (ROWLES, 2000). In these areas, cider is a central element in the local culture and most often touristic concepts are based on the local cider industry.

Moreover, the growing consumer interest in product attributes such as origin, sustainability, traceability and authenticity has fuelled the demand for regional foods and regional specialties.[3] The product cider seems to be well-suited for such a setting due to its long history and the large variety of different ciders reflecting regional differences in climate, apple varieties and local production techniques. This association between provenance and quality is sometimes denoted *terroir*. The French term *terroir* means that there is a certain link between the context of production (i.e., climate, soil, culture, tradition, local knowledge) and the quality of the produced product (PARROTT et al., 2002). Such a quality-origin link is a necessary condition for a product to become protected under regulation EC No. 510/2006. The increasing interest in protecting cultural heritage and promoting authentic products is possibly the underlying reason for the growing number of ciders registered either as PGI or PDO. Table 1 presents an overview of all currently protected ciders in Europe.

Table 1:   Ciders Protected under Regulation EC No. 510/2006, August 2009

Country	Protected Product	PDO/PGI	Registered since
France	Cournaille	PDO	1999
France	Pays d'auge/Pays d'auge Cambremer	PDO	1999
France	Cidre de Bretagne	PGI	2000
France	Cidre de Normandie	PGI	2000
Spain	Sidra de Asturias	PDO	2005
UK	Gloucestershire cider	PGI	1996
UK	Herefordshire cider	PGI	1996
UK	Worcestershire cider	PGI	1996

Source: Own compilation based on the EU database on PDOs and PGIs.

In Germany, the production and consumption of apple wine is concentrated in a few regions, namely Hesse, Bavaria, Rhineland-Palatinate and Baden-Wuerttemberg. Hesse, particularly the region around Frankfurt, is the leading producing and consuming region. In the year 2008, the production was 37 million litres, which represent around 85 % of total apple wine production in Germany (Verband der Hessischen Apfelwein- und Fruchtsaft-Keltereien e.V.). Around 50 companies produce cider in Hesse, with the major share being small-scale

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[3] There is no clear definition of regional foods or regional specialties. In this paper regional specialties are defined as products that are protected under regulation EC No. 510/2006 and products protected under regulation EC No. 509/2006 as traditional speciality guarantees (TSG).

producers selling their cider only locally [4]. The per-capita consumption in Hesse was six litres in 2008, ten times the average German per-capita consumption of 0.6 litre (IBIDEM). Of great importance is the out-of-home consumption, with only one fourth of total consumption taking place at home (KUBITZKI et al, 2010).

Hessian apple wine has got a long history and has been in the market place for decades. However, due to the steadily declining consumption in the 1990s, new ways to stimulate demand had to be found. KUBITZKI et al. (2010) analysed the Hessian apple wine market with the main objective to identify the underlying reasons for the steadily declining consumption of apple wine in Hesse in order to provide strategies for the Hessian apple wine producer association to overcome this declining trend. The results from an online-survey of 1000 Hessian consumers conducted in 2006 highlighted that the group of regular apple wine consumers is quite satisfied with the current product. For these consumers the attributes "authenticity" and "tradition" are of great importance. They prefer a dry apple wine that is produced traditionally, which means that it is made of Hessian apples without any additives. The Hessian origin is an important attribute for these consumers. In contrast, non-consumers often cite the harsh and bitter taste as a reason for not drinking apple wine. Thus, this consumer group, comprising mainly younger and female consumers, should be attracted by sweeter apple wine and apple wine mixed with lemonade. Several apple wine companies launched such products in recent years.

3 The Role of Geographical Indications in the Supply Chain

3.1 PDO and PGI Products from a Producers' Point of View

Geographical indications like trademarks are distinctive signs that enable producers to secure their established reputation against imitation and fraud. However, trademarks are individually owned rights whilst geographical indications can be considered as club goods (JOSLING, 2006). The clubs owing these rights are typically producer groups or vertically integrated producer-processing associations. According to this club good nature of a PDO/PGI, BELLETTI et al. (2009) conclude that the protection of a PDO/PGI can reinforce the collective action among the participating producers.

One of the earliest studies analysing the adoption of GIs in a non-Mediterranean country is the one by ILBERY and KNEAFSEY (2000a) for the UK. In order to find out who applied for a PDO/PGI and why, a brief postal questionnaire was sent to 22 registered

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[4] In Hesse, apple wine is also produced by home-brewers for personal consumption and by small companies that are not members of the Hessian apple wine producer association. These quantities are not included in the official statistics.

producer groups in the UK. The results point out that there is no clear pattern in terms of business type and structure among the applicants. Moreover, the PDO/PGI producer groups exhibit a large heterogeneity. With respect to the reasons for application the answers suggest that the early adopters have sought PDO/PGI status primarily to protect their named products against usurpation. The motivation to use the PDO/PGI logo as a marketing tool was not important at all. Only two of the respondents used the logo at that time on their products. Among the respondents was also one apple cider producer group, the Cider and Perry Makers. This producer group producing Gloucestershire apple cider stated that there were rumours that French cider makers wanted to enter the UK market with UK-style ciders. Consequently, cider producers in the UK applied for the protection as a PGI, because they were afraid to loose market shares if French producers were able to enter the expanding UK market with UK-style ciders. These findings are in line with the other investigated producer groups in the UK leading to the conclusion that in these cases the PDO/PGI certification scheme is primarily a mechanism to protect national producer interests rather than a marketing tool (ILBERY and KNEAFSEY, 2000a).

DIMARA, PETROU and SKURAS (2004) draw a similar conclusion. They argue that regional denomination certification can be considered either as a promotion or as a protection strategy from the producers' point of view. In the latter case applying for registration pursues the objectives to protect an established reputation and raise barriers to entry. In the former case certification is considered a useful marketing instrument to create niche markets. The empirical analysis focused on black currant producers in Greece, who had applied for PDO status at the time the survey was carried out. The results suggest that for most producers PDO certification is not evaluated as an important marketing indicator but as a protection strategy raising barriers to entry.

3.2   PDO and PGI Products from a Consumers' Point of View

Consumer studies dealing with PDO and PGI labels typically investigate the awareness and knowledge of these labels as well as consumers' perceptions and attitudes towards products carrying such a regional certification label.

The most comprehensive study with respect to consumers' appreciation and attitudes towards PDO/PGI-labelled products was conducted by VAN ITTERSUM et al. (2007). In their proposed and tested model on consumers' product evaluation of protected regional products two different effects are distinguished, the effect of the region-of-origin cue and the effect of the certification label itself. The region-of-origin cue is assumed to influence consumers' attitudes towards the protected regional product through the perceived quality. The regional

certification label, which guarantees that the product is the authentic product and not an imitation, is supposed to influence consumers in their purchasing behaviour through two different dimensions. The first one is the quality warranty dimension, which represents consumers' belief about the ability of the label to guarantee a higher quality level. The second dimension is the economic support dimension, which captures consumers' beliefs about the way and degree the label can support the economy in that region (VAN DER LANS et al. 2001; VAN ITTERSUM et al. 2007). The first dimension is assumed to be relevant for all consumers of the product, whereas the second dimension is supposed to be of particular relevance for consumers located inside the production area. The model was tested based on survey data for six different PDO/PGI products from three different European countries, namely Italy, Greece and the Netherlands. The empirical results highlight that consumers have a favourable image of regional certification labels and that this image can be represented by the proposed two-dimensional construct consisting of a quality warranty and an economic support dimension. The results reveal further that the perceived higher quality of these products is the most important determinant of consumers' willingness to buy and willingness to pay for protected regional products. Moreover, VAN DER LANS et al. (2001) point out that the success of a marketing strategy based on the region of origin crucially depends on consumers' awareness and favorable image of the region. These findings are fully in line with findings from the country of origin and branding literature (KOTLER and GERTNER 2004; VERLEGH and STEENKAMP 1999). Accordingly, a marketing strategy based on regional certification labels resembles a branding strategy in many aspects, particularly in terms of reputation -building and promotional activities.

Another relevant study for our analysis is the one by CARPENTER and LARCENEUX (2008). They tried to explore the decision-making process of consumers when faced with products carrying different value-based labels. Their experimental framework enabled them to compare the impact of a PGI label, when explained, to a PGI label not explained, a local terroir label and no label at all. The experiment was carried out with French consumers and two products, chicken and foie gras. The results highlight that the PGI label without additional information has got no positive impact on perceived quality of the product. However, if the PGI label is explained, it influences the quality perception and purchase intention positively.

It can be summarised that the empirical evidence so far suggests that the most important factor determining the success of a PDO/PGI product is the perceived higher quality compared to non-protected products. In this context it must be stressed that quality is a

social construct and may vary for specific products and between individuals (ILBERY and KNEAFSEY 2000b). Moreover, quality in relation to regionally denominated foods is closely related to other socially constructed concepts such as "authenticity", "healthy" and "tradition". This notion is important in that respect, that if regionally denominated products are perceived as being of a higher quality, this higher quality can comprise many different aspects.

4   Empirical Results

4.1   Producers' Motivation and Expectations

The Hessian apple wine producer association submitted the application for a registration of the term "Hessischer Apfelwein" as a protected geographical indication to the German Patent and Trade Mark Office (DPMA) in spring 2006. In August 2007, it was forwarded to the European Commission, where it is still under consideration.

In November 2008, an in-depth interview with one of the leading producers of Hessian apple wine and member of the Hessian apple wine producer association was conducted. The main research hypothesis to be tested is based on results from previous studies on the Hessian apple wine market (KUBITZKI et al. 2010; KUBITZKI and SCHULZ 2007). These studies proposed using the protection of the region of origin as a marketing tool in order to stop the declining apple wine consumption in Hesse. Hence, it is hypothesised that the main motivation of Hessian apple wine producers to apply for a PGI is to use this label as a marketing tool, i.e. they primarily want to pursue a promotion instead of a protection strategy.

The Hessian apple wine producer association was founded in 1948 with the aim to represent the interests of Hessian apple wine producers in public. Hence, co-operation and bundling of interests has got a long history in the Hessian apple wine industry. This is very contrary to the case of Herefordshire, Worcestershire and Gloucestershire Cider analysed by ILBERY and KNEAFSEY (2000a), where a producer association was newly-founded in order to submit an application for a PGI. However, the main motivation to apply for EU-wide registration is the same in both cases. Both producer groups want to achieve protection against free-riders and imitations. The Hessian apple wine producer association considers the EU-wide registration as an important tool in securing the quality level of Hessian apple wine. In this regard the protection shall secure the recent price level and prevent price erosion due to copycat products with lower quality in the market. Moreover, the Hessian apple wine producers have got the feeling that this type of certification is somehow demanded by retailers due to a growing focus on labels and certification schemes. These results are in contrast to the

hypothesis stated above that the application for protection is driven by the aim to use the EU-wide protection as an active marketing tool both in the domestic as well as in foreign markets.

Another question addressed was the decision to apply for a PGI instead of a PDO. There was no discussion on this topic among the Hessian apple wine producers, since the restriction to use only Hessian apples in the case of a PDO application would impose severe difficulties. Thus, the general consensus was to apply for a PGI with the specification to use, if possible, 100 % Hessian apples from *Streuobstwiesen*. This leads to the aspect of product specification. This is of great importance, because the product specification is the decisive factor in obtaining registration (LONDON ECONOMICS 2008). Within the product specification, the documentation of an existing link between the product's quality or at least one characteristic and the defined geographical region is the most important part. According to the interview results, the product specification caused no problems among producers and was agreed by all participants very quickly. This can certainly be due to the long history of producing apple wine. Hence, it seems to be that endogenous obstacles were not of any importance in the application process. The same seems to be true for exogenous obstacles. No major difficulties were faced during the application process and the direct costs (e.g., application fees), were very low. This is also true for indirect costs, i.e. costs arising from restrictions on certain agricultural or processing practices. These costs that are often cited to be of significance in the context of geographical indications seem to be of low importance in the case of Hessian apple wine. One possible explanation is that the established way of production is the basis for the product specification.

4.2 Consumers' Awareness, Perceptions and Willingness-to-pay for the EU Protection

At the same time the in-depth interview was carried out, an online survey with 741 Hessian consumers was conducted. The sample is representative for the population of Hesse with respect to sex, age and place of residence in the age group 15-59 years. Older consumers are clearly underrepresented while higher educated people are clearly overrepresented. This is a typical bias in online surveys and should always be kept in mind while interpreting the results.

In the first part the survey addressed the level of awareness of the official EU logos (presented in Figure 2) among Hessian consumers and the associations with these labels [5].

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[5] For the survey the old PDO logo was used. The new PDO logo was introduced in July 2008 due to the claim that consumers cannot distinguish between the two labels because of the optical similarity. However, at the time the survey was carried out a large share of PDO products was still labelled with the old logo. Therefore, it was decided to use the old blue-coloured logo instead of the new red-coloured one.

The second part contained questions with regard to Hessian apple wine and the possible protection as a PGI. The main results are presented and discussed below.

Figure 2:   **EU Logos PDO and PGI**

PDO and PGI Labels in General

The awareness of the official EU logos is very low among Hessian consumers. Only 9.6 % (N=71) of all respondents claimed to know at least one of the two EU logos. This is in line with a note by the European Economic and Social Committee (EESC) issued in 2008 that the recognition of "European certification schemes and their logos and labels is still inadequate and very patchy". Moreover, due to follow-up questions it turned out that some consumers did confuse the labels with other labels. Hence, the share of consumers knowing this certification scheme and the associated labels is even overstated with 9.6 %.

It was investigated whether there are significant differences between consumers claiming to know at least one label and consumers not being aware of the labels ($p < 0.05$). No significant differences between these two groups were found with respect to sex, income, and household size. However, significant differences could be identified in terms of education level and age. Higher educated respondents and respondents under the age of 30 are more likely to know the labels. A significant difference was also found with respect to organic shopping behaviour. People stating to buy regularly organic products have got a significant higher awareness of the PDO/PGI label than people who buy organic products rarely or never. This can be explained by the fact that people who buy regularly organic foods are most often more interested in the foods they purchase and, hence, are generally better informed than non-organic buyers.

Of great interest is the signal effect of a label, i.e. what is transmitted by the label to the consumer. This question was investigated for consumers claiming to know at least one of the labels and consumers not being aware of these labels separately. One striking result is that among consumers declaring to have seen one of the logos before, nearly 40 % did not state any association with the labels. This does reflect the wide-spread lack of knowledge among Hessian consumers what these labels stand for. Among the stated associations, the statements

"the label secures that the origin is the true origin", "the product is the original one", "the product is a high-quality product" and "the product is controlled" were mentioned most frequently. This group was also questioned closed-ended with respect to their expectations towards products protected either as PDO or PGI. The results are presented in Figure 3.

Figure 3: Expectations towards PDO and PGI products (N=71)
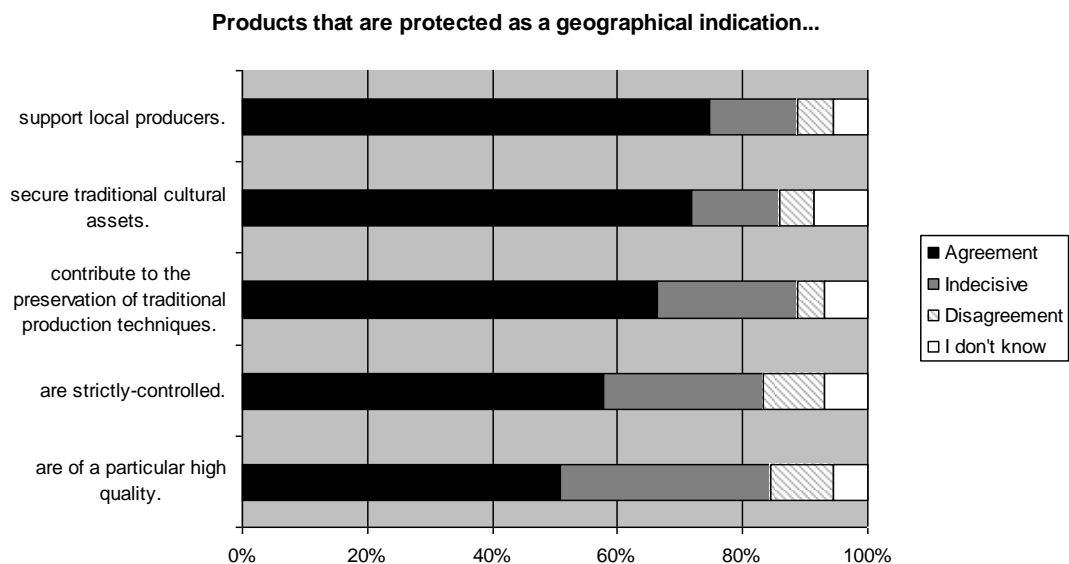
Source: Own presentation.

Consumers' agreement respectively disagreement to the presented statements was measured on a 5-point Likert scale ranging from "1= I totally disagree" to "5= I totally agree" with an additional "I don't know"-option. Over 70 % of the respondents agree that geographical indications support local producers and secure traditional cultural assets. On the other hand, the share of respondents associating tight controls and a particular high quality with geographical indications is 57.7 % and 50.7 %, respectively. For these two statements the share of respondents being indecisive was highest with 25.4 % and 33.8 %, respectively. It seems to be the case that geographical indications are tightly connected with protecting tradition and supporting the local economy, whereas around 50 % are not convinced that these products possess a particularly high quality. This is an important finding given the results from previous consumer studies presented above that in most cases the higher perceived quality of protected products determines the preference and WTP for these products.

Hessian Apple Wine and the Protection as PGI

After this general part on the EU Certification labels, the second part addressed Hessian apple wine. Based on their consumption frequency the respondents were classified in consumers and non-consumers.

42 % of respondents state to drink apple wine at no time. These consumers constitute the group of non-consumers. All other respondents comprise the group of consumers. All respondents were asked to state their associations with Hessian apple wine open-ended and closed-ended. The results for the closed-ended statements for the consumer group are presented in Figure 5 (see Annex 1 for a complete statements list plus codes).

Figure 4: **Associations with and expectations towards Hessian apple wine and the protection as geographical indication, apple wine consumers (N=432)**
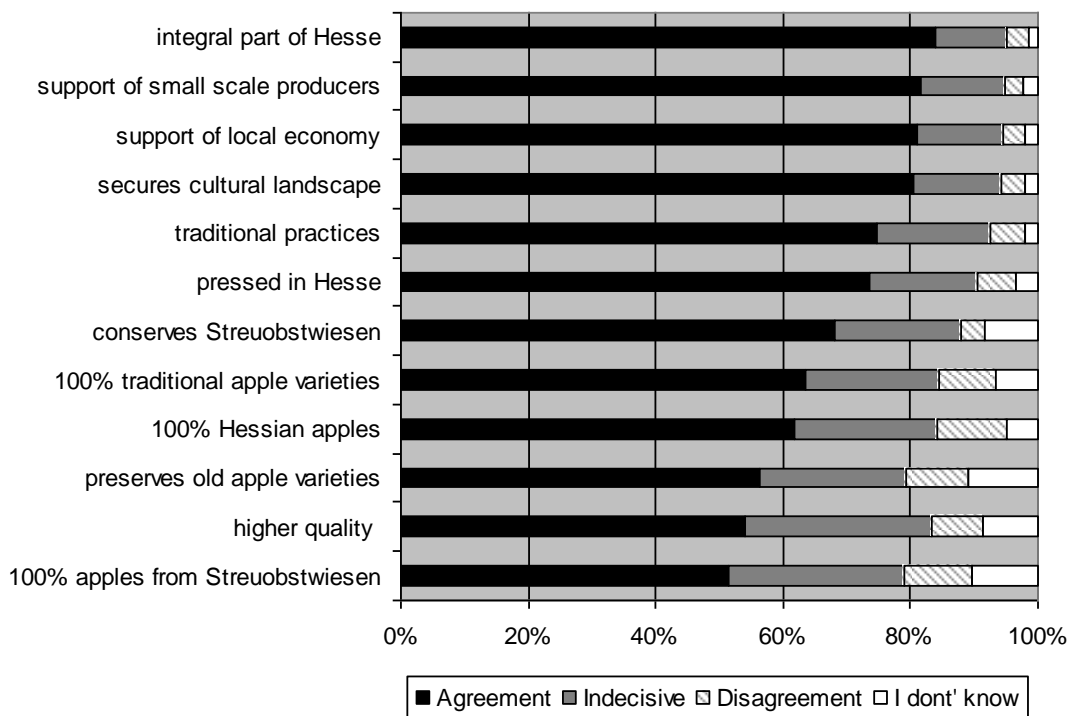
Source: Own presentation.

Figure 4 points out that the highest share of agreement can be found for statements that are related to constructs of culture, economic support and the use of traditional processing methods. The lowest degree of agreement is present for statements related to higher quality and raw material specifications such as the exclusive use of Hessian apples, traditional apple varieties or apples from *Streuobstwiesen*. These results suggest that from the consumer point of view, Hessian apple wine is deeply rooted in the local culture and tradition, whereas detailed expectations with respect to the product specification are not very pronounced.

Furthermore, the respondents had to indicate whether they were willing to pay a higher price for a protected apple wine. 48 % of consumers stated to be willing to pay a higher price for a protected apple wine. Hence, the question arises which factors may contribute to this hypothetical willingness to pay (WTP) for protection. Therefore, a binary logit model was estimated with the hypothetical WTP as the dependent variable. Such a model permits the examination of the marginal impact of variables on the probability of a positive WTP for protection *ceteris paribus*. The included explanatory variables comprise socio-demographic variables as well as consumers' attitudes and expectations towards organic products, Hessian apple wine in general and the protection in particular. Before estimating the binary logit model, an explorative factor analysis (EFA) was carried out in order to reduce the large number of statements to a few independent factors that can be incorporated into the model. Several extraction (principal component, maximum likelihood) and rotation (varimax, oblimin) methods were tested, whereby the most reliable solution is a 2-factor solution which is presented in Table 2. Moreover, Table 2 presents the factor loadings on each single-item statement, as well as the mean of the single-item statement for the group of consumers stating to have a positive WTP for a protected apple wine and the group stating to have no WTP, separately.

Table 2:   Retained Factors, Single-Item Statements, Factor Loads and Mean

Factors and the associated single-item statements[a]	Factor loading	Mean	
		Positive WTP	No WTP
Factor 1: Support dimension (% of variation explained: 50.8%)			
Support of small-scale producers	0.874	4.45	4.05
Support of local economy	0.791	4.41	3.91
Secures cultural landscape	0.758	4.44	3.94
Factor 2: Processing dimension (% of variation explained: 14.8 %)			
100 % apples from *Streuobstwiesen*	0.812	3.98	3.30
100 % traditional apple varieties	0.732	4.07	3.54
100% Hessian apples	0.711	4.16	3.50
Protection secures old apple varieties	0.705	4.27	3.41
KMO = 0.851 (p < 0.000)		N=206	N=226

Notes: [a] The agreement to each statement is measured on a 5-point Likert scale with 1 = "I don't agree at all" to 5 = "I totally agree". The "I don't know" answers were dropped; Results were obtained by using the principal component method with varimax rotation.

Source: Own presentation.

In the binary logit model the dependent variable is a dichotomous variable, whereby in this case the top-two answers, that is "I totally agree" and "I agree" with respect to the statement "I were willing to pay a premium for an apple wine that is protected as a geographical

indication", were coded as "1 = WTP for protection" and all other answers as "0 = no WTP for protection".

It is important to note that the variable WTP does only measure a hypothetical WTP, since it is derived from a hypothetical questionnaire. In hypothetical settings, researchers typically worry about two possible biases, the social desirability bias and the hypothetical bias (LUSK and NORWOOD, 2009; MURPHY and STEVENS, 2004). The social desirability bias refers to a situation where respondents provide answers they consider as being in line with social norms. This bias is assumed to be more pronounced in face-to-face interviews than in online surveys because of the presence of an interviewer in the former case (DUFFY *et al.,* 2005). The hypothetical bias, which refers to a discrepancy between what people say in a hypothetical survey and how they will actually behave in a real purchase situation, typically leads to overstated WTP measures.

Whereas it is assumed that the social desirability bias is not a point of major concern in our setting due to the anonymous online survey structure), the hypothetical bias certainly is. In order to take this possible bias into account, the model is specified very carefully by just considering the top-two answers as a hypothetical WTP. Moreover, since the respondents were able to indicate their agreement on a 5-point Likert scale with an "I don't know" option, we are quite confident that the hypothetical bias is reduced compared to the usually applied dichotomous choice. Nevertheless, the hypothetical nature of the setting must be kept in mind when drawing conclusions from the model.

The estimated model is

$$logit(p_i) = \ln\left(\frac{p_i}{1-p_i}\right) = \alpha + \sum_j \beta_j X_{ji} \tag{1}$$

with p_i being the probability of consumer *i* having a positive WTP, α and β are regression coefficients and X_{ji} are explanatory variables (a detailed list of all included variables is presented in Annex 2). The maximum likelihood estimates are presented in Table 3.

Table 3: Results from the Binary Logit Model

Variables	Code	Reduced Model Exp(β)		Comprehensive Model Exp(β)	
Dependent Variable : Willingness to pay (no WTP =0, positive WTP=1)					
Explanatory Variables					
Constant term		0.631	(0.361)	0.716	(0.556)
Sociodemographics					
Age	*30-49 yrs*	0.892	(0.659)	0.658	(0.147)
	above 49 yrs	1.016	(0.963)	0.799	(0.548)
Gender	*Female*	1.253	(0.327)	1.186	(0.498)
Socioeconomics					
Education	*Higher_edu*	1.167	(0.507)	1.167	(0.507)
Income	*Income_medium*	1.539	(0.147)	1.761[*]	(0.081)
	Income_high	1.716[*]	(0.072)	1.794[*]	(0.075)
Size of home town	*Urban*	1.014	(0.966)	1.042	(0.905)
Residence in Hesse	*Southern Hesse*	0.899	(0.666)	0.962	(0.886)
Shopping and Consumption Behaviour					
Place of apple wine purchase	*Producer*	0.595.	(0.218)	0.745	(0.538)
	Supermarket	0.959	(0.910)	0.912	(0.824)
Organic foods	*Organic_occass*	1.525[*]	(0.085)	1.323	(0.292)
	Organic_regularly	2.070*	(0.032)	1.566	(0.237)
Psychographic factors					
Factor 1	*Support dimension*			2.342***	(0.000)
Factor 2	*Processing dimension*			1.780***	(0.000)
N		339		339	
Percent correctly predicted		56.9 %		73.2 %	
LL- Value		453.05		392.45	
Nagelkerke's R²		0.059		0.268	

Notes: [*], *,**,*** denote statistically significance at the 10 %, 5 %, 1 %, and 0.1 % level, respectively.

Source: Own presentation.

Overall, the model fit of the comprehensive model is satisfying with a Nagelkerke R^2 of 0.268 and a correct prediction of 73.2 %. The impact of the independent variable is reported by the effect coefficient exp (β), which indicates the change of the odds ratio when the independent variable increases by one unit. The odd ratio is defined as

$$Odds(WTP = 1) = \frac{p(WTP = 1)}{1 - p(WTP = 1)} . \quad (2)$$

This implies that an effect coefficient above unity signals a positive impact of the independent variable on the probability of having a positive WTP, whereas an effect coefficient below unity signals a negative impact.

None of the sociodemographic and socioeconomic characteristics with the exception of income is significant in explaining the hypothetical WTP for protection. It was assumed that older people, people living in rural areas and people living in southern Hesse are more likely

to pay a premium for a protected apple wine. This was based on the hypothesis that these consumer groups are more closely connected with Hesse resulting in a significantly higher probability to be willing to pay a premium for protection. This could not be proven by the data. However, significant impacts are found for the constructs "economic support" and "processing methods". If consumers are convinced that geographical indications or regional specialties contribute to the local economy, they are willing to pay a price premium for a protected apple wine. The same is true for the perceptions about the way Hessian apple wine should be processed. People stating that they expect Hessian apple wine to be produced by using Hessian apples from *Streuobstwiesen* are also willing to pay a price premium for a protected Hessian apple wine. These results are in line with findings from previous consumer studies on perceptions and willingness to pay for regional and local foods. Sociodemographic and socioeconomic variables seem to be poor predictors of preferences for local food and regional specialties, whereas in most cases attitudes and perceptions can explain preference heterogeneity to a significant extent (HENSELEIT *et al.,* 2009; ZEPEDA and LIN, 2006).

5   Discussion and Conclusions

Previous studies on the Hessian apple wine market worked out that consumers perceive apple wine as a very region-specific product that is deeply rooted in Hesse. This result is confirmed and supported by the present study. This is an important requirement for a successful geographical indication. BARJOLLE and SYLVANDER (2000) analysed 20 PDO and PGI products with respect to the factors that are most important in determining the success of a geographical indication. They concluded that one of the most important determinants of success is the specificity of the product. Hence, the PGI label seems to be an appropriate tool to enforce this specificity and to promote the product at the regional and interregional level to target the growing consumer demand for traditional regional specialties.

However, a registered Hessian apple wine does not constitute its own reward. Like other labels or brands it must be promoted and advertised. This is especially relevant given the results from the consumer survey that only a very small share of consumers is familiar with this certification scheme. These findings suggest that the PGI logo itself will not boost the apple wine consumption in Hesse or in Germany. It seems rather necessary to involve the EU protection in a wider promotion campaign informing consumers about the granted protection and stressing the attributes of authenticity and typicality of Hessian apple wine. This conclusion is also strongly supported by the result that psychographic factors, that is attitudes and beliefs towards Hessian apple wine and the GI protection, do significantly

influence the willingness to pay for protection. Informing consumers with respect to the impacts of a protected geographical indication seems to be indispensable. If consumers are convinced that through this certification scheme the local economy and the local culture can be supported, the protection can result in a higher willingness to pay. Hence, even if the results from the supply side indicate that the producer association primarily pursues a protection strategy, the granted protection should also be embedded in a promotion strategy. This seems to be appropriate given the increasing consumer interest in traditional and authentic products on the one hand and the lack of knowledge these labels stand for on the other hand. In promoting the protected Hessian apple wine, both traditional apple wine drinkers and potential new consumers interested in regional specialties can be attracted. However, different strategies may be pursued for different consumer segments. For local consumers the economic support dimension should come to the fore. If the protection is embedded in a broader promotion concept stressing the local support and biodiversity dimension, the PGI protection can possibly enhance the turnover in already existing marketing channels. Since out-of-home consumption is of great importance, the gastronomy must also be included. This could be accompanied by building up networks with producers of other Hessian specialty products such as Hessian Handkaes' which is typically consumed with Hessian apple wine. On the other hand, a promotion strategy targeting at new consumers that are not located in Hesse should focus on the quality warranty dimension and stress the high quality and authenticity of this product.

While targeting new marketing channels, especially long-distance distribution channels such as exports to foreign markets, the PGI label may serve as a quality standard securing authenticity and traceability. Consequently, the PGI label can reduce transaction costs if foreign retailers and/or consumers are already familiar with this certification scheme.

Even though this study provides valuable insights on consumers' perceptions and attitudes towards regional certification schemes, it has also raised several points for future research. One interesting aspect seems to be the interaction between the PGI label and individual brands. From the producers' point of view, the PGI label is considered to benefit all producers of Hessian apple wine likewise. Research on the effects of generic advertising, however, has shown that this does not necessarily be the case and that the promotion of the PGI label could affect individual producers and brands differentially (CRESPI, 2007; CRESPI and MARETTE, 2002).

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Annex

Annex 1:   Codeplan and Detailed Statements with Respect to Hessian Apple Wine and the Protection as Geographical Indication

Construct	Statement
Code	
Economic support	
Support of local economy	By buying Hessian apple wine I support the local economy.
Support of small-scale producers	Regional specialties contribute to the survival of small scale producers.
Quality and Brand Affinity	
Higher quality	Hessian apple wine is of a higher quality than apple wine from other regions.
Brand affinity	I always buy apple wine from a certain producer.
Product and Processing Specifications	
100% Hessian apples	Hessian apple wine must be produced by using exclusively Hessian apples.
100% traditional apple varieties	Hessian apple wine must be produced by using exclusively traditional apple varieties.
100% apples from Streuobstwiesen	Hessian apple wine must be produced by using exclusively apples from *Streuobstwiesen*.
Pressed in Hesse	Hessian apple wine must be pressed in Hesse.
Culture and Tradition	
Integral part of Hesse	Hessian apple wine is an integral part of Hessian culture.
Traditional practices	Hessian apple wine must be manufactured according to traditional practices.
Preservation	
Secures Streuobstwiesen	The protection as geographical indication preserves Hessian *Streuobstwiesen*.
Secures cultural landscape	Regional specialties such as Hessian apple wine contribute to the survival of the domestic cultural landscape.
Preserves old apple varieties	The protection as geographical indication conserves endangered apple varieties.

Notes: The agreement to each statement is measured on a 5-point Likert scale with 1 = "I don't agree at all" to 5 = "I totally agree" with an additional "I don't know option".

Source: Own presentation.

Annex 2:   Variables Description and Descriptive Statistics, Apple Wine Consumers (N=432)

Variables	Code	Mean	
"I were willing to pay a premium for an apple wine that is protected as a geographical indication."[a)]	WTP	0.48	
Independent variables		**WTP**	**No WTP**
Sociodemographics			
Age Below 30 years (reference) Between 30 and 49 years old Above 49 years old	 *30-49 yrs* *above 49 yrs*	 0.31 0.46 0.23	 0.35 0.46 0.19
Sex Male (reference) Female	 *Female*	 0.47 0.53	 0.53 0.47
Socioeconomics			
Education No qualification for university entrance (reference) Qualification for university entrance	 *Higher_edu*	 0.55 0.45	 0.62 0.38
Available Monthly Per-Capita Income Below 750 € (reference) 750 € - 1250 € Above 1250 €	 *Income_medium* *Income_high*	 0.38 0.51 0.52	 0.62 0.49 0.48
Size of the Home Town Below 5,000 citizens (reference) Above 5,000 citizens	 *Urban*	 0.15 0.85	 0.16 0.84
Residence in Hesse Middle and Northern Hesse (reference) Southern Hesse	 *Southern Hesse*	 0.33 0.67	 0.29 0.71
Shopping and Consumption Behaviour			
Place of Apple Wine Purchase Discounter (reference) Supermarket Producer	 *Supermarket* *Producer*	 0.13 0.70 0.17	 0.12 0.62 0.26
Shopping Frequency of Organic Products Never/ Seldom (reference) Occasionally Regularly	 *Organic_occass* *Organic_regularly*	 0.29 0.50 0.21	 0.46 0.42 0.12

Notes: [a)] The top-two answers, "I fully agree" and "I agree", are coded as 1, all other answers are coded as 0.

Source: Own calculations.

2.3 Section III: Empirical Evidence – Price Analyses

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Geographical Indications of Origin as a Tool of Product Differentiation – The Case of Coffee

by Ramona Teuber

Institute of Agricultural Policy and Market Research,

Justus-Liebig-University Giessen, Germany

ABSTRACT. 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 appellation 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. However, the recent acceptation 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 price determinant in the specialty coffee market.

Keywords: *Geographical Indications of Origin, Coffee, Legal Regulatory Systems, Price Premium, Hedonic Pricing Analysis*

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 emerged in recent years (DAVIRON and PONTE, 2005; LEWIN et al., 2004). While the bulk of coffee is sold to consumers as a blend, meaning that coffees from different, mostly unidentified origins are mixed, single-origin coffees are, as the name indicates, coffees coming from only one origin. Since the term "single-origin" is not precisely defined, single-origin coffees can originate in one country, one region or one estate or farm (KNOX and SHELDON HUFFAKER, 1996).

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.[2] But what is new in recent years is the growing number of products labeled with GIs at the European as well as at the international level. Since the EC No. 2081/92 came into force in 1993, the number of applications per year has steadily increased. Today more than 700 products are registered either as a PDO or a Protected Geographical Indication (PGI).

Moreover, geographical indications are a current topic in international negotiations. 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,

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[1] Statement by the chief buyer of the major UK retailer of coffee (KAPLINSKI and FITTER 2004:7).

[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).

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, p. 183; LIEBIG, 2000, p. 9).

All these recent developments document the rising interest in GIs. While in the past GIs have mainly been a product differentiation tool in European markets and for European producers, recently more and more developing countries have discovered this marketing instrument for their products. Some studies dealing with European GIs exist, whereas studies addressing GIs in developing countries are rare. Thus, the objective of this paper is to provide insights into recent developments in the world coffee market with a particular focus on GIs. This is done from two points of view. First, the legal framework of GIs in the coffee market is explored in order to find answers to the following research questions:

(i)   Which GIs for coffee do already exist?

(ii)   How are these GIs protected and by which legal means?

(iii)   In which markets are these GIs protected?

Second, GIs for coffee are examined from an economic point of view. Questions arising in this context are:

(iv)   Which price premiums can be achieved by GIs?

(v)   Do price premiums differ across countries and regions due to their reputation?

The paper is structured as follows. The next section will give an overview about the legal situation of GIs in the coffee market. Thereafter, the economic aspects of coffees with GIs will be explored. This is done in two parts. First, an overview of available coffees labeled 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 sold to importers and roasters, are used to estimate a hedonic pricing model. By means of this econometric tool it will be elaborated how the country and region of origin influences the price for high-quality coffee controlling for other relevant product attributes such as coffee variety, sensory quality and different certification schemes.

2   Geographical Indications of Origin for Coffee from a Legal Point of View

Although TRIPs is considered the first multilateral agreement giving an explicit definition of the term "geographical indication", there is no uniform definition of geographical indications. Moreover, regulatory systems under which GIs are protected vary strongly across different countries (THÉVENOD-MOTTET 2006, p. 26; WTO 2004, p. 73). GIs may be protected through special means of protection (e.g. PDO/PGI), as trademark or by already existing laws such as laws against unfair competition. Whereas most industrialized countries possess rather well-developed regulatory systems, this is often not the case in developing countries. In these countries 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, p. 170; JOSLING 2006, p. 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 growers' associations. Since coffee consumption is still at a low level in most producing countries, the export markets are more important in terms of income generation than the domestic market (LEWIN et al. 2004, p. 59). The main export markets for single-origin coffees are Japan, the United States and Europe. The following table concentrates on protected GIs in Europe and the USA as no data could be obtained for the Japanese market.

Table 1:   Protected GIs for Coffee in Europe and the United States, August 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 Denominacion de Origen	CTM – Figurative	2006	FNC
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	CM	1981	Republic of Colombia
Juan Valdez	TM	1969/2005	FNC
100 % Kona Coffee	CM	2000	Department of Agriculture of the State of Hawaii
Jamaica Blue Mountain Coffee	CM	1986	Coffee Marks Ltd.
Jamaica High Mountain Supreme	TM	2003	Coffee Marks Ltd.
Harrar	TM	-[1]	Government of Ethiopia
Sidamo	TM	-[1]	Government of Ethiopia
Yirgacheffe	TM	2006	Government of Ethiopia
Café Veracruz	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).

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) and the Specialty Coffee Association of America (SCAA)[3] about the correct way to protect geographical indications in the coffee sector. The WTO recommends the use of certification marks for the protection of geographical indications and this is also the position of the SCAA (SCAA, 2006). The Ethiopian government, however, considers trademarks as the better way of protecting its coffee GIs. Whereas both concepts rely on the same economic rationale, i.e. the protection of goodwill against free-riding by third-parties and the reduction of consumer search costs, there are substantial differences between these two legal protection schemes (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 cannot be sold or licensed (JOSLING 2006, p. 348). While a detailed analysis of the advantages and disadvantages of both legal 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 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 a registered common trademark, whereas in the United States no final decision about the registration of "Harrar" as a word mark has been made so far.

As can be seen from Table 1, 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 and PDOs is only possible in the EU. Since September 2007, "Café de Colombia" is the first non-EU product registered as a European PGI. 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).

To sum it up, Colombia and Ethiopia can 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,

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[3] 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).

altitude and processing methods were currently defined (GERMAIN 2005). A regional approach is also followed by Costa Rica and Guatemala. Both countries have already identified seven different growing regions, every region with an individual profile (ICAFE 2007; 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).

3   Economic Implications of Geographical Indications of Origin for Coffee

3.1   Data and Methodology

While 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, p. 340; WTO 2004, p. 87). This is especially true for non-European countries and coffee. The coffee market in general is well-documented but data and analyses regarding the single-origin market are limited (LEWIN et al. 2004, p. 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 has just emerged currently (LEWIN et al. 2004, p. 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. By 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 several hedonic pricing models were estimated. This econometric tool is used to determine the implicit value of the origin for high-quality coffee controlling for other relevant product attributes such as coffee variety, sensory quality or certification schemes. The hedonic approach is most often applied to wine datasets in order to explore the value of different wine

attributes. Some hedonic studies can also be found for European GIs such as olive oil or cheese (SANTOS and RIBEIRO 2005; SCHAMEL 2006; SCHAMEL and ANDERSON 2003). Hedonic price analyses for coffee are scarce, especially those dealing with the value of origin. Only one study has already been published investigating the effects of sensory and reputation quality attributes on specialty coffee prices based on internet auction data (DONNET et al. 2007). Our approach differs from the one by DONNET et al. (2007) in three crucial points. First, our data set is more comprehensive covering more recent data. Second, different explanatory variables are included in our analysis. Third, the focus of the present paper is clearly on the value of the origin in order to explore the importance of reputation at the country as well as at the regional level.

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 eight Latin-American countries.[4] The procedure is as follows. Farmers, located in the host country, can submit a coffee sample to the organization committee. These coffee samples are cupped by a national as well as an international jury and each coffee gets a score for its taste profile on a 100-point scale. This approach is very similar to the one in the wine industry, where expert quality wine ratings are widely used (SCHAMEL and ANDERSON 2003, p. 359). Only coffees scoring 84 points and above are awarded the Cup of Excellence®. In a next step these awarded coffees are sold to the highest bidder during an internet auction (COE Homepage). Contrarily to the consumer price data from the online retail shops, these prices are prices at the procurement level. This is different to most hedonic price analyses using price data at the retail level. However, the demand at the procurement level is a derived demand from the retail level.

All data regarding the awarded farms such as the achieved score, farm characteristics and the achieved auction price are freely-available on the COE Website. Some coffee-producing countries such as Ethiopia do not take part in the COE competition but have established their own competition-auction programs. In Ethiopia this program is called ECafé Gold.

Data from COE auctions covering the period 2003-2007 were collected in order to investigate country of origin effects. We posit that even after controlling for quality differences between different coffee origins, the country of origin has got a significant impact on the auction price. These effects can be considered reputation effects. Our first hypothesis is, that Guatemala, Costa Rica and Colombia will achieve the highest price premiums due to

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[4] Bolivia, Brazil, Colombia, Costa Rica, El Salvador, Guatemala, Honduras, Nicaragua

their established image of high-quality coffee producers . Additionally, data from Ethiopian and Colombian auctions for the years 2005 and 2006 were used to explore region of origin effects. Ethiopia and Colombia were chosen for 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 and 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, exporters and roasters differentiate Ethiopian coffees by regional origin for over 100 years (SCAA 2006). Therefore, a significant regional price differentiation based on reputation is hypothesised for Ethiopian coffee. No significant regional reputation effects are expected for Colombian coffee, since the establishment of distinctive coffee regions is still in its infancy.

Descriptive statistics of the used data sets are given in Annex 1. The COE data set for investigating country of origin effects includes 792 observations from 27 COE auctions covering the auction years 2003 to 2007. The data set for investigating region of origin effects includes 111 observations for Colombian coffees sold in COE auctions and 53 observations for Ethiopian coffees sold in ECafé Gold auctions.

3.2 Results

Prices and Quantities

Although only few coffee GIs are legally protected up to now, many different single-origin coffees are 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 section two. 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), Sulawesi[5] (40), Java Estate (31), 100 % Kona (41), Jamaica Blue Mountain (28) and Papua New Guinea (27). The US retail prices for these different single-origin coffees are presented in Figure 1.

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[5] This includes all coffees either labelled as Sulawesi, Celebes Kalossi or Celebes Kalossi Toraja.

Figure 1:   Average Retail Price of Single-Origin Coffees (Survey Period: Aug - Dec 2006)
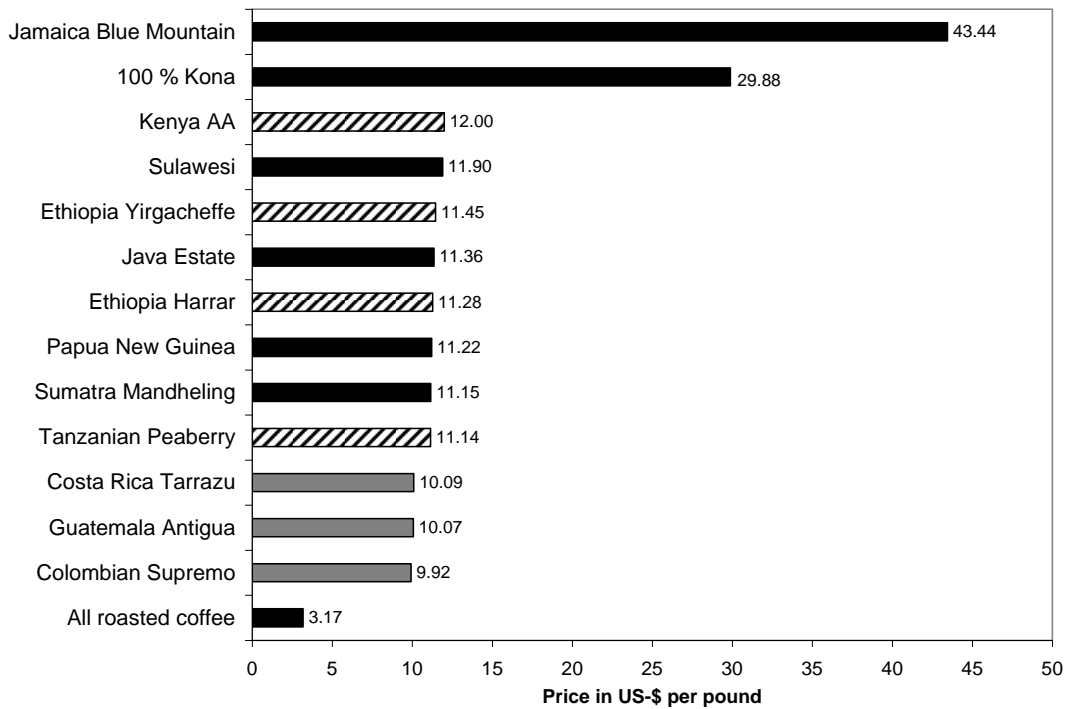
Source: Own Presentation.

In the Japanese market, the most important export market for the Indonesian high-quality coffee, the term 'Toraja' is Toraja Kalosi or Mandheling depending on the export destination. All these coffees sell for at least three times the average 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 ranging between 11 and 12 US-$/Ib. The most expensive coffees are the Hawaiian 100 % Kona and the Jamaican Blue Mountain with an average retail price of 29.88 resp. 43.44 US-$/Ib. 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 2:   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			
Regional GIs	8,100	1.40	Japan
Guatemala			
Genuine Antigua	2,940	1.42	US and Japan
Indonesia			
Toraja, Kalosi, Mandheling	3,644	1.13	US and Japan

Source: Own presentation based on FAOStat; GIOVANNUCCI et al. (2002); NEILSON (2005).

Information about sold quantities of single-origin coffees is even scarcer than for prices. But some data could be collected from the sources mentioned above. According to Table 2, 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 (RANGNEKAR 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 of high-quality Indonesian coffee. The data in Table 2 just covers coffee exports from Sulawesi. This coffee is not labeled uniformly but either as Sulawesi, Toraja or 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 volumes could be obtained. But it is estimated that about 85 % of all Jamaica Blue Mountain coffee is sold to Japan (LU 2006).

Hedonic Pricing Model

Since the functional specification of a hedonic pricing model is not fixed a priori, several specifications were tested to find the most appropriate one for this dataset. Based on the Ramsey RESET test, which allows discriminating between alternative specifications, the following specification was chosen as the one fitting the data best:

$$\log(p_i) = \alpha + \beta_1 score_i + \beta_2 rank_i + \beta_3 \log(lotsize_i) + \beta_4 \log(coffeearea_i) + \beta_5 origin_i + \beta_6 variety_i$$
$$+ \beta_7 certification_i + \beta_8 year_i + \varepsilon_i$$

where the subscript *i* stands for the auctioned coffee i, log is the natural logarithm and p is the price of the auctioned coffee in US-Dollar per pound. The *score* is the achieved score in the COE competition, the *lotsize* stands for the quantity sold expressed in kg and the *coffeearea* is the size of the area planted with coffee expressed in ha. The other five variables are categorical dummy variables for the achieved rank, the coffee variety, the country of origin, possible certification schemes, and the auction year. ε is the stochastic error term. Unfortunately, no data with respect to altitude, precipitation, soil type or processing methods could be included because of missing values.

The achieved score in the cupping competition can be considered a sensory quality proxy and a positive impact on the price is expected. A positive influence is also expected for the first three ranks, which are included as dummy variables meaning the variable for 1st rank has got the value 1, when the coffee was ranked first and 0 otherwise. Contrarily, a negative influence is expected for the *lotsize*. This is based on the idea that this variable can be interpreted as a proxy for exclusiveness. A limited availability will lead to a higher auction price and vice versa. In some hedonic studies for wine the farm or producer size is used as a proxy for exclusiveness, limited availability and "trendiness" (OCZKOWSKI, 1994, p. 99). Therefore, the size of the area planted with coffee is included as another proxy for limited availability

With regard to the origin and the coffee variety the hypotheses are that significant reputation effects can be found coffee from Guatemala, Colombia and Costa Rica and for traditional coffee varieties such as bourbon and typica. As it is common in the wine industry to distinguish wines based on the grape variety such as Merlot or Cabernet wine, it is also possible to distinguish coffees based on the coffee variety. Since a statement was found saying that many coffee professionals favor traditional varieties, it is hypothesized that these varieties earn a price premium in comparison to modern varieties such as caturra, catuai and pacamara. Moreover, it is assumed that certified coffees earn higher prices than non-certified coffees of the same quality.

A problem often arising in hedonic price regressions because of the large number of product characteristics included in the analysis is multicollinearity. Multicollinearity, which is present when explanatory variables are highly correlated with each other, can lead to higher standard errors of the estimated coefficients, making them possibly insignificant (RAMANATHAN, 2002, p. 214). In order to explore whether multicollinearity is a problem in

this dataset, the pairwise correlation coefficients for all explanatory variables were calculated. The highest correlations could be observed between some country and variety dummies, e.g. for Nicaragua and Caturra a correlation coefficient of 0.42 was calculated. However, all calculated correlation coefficients were smaller than 0.55 indicating that no severe problem of multicollinearity is present in the dataset.

Table 3:   OLS Estimates for the COE Auction Data Set

Dependent Variable	Comprehensive Model		Reduced Model	
	Log(price)		Log(price)	
Score	0.072 ***	(0.000)	0.077 ***	(0.000)
Competition Ranking				
Reference: Rank 4th and below				
1st Rank	0.889 ***	(0.000)	0.854 ***	(0.000)
2nd Rank	0.323 ***	(0.000)	0.277 **	(0.000)
3rd Rank	0.258 ***	(0.000)	0.233 **	(0.000)
Log (Lot size)	-0.390 ***	(0.000)	-0.363 ***	(0.000)
Log (Coffee area)	0.028 **	(0.007)	-	
Coffee Variety (*Reference: Bourbon*)				
Catuai	0.013	(0.747)	0.019[1]	(0.581)
Caturra	0.049	(0.086)		
Pacamara	0.007	(0.926)		
Typica	0.051	(0.564)		
Others	0.048	(0.366)		
Country of Origin (*Reference: Honduras*)				
Bolivia	0.488 ***	(0.000)	0.458 ***	(0.000)
Brazil	0.409 ***	(0.000)	0.391 ***	(0.000)
Colombia	0.311 ***	(0.000)	0.293 ***	(0.000)
Costa Rica	-0.083	(0.162)	-0.095	(0.062)
El Salvador	0.226 ***	(0.000)	0.203 ***	(0.000)
Guatemala	0.559 ***	(0.000)	0.576 ***	(0.000)
Nicaragua	0.168 ***	(0.000)	0.194 ***	(0.000)
Certification (*Reference: No Certification*)				
Organic	0.237 **	(0.002)	0.204 **	(0.010)
Rainforest Alliance	-0.054	(0.203)	-0.049	(0.245)
Year (*Reference: 2003*)				
2004	0.134 **	(0.004)	0.128 **	(0.004)
2005	0.113 **	(0.009)	0.079 **	(0.057)
2006	0.275 ***	(0.000)	0.249 ***	(0.000)
2007	0.584 ***	(0.000)	0.562 ***	(0.000)
Adjusted R squared	0.71		0.70	
F-Statistic	92.58		99.69	
Number of observations	736		789	

Note: ***, **,* indicate statistically significance at the 0.1 %, 1 % and 5 % level, respectively; p-values are presented in parentheses.

[1] This is the estimated coefficient for the new constructed variable *traditional*.

Source: Own estimations.

First, a comprehensive model including all available variables was estimated by using ordinary least squares (OLS) robust estimation. The overall goodness of fit is satisfying with an adjusted R squared of 0.71. While the score, the ranking, the lot size, the size of the coffee growing area, and most of the origin and year dummies are highly significant, this is not true for the different coffee varieties. In the group of the certification dummies only the estimated coefficient for the organic certification is significant at the 1%-level.

The score and a high ranking influence the auction price positively. An increase in the score by one point results in a price premium of 7.7 %. The impact of a good ranking is even stronger. A coffee ranked 1st in a competition achieves on average a 143 %[6] higher price compared to coffees ranked fourth and below. Second- and third-ranked coffees achieve price premiums of 38 % and 29 %, respectively. As hypothesised the offered quantity has got a negative influence on the achieved auction price. Since the quantity is expressed in logarithms, the estimated coefficient can be interpreted as the price flexibility coefficient[7]. A 1 % increase in the lot size leads to a price decrease by 0.39 %. This underlines the assumption that scarcity, which can also be interpreted as exclusiveness, is valued by buyers. Furthermore, it can be concluded from a price flexibility coefficient below unity that the demand for these auctioned specialty coffees is highly price-elastic (TOMEK and ROBINSON 2002, p.53). Contrarily, the size of the farm's coffee area has got a significant positive influence on the price. Thus, the assumption that coffee buyers use this information as an additional proxy for exclusiveness and "trendiness" could not be proven. However, the influence is rather marginal. A 1 % increase in the area size results in a 0.03 % higher price. A certified organic coffee receives a price premium of around 27 % compared to a non-certified coffee, whereas the coefficient for the rainforest alliance certification scheme is not significant. This may be due to the fact that only very few coffees are certified in the considered dataset. Thus, the importance of certification schemes in the high-quality segment needs further consideration.

With the exception of the coefficient for Costa Rica all origin dummies are highly significant. 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 origins. The ranking of countries in the hedonic pricing model confirms the picture found in the literature (KNOX and SHELDON HUFFAKER 1996, p. 49). 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

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[6] Since the dependent variable appears in logarithmic form, the percentage interpretation of the dummy variable has to be calculated as $100 \ast (\exp(\text{ß}) - 1)$ (HALVORSEN and PALMQUIST, 1980).

[7] The price flexibility is the percent change in the price of a good associated with a one percent change in quantity, *ceteris paribus* (HOUCK, 1965, p. 1).

Guatemalean coffees, which receive a price premium of around 75 % compared to Honduran coffees, coffees from Bolivia receive a price-premium of 63 %. Colombian and Brazilian coffees are also higher priced than Honduran coffees but the price premium is smaller compared to 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-, 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 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, p. 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 confirmed by the data (see Annex 2). In fact, 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. However, considering auction prices for specialty coffees with a mean of 3.84 US-$ per pound and retail prices ranging from 15 US-$ to over 50 US-$ for a pound of roasted coffee, transportation costs can be seen as a more or less negligible determinant of the auction price.

With regard to the above stated hypothesis that coffees from Guatemala, Colombia and Costa Rica will receive the highest price premiums the results prove this statement only for Guatemalan coffee. Colombian coffee also receives a price premium compared to Honduran coffee, but this price premium is smaller than for Bolivian and Brazilian coffee. These results are somehow surprising, since Colombia has invested substantial amounts to create an image of a high-quality producer in the mass market. Even more surprising is the result for Costa Rican coffee. No significant price differentiation between Honduran and Costa Rican coffee could be detected in the hedonic price analysis.

In contrast to the significant country effects, no significant variety effects were found. None of the estimated coefficients for the coffee varieties is significant indicating that no price differentiation due to variety reputation takes place so far. In order to test the hypothesis, that specialty buyers value traditional varieties more strongly than modern hybrids, a binary dummy variable called *traditional* was constructed and included in a reduced model. This variable takes the value 1 for a traditional variety and the value 0 for a non-traditional one. Additionally, the variable *coffeearea* was excluded in the reduced model, since the inclusion of this variable led to a drop of 50 observations. The results of the reduced model are also listed in Table 3. Again, the estimated coefficient for the variety variable is not significant. Thus, the hypothesis that specialty buyers pay more for coffees coming from traditional varieties could not be proven.

Compared to the base year 2003 the prices paid in the following auction years increased. These increasing auction prices over time can possibly be due to increasing world market prices for coffee in general.

Table 4:   OLS Estimates for Colombian and Ethiopian Coffees

	Colombia		Ethiopia	
Dependent Variable	**Log(Price)**		**Log(Price)**	
Score	0.066 ***	(0.000)	0.116 ***	(0.000)
Competition Ranking				
Reference: Rank 4th and below				
1st Rank	0.811 ***	(0.000)	0.081	(0.653)
2nd Rank	0.244 **	(0.007)	-0.078	(0.693)
3rd Rank	0.347	(0.254)	0.022	(0.931)
Log (Lot size)	-0.270 *	(0.034)	-0.393 *	(-3.39)
Region of Origin				
Reference: Huila / Yirgacheffe				
Cauca / Sidamo	-0.280 **	(0.004)	-0.228 *	(0.033)
Meta	0.205 **	(0.001)		
Nariño	-0.130 *	(0.016)		
Tolima	-0.249 ***	(0.000)		
Other	-0.013	(0.853)	-0.396 **	(0.004)
Year				
Reference: 2005				
2006	-0.074	(0.153)	0.011	(0.923)
Adjusted R squared	0.57		0.53	
F- Statistic	14.40		8.34	
Number of observations	111		53	

Note: ***, **,* indicates significance at the 0.1 %, 1 %, and 5 % level, respectively; p-values are presented in parentheses.

Source: Own estimations.

The results regarding the implicit value of the region of origin are presented in Table 4. Dummies for coffee varieties as well as for different certification schemes could not be included because of missing data (Ethiopia) or a missing variance (Colombia). Again, the achieved score is highly significant in both regressions. For Colombian coffees a one-point increase on the 100 point scale results in a price increase of 6.6 %. For Ethiopian coffees the impact is smaller with a price increase of 1.6 %. The ranking variables are only significant for Colombian coffees and the implicit values are of the same order than in the country-level model. The insignificant regression coefficients of the ranking variables in the Ethiopian model may be due to the limited sample size and needs further investigation with a more comprehensive database. Analogue to the results at the country-level, the lot size has got a significant negative influence on the auction price. Nearly all regional dummies are significant with rather high impacts on the achieved price. 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 50 % compared to coffees from Yirgacheffe, other things equal. Hence, the hypothesis of a significant regional price differentiation for Ethiopian coffee is supported by the empirical results. By contrast, our hypothesis with regard to Colombian coffees is rejected by the data. The results for Colombia indicate that in the specialty coffee segment buyers already differentiate between different Colombian coffee regions. Compared to the reference region Huila all other growing regions sell at discounts between 13 % (Nariño) and 32 % (Cauca).

4   Concluding remarks

As data on exported quantities document, the single-origin coffee market is still a niche market. However, growth rates in this market are high and experts predict a further expansion of this segment. Many coffee-producing countries have already decided to invest in the establishment of appellation systems for coffee and are trying to formalize these regions by legal means to address the rising consumer demand for variety, quality and exclusiveness. Up to now Colombia, Costa Rica, Guatemala and Ethiopia are the main actors in this field, but in other countries efforts to establish regional coffees are underway, too.

The main export markets for single-origin coffees are the United States and Japan. In Europe these coffees have just emerged. This picture is underlined by the internet auction data showing that 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 internet auctions for specialty coffee the most important price determinants are the sensory quality,

proxied by the achieved score, and the achievement of one of the first three ranks in the cupping competition. These attributes are easy to communicate to consumers and are, thus, a valuable marketing tool.

Moreover, the results indicate that different coffee regions have already established a reputation and this is valued by buyers in the specialty segment. These findings suggest that pursuing an origin-labeling strategy can be a successful marketing tool. The reputation, however, has to be built up and this needs time as well as financial resources. Many projects in the coffee sector aim at improving the coffee quality by educating coffee farmers about the main quality-determining factors in the growing and harvesting process. This is very important, since in contrast to winemakers coffee farmers sell a semi-finished product. Usually they do not know how the coffee tastes they sell. Therefore, educating coffee farmers about coffee quality is a crucial point with respect to entering the specialty coffee segment.

The results indicate that single-origin coffees earn the highest retail prices and offer the opportunity to create a somehow unique selling position, either for a whole country, a region or an individual farmer. Jamaica has been very successful in creating a unique selling position, which is reflected in the tremendous price premium these coffees achieve in the US retail market. What should be added in this context is that many coffee experts do not consider Jamaica Blue Mountain coffee as a coffee of extraordinary quality. Consumers, however, value this exotic coffee and it does not matter for the Jamaican coffee industry whether this valuation is based on objective or perceived quality. A similar situation can be found for Colombian coffee. In the mass consumer market, Colombian coffee is synonymous with high-quality coffee. This is most likely a consequence of enormous marketing efforts by the FNC. However, in the specialty market Colombian coffees are not the highest valued coffees as the results from the hedonic regression document. This is also in line with statements of specialty coffee experts. KNOX and SHELDON HUFFAKER (1996) present a rating list for different single-origin coffees in which Guatemala Antigua and Costa Rican coffee from the estate *La Minita* are rated as outstanding, whereas Colombian coffee is only considered mediocre or good. The authors also state that Colombia has done a great job in marketing so that most consumers are convinced that all Colombian coffees are somehow "special". This point of view is not present in the specialty segment. Nevertheless, KNOX and SHELDON HOUFFAKER (1996) point out that there are real good Colombian coffees and these outstanding coffees are normally regionally designated coffees. This observation could possibly explain the fact that some Colombian regions have already built up a reputation reflected in the significant region of origin effects in the hedonic regression. Indeed, it seems

that the are large differences in the valuation of coffee origins between the mass and the specialty market. Colombia was successful in the establishment of a premium image in the mass market and is now trying to enter the specialty segment with regionally designated coffees. However, Colombia is the world's third largest coffee producer and the specialty segment is just a small part of its coffee economy. Contrarily, for small coffee-producing countries such as El Salvador, Honduras or Nicaragua entering the specialty segment could be a valuable differentiation strategy, since they cannot compete with Colombia in terms of quantity and in terms of financial investment in branding and marketing.

At last it should be stressed that single-origin coffees are coffees telling a story and therefore the success of a coffee GI will crucially depend on the story it tells. Such a development towards story-telling can particularly be observed in the COE internet auctions. Whereas in the first years only very limited information about the individual coffee farm 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. This is often used as marketing tool for the consumer market. Consumers buying this kind of coffee do not drink a faceless product any longer; they drink a coffee grown by Isaias Cantillo Osa[8].

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[8] This was the winning coffee farmer in the Colombian COE auction in 2007

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Annex

Annex 1:   Descriptive Statistics of the Data Sets

	Country		
	COE Data 2003-2007	**Colombia**	**Ethiopia**
Number of observations	792	111	53
Price (in US-$/Ib)			
Mean	3.84	4.31	2.94
Min	1.20	1.85	1.50
Max	49.75	19.10	10.65
Score			
Mean	86.81	86.81	87.94
Min	80.25[1]	84.05	85.03
Max	95.85	93.72	92.50
Lot Size in kg			
Mean	1,396	1,202	1,286
Min	620	980	480
Max	8,417	5,253	2,220
Origin	Bolivia, Brazil, Costa Rica, Colombia, El Salvador, Guatemala, Honduras, Nicaragua	Cauca, Huila, Meta, Nariño, Tolima, Other	Sidamo, Yirga-cheffe, Other
Variety	Bourbon, Catuai, Caturra, Pacamara, Typica, Other	Colombia	N/A
Certifications	Organic, Rainforest Alliance	None	N/A
Buyer (Mean)			
Japanese company	0.49	0.60	0.53
US company	0.25	0.14	0.34
European company	0.22	0.21	0.09
Others	0.04	0.05	0.02
N/A	-	-	0.02

Notes: [1]In the Nicaraguan COE competition 2003 the threshold was a score of 80 instead of 84. This was changed in 2004. N/A: no data available.

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
Costa Rica	0.480	0.495
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.

Café de Marcala –

Honduras' GI Approach to Achieving Reputation in the Coffee Market

by Ramona Teuber

Institute of Agricultural Policy and Market Research,
Justus-Liebig-University Giessen, Germany

Abstract

The objective of the present article is to investigate the importance of geographical indications (GIs) in the coffee market, particularly for Honduran coffees. Geographical indications for coffee have emerged only recently, and only a few scientific studies have been carried out on this topic so far. The present article addresses this lack of research by highlighting recent developments in the coffee market and by presenting the results of a hedonic price analysis that used internet auction data for specialty coffees. The aim of this analysis is to investigate the influence of the region of origin on the achieved auction price of Honduran specialty coffee, controlling for other coffee attributes. The results indicate that coffees from the region Marcala, for which a denomination of origin was established in 2005, possess on average a higher quality than coffees grown in other Honduran regions. Consequently, since quality is the most important price determinant in the internet auctions, coffees from Marcala achieve on average higher prices than coffees from other Honduran coffee-growing regions. However, the hypothesis that Marcala coffees can also achieve a higher price due to an already established reputation could not be confirmed.

*Keywords***:** *Single-Origin Coffees, Honduras, Hedonic Pricing Model, Region-of-Origin Effects*

1 Introduction

Whereas origin labeling for agro-food products has a rather long history, it has gained enormous attention in recent years in both national and international markets. It is a current topic in agricultural marketing and trade discussions as well as in disputes addressing the appropriate way of protecting intellectual property. While in the past labels of origin[1] were mainly a marketing tool used by European countries, more and more developing countries have established legal systems for the protection of this kind of intellectual property. Especially, coffee-producing countries have been very active in recent years in establishing labels of origin for their coffees. Despite the efforts undertaken so far, most labels of origin for coffee are still informal, meaning they lack proper legal protection. The aim of the present article is to explore the importance of the region of origin, sometimes also referred to as *terroir,* in the coffee market, with a particular focus on Honduras. Honduras was chosen as a case study for two reasons. First, the coffee economy is economically and socially important in Honduras. It is estimated that about one million people in Honduras are directly and indirectly dependent on the coffee economy, and about 8 percent of the national GDP and 33 percent of the agricultural GDP can arise from the coffee sector (IHCAFE, 2007a). Second, Honduras established labels of origin for coffee very recently with the objective of gaining recognition as a high-quality producer in the main export markets. Central research questions in this context are

(i) How large is the market for GI-labeled coffees so far, and what future developments can be expected?

(ii) Is the region of origin already a significant price determinant in these markets?

(iii) Which image is connected with Honduran coffee in the international market, and what can be expected from the GI approach?

The remainder of the article is structured as follows. The next section provides an overview of the specialty coffee market in general and the importance of this segment for Honduras in particular. After this, the present situation with respect to use of labels of origin for Honduran coffee is presented. The hedonic methodology used for the empirical investigation of "the value of terroir", as well as relevant studies, will be discussed briefly in the subsequent section, followed by a presentation of the hedonic regression results. The final section contains conclusions and prospects for future research.

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[1] There are several different types of labels of origin, e.g. geographical indications, appellations of origin, denominations of origin or indications of source. Since the investigation of these different legal approaches is covered by other papers in this special issue, to simplify matters the general term label of origin will be used in this paper unless a certain label is addressed explicitly.

2 The Specialty Coffee Market

General Overview

Due to a growing interest in health, environmental and social issues, consumer demand for so-called sustainable and high-quality products has increased over the past years. This is also true for the coffee market. The desire for variety and high quality has resulted in the creation of niche markets, in which labeling and certification play a central role. In the case of coffee, these niche markets are often denoted the *specialty* or *differentiated* coffee market (LEWIN et al., 2004; PONTE, 2002). There is no clear definition of the term *specialty coffees,* but most often it refers to high-quality beans and sustainable production processes, such as organic, fair trade and shade-grown. LEWIN et al. (2004, p.105) define *differentiated coffees* as coffees that can "be clearly distinguished because of distinct origin, defined process, or exceptional characteristics like superior taste or zero defects." This definition points out that in contrast to the mainstream coffee markets, in which blends dominate, the origin of the coffee is a central characteristic in the specialty segment. Coffee coming from just one origin is called single-origin, where the origin can comprise a single estate, e.g., *Nicaraguan Estate Santa Lucia*, a region, e.g., *Costa Rica Tarrazu*, or even a whole country, e.g., *Café de Colombia*. Unfortunately, nearly no data exist with regard to the volume or value of the specialty coffee market in general and the single-origin market in particular. There are estimations that specialty coffees make up about 10 percent of total production and about 9 to 12 percent of the import volume in the most developed specialty coffee markets, such as North America, Japan and Europe (LEWIN et al., 2004; SCHOLER, 2004). These estimates document that the specialty coffee market is still a niche market (GIOVANNUCCI and KOEKOEK, 2003). However, most authors agree that in contrast to the mass market, which is more or less saturated in the main consuming countries such as the United States and Europe, this niche market has grown tremendously in recent years and there is still potential for further growth (GIOVANNUCCCI, 2001; PONTE and DAVIRON, 2005).

According to data provided by the Instituto Hondureño del Café (IHCAFE), Honduras exported 4.2 million bags of coffee[2] in the harvest year 2006/2007. These coffee exports generated export revenues in the amount of 470 million US$. Specialty coffee exports added up to 262,425 bags, representing 6.3 percent of all Honduran coffee exports. The category *specialty coffee exports* comprises organic, fair trade, Rainforest Alliance and Utz Kapeh certified coffees, as well as coffees labelled as Genuine Marcala. The most important categories in terms of volume in 2006/2007 were Utz Kapeh certified coffees, accounting for

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[2] One coffee bag contains 46 kg of green coffee beans.

over 20 percent of the specialty coffee exports, followed by Genuine Marcala labeled coffee, with 17 percent. The third largest category (16 percent) consisted of coffees with the double-certification of organic/fair trade (IHCAFE, 2007b).

The Terroir Concept

In the specialty coffee market, coffee is often compared to wine, due to the high variety of flavour profiles both products offer. It is said that the flavour profile of each of these products is mostly determined by *terroir* (SCAA, 2007*)*. The *terroir* concept was first developed for wine and viticulture, but nowadays the concept is applied to a broad range of foodstuffs. The underlying idea of the *terroir* concept is that special geographical microclimates produce food products with a unique flavour profile that cannot be produced elsewhere (BARHAM, 2003; DAVIRON and PONTE, 2005). In a narrow sense, *terroir* refers only to a physical environment, including soil, elevation, climate and related factors. In a broader sense, *terroir* also includes the human environment, i.e., traditional knowledge, local skills and processing practices (BROUDE, 2005; GALLAND et al., 2006).

An increasing interest in the *terroir* concept for coffee is reflected in the scientific literature. Recent studies have investigated the relationship between cup quality and environmental factors (AVELION et al., 2005; DECAZY et al., 2003). The results of these studies suggest that major determinants of cup quality are altitude, rainfall, soil type, shading, varieties, harvesting and post-harvesting processes.

Another prominent feature of the wine industry, the review, cupping and rating of different wines, can nowadays be found also in the coffee market. Kenneth Parker founded *Coffee Review* in 1997 – similar to the famous wine guide *The Wine Advocate,* by Robert Parker – with the aim of educating coffee drinkers by offering an easy-to-use coffee guide based on blind reviews (COFFEE REVIEW*,* 2007). This initiative highlights another development in the coffee market, the stressing of the importance of consumer education. A consumer who is not aware that there are more coffee profiles than just "normal" blends will most likely not miss anything while just drinking the same coffee every day. Thus, consumer education about the different coffee-growing regions, that is to say about the different coffee *terroirs* and their distinctive flavour profiles, is considered to be a crucial aspect of establishing a successful label of origin.

Establishment and Use of Labels of Origin for Coffee – Status Quo in Honduras[3]

Nearly all the major coffee-producing countries have already identified and established labels of origin for their coffees. But in many cases these labels are still informal; that is to say no certification, trademark or other form of legal protection has been achieved so far. This is, for example, the case in most Latin American countries, such as Guatemala and Costa Rica, two countries very well known for their high-quality coffees. Both countries have identified different coffee-growing regions characterized by differing microclimates and are now trying to formalize designation of these by legal means (ANACAFE, 2007; SCACR, 2007). However, only one Guatemalan coffee-growing region is certified to date: Genuine Antigua Coffee.

The situation in Honduras is similar. A short time ago Honduras identified five different coffee-growing regions, each producing coffee with a distinct flavour profile. But only one region has so far been registered as a *denominación de origen protegida* (DO)[4]. *Café de Marcala* has been registered since November 2005 and not only is the first DO in Honduras but was also the first in Central America (IHCAFE, 2007c; see figure 1 for the logo). The DO concept includes explicitly the term *terroir* and stresses the fact that the specific product quality or specific product characteristics are essentially due to the geographical environment, i.e., natural and human factors, in which the production takes place. According to IHCAFE, the establishment of this DO is seen as an opportunity to create awareness of Honduran coffees in the EU and Japan, the main export markets for Honduran coffee. This development of awareness of Honduras as a high-quality producer is necessary, since up to now Honduran coffees have been used only for blending, resulting in low prices being paid for Honduran coffee. Other actors within the specialty coffee market share this assessment of the importance of consumer education. The Terroir Coffee Company, a specialty roaster in the United States, states that Honduran coffees have the same level of quality as coffees from their more famous neighbors Guatemala, Nicaragua and El Salvador, but have not received any special recognition yet. From the point of view of the company, one reason for this lack of reputation is the poor infrastructure in Honduras, which makes purchasing Honduran coffees a more complicated and more expensive process than purchasing from other Latin American countries (GEORGE HOWELL'S TERROIR COFFEE, 2007). These circumstances – a low reputation and the resulting low prices – have led to the situation where Honduran coffee is smuggled into neighbouring Guatemala to gain from

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[3] A comprehensive overview about labels of origin for coffee can be found in TEUBER (2007).
[4] In English this term is either translated as "Denomination of Origin" or "Appellation of Origin". However, both terms describe the same type of protection and are interchangeable.

higher prices paid for Guatemalan coffee (F.O. LICHT'S *International Coffee Report,* 2007). Moreover, it is reported that in recent years the term *Café de Marcala* has been misused in such a way that low-quality coffee not being produced in this region has been labeled as *Café de Marcala*. This usurpation resulted in a loss of reputation and, consequently, to lower coffee prices being paid for genuine *Café de Marcala* (OSORTO, 2007). Therefore, the legal protection of the name is considered a necessary step in order to prevent continuing deterioration of the established reputation.

Figure 1 : Logo Café de Marcala

Source**:** Osorto (2007).

3   Empirical Research Approach

3.1   Hedonic Pricing Analysis

Another feature of the specialty coffee sector is internet auctions for award-winning high-quality coffees. The most famous one is the Cup of Excellence (COE) competition. The first internet auction for specialty coffee took place in Brazil in 1999. By now, eight Latin American countries, namely Bolivia, Brazil, Colombia, Costa Rica, El Salvador, Guatemala, Honduras and Nicaragua, take part in the COE program and sometimes this competition is called the *Oscar* for coffee (COE, 2007). All data regarding the participating farms, the coffee characteristics and the achieved auction prices are available on the COE website. These data were used to conduct a hedonic pricing analysis in order to investigate the value of each coffee characteristic, especially focusing on the value of the region of origin, interpretable as the value of *terroir*.

Hedonic pricing analysis is a valuable tool in estimating implicit prices for individual product characteristics. The underlying idea of the hedonic approach is that products offer a bundle of product characteristics, and consumers buy products because of these utility-bearing characteristics (ROSEN, 1974). Hence, a product price can be interpreted as the sum of the

implicit prices for each product attribute, and the hedonic price model can be used to estimate these implicit prices.

A rather large number of hedonic studies can be found for wine, but only very few hedonic studies have been carried out for coffee so far. GALARRAGA and MARKANDYA (2004) deal with the implicit value of fair trade and organic labeling for coffee. Moreover, two studies have used the COE data to investigate the price determinants of specialty coffee in internet auctions (DONNET et al., 2007; TEUBER, 2007). TEUBER (2007) estimated a hedonic regression based on pooled data coming from specialty coffee auctions covering the period 2003-2007. The explanatory variables included agronomic variables as well as quality ratings and reputation variables. The results suggested that the main price determinants for specialty coffee are the achieved score and the ranking in the competition, both having a significant positive influence on the auction price. A significant negative impact was found for the quantity sold, indicating that buyers value limited availability, which can be seen as a proxy for exclusiveness. Concerning the country-of-origin effect, the results indicated that Guatemalan coffees possess the highest reputation, since these coffees receive a 75 percent price premium compared to Honduran coffees. Moreover, Honduran coffees are discounted compared to all other origins included in the analysis. These results support the hypothesis that Honduran coffees have not yet established a good reputation. DONNET et al. (2007) reported similar results. Additionally, TEUBER (2007) estimated hedonic regressions at the regional level for Colombian and Ethiopian coffee in order to investigate region-of-origin effects. For both countries an existing regional price differentiation could be found.

The present article differs from the two studies mentioned above in the way in which the regional approach is adopted and applied to Honduran coffees sold in the COE auctions. Given the recent establishment of the DO for *Café de Marcala*, the research question arising in this context is whether or not a significant influence of the region of origin on the price paid for Honduran specialty coffee can already be identified, as was the case for Colombian and Ethiopian coffees.

3.2   Data and Results

All data originate from the Cup of Excellence website. The procedure of the COE programme is as follows. Any coffee farmer located in the country in which the competition takes place can submit a coffee sample. In a first step, a pre-selection of the coffee samples by visual inspection and cupping analysis is conducted. After this, the pre-screened coffees are cupped by a national jury, twice. All coffees receive a score ranking from 0 to 100, and only the top

coffees – those scoring 84 and above – enter the third stage of the competition.[5] Finally, the coffees are cupped by an international jury, and the best coffees are awarded the Cup of Excellence. After this procedure, all data regarding the coffee farms offering the coffee samples and their achieved results in the competition are published online.

The dependent variable of the hedonic price analysis is the price the coffee achieved in the internet auction, expressed in US$ per pound. The chosen characteristics, which represent the set of independent variables, comply with the information presented to the bidders in advance at the COE website. Table 1 presents descriptions and descriptive statistics of the included independent variables. The coffee variety, the coffee-growing region and certifications are included as categorical dummy variables. The score and the altitude are both proxies for general coffee quality, and the lot size is a proxy for scarcity and exclusiveness. Unfortunately, some variables, such as precipitation, soil quality and dummies for different harvest and post-harvest processes, could not be included because of missing or inconsistent data.

With regard to the already established DO for *Café de Marcala,* the question of whether or not coffees grown in this region differ qualitatively from other Honduran coffees is of special interest. Therefore, in a first step a simple equality test of the score means was conducted to investigate whether significant differences between coffees from the Montecillos-Marcala and the other growing regions exist. The results indicate that the mean score of Montecillos-Marcala coffees differs significantly from the mean score of coffees coming from a non-Montecillos region (see Annex 2).

After this preliminary analysis a hedonic price regression was estimated (see the Technical Appendix for details). Two models were estimated, a comprehensive one including all variables under consideration and a reduced one containing solely statistically significant variables. The results of the reduced model are presented in Table 1 and the results of the comprehensive one can be found in Annex 3.

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[5] This type of ranking by using a 100-point scale was developed in the wine industry by Robert Parker and can now also be found in the coffee industry.

Table 1:   OLS Hedonic Regression Results for Honduran Coffees, Reduced Model

Variable	Coefficient	p-Value
Constant	- 46.335 ***	(0.000)
Log(Score)	10.308 ***	(0.000)
1ˢᵗ Rank	0.613 *	(0.010)
Log(Lot Size)	- 0.442 ***	(0.000)
Log(Altitude)	0.374 *	(0.037)
Year (*Reference: 2004*)		
2005	- 0.350 **	(0.004)
2006	0.003	(0.982)
2007	0.420 ***	(0.000)
Adjusted $\overline{R}^2$	0.82	
F-Statistic	71.73	

Notes: *, **, *** denotes significance at the 5 %, 1 %, and 0.1 % level, respectively.

Source: Own presentation.

The explanatory power reflected by the adjusted *R-squared* is rather good in both models. The *score* and the *lot size* are highly significant in both specifications. If the *score* increases by 1 percent, the price increases by 10 percent; in other words, a one-point increase results in an 11 percent price increase. In contrast, the *lot size* has a negative impact on the price. This underlines the assumption that scarcity, which can also be interpreted as exclusiveness, is valued by buyers. Furthermore, it can be concluded from a price flexibility coefficient below unity that the demand for these auctioned specialty coffees is highly price-elastic (TOMEK and ROBINSON, 2002, p.53).

The *1st rank* is also significant, but only at the 95 percent level. A coffee that was ranked first in the cupping competition achieved on average an 85 percent higher price compared to the lower-ranked coffees.[6] The variable *altitude* is only significant at the 95 percent level in the reduced model, in which the *variety* and *regional* dummies are excluded. The reduced model reveals that inclusion of the *variety* and *regional* dummies neither alters the estimated coefficients of the other included variables nor explains any variance of the achieved price. None of the *variety* or *regional* dummy variables are statistically significant (see Annex 3). Additionally, some models were estimated with the inclusion of coffee variety groups, i.e., the coffee varieties were not included separately but as a categorical dummy with three categories. This approach is based on a statement by KNOX and SHELDON HUFFAKER (1996) that traditional varieties, such as bourbon and typica, are often preferred by specialty coffee buyers because of their superior and distinctive taste qualities. Hence, the varieties bourbon and typica as traditional ones constituted the categorical dummy *traditional varieties.*

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[6] Since the dependent variable appears in logarithmic form, the percentage interpretation of the dummy variables has to be calculated as 100*(exp(β)-1) (HALVORSEN and PALMQUIST, 1980).

The modern hybrids caturra, catuai and IHC-90 were grouped together as the *modern varieties,* and the remaining two varieties, pacas and pacamara, constituted the group *other varieties*. These two varieties are not considered to be traditional varieties; nevertheless, they are often considered to offer an extraordinary cup quality. Ultimately, even the grouping into *traditional, modern* and *other* varieties did not lead to any significant results.

A possible explanation for the insignificance of both the *regional* and the *variety* dummies could be that these variables are already embodied in the *score* variable and therefore no significant impact of these variables could be found in the hedonic regression. This would be in line with the results from the t-test for equality of means of score (Annex 2). Therefore, some models were estimated excluding the *score* and including the *variety* and *region* dummies. But again, no significant impact of the region could be detected. These results are in contrast to the findings of DONNET et al. (2007) and TEUBER (2007), who found significant country-of-origin and region-of-origin effects even after controlling for quality differences by including the *score* variable and the *origin* dummies jointly. This is not the case for Honduran coffees.

As could already be seen from the descriptive statistics, the only certification scheme that can be found for Honduran COE coffees is the organic one. Only two coffees out of 119 were certified organic. The certification has no statistically significant impact on the achieved price in this data set. The same is true for the location of the company buying the coffee.

4   Concluding Remarks

A hedonic price function was estimated for Honduran specialty coffee. The results suggest that the main price determinants are the achieved score in the cupping competition and the 1st rank. This is useful information, since both attributes can easily be employed in a marketing strategy. They can be communicated to consumers without any major explanations. Furthermore, the quantity sold is highly significant, pointing out that buyers value scarcity and exclusivity. This observation is consistent with findings from the wine industry.

Earlier studies found that, at the country level, Honduran coffees are sold at a price discount compared to coffees originating in other countries, indicating that Honduras has not been able to establish a reputation for high-quality coffees so far. In order to change this fact, Honduras, particularly the Instituto Hondureño del Café, has identified five different coffee *terroirs* and is trying to establish them in international export markets. In a first step, the term *Café de Marcala* was protected as a denomination of origin in 2005. It seems that coffees from this region offered in the COE auctions have a higher quality, reflected in the higher

average score these coffees receive in the cupping competitions. However, in the hedonic regression no significant impact of the region itself could be detected after controlling for quality differences by including the score as a quality proxy. The score along with the 1st rank and the lot size are the main price determinants in the hedonic regression. These findings indicate that at the moment Honduran coffee *terroirs* do not yet influence the coffee price directly by means of a well-established reputation but rather indirectly by offering different coffee qualities.

Considering the efforts many countries have already undertaken to establish labels of origin for their coffees, the fact must be stressed that establishing a label of origin does not automatically lead to consumer awareness and recognition of the label in the consumer market. Creating a reputation takes time and, especially, financial expenditures. A commercially successful GI will not emerge simply as a result of protection of the term *Café de Marcala* in the domestic market. It is even more important to protect the term in the export markets and to create awareness of the name. In order to become successful, a label of origin or a GI has to be managed the same way a brand has to be managed. On the other hand, internet auctions for specialty coffees have helped to make buyers aware of the different coffee origins and have fuelled the growth of this niche market. According to a McKinsey study assessing the participation of Nicaragua in the COE competition, Nicaragua was able to expand its specialty coffee exports expressed as a share of total coffee exports from 2 percent in 2001 to 15 percent in 2005. Furthermore, the COE has been an incentive for quality improvements and has greatly enhanced the reputation of Nicaraguan coffee (MCKINSEY 2006). The same could turn out to be the case for Honduras.

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Annex

Annex 1: Descriptive Statistics of Honduran Coffees Sold in COE Auctions, 2004-2007

Variable	Description	Mean	Standard Deviation
Price	Price in US-$ per pound of coffee	3.82	2.79
Score	Score achieved in the cupping competition (ranging from 84 to 100)	87.04	2.63
1st Rank	1 if the coffee was ranked first	0.03	0.18
Lot size	Quantity of coffee sold, expressed in kg	1300	444
Altitude	Altitude in metre above sea level, at which the coffee was grown	1520	145
Farm Size	Farm size in ha	24.90	23.59
Coffee Variety			
Bourbon	1 if Bourbon	0.03	0.16
Catuai	1 if Catuai	0.54	0.50
Caturra	1 if Caturra	0.16	0.37
IHC-90	1 if IHC-90	0.03	0.18
Pacamara	1 if Pacamara	0.03	0.16
Pacas	1 if Pacas	0.14	0.35
Others	1 if other variety	0.06	0.24
Region[a]			
Agalta Tropical	1 if originating in Agalta Tropical	0.19	0.39
Azul Meambar	1 if originating in Azul Meambar	0.05	0.22
Copán	1 if originating in Copán	0.24	0.42
Montecillos-Marcala	1 if originating in Montecillos-Marcala	0.36	0.48
Opalaca	1 if originating in Opalaca	0.16	0.37
Certification			
Organic	1 if certified organic	0.02	0.13
None	1 if not certified	0.98	0.13
Buyer			
European	1 if bought by a European company	0.20	0.40
Japanese	1 if bought by a Japanese company	0.47	0.50
North American	1 if bought by a North American company	0.32	0.47
Total number of coffees sold		*119*	

[a] One shortcoming of the Honduran COE data is that this data just informs about the administrative region the farm is located in. The IHCAFE website offers two maps with the locations of the awarded farms and the classification into one of the five newly-defined growing regions. These maps are available for the years 2005 and 2006. Therefore, for the two remaining years, each participating farm had to be allocated to one of the five coffee regions. This was done by using GoogleEarth and a map of the newly-defined coffee-growing regions offered by IHCAFE. The resulting regional dummies are the five coffee-growing regions, namely Azul Meambar, Agalta Tropical, Copán, Montecillos-Marcala, and Opalaca.

Source: Own calculations.

Annex 2: **Result of the t-Test for Equality of Means of Score between Montecillos Coffee and Non-Montecillos Coffee**

Test for Equality of Means of SCORE			
Categorized by values of MONTECILLOS			
Included observations: 117			
Method	df	Value	Probability
t-test	115	2.395107	0.0182
Anova F-statistic	(1, 115)	5.736537	0.0182

Source: Own calculations.

Annex 3: **OLS Regression Results for Honduran Coffees, Comprehensive Model**

Dependent Variable	Log(price)	
Variable	**Coefficient**	**p-Value**
Log(Score)	10.738***	(0.000)
1st Rank	0.589*	(0.046)
Log(Lot Size)	-0.431***	(0.000)
Log(Altitude)	0.378	(0.103)
Log(Farm size)	-0.006	(0.843)
Variety *(Ref. Bourbon)*		
Catuai	0.068	(0.668)
Caturra	0.096	(0.563)
IHC-90	-0.143	(0.418)
Pacamara	0.088	(0.639)
Pacas	0.101	(0.561)
Others	0.063	(0.741)
Regions *(Ref. Montecillos-Marcala)*		
Agalta Tropical	0.052	(0.528)
Azul Meambar	0.004	(0.977)
Copán	0.001	(0.986)
Opalaca	0.086	(0.362)
Certification *(Ref. None)*		
Organic	0.109	(0.626)
Buyer *(Ref. Japanese Company)*		
European Company	0.046	(0.542)
US Company	0.019	(0.736)
Year *(Ref. 2004)*		
2005	-0.344**	(0.008)
2006	0.007	(0.951)
2007	0.453***	(0.000)
Adjusted R squared	0.80	
F-Statistic	22.07	
Number of observations	112	

Notes: *, **, *** denote statistically significance at the 5 %, 1 %, and 0.1 % level, respectively.

Source: Own calculations.

Technical Appendix

Hedonic Pricing Model

A hedonic pricing model is based on the idea that heterogeneous goods are aggregations of characteristics, and these characteristics are the variables that generate utility to the consumer. Hence, consumers buy products because of the characteristics these products offer, and the price of a product can be considered as the sum of implicit prices for each product attribute (ROSEN, 1974; TRIPLETT, 2006). Through application of the hedonic approach, the product price is regressed on the product attributes to achieve an implicit price for each product attribute. Algebraically, the statistical relationship between the market price of a product and the product characteristics can be expressed as

$$p_i(z) = f(z_{i1}, z_{i2}, \ldots, z_{ij}), \tag{1}$$

with p_i representing the market price of good i and z_{ij} measuring the amount of the jth characteristic contained in good i. Accordingly, the implicit price of characteristic j can be calculated as

$$\frac{\partial p_i(z)}{\partial z_{ij}} = p_j, \tag{2}$$

with p_j representing the implicit price of characteristic j.

The hedonic theory shows that the form of the hedonic price function, presented by equation (1), cannot be determined *a priori*. Moreover, finding the appropriate functional form is an entirely empirical task and should be based on statistical tests (BROWN and ETHRIDGE, 1995; TRIPLETT, 2006). In order to find the appropriate functional form for the COE data set, a RESET-test was conducted for each of the following specifications: linear, linear-log, log-linear and double-log. The RESET-test indicates whether a model is misspecified; thus, it allows discrimination between different functional specifications (RAMANATHAN, 2002). Based on the test results, the following specification was chosen as the one that best fits the data:

$$\log(p_i) = \alpha + \beta_1 \log(score_i) + \beta_2 1^{st} rank_i + \beta_3 \log(altitude_i) + \beta_4 \log(lotsize_i) + \quad (1') $$
$$\beta_5 \log(farmsize_i) + \beta_6 variety_i + \beta_7 origin_i + \beta_8 certification_i + \beta_9 year_i + \varepsilon_i,$$

where the subscript i stands for the auctioned coffee i, p is the price of the auctioned coffee in US-\$ per pound and ε is the stochastic error term. The explanatory variables are defined as

described in Annex 2. A problem often found in hedonic regressions is multicollinearity, which arises when explanatory variables are nearly linearly correlated with each other (RAMANATHAN, 2002). Therefore, the pair-wise correlation coefficients of the exogenous variables were calculated and examined. The calculated correlations were all quite low, leading to the conclusion that multicollinearity is not a severe problem in the data set.

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Estimating the Demand for Sensory Quality – Theoretical Considerations and an Empirical Application to Specialty Coffee

Ramona Teuber

Institute of Agricultural Policy and Market Research

Abstract

An increasing product differentiation coupled with an increasing availability of electronic data has boosted the number of hedonic price analyses applied to food and agricultural products. Most of these studies estimate the first stage of a complete two-stage model as proposed by Rosen. However, there are also few studies that estimate the second stage, i.e. supply and demand functions for characteristics. The present paper reviews both the theoretical and applied literature on Rosen's two-stage model in the context of food and agricultural economics. Based on these findings, a theoretical model for specialty coffee auction data is proposed and tested empirically. The empirical model comprises nonlinear hedonic bid functions at stage one and an inverse demand function for one characteristic, the sensory quality score (SQS), at stage two. The first-stage results indicate a high variability of the marginal price of the SQS across different auctions, i.e. across time and space. The second-stage results identify that the marginal prices of the SQS have increased in the analysed period 2003-2009 and that country-of-origin and buyer effects are important. The highest marginal prices are paid for Rwandan and Honduran coffee. At first glance, this is surprising, since at the first stage Honduran coffees are almost always discounted compared to other origins. However, it seems to be that the SQS is a much more important quality cue for a coffee origin with a low reputation than for a coffee origin with a well-established reputation in the marketplace.

Zusammenfassung

Die zunehmende Produktdifferenzierung und Verfügbarkeit elektronischer Datensätze hat zu einer stetig steigenden Zahl hedonischer Analysen für Agrarprodukte und Lebensmittel geführt. Die Mehrzahl dieser Studien schätzt hierbei die erste Stufe des von ROSEN theoretisch hergeleiteten zweistufigen hedonischen Modells. Es gibt jedoch auch einige wenige Studien, die auch die zweite Stufe, d.h. Angebots- bzw. Nachfragefunktionen für Eigenschaften schätzen. Der vorliegende Beitrag analysiert die bisherige theoretische und empirische Literatur zu zweistufigen hedonischen Modellen im Kontext der Agrar- und Ernährungsökonomie und leitet darauf basierend ein theoretisches und empirisches zweistufiges Modell für Spezialitätenkaffee ab. Das empirische Modell besteht aus einer nichtlinearen hedonischen Preisfunktion auf der ersten Stufe und einer inversen Nachfragefunktion für eine Produkteigenschaft, der sensorischen Qualitätspunktzahl (SQS), auf der zweiten Stufe. Die Ergebnisse der ersten Stufe weisen eine hohe Variabilität der impliziten Preise dieser Eigenschaft, sowohl über die Zeit als auch über Regionen hinweg, nach. Die Ergebnisse der zweiten Stufe belegen einen Anstieg der impliziten Preise der sensorischen Qualitätspunktzahl in der betrachteten Zeitperiode 2003-2009 und signifikante Anbauländer- und Käufereffekte. Kaffee aus Honduras erzielt hierbei neben Kaffee aus Rwanda die höchsten impliziten Preise. Dieses Ergebnis erscheint zunächst überraschend, da Kaffee aus diesen Ursprungsländern typischerweise auf der ersten Stufe diskontiert wird. Auf den zweiten Blick erscheint dieses Ergebnis aber durchaus plausibel. Für Kaffee aus Ländern mit einer bisher nur gering ausgeprägten Reputation für Qualität ist die Qualitätsbewertung signifikant bedeutsamer als für Kaffees aus Ländern mit einer etablierten Reputation für Qualität.

Schlüsselwörter: Zwei-Stufige Hedonische Modelle, Implizite Preise, Sensorische Qualitäts-bewertung, Spezialitätenkaffee

1   Introduction

A steadily increasing product differentiation paired with an increasing electronic data availability has boosted the number of studies applying hedonic price analyses to food and agricultural products (DONNET et al., 2008; HUANG and LIN, 2007; KRISTOFERSSON and RICKERTSEN, 2007; WARD et al., 2008). These studies aim at investigating which characteristics are most important in determining product prices. This is done by estimating implicit prices for characteristics using multiple regression analysis. Based on these isolated implicit prices it is possible to infer which characteristics are highly-priced in the market.

However, it has to be kept in mind that the estimated marginal characteristic prices are the result of supply of and demand for characteristics. Therefore, marginal prices are not constant over time and space and the question arises what determines marginal characteristic prices. Several approaches have been discussed in the literature how to estimate the underlying supply and demand functions for characteristics. Nevertheless, it seems to be that there is still no real consensus in the scientific community which way is the most adequate one to estimate a complete two-stage hedonic model.

Given this background, the present paper pursues the following objectives. First, it aims at reviewing the different two-stage hedonic modelling approaches discussed in the literature highlighting estimation problems and the suggested solutions. Second, based on these findings a theoretical model for the estimation of a two-stage hedonic model for auction data will be developed. Finally, the theoretical model will be tested empirically by using internet auction data for specialty coffee for nine different countries covering the period 2003-2009.

The specialty coffee market was chosen for several reasons. To begin with, it is a market which has experienced an enormous increase in product differentiation in recent years. Moreover, despite the fact that it is still a niche market, it has grown tremendously compared to the stagnating mass coffee market. Hence, it is of great interest to coffee producers to know which characteristics are highly-valued in the marketplace. Former studies on specialty coffee found significant price impacts of the current quality proxied by a sensory quality score (SQS) and significant country-of-origin effects using pooled auction data for high-quality coffee (DONNET et al., 2008; TEUBER, 2009). Whereas these studies highlight the importance of the SQS on the achieved auction price, none of these previous studies has investigated which factors determine the marginal price of the SQS. Thus, the central research question addressed in the present paper is whether the SQS is valued differently across auctions and if so, which determinants can explain this variance.

1.   Valuing Diversity – A Review of the Hedonic Methodology

In the context of product differentiation and product demand it is often convenient to think of goods in terms of their location in a map of characteristics. Consequently, whether a product is more desirable than another one is determined by its location in characteristics space (ROSEN, 2002). Hence, if we analyse the demand for and the price formation of differentiated agri-food products, it is essential to include characteristics in order to derive plausible and reliable results. Valuing characteristics for which no explicit market does exist and identifying supply and demand functions for these characteristics are the core of the hedonic methodology. The idea that consumers have preferences over characteristics instead of goods has been established by GORMAN (1956), LANCASTER (1966) and ROSEN (1974), and since then a large number of studies has been published on this subject. The following section provides an overview about the main aspects of hedonic pricing models[1], covering theoretical and applied research.

2.1   Rosen' s Two-Stage Model

The basic idea of hedonic pricing models is that the price of a unit of a market good varies with the set of characteristics it possesses and, thus, price differences between goods reflect differences in the utility-bearing characteristics. Accordingly, each good i has a quoted market price and is associated with a vector of characteristics $z_i = (z_{i1},…,z_{in})$ with z_{ij} being the quantity of characteristic j $(j = 1,2,…,n)$ embodied in good i. This leads to the hedonic price function $p_i = p(z_i) = p(z_{i1},...,z_{in})$, which relates market prices and characteristics. ROSEN (1974) described how this hedonic price function (HPF) is generated in a competitive market. Analogously to the traditional utility-maximization model, utility functions have to be maximized subject to the budget constraint (ROSEN, 1974).

Assuming that preferences for the differentiated product are defined over the product's characteristics, the consumer's utility function $U(X, z_i)$ is a function of the characteristics embodied in the differentiated product and X, an aggregate of all other goods consumed. This utility function is maximized subject to the budget constraint

(1) $X + p(\mathbf{z}_i) = Y$

---

[1] Sometimes authors use the term characteristics models instead of hedonic models (i.a. BLOW et al., 2008). In most cases the terms can be used interchangeably.

where $p(z_i)$ is the price of the differentiated good i and Y is income. From this utility function, which is concave in the characteristics, ROSEN (1974) derives a consumer's bid function $\Theta(z_{ij})$ by inverting the utility function holding all but the amount of characteristic j constant[2]:

(2) $\Theta = \Theta(z_{ij}; u(\alpha), y)$

with α being a taste parameter that parameterizes preference heterogeneity across consumers. The bid function represents consumer's willingness to pay (WTP) for different amounts of characteristic j given his preferences (α), income (y) and a certain utility level (u). Since consumers differ in preferences, income, or both, each individual has got a different bid function. The counterpart to the bid function on the demand side is the offer function by suppliers. It is defined as:

(3) $\Phi = \Phi(z_{ij}; \pi, \beta)$

where β is a shift parameter reflecting underlying variables such as factor prices or production technologies and π is profit.

In equilibrium, consumer's marginal willingness to pay (MWTP) for an attribute must be equal to the marginal price which, in turn, must be equal to producer's marginal cost to provide the characteristic. Hence, the optimum condition can be expressed as:

(4) $\partial\Theta / \partial z_{ij} = \partial\Phi / \partial z_{ij} = \partial p / \partial z_{ij} = p_j$

with p_j being the marginal price for characteristic j.

The fact that consumers and producers differ with respect to preferences (α) and technologies (β), respectively, leads to multiple equilibria. These equilibrium points are identified by the HPF as illustrated in Figure 1 (PALMQUIST, 1984; ROSEN, 1974). The left-hand side panel illustrates the bid functions of two consumers, who differ in α, that are matched with two suppliers, who differ in β, holding all other characteristics, income and utility constant. Consumers with taste preferences $\Theta^1(z)$ buy a product from seller $\Phi^1(z)$ containing amount z^1 of the characteristic 1, whereas consumers with a higher preference for the characteristic, i.e. $\Theta^2(z)$, purchase a good from seller $\Phi^2(z)$ containing amount z^2 of characteristic 1.

The right-hand side panel of Figure 1 presents the market equilibrium in marginal terms, i.e. the first derivatives of the bid and offer functions of two different suppliers and buyers represent the compensated demand and supply function for characteristic j, respectively. The first partial derivative of the HPF with respect to j yields the set of the market equilibria.

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[2] In the literature the terms value function and indifference curve are sometimes utilized rather than the term bid function. However, they all refer to the same function.

Figure 1: The Market Equilibrium in Hedonic Markets
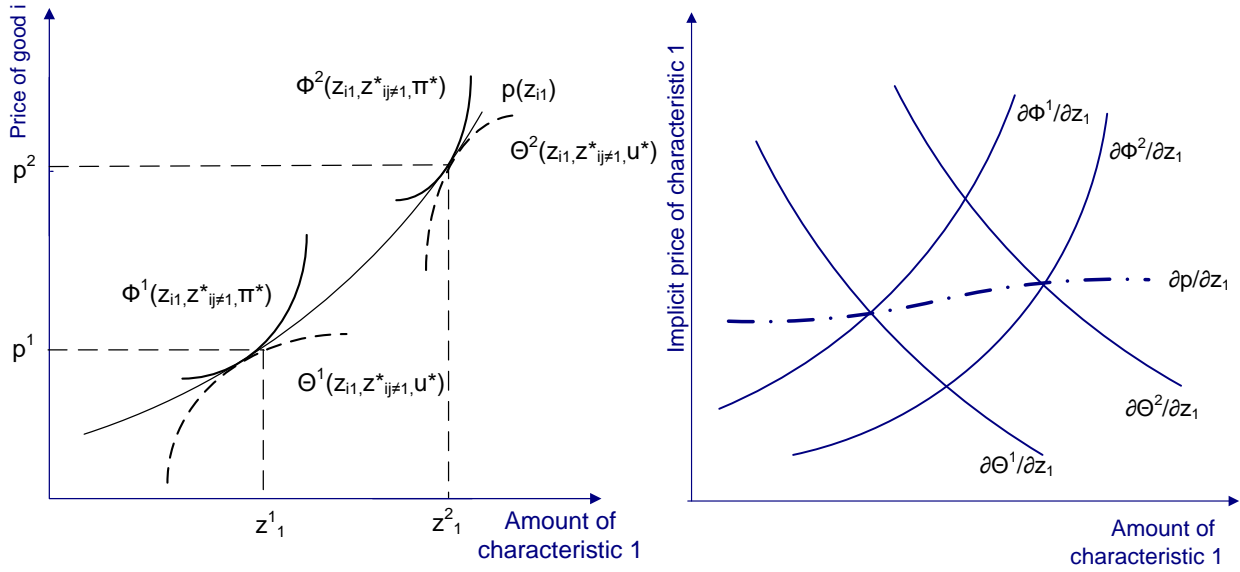
Source: Modified according to ROSEN (1974), p. 39, 43 and 49.

In order to identify these underlying supply and demand functions empirically, ROSEN (1974) proposed a two-step procedure. In the first step, market data are used to estimate the HPF by choosing the functional form that fits the data best:

$$(5) \qquad p_i = p(z_{ij}).$$

Computing the partial derivatives yields the marginal price of each characteristic j:

$$(6) \qquad \partial p_i / \partial z_{ij} = \hat{p}_j.$$

The estimated implicit marginal price $\hat{p}_j$ for a certain characteristic is the additional amount a consumer has to pay to move to a good with a higher level of that characteristic, other things being equal. These estimated marginal prices can be used to measure the WTP for a marginal change in the characteristic. However, if one is interested in the WTP for a non-marginal change in a characteristic, the inverse demand function for this characteristic has to be estimated. This is done by using the estimated marginal prices from stage one to estimate demand and supply functions for each characteristic j at stage two in the following way:

$$(7) \qquad \hat{p}_j(z) = f_j(z_1,..., z_n, Y_1, e_{j1}) \qquad \text{(demand)}$$

$$(8) \qquad \hat{p}_j(z) = g_j(z_1,..., z_n, Y_2, e_{j2}) \qquad \text{(supply)}$$

with $j = 1,\ldots,n$, where Y_1 is a vector of income and consumer attributes and Y_2 is a vector of factor prices and producer attributes[3]; e_{j1} and e_{j2} are vectors of error terms. Equations (7) and (8) are the marginal bid and offer curves representing inverse supply and demand curves for each characteristic j. According to ROSEN (1974), this simultaneous system can be solved by simultaneous estimation methods such as two-stage least squares, using Y_1 and Y_2 as instruments.

One necessary prior condition for this two-stage procedure using data from a single market is that $p(z_{ij})$ is nonlinear at stage one. If $p(z_{ij})$ is linear at stage one, the implicit marginal prices are constants leading to a zero variance across sample observations. However, in this case it is still possible to estimate marginal prices, which represent the individuals' MWTP for the characteristic. There are two special cases, in which no two-stage procedure is needed. First, if all consumers are assumed to be identical with respect to income and preferences, all individuals have got the same inverse demand function, which is identified by the HPF. Second, if β is identical across all suppliers, the HPF is identical with the compensated supply function and there is no need to estimate the two specified functions above simultaneously (FREEMAN, 2003; ROSEN, 1974). Moreover, in consumer characteristics models in the tradition of GORMAN (1956) and MUELLBAUER (1974) it is assumed that consumers are price-takers. This assumption allows focusing solely on the demand side without considering any simultaneity issues (BLOW et al., 2008).

Whereas the theoretical two-stage procedure seems to be straightforward, the empirical application can be rather tricky due to the fact that characteristics are usually part of a bundle of characteristics and cannot be traded separately. This bundling has got important implications with respect to the law of one price and the budget constraint in hedonic models. In contrast to traditional utility maximization models, the law of one price does not necessarily hold in the characteristics space and the budget constraint is generally nonlinear. This nonlinearity stems from the fact that bundled goods are assumed to be indivisible and, hence, no arbitrage is possible. If consumers cannot unbundle and repackage different products to obtain a certain amount of the characteristic j, they have to search for the product that contains the desired amount of j. This can be illustrated by the following example. Let us suppose that a consumer searches for a new car and, for simplicity, that the only characteristic relevant in his purchase decision is the engine size. There is one car available with a 4000cc engine size and one car with a 2000cc engine, whereas the last car sells for less than half the price of the first one. In this context, it is infeasible for the consumer to obtain a 4000cc

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[3] ROSEN (1974) calls Y_1 and Y_2 the empirical counterparts of α and β introduced in equations (2) and (3).

engine by purchasing two 2000cc engines. This fact, which is most likely in many markets, implies that the law of one price does apply to the marketed good itself but not necessarily to the characteristics embodied in the good. Therefore we usually expect to observe different implicit characteristics prices across varieties implying a nonlinear HPF with a non-constant price gradient (AGARWAL and RATCHFORD, 1980; ROSEN, 2002; ROSEN, 1974).

2.2 Critics, Explorations and Modifications of Rosen's Two-Step Approach

BROWN and ROSEN (1982) demonstrated that the proposed methodology by ROSEN (1974) contains several pitfalls, which can lead to problems at stage two. They derive algebraically that in the case of a linear-quadratic HPF and linear demand and supply functions, the second stage leads to parameter estimates that are identical to estimated coefficients at the first-stage (BROWN and ROSEN, 1982). Put differently, they showed that the second-stage estimation can do no more than reproduce the coefficients from stage one as no additional data beyond that already contained in the HPF is available at stage two (BROWN and ROSEN, 1982; FREEMAN, 2003).

Several ways have been discussed in the literature how to overcome this problem in estimating demand functions for characteristics. One "technical" solution proposed by BROWN and ROSEN (1982) is to place restrictions *a priori* on the functional form. If the initial market equilibrium function is of order m^{th} in the *z*'s, identification of structural demand and supply parameters is possible, if the marginal price function is of *m-1* order in the *z*'s and the supply and demand functions are of *m-2* or less order in the *z*'s. This kind of proceeding is considered to be rather problematic, because functional form restrictions seem to be arbitrary and not testable.

Another solution proposed by several researchers is to use data from multiple markets, i.e. spatially or temporally distinct markets (BARTIK, 1987; BROWN and ROSEN, 1982; EPPLE, 1987; KAHN and LANG, 1988). The line of argument is as follows. Underlying demand and supply functions for characteristics depend on the preferences of consumers and the technologies of producers that are characterized by a certain set of attributes. It is assumed that demand and supply functions are the same across markets, whereas the distribution of consumers and producers with a certain set of attributes is assumed to vary from market to market. Since the HPF is shaped by the distributions of consumers and producers, each market exhibits a different hedonic price function (EPPLE, 1987). Hence, the within-market variation is used to identify the HPF, and the between-markets variation is used to identify underlying supply and demand curves (KRISTOFERSSON and RICKERTSEN, 2004). Practically,

temporal cross-section data, cross-section data from different regions or panel data seem to be appropriate for overcoming this type of identification problem in hedonic models. Although using data from different markets is considered to be the most promising way to identify hedonic models, very recent publications by EKELAND ET AL. (2002, 2004) work out that multimarket data is no panacea for identifying hedonic models. ROSEN (2002) himself pointed out that the data requirements for the second-stage estimation are in most cases too demanding, since usually prices and attributes of goods are measured independently of the characteristics of buyers and sellers. Another problem arises with discrete instead of continuous variables. In such a case, it is not feasible to estimate the second-stage as proposed by ROSEN (1974).

2.3   Empirical Two-Stage Models

Most of the empirical work on two-stage hedonic modelling has been carried out in the real estate literature and the non-market valuation of environmental amenities (BOCKSTAEL and MCCONNELL, 2007). Hedonic housing models are typically used to derive willingness-to-pay estimates for changes in environmental public goods such as air quality or recreational opportunities. MALPEZZI (2003) provides a review of hedonic property value models and the problems that usually arise in estimating these models. He concludes that the hurdles that must be tackled in estimating a structural hedonic model make a reliable estimation of demand for characteristics via two-stage models quite difficult. In most real estate studies it is assumed that the housing stock is given. This implies a totally inelastic supply of characteristics. Hence, if two-stage models are estimated, they are only concerned with the estimation of demand functions using either data from multiple markets, i.a. DAY et al. (2007) and ZABEL and KIEL (2000), or imposing functional form restrictions, e.g. CHATTOPADHYAY (1999). With regard to functional specifications it is noteworthy to mention that semi- and nonparametric methods have gained in importance in recent years. These methods allow for a greater flexibility in estimating implicit prices. Empirical applications in the real estate literature are for example PACE (1993) and PARMETER et al. (2007) who apply kernel regressions on housing market data. Yet to the best of our knowledge, there is no study estimating a two-stage model relying on nonparametric estimates.

There are also few studies in which a two-stage hedonic model is estimated for agri-food products. Whereas the majority of hedonic first-stage studies has been carried out for wine, this is not the case for two-stage models as can be seen from Table 1. EDMEADES (2007) estimates a two-stage hedonic model for bananas in Uganda. This study is different from the

other studies in that respect that the product under consideration is a semi-subsistence crop which is produced and sold as well as consumed.

Table 1:   Overview of Two-Stage Hedonic Models for Agri-Food Products

Author/Year	Type of Data	Hedonic Model	
		First Stage	**Second Stage**
EDMEADES (2007)	Survey data for Bananas in Uganda, 2003, N=886 Cross-Section Data Producer/Consumer level	Log-linear specification	Supply functions for three variety attributes are estimated using 2SLS
KRISTOFFERSON and RICKERTSEN (2007)	Icelandic fish auction data, 1996-2000 N=289,406 Panel Data Set Wholesale level	Nonlinear HPF and inverse input demand functions for characteristics are estimated simultaneously using a random coefficient (RC) model	
KRISTOFFERSON and RICKERTSEN (2004)	Icelandic fish auction data, 1998-2000 N=172,946 Panel Data Set Wholesale level	Linear HPF and inverse input demand functions for characteristics are estimated simultaneously using a random coefficient (RC) model	
BOWMAN and ETHRIDGE (1992)	Cotton spot market prices, U.S. market, 1977-1988, N=2,967 Temporal Cross-Section Data Producer level	Linear difference model with regional intercept- and slope-dummies	Inverse characteristics demand and ordinary supply functions for five attributes were estimated using SUR

Notes: HPF=Hedonic Price Function; N=Number of included observations; 2SLS = Two-Stage Least Squares; SUR = Seemingly Unrelated Regressions.

Source: Own presentation.

What all four studies have in common is that they use data from multiple markets in order to estimate the second stage. BOWMAN and ETHRIDGE (1992), hereafter BE, estimate a hedonic price function for each year by including regional intercept- and slope-dummies to obtain an average implicit price for each characteristic in each region and year. KRISTOFERSSON and RICKERTSEN (2004, 2007), hereafter KR, treat data from each auction day as coming from a separate market and EDMEADES (2007) uses data from three different regions in Uganda.

In three studies, KR (2004, 2007) and BE (1992), it is assumed that the supply of characteristics is perfectly inelastic. KR justify this assumption by stating that the daily supplies of characteristics of fresh fish are given at the start of each auction day, since this supply cannot be changed during the auction day. Consequently, the supplied characteristics are treated as exogenous. This implies that the prices of characteristics are solely determined by demand, and the second stage is reduced to estimate an inverse demand system. KR (2004) identify three different scenarios that have to be distinguished in the context of two-stage hedonic models (see Figure 2).

Figure 2:   Different Assumptions about Supply and the Following Estimation Consequences
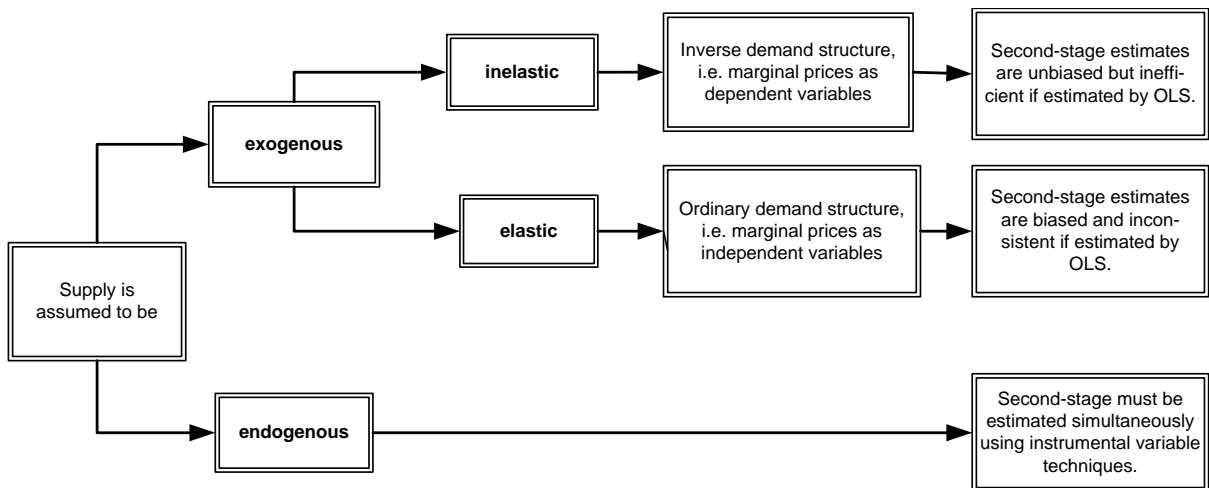
Source: Own presentation.

It is important to note that in the case of exogenous inelastic supply, second-stage estimates are efficient if first-stage estimates are equally accurate. However, unequal variances of estimated first-stage regression coefficients are quite likely and, thus, second-stage estimates will be inefficient if estimated by OLS (KRISTOFERSSON and RICKERTSEN, 2004; STANLEY and JARELL, 2005). In such a case, weighted least squares can be used to derive unbiased and efficient estimates at the second stage.

The assumption of exogenous elastic supply, which is often found in empirical studies applying characteristics models, implies that individuals are price takers. If individuals are price takers, the individual's purchase decision does not impact the supply side. This makes it possible to focus solely on the demand side and abstract from any supply-side simultaneous issues. The decision about elastic or inelastic supply is not just important for the specification of the second-stage but also for the first-stage estimation. There are few papers, amongst others NERLOVE (1995) and RESANO and SANJUÁN (2008), arguing that if consumers are price takers, they reveal their preferences through the quantities purchased. Consequentially, they estimate the first-stage HPF as a quantity-dependent model. This seems to be a reasonable approach for most retail situations. However, in the case of auction data, consumers reveal their preferences by the price they are willing to pay for the auctioned good and estimating a price-dependent hedonic model seems to be more adequate. Accordingly, it seems to be the case that each data set (auction vs. spot market vs. farm level/subsistence) has to be treated differently.

3   Theoretical Model

In this paper, data from spatially and temporarily separated markets, i.e. from different coffee auctions are used. Following KR (2007), it is assumed that the supply of coffee is fixed at the beginning of each auction resulting in a totally inelastic supply. As coffee is a perennial crop the supplies of characteristics in each auction are predetermined due to planting decisions taken several years ago and due to climatic conditions. This implies that the prices of characteristics are solely determined by the quantities of characteristics demanded by coffee importers and roasters. Consequently, the estimation problem is reduced to estimate a non-linear hedonic bid function (HBF) for each market and an inverse characteristic demand function for one characteristic, the sensory quality score (SQS) (see Figure 2).

The estimated parameters for each auction are treated as coming from separate markets with identical buyer preferences, i.e. there is no difference in buyer preferences across time and space. This makes it possible to use the within-market variation to identify the marginal characteristics prices and the between-markets variation to identify the inverse demand function for the SQS. The estimated market-clearing HBF is presented by equation (9):

$$(9) \qquad b_{in} = \beta_0 + \sum_{j=1}^{K} \beta_j z_{jin} + \varepsilon_{in}$$

with b_{in} being the winning bid for coffee i in market n, z_{jin} is the level of characteristic j in coffee i, K is the number of characteristics, β_0 and β_j are parameters to be estimated and ε is a stochastic error term. For each coffee i in the sample, an implicit price for the SQS is calculated from the HBF according to

$$(10) \qquad \partial b_{in} / \partial z_{sqs_{in}} = \hat{p}_{SQS_{in}} .$$

At the second stage, the inverse demand function for the SQS is estimated according to equation (11):

$$(11) \qquad \hat{p}_{SQS_{in}} = \gamma_0 + \sum_{m=1}^{M} \gamma_{inm} x_{inm} + \omega_{SQS_{in}}$$

with $\hat{p}_{SQS_{in}}$ being the estimated marginal price for the SQS of coffee i in market n, x_{inm} are the included explanatory variables with $m = 1,..M$, γ_o and γ_m represent structural parameters and ω is an error term. To take the problem of unequal accuracy of first-stage estimates into account the second stage is estimated by weighted least squares, whereas the reciprocal standard errors of the first-stage regression coefficients are used as weights.

4 Data and Empirical Model

The used auction data for specialty green coffee beans cover the time period 2003-2009. Cup of Excellence (COE) competitions and auctions were introduced in Brazil in 1999 to reward high-quality coffee producers and to promote high-quality coffee to consumers. By now, eight Latin American countries, namely Bolivia, Brazil, Colombia, Costa Rica, El Salvador, Guatemala, Honduras and Nicaragua, as well as one African country, Rwanda, take part in the COE program. With the exception of Colombia, where auctions take place twice a year, in all other countries there is usually one auction per year.[4] All data regarding the participating coffee farmers, the coffee characteristics, and the achieved auction price are available on the COE website (http://www.cupofexcellence.org). All coffees are cupped in advance by a national and international jury and based on the cupping experience each coffee gets a SQS on a scale from 0 to 100 points. Only coffees with a SQS of 84 and above are awarded the COE and are offered in the subsequent internet auctions.[5]

Table 2 presents some descriptive statistics pooled across all data. In total, 1,215 observations from 43 auctions are included. The number of coffee lots sold in an auction varies from 15 to 43 with an average of 28 lots. The average coffee lot size is 2,904 pounds.[6] The price paid for a pound of green coffee beans varies from US-$ 1.3 to US-$ 80.2 with an average of US-$ 5.34. The data set includes 1620 tonnes of green coffee beans with a total market value of US-$17.6 million. The variables denoted as HBF are coffee characteristics included in the estimation of the hedonic bid functions and variables denoted as ID are explanatory variables included in the inverse demand function.

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[4] However, there are countries in which auctions do not take place every year. Consequently, there are countries with just one or two observation(s) in the dataset.

[5] For more information on the procedure please visit http://www.cupofexcellence.org.

[6] Normally, the lot size is given by the number of coffee bags sold. However, since the coffee bag size differs across countries, the average lot size was converted to pounds.

Table 2:   Description and Summary Statistics of the Included Variables

Variable	Definition	Mean	Std. Dev.
Dependent variable HBF			
Highest Bid (*high_bid*)	Winning bid for coffee i in US-$/pound	5.34	4.30
Independent variables HBF			
Sensory Quality Score (*SQS*)	The achieved score in the cupping competition that takes place in advance of the auction ranging from 84 -100 points	86.80	2.53
Quantity (*quantity*)	Quantity of coffee i sold in market n in pounds	2651.2	824.5
		Relative Share	
Ranking (*rank*)	Dummy variables for the achieved rank in the cupping competition		
1st Rank	Takes the value 1 if the coffee achieved the 1st rank, and 0 otherwise	0.04	
2nd Rank	Takes the value 1 if the coffee achieved the 2nd rank, and 0 otherwise	0.04	
3rd Rank	Takes the value 1 if the coffee achieved the 3rd rank, and 0 otherwise	0.04	
Rank 4 and lower	Takes the value 1 if the coffee achieved the 4th rank and lower, and 0 otherwise	0.88	
Certification (*certification*)	Dummy variables for different certification schemes		
Organic	Takes the value 1 if the coffee is certified as organic, and 0 otherwise	0.02	
Rainforest Alliance	Takes the value 1 if the coffee is Rainforest-Alliance certified, and 0 otherwise	0.02	
None	Takes the value 1 if the coffee is not certified, and 0 otherwise	0.96	
Dependent variable ID			
Marginal price of the SQS ($\hat{p}_{SQS}$)	Estimated implicit marginal price of the Sensory Quality Score	0.55	0.48
Independent variables ID			
Total number of coffee lots (*total_lots*)	The total number of coffee lots sold in auction n	28.95	6.03
Average score (*average_score*)	The average quality score of all coffees sold in auction n	86.80	0.69
Score Ratio (*score_ratio*)	The score of coffee i in relation to the average score in auction n	1.00	0.03
Time trend (*trend*)	A time trend that takes the value 0 for the year 2003 and the value 6 for the year 2009	3.47	1.86
		Relative Share	
Country-of-Origin (*CO*)	Dummy variables for different coffee origins		
Bolivia	Takes the value 1 if it is a Bolivian coffee, and 0 otherwise	0.05	
Brazil	Takes the value 1 if it is a Brazilian coffee, and 0 otherwise	0.14	
Colombia	Takes the value 1 if it is a Colombian coffee, and 0 otherwise	0.17	
Costa Rica	Takes the value 1 if it is a Costa Rican coffee, and 0 otherwise	0.08	
El Salvador	Takes the value 1 if it is an El Salvadoran coffee, and 0 otherwise	0.17	
Guatemala	Takes the value 1 if it is a Guatemalan coffee, and 0 otherwise	0.07	
Honduras	Takes the value 1 if it is a Honduran coffee, and 0 otherwise	0.09	
Nicaragua	Takes the value 1 if it is a Nicaraguan coffee, and 0 otherwise	0.19	
Rwanda	Takes the value 1 if it is a Rwandan coffee, and 0 otherwise	0.03	
Buying company (*buyer*)	Dummy variable for different buyer origins		
Asian	Takes the value 1 if the coffee was bought by an Asian company, and 0 otherwise	0.52	
European[a]	Takes the value 1 if the coffee was bought by an European company, and 0 otherwise	0.22	
North American	Takes the value 1 if the coffee was bought by a North American company, and 0 otherwise	0.21	
Others	Takes the value 1 of the coffee was bought by a company originating in another country as stated above or a group of companies from different regions, and 0 otherwise	0.05	

[a] European buyer seems to be a rather broad category given the rather large differences between Northern and Southern European countries in terms of their coffee consumption patterns. However, since there are only very few buyers from Southern Europe in the dataset, a more detailed categorisation would not be very meaningful.

Source: Own presentation.

In a first step, hedonic bid functions are estimated by OLS for each auction separately. Non-linear HBF are chosen because in the specialty coffee market unbundling and rearranging different qualities is not possible as these coffees are sold as single-origin coffees. In the mass coffee market this is different as blending is a standard tool to achieve a certain quality.

The included characteristics are the sensory quality score (*SQS*), the achieved rank in the competition *(rank)*, certification schemes such as organic or fair trade *(certification)* and the available quantity (*quantity*). This leads to the following empirical HBF:

$$(12) \quad \log(b_{in}) = \beta_o + \beta_1 SQS_{in} + \beta_2 rank_{in} + \beta_3 \log(quantity_{in}) + \beta_4 certification_{in} + \varepsilon_{in}.$$

The first three ranks are included as dummy variables due to former results on specialty auction coffee highlighting the value of the first three ranks as a marketing tool for consumers (DONNET et al., 2008; TEUBER 2010).[7] The available coffee quantity is included as a factor of exclusiveness since it has been shown in hedonic studies on wine that wine produced in limited quantities can achieve higher prices (i.a. COSTANIGRO et al., 2007; SCHAMEL, 2006).[8] Each HBF is estimated in several functional specifications and each is tested on misspecification using the Ramsey RESET test. The specification fitting the data best is chosen. Furthermore, if heteroscedasticity was detected by the Breusch-Pagan test, the HBFs were estimated with the White Heteroscedasticity consistent estimator.

At the second stage, the following empirical model is estimated:

$$(13) \quad \hat{p}_{SQS_{in}} = \gamma_0 + \gamma_1 average\_score_n + \gamma_2 score\_ratio_{in} + \gamma_4 total\_lots_n + \gamma_5 trend_n + \gamma_6 CO_n + \gamma_7 buyer_{in} + \varepsilon_n$$

in which the variables are defined as in Table 2. It is assumed that the variable *average_score* has got a negative impact on the marginal price, whereas the *score_ratio* is assumed to have got a positive impact. The first hypothesis is based on the idea that if the average quality level in terms of the SQS increases, the marginal price of quality will decrease. The second hypothesis implies that relative quality, i.e. the quality of coffee *i* in relation to all others coffee sold in auction *n*, has got a positive impact on the marginal price paid for the SQS. We expect a negative impact of the variable *total_lots* assuming that the larger the auction the less is paid for the SQS. *CO* and *buyer* refer to the geographical origin of the coffee and bidding company, respectively. We distinguish between Asian, European and North American

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[7] The variables for different certification schemes had to be dropped because of insignificance or too few observations, respectively.

[8] Two anonymous referees raised concerns over the inclusion of quantity as an explanatory variable due to possible endogeneity problems. Endogeneity is of no concern in this setting, since the auction quantity is fixed before the auction bidding starts. However, I did also estimate hedonic price functions excluding the quantity variable in order to check for the robustness of the regression coefficient for the SQS variable. In all cases, the regression coefficient proved to be robust even after dropping the quantity variable.

companies assuming that consumers' preferences may differ across these market segments. At first glance the inclusion of this variable may seem puzzling given the statement above that we assume identical buyer preferences across time and space. However, this approach is fully in line with the theoretical model since identical buyer preferences refer to each buyer category across different auctions. This means that we expect that a European buyer exhibits the same preferences across all included auctions but we do not assume that European and Asian buyers possess identical preferences.

4   Results

In all cases, the HBF is estimated in a log-linear specification as presented in equation (12). This means that the marginal price of the SQS has to be calculated as:

(14) $\hat{p}_{SQS_{in}} = \beta_1 * b_{in}$

with b_{in} being the winning bid of coffee i in auction n.

Figure 3 illustrates the high variability of the marginal price of the SQS across different auctions by depicting all estimated marginal prices as well as the marginal prices calculated at the weighted mean price achieved in auction n in absolute terms.[9] If we just look at the marginal prices calculated at the weighted average, there seems to be no clear pattern in terms of an increasing or falling marginal price according to the level of the SQS. This is different, if we look at the dispersion of marginal prices within an auction. Marginal prices for two different auctions, namely Guatemala 2009 and El Salvador 2003, are highlighted in order to illustrate the increasing marginal pricing schedule. Moreover, these highlighted marginal prices do also stress the existing level-differences between auctions. This is in line with findings from previous hedonic studies on the specialty coffee market, stressing the importance of region and time dummies in pooled hedonic regressions (DONNET et al., 2008; TEUBER, 2010).

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[9] The weights are sold quantities.

Figure 3: Marginal Pricing Schedule from First-Stage Hedonic Bid Functions
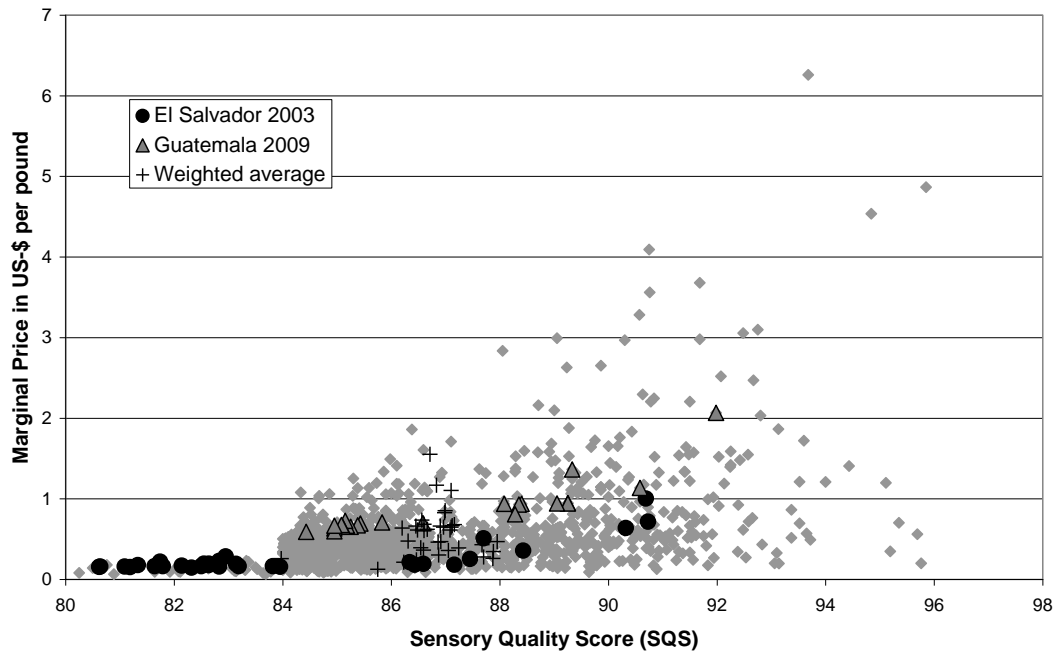
Source: Own presentation.

One example of a HBF based on data for the year 2008 is presented in Table 3. The estimated parameters of three different model specifications based on pooled data across all auctions that have taken place in the year 2008 are presented in the first three columns. The last column contains estimated regression coefficients for the SQS from HBF estimated on data from individual auctions. Consequently, regression coefficients for the other variables are not reported. The model specification presented in the second column allows the price level to differ across countries but assumes a constant regression coefficient for the SQS. The model specification in the third column introduces flexibility by allowing the impact of the SQS to differ across countries, whereas all other explanatory variables are assumed to have the same impact across countries.

Table 3: Parameter Estimates of the Hedonic Bid Function, Auction Year 2008

	Model 1: Basic Model	Model 2: Basic Model with CO Effects	Model 3: Basic Model with CO and Interaction Effects (CO * Score)	Score Parameter Estimates from Individual HBF
Dependent variable Log(High_bid)				
Constant	-5.28***	-5.00***	-11.24***	
	(0.000)	(0.000)	(0.000)	
SQS	**0.115*****	**0.110*****	**0.179*****	
	(0.000)	(0.000)	(0.000)	
Ranking (Reference : Rank 4 and lower)				
1st Rank	0.521**	0.527***	0.542***	
	(0.003)	(0.000)	(0.000)	
2nd Rank	0.305**	0.305**	0.307***	
	(0.009)	(0.007)	(0.000)	
3rd Rank	0.240	0.232*	0.213*	
	(0.064)	(0.042)	(0.011)	
Log(*quantity*)[a]	-0.367***	-0.353***	-0.318***	
	(0.000)	(0.000)	(0.000)	
CO Dummies (Reference : Honduras)				
Bolivia		-0.167**	-0.171**	
		(0.006)	(0.003)	
Brazil		-0.018	-0.011	
		(0.805)	(0.834)	
Costa Rica		-0.167*	-0.176**	
		(0.010)	(0.003)	
Colombia		0.154*	0.212***	
		(0.027)	(0.000)	
El Salvador		-0.126*	-0.138*	
		(0.032)	(0.013)	
Guatemala		0.325***	0.328***	
		(0.000)	(0.000)	
Nicaragua		-0.087	-0.097	
		(0.206)	(0.135)	
Rwanda		0.099	0.092	
		(0.138)	(0.143)	
Interaction Effects CO Dummies * Score[a] (Reference: Honduras*SQS)				
Honduras*SQS				0.214***
				(0.000)
Bolivia*SQS			-0.079**	0.125***
			(0.003)	(0.000)
Brazil*SQS			-0.148***	0.063***
			(0.000)	(0.000)
Costa Rica*SQS			-0.036	0.109**
			(0.272)	(0.002)
Colombia*SQS			-0.140***	0.057***
			(0.000)	(0.000)
El Salvador*SQS			-0.070*	0.123***
			(0.011)	(0.000)
Guatemala*SQS			-0.020	0.078*
			(0.625)	(0.038)
Nicaragua*SQS			-0.067*	0.089
			(0.034)	(0.077)
Rwanda*SQS			-0.064*	0.140**
			(0.039)	(0.005)
Adjusted R²	**0.64**	**0.76**	**0.80**	**-**
RESET statistic	**1.80**	**6.18**	**24.39**	**-**
	(0.18)	**(0.01)**	**(0.00)**	
N			**236**	

Notes: [a] The score is centred at its sample mean. *,**,*** denote statistically significance at the 5 %, 1 % and 0.1 % level, respectively. p-values are presented in parentheses;

Source: Own estimations.

All estimated coefficients exhibit the expected signs. The SQS and the first three ranks influence the auction price positively, whereas the quantity has got a negative impact. The regression coefficient for the SQS in the country-effects model is the average impact across all included auctions, i.e. across countries. This parameter indicates that an increase in the SQS by one unit results in a price increase by 11 %. The same parameter is obtained, if we calculate the average across all individual country regression coefficients presented in the last column of Table 3.

The results with respect to price level differences between countries are surprising. Honduras was chosen as the reference category, since in former studies its coffees were sold at a discount compared to other origins *ceteris paribus*.[10] This is not the case in the auction year 2008, in which only Colombian and Guatemalan coffees are sold at a significantly higher price level looking at the main *CO* effects in Model 2. These main *CO* effects change only slightly, if interaction effects (CO*SQS) are included (Model 3). In five out of eight cases the main CO effect is statistically significant different from zero. Coffees from Bolivia, Costa Rica and El Salvador are sold at a lower price level than Honduran coffees, whereas Colombian and Guatemalan coffees can achieve higher prices holding all other variables constant. However, our main interest concerns the conditional score effects. Six out of eight interaction effects are statistically significant negative implying that the score is less valued for coffees from Bolivia, Brazil, Colombia, El Salvador, Nicaragua, and Rwanda compared to coffee from Honduras. Hence, adding interaction effects highlights that the SQS has not the same impact on the achieved auction price across countries. In the case of Honduran coffee, a one-unit increase in the score results in an 18.1 % higher auction price. In contrast, a one-unit increase in the score of a Brazilian coffee induces a price increase of 3.3 % only.[11]

If we compare the estimated regression coefficients from the cross-section model with the parameter estimates for the score variable from separately estimated HBFs, the tendency is in both cases the same, i.e. the estimated coefficient is highest in the case of Honduras and lowest in the case of Brazil and Colombia. However, since not all possible interaction effects are included in the pooled model presented in the third column, the estimates are not identical. For the inverse demand model at the second stage, first-stage parameters from individually estimated HBFs are used. The second stage is estimated both by ordinary and weighted least squares. In the latter case the inverse standard errors from the first-stage estimates are used as

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[10] This is also the case if a HBF is estimated based on the whole data set. These results are not reported due to space limitations.

[11] This is calculated by subtracting the estimated parameter for Brazil*score from the reference score regression coefficient, i.e. [0.181-0.148].

weights. This means that more precise estimates are given more weight than less precise ones. Moreover, several functional specifications were tested and the double-log models performed best. The results for both estimation procedures are presented in Table 4.

Table 4:   Parameter Estimates of the Inverse Demand Function for the SQS

	OLS		WLS[a]	
Variable	**Parameter estimate**	**p-value**	**Parameter estimate**	**p-value**
Dependent variable: $\log(\hat{p}_{SQS_{in}})$				
Constant	15.067*	0.048	69.329***	0.000
Log(total_lots)	0.263***	0.000	-0.153*	0.046
Log(average_score)	-6.385***	0.000	-18.405***	0.000
Score_ratio	10.99***	0.000	11.987***	0.000
Trend	0.244***	0.000	0.234***	0.000
CO Effects (*Reference: Honduras*)				
Bolivia	0.019	0.709	-0.231***	0.000
Brazil	-0.064	0.064	-0.222**	0.000
Colombia	-0.204***	0.000	-0.258**	0.000
Costa Rica	-0.567***	0.000	-0.685***	0.000
El Salvador	-0.357***	0.000	-0.567***	0.000
Guatemala	-0.123*	0.029	-0.374***	0.000
Nicaragua	-0.194***	0.000	-0.224***	0.000
Rwanda	0.368***	0.000	0.150*	0.000
Buyer (*Reference: North American*)				
Asian	-0.136***	0.000	-0.156***	0.000
European	-0.046	0.220	-0.032	0.492
Others	0.128*	0.050	0.082	0.284
Adjusted R²	**0.67**		**0.73**	
RESET statistic	**2.36**		**3.64**	
(p-value)	**(0.12)**		**(0.06)**	
N		**1216**		

[a] Weights are equal to the inverse standard error of the regression coefficient from stage one. *, **, *** denote significance at the 5 %, 1 % and 0.1 %-level, respectively. Test statistics are based on White's corrected standard errors.

Source: Own estimations.

Despite the results for the variable *total_lots*, the OLS and WLS estimates are consistent in terms of the direction of the impact. For some variables such as *average_score* and several *CO* dummies the magnitude of the impact differs. As expected, the WLS estimates are more efficient than the ones derived by OLS and will be interpreted and discussed in the following. The impact of the variables *total_lots*, *average_score* and *score_ratio* confirm our hypotheses. If the number of coffee lots sold in auction *n* increases, the marginal price for the SQS decreases. The same negative relationship is true for the average score achieved in auction *n*. If the average score increases by 1 %, the marginal price of the SQS decreases by 18 %. In contrast, an increasing *score_ratio* leads to an increase in the marginal price of the SQS. This finding is fully in line with the increasing marginal price schedule presented in Figure 3. As indicated by the positive time trend, marginal prices of the SQS have increased over time due to the increasing price level in these auctions.

The implicit price paid for a one-unit increase in the SQS is highest for Rwandan and Honduran coffee. This is reflected in the significant negative coefficients for all other *CO* dummies. At first glance, this seems to be contradictory to first-stage findings from previous studies, where Honduran coffees are discounted to all other origins (DONNET et al., 2008; TEUBER, 2010).[12] However, at the second sight these results might even explain the findings presented here. Since Honduras does not possess a well-established reputation as a high-quality producer yet, the SQS seems to be a more important product characteristic than for coffees from other origins which sell by "themselves" due to their established image. The results suggest that the same is true for coffee from Rwanda. However, since only one auction has taken place in Rwanda so far, these results have to be interpreted with caution.

Another interesting finding refers to the impact of the *buyer* variable. No statistically significant differences could be detected between North American, European and Other buyers. Contrarily, there is a statistically significant negative impact on the marginal price of the SQS by the Asian buyer variable. A possible explanation maybe that Asian consumers rely more on other product characteristics such as regional reputation or ranking and, thus, the SQS is valued not as highly as by buyers from other consumer markets. This raises the question whether distinct consumer segments exist in the specialty coffee market, in which product characteristics are valued differentially. This seems to be an interesting aspect for future research.

5   Concluding Remarks

It is known that estimating demand and supply functions in the characteristics space is quite distinct from the goods space. Although the theoretical basis of two-stage hedonic models is sound, empirical applications are not straightforward. Data requirements are demanding and several estimation problems have to be tackled depending on the type of data used. Given the increasing availability of comprehensive electronic datasets, the number of studies estimating two-stage hedonic models will certainly increase.

The present paper has used a data set on specialty coffee to estimate a two-stage hedonic model. First-stage marginal prices were estimated for the achieved sensory quality score for each auction and these marginal prices were then used as dependent variables in an inverse demand model. The first-stage results point out that marginal prices differ significantly across auctions and that a pooled HBF can only provide a complete picture if all possible interaction terms are incorporated. The second-stage results highlight that marginal prices of the SQS

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[12] Rwandan coffee was not included in these previous studies.

have increased from 2003 to 2009 and differ significantly across growing and buyer origins. Surprisingly, the country-of-origin effects are different between the goods and the characteristics space. In the first instance, Honduran coffee has been usually discounted to all other origins, whereas Guatemalan and Colombian coffees have achieved the highest prices. This is not the case if we look at the second-stage results. In the characteristics space, the marginal price paid for the SQS is significantly higher for Honduran and Rwandan coffees than for any other origin. This can possibly be due to the lack of reputation of these two growing exporters. The SQS seems to be a much more important quality cue for these coffees than for coffees originating in coffee-growing countries with a well- established reputation.

Though the present empirical analysis offers some interesting results, it has several limitations. First, only very few characteristics could be included because of missing detailed data or a missing variance in the dataset. Therefore, no substitutive or complementary relationships, for example attribute trade-offs, could be modelled. Second, the data set used includes only a small portion of the whole specialty coffee market. In order to overcome these limitations, it seems fruitful in future research to utilize more comprehensive data sets as far as they become available.

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Acknowledgements

Annex

Annex 1:   Included Auctions in the Two-Stage Hedonic Model

Country	Included auction years (*number of coffees sold*)
Bolivia	2004 *(13)*, 2005 *(29)*, 2007 *(26)*, 2008 *(29)*
Brazil	2003 *(43)*, 2004 (36), 2005 *(36),* 2006 *(29)*, 2008 *(23)*
Colombia	2005 *(33, 25)*, 2006 (30, 23), 2007 (30), 2008 (18), 2009 (27)
Costa Rica	2007 *(25)*, 2008 *(30)*, 2009 *(24)*
El Salvador	2003 *(31)*, 2004 *(35)*, 2005 *(17)*, 2006 *(23)*, 2007 *(23)*, 2008 *(36)*, 2009 *(33)*
Guatemala	2006 *(25)*, 2007 *(19)*, 2008 *(25)*, 2009 *(23)*
Honduras	2004 *(21)*, 2005 *(41)*, 2006 *(33)*, 2007 *(24),* 2008 *(26)*
Nicaragua	2003 *(37)*, 2004 *(29)*, 2005 *(35)*, 2006 *(25)*, 2007 *(34)*, 2008 *(25)*
Rwanda	2008 *(24)*

Source: Own presentation.

Investigating Direct and Indirect Origin Effects –
Do Direct Effects Differ across Market Segments?

Ramona Teuber
Institute of Agricultural Policy and Market Research
Justus-Liebig University Giessen

Abstract

Origin matters. This has been proven by numerous studies using either discrete choice or hedonic approaches to derive implicit prices for origin as a product attribute. These studies highlight that in most cases the origin itself has got a direct impact on consumers' evaluation of a product which results in a price premium or price discount compared to products from other origins. At the same time it is assumed that origin has an indirect impact via the expected sensory quality on price. This is relevant if we think of geographically differentiated products and the *terroir* concept. The present paper provides a framework to analyze direct and indirect effects of origin via a recursive hedonic model if detailed data on product characteristics and prices are available. Thus, in contrast to consumer studies relying on stated preference data the present analysis is based on revealed preference data. Moreover, it contributes to the existing literature by segmenting the specialty coffee market according to the buyer origin. The results suggest that (i) direct origin effects are more important than indirect origin effects via the sensory quality and (ii) that implicit prices for certain coffee characteristics differ significantly across market segments.

Keywords: Hedonic Models, Direct and Indirect Origin Effects, Market Segments

1   Introduction

The literature on country- and region-of-origin effects for agri-food products is comprehensive. Consumer studies typically employ discrete choice modelling approaches to investigate whether consumers value the product cue origin per se and, if so, how much they are willing to pay for a product coming from a certain origin. Another branch of the literature relies on hedonic pricing models to estimate implicit prices for the origin cue. Market data is used to investigate the major price determinants for the product under consideration. This methodology has been used extensively for analyzing price formation in the wine market. However, due to a growing availability of market and price data the number of hedonic studies for other agri-food products has risen in recent years, too (DONNET et al. 2008; HUANG and LIN 2007; KRISTOFERSSON and RICKERTSEN 2007; WARD et al. 2008).

An interesting example of a heterogeneous good is coffee. Coffee, especially the so-called specialty coffee, is supposed to offer the same product variety as wine.[1] Few hedonic analyses have been carried out for this emerging niche market (DONNET et al. 2008, 2007; TEUBER 2009, 2010a). DONNET et al. (2008) analysed the single-origin market with respect to the importance of sensory and reputation attributes. They found significant country-of-origin effects even after controlling for quality differences by incorporating a sensory quality score (SQS). On the other hand, no significant region-of-origin effects could be detected by TEUBER (2009) for Honduras. Since in these studies, hedonic price functions are estimated based on pooled data and no interaction effects between the sensory quality score and time and regional dummies are incorporated, they derive average marginal prices for the sensory quality score and average country of origin (CO) effects. Such an approach assumes that parameters are stable and invariant across auctions, i.e. across time and space. Parameter invariance, however, seems to be a questionable assumption. Several hedonic housing market studies have pointed out that parameters vary significantly with the context (i.a. ORFORD 2000; ZIETZ et al. 2008) and in recent papers by COSTANIGRO et al. (2007, 2009) a similar conclusion is drawn for wine. By estimating hedonic price functions specific to different wine price ranges, they show that the estimated parameters and, thus, implicit prices differ significantly across price ranges. In such a context, a uniform hedonic price function may lead to biased results.

Against this background, the present paper pursues the following objectives. First, it addresses the question whether it is reasonable to assume parameter stability across auctions,

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[1] There are several definitions of specialty coffee. According to the Specialty Coffee Association of America (SCAA), the term was first coined by Erna Knutsen in 1978 stating in essence that 'specialty coffees' are coffees made from coffee beans grown in special geographic microclimates with unique flavor profiles (RHINEHART 2009).

focusing particularly on the SQS and CO coefficients. Whereas previous studies highlighted the importance of the SQS and CO effects on the achieved auction price, none of these studies has investigated whether implicit prices of these variables differ across certain market segments. Specifically, it will be analysed whether single-origin coffees sold in internet auctions can be assumed one single market with identical implicit prices for characteristics or whether certain market segments exist. Markets for differentiated products are usually segmented based on space, time or product characteristics. In our case we test for market segmentation according to the geographical origin of the buying company, i.e. we test whether an Asian importer or roaster values characteristics in the same way as a European or North American company.[2]

The second major objective is to investigate whether a recursive model consisting of a score and a price regression can be used to derive meaningful findings with respect to direct and indirect effects of product attributes on auction prices. It is assumed that the score itself is a function of several product characteristics which at the same time also have a direct impact on the auction price. Consequently, variables such as coffee tree variety and origin are included in both regressions.

The remainder of the paper is structured as follows. The next section will briefly review the existing literature on hedonic models with a clear focus on origin and reputation effects and market segmentation in the context of agri-food products. Section 3 introduces the estimation strategy and the data set. In section 4 the results are presented and discussed. The last section concludes.

2 Literature Review

2.1 Empirical Evidence from Hedonic Models on Origin and Reputation Effects

Results from hedonic studies typically document that origin matters. Significant country- or region-of-origin effects were found in numerous studies (ANGULO et al. 2000; LANDON and SMITH 1997; SCHAMEL and ANDERSON 2003).

HAEGER and STORCHMANN (2006) analyse suggested retail prices of American Pinot Noir wines by including climate variables such as temperature and precipitation, dummy variables for the winemaker, and exogenous expert scores. Their results suggest that regional dummy variables, dummy variables for certain winemakers and brand reputation explain a large share of the price variation. In contrast, expert scores do not possess much explanatory value in their analysis. A similar conclusion is drawn by LANDON and SMITH (1997) for

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[2] Hence, we implicitly test for differing consumer preferences across markets.

Bordeaux wine prices. They study the impact of wine quality proxied by *Wine Spectator* ratings and collective reputation based on Bordeaux regional appellations. Their results indicate that collective reputation has got a larger impact on price than quality ratings do have. SCHAMEL and ANDERSON (2003) worked out that regional reputation has become more important over time with cool-climate regions gaining in terms of higher prices.

There is also empirical evidence for other agri-food products that origin and collective reputation based on origin are important price determinants. O'CONNELL (1986) investigated prices for carcase lamb sold in the Paris whole market. He found significant CO effects even after controlling for quality differences by incorporating variable such as fat content or lean colour. Imported lamb is discounted compared to French lamb. Since an implicit price derived from a hedonic price function is an equilibrium price of supply and demand for characteristics, this difference can be attributed both to supply and demand factors. Consequently, the price premium for French lamb can either be due to higher production costs by French producers or it may be attributable to ethnocentric behaviour of French consumers resulting in a higher willingness to pay for domestic lamb. The last point is a general finding in the CO literature. Consumers tend to prefer products from their home region or country, because they want to support the domestic economy. However, it has also been worked out that if several product attributes are considered jointly the origin attribute seems to be one of the least valued ones (EHMKE et al. 2008; VERBEKE and ROOSEN 2009).

Few hedonic studies have been carried out for high-quality coffees. DONNET et al. (2007, 2008) and TEUBER (2010a) found significant country-of-origin effects even after controlling for quality differences by incorporating a sensory quality score. These findings are in line with the empirical evidence for wine. Collective reputation based on the geographical origin seems to be an important price determinant in both markets.

2.2 Market-Segment Specific Hedonic Regressions

ORFORD (2000) points out that contextualising hedonic models is an important point in empirical applications of the hedonic pricing methodology. Parameters must be specified in a way that they can vary with the context. This can be achieved either by incorporating interactions effects or by estimating individual hedonic regressions for each sub-market or market segment. In the context of hedonic housing models this implies that separate hedonic regressions are estimated for different geographical locations or different price ranges.

The most common segmentation approach in the hedonic literature on wine is to segment according to the basic wine colour. Different hedonic regressions are estimated for

white and red wine assuming that product characteristics are not equally valued across these two market segments (i.a. SCHAMEL 2006). However, there are also very recent studies by COSTANIGRO et al. (2007, 2009) testing for possible structural breaks in implicit prices for certain wine attributes across price ranges. In these studies, the wine market is segmented into four distinct price classes: the commercial, the semi-premium, the premium and the ultra-premium segment. A very interesting result that is also highly relevant for the present paper is that both the expert score and the region of origin are valued differently across these four price segments. The score becomes more important the more expensive the wines are. With respect to region-of-origin effects the results indicate that Washington wines are discounted in the two most expensive market segments, but not in the commercial one. Moreover, they found that in the more expensive market segments only very few key attributes signal quality reflected in their statistically significant impact on the price. This is different for the lower prices market segments in which a rather large number of attributes signals quality. Based on these results it can be concluded that quality signals that are relevant in one market segment do not necessarily have to be relevant in another one and vice versa.

This is in line with findings by LANGYINTUO et al. (2004) on implicit prices for cowpea characteristics in seven spatially separated markets in Ghana and Cameroon. Their results point out that in Ghanaian markets black-eyed cowpeas achieve significant price premia, whereas in Cameroon markets these cowpeas are discounted.

3 Pooled and Segment-Specific Hedonic Models for Single-Origin Coffee

3.1 Data and Estimation Strategy

The used data originates from Cup of Excellence (COE) auctions covering the time period 2003-2009. Cup of Excellence competitions and auctions were introduced in Brazil in 1999 to reward high-quality coffee producers and to promote high-quality coffee to consumers.[3] The coffees traded in these auctions are all single-origin coffees of a particularly high quality. By now, eight Latin American countries, namely Bolivia, Brazil, Colombia, Costa Rica, El Salvador, Guatemala, Honduras and Nicaragua, and one African country, Rwanda, take part in the COE program. With the exception of Columbia, where auctions take place twice a year, in nearly all other countries there is usually one auction per year. All data regarding the participating farms, the coffee characteristics, and the achieved auction price are available on

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[3] The period cover does not start in 1999 because in the first auction years only very few data was made available online.

the COE website (http://www.cupofexcellence.org). For a detailed description of the cupping and auction procedure see DONNET et al. (2008).

Table 1 provides an overview about the available auction data across countries and across years.

Table 1:   Overview about Available Auction Data

Year / Country	2003	2004	2005	2006	2007	2008	2009
Bolivia		X *(13)*	X *(19)*		X *(26)*	X *(29)*	X *(30)*
Brazil	X *(43)*	X *(36)*	X *(36)*	X *(29)*		X *(23)*	X *(26)*
Colombia			X *(25+33)*	X *(23+30)*	X *(30)*	X *(18)*	X *(27)*
Costa Rica					X *(25)*	X *(30)*	X *(24)*
El Salvador	X *(31)*	X *(35)*	X *(17)*	X *(23)*	X *(23)*	X *(36)*	X *(33)*
Guatemala				X *(25)*	X *(19)*	X *(25)*	X *(23)*
Honduras		X *(21)*	X *(41)*	X *(33)*	X *(24)*	X *(26)*	X *(39)*
Nicaragua	X *(37)*	X *(29)*	X *(35)*	X *(25)*	X *(34)*	X *(25)*	X *(26)*
Rwanda						X *(24)*	

Notes: The number of coffees sold in each auction is presented in parentheses.

Source: Own presentation.

Table 2 presents some descriptive statistics pooled across all data. In total, 1,280 observations from 46 auctions are available. The number of coffee bags sold in an auction varies from 9 to 122 with an average of 22 bags. On average each farmer sold 2,904 pounds of green coffee beans.[4] The price paid for a pound of green coffee beans varies from US-$ 1.3 to US-$ 80.2 with an average of US-$ 5.40. The data set includes 1691 tonnes of green coffee beans with a total market value of US-$18.8 million.[5]

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[4] Normally, the sold quantity is given by the number of coffee bags sold. However, since the coffee bag size differs across countries from 60 to 70 kg the quantity sold is expressed in pounds.
[5] The Rwanda data were dropped because of the fact that just one auction has taken place in this country so far.

Table 2: **Description and Summary Statistics of the Available Variables**

Variable	Definition	Mean	Std. Dev.
Price (*price*)	Auction price for coffee i in US-$/pound	5.36	4.35
Sensoric Quality Score (*SQS*)	The achieved score in the cupping competition that takes place in advance of the auction ranging from 84 -100 points	86.80	2.54
Quantity (*quantity*)	Quantity of coffee i sold in market n in pounds	2923	1269
Altitude (*altitude*)	Altitude at which the coffee was grown in metre above sea level	1472	223

		Relative Share
Ranking (*ranking*)	Dummy variable for the achieved rank in the cupping competition	
Rank 1st	Takes the value 1 if the coffee was ranked 1st	0.036
Rank 2nd	Takes the value 1 if the coffee was ranked 2nd	0.036
Rank 3rd	Takes the value 1 if the coffee was ranked 3rd	0.036
Rank 4th and above	Takes the value 1 if the coffee was ranked 4th and above	0.892
Certification (*certification*)	Dummy variable for different certification schemes	
Organic	Takes the value 1 if the coffee is certified organic	0.026
Rainforest Alliance	Takes the value 1 if the coffee is Rainforest Alliance certified	0.021
No certification	Takes the value 1 if it the coffee is not certified	0.953
Coffee Variety (*variety*)	Dummy variable for different coffee tree varieties	
Bourbon	Takes the value 1 of the coffee variety is Bourbon	0.196
Catuai	Takes the value 1 if the coffee variety is Catuai	0.144
Caturra	Takes the value 1 if the coffee variety is Caturra	0.245
Pacamara	Takes the value 1 if the coffee variety is Pacamara	0.042
Typica	Takes the value 1 if the coffee variety is Typica	0.011
Others	Takes the value 1 if the coffee variety is another as the one mentioned above	0.082
Mix	Takes the value 1 if the coffee is a mix of different varieties	0.276
Buyer (*buyer*)	Dummy variable for the type of buyer	
Asia	1 if the coffee was bought by an Asian company	0.523
Europe	1 if the coffee was bought by an European company	0.217
North America	1 if the coffee was bought by a North American company	0.215
Others	1 if the coffee was bought by another company	0.046
Country-of- Origin (*CO*)	Dummy variable for the country of origin	
Bolivia	Takes the value 1 if it is a Bolivian coffee	0.093
Brazil	Takes the value 1 if it is a Brazilian coffee	0.153
Colombia	Takes the value 1 if it is a Colombian coffee	0.148
Costa Rica	Takes the value 1 if it is a Costa Rican coffee	0.063
El Salvador	Takes the value 1 if it is a El Salvadoran coffee	0.158
Guatemala	Takes the value 1 if it is a Guatemalan coffee	0.073
Honduras	Takes the value 1 if it is a Honduran coffee	0.144
Nicaragua	Takes the value 1 if it is a Nicaraguan coffee	0.168

Source: Own presentation.

The findings pointed out in the previous section are highly relevant in the present paper, since data from different coffee auctions are used in order to investigate implicit prices for certain characteristics. If we assume that there is only one single-origin coffee market and no heterogeneity with respect to the valuation of certain characteristics across different coffee origins, coffee buyers or price ranges, a pooled regression including intercept dummies seems to be appropriate. However, if we assume that characteristics are not valued equally for all single-origin coffees in the dataset (i.e., we assume specific market segments) such an

approach may lead to biased estimates. Hence, it will be tested whether one single market with identical implicit prices for characteristics does exist or whether certain market segments can be identified.

Additionally, we will test for direct and indirect effects of certain characteristics by estimating a recursive model consisting of a sensory quality score (SQS) and a price regression. The model structure is illustrated in Figure 1.

Figure 1: Model Structure
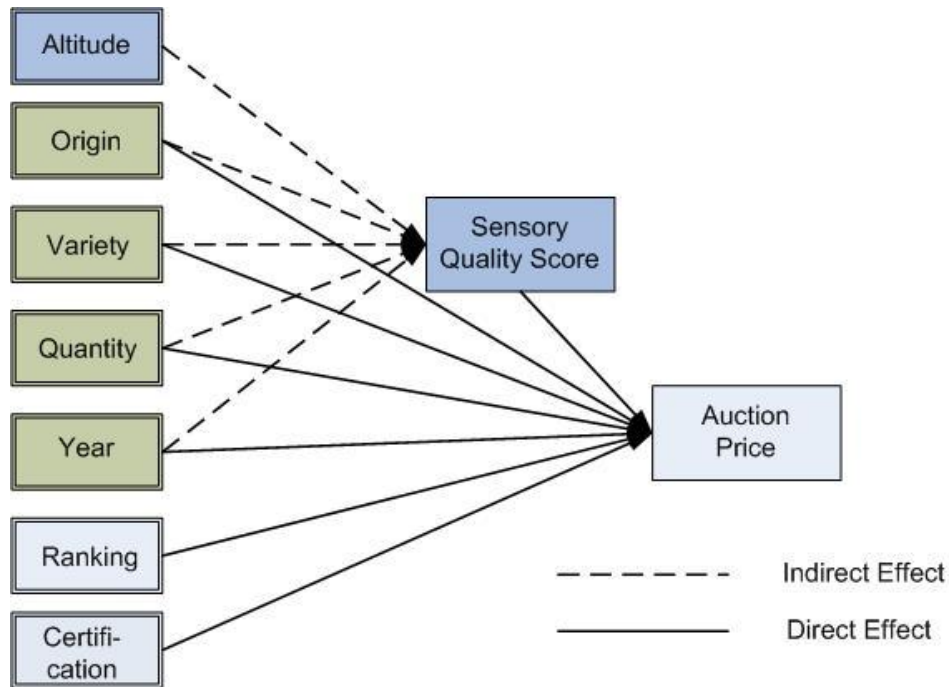
Source: Own presentation.

It is assumed that the sensory quality score itself is a function of the altitude at which the coffee is grown, the variety, the country of origin, the quantity produced and the year as a proxy for weather conditions. As can be seen from Figure 1, altitude is assumed to influence the auction price only indirectly via its impact on the SQS. On the other hand, ranking and certification are assumed to influence the auction price only directly. All other variables are expected to have a direct and an indirect impact on the auction price. These relationships are translated into the following econometric model:

(1) $SQS = f\,(altitude, quantity, variety, CO, Altitude * CO, auction\ year)$

(2) $Price = f(SQS,\ ranking,\ quantity, certification, variety, CO, SQS * CO, auction\ year)$

The first equation represents the score equation and the second one the price equation. The decision to include the quantity produced as an explanatory variable in the score regression is based on a supposed negative quality-quantity relationship in coffee bean production. This

argument is often put forward in wine production and an analogue argumentation can be adopted for coffee: Picking only the best beans implies a reduced harvest which results in a negative score-quantity relationship. On the other hand, a positive altitude-quality relationship is expected, since several authors have reported that an increasing height above sea level results in a better beverage quality (PERRIOT et al., 2006).

The country of origin (CO) is incorporated in both stages. First, the origin influences the SQS, which in turn influences the price. This is the indirect origin effect. The direct origin effect is captured by the second equation. In this context, it is assumed that certain countries possess a favourable collective reputation which is reflected in significant CO effects as it is common for wine. Moreover, flexibility is introduced in both equations by incorporating interaction effects. In the score regression, the altitude impact is allowed to differ across countries by incorporating interaction terms between these two variables. Analogously, in the price equation the slope of the SQS is permitted to differ across countries. It has been worked out in previous research on the specialty coffee market that adding interaction terms is important to derive the correct impact of the SQS on the achieved auction price across different countries (TEUBER 2010b). In order to derive useful meanings of the initial coefficients and ready-to-interpret standard errors for the partial effect, the variables altitude and SQS have been centred with respect to their sample means before creating the interaction terms (WOOLDRIDGE 2006, p. 204).

3.2 Results

Recursive Model

In a recursive model as specified by equations (1) and (2) the correlation of error terms across equations can pose estimation problems. If cross-equation error correlations exist, the OLS estimator is still consistent but ZELLNER's (1962) seemingly unrelated regression (SUR) estimator is more efficient. Hence, it was tested for correlation across equations by applying a Lagrange multiplier test. The estimated chi-squared value is 0.06 leading to a non-rejection of the null hypothesis of zero covariance. Consequently, both equations were estimated individually by OLS. Several model specifications were tested and compared with each other. The score regression was estimated in linear form, whereas for the price regression the log-linear functional form performed best.[6] It was also tested whether the inverse square root

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[6] The log-linear functional form is the most widely used specification in hedonic models. This can be explained by the non-negativity of product prices and their usually right-skewed distribution; two features that are fully in line with the log-normal distribution (COSTANIGRO et al. 2010).

function, a functional form used in several hedonic wine studies, should be preferred over the log-linear functional form by comparing and evaluating the two specifications in terms of normality of residuals and the regression specification test. With respect to the last point, the log-linear functional form outperformed the inverse square root one, leading to the following empirical model:

(1')
$$SQS = \alpha_0 + \alpha_1 altitude + \alpha_2 \log(quantity) + \alpha_3 variety + \alpha_4 CO + \alpha_5 CO*altitude + \alpha_6 auctionyear .$$

(2')
$$\log(price) = \beta_0 + \beta_1 \log(quantity) + \beta_2 SQS + \beta_3 organic + \beta_4 ranking + \beta_5 variety + \beta_6 CO + \beta_7 CO*SQS + \beta_8 auctionyear$$

Tables 3, 4 and 5 present the results with respect to the score and the price regression of the recursive model. The Rwanda data had to be dropped because of the fact that just one auction took place in this country making it technically impossible to include this country dummy besides the auction year dummies. Additionally, the variable *Rainforest Alliance* had to be removed from the model due to high multicollinearity with the country dummy El Salvador. Several model specifications with different sets of explanatory variables are presented. This is based on the critique by THANE (2009) who argues that in order to reach reliable and trustworthy conclusions with respect to the relative importance of different sets of explanatory variables it is not sufficient to present results for a combined model including all sets of explanatory variables. It is rather necessary to provide estimates for models containing specific sets of explanatory variable only. His critique is related to the lively discussion in the hedonic wine literature whether objective or sensory attributes are relatively more important in determining wine prices. In our case, three different score models were estimated in order to investigate the relative explanatory strength of variety and origin, respectively. Modell I (Modell II) contains besides the auctioned quantity, altitude and year effects the variety (origin) effects, whereas Modell III comprises all explanatory variables as specified in equation (1').

Table 3: **OLS Estimates of the Score Regression**

Explanatory Variables	Model I		Model II		Modell III[a]	
	Score Regression					
Dependent variable	SQS					
	Coefficient	p-value	Coefficient	p-value	Coefficient	p-value
Constant	90.095***	(0.000)	90.554***	(0.000)	85.132***	(0.000)
Altitude	0.001**	(0.005)	0.001**	(0.003)	0.006*	(0.020)
Log(quantity)	-0.566*	(0.029)	-0.591*	(0.029)	-0.563*	(0.033)
Country-Specific Altitude Effects (*Reference: Brazil*)						
Bolivia					-0.001	(0.691)
Colombia					-0.005*	(0.049)
Costa Rica					-0.004	(0.157)
El Salvador					-0.005*	(0.049)
Guatemala					-0.003	(0.291)
Honduras					-0.005*	(0.073)
Nicaragua					-0.005*	(0.084)
Variety (*Reference: Mix*)						
Bourbon	0.098	(0.671)			0.201	(0.534)
Catuai	-0.091	(0.695)			-0.179	(0.607)
Caturra	0.162	(0.395)			0.106	(0.636)
Pacamara	1.094*	(0.012)			1.353**	(0.002)
Typica	0.450	(0.581)			0.675	(0.316)
Others	0.573	(0.059)			0.543	(0.117)
Country-of Origin (*Reference: Brazil*)						
Bolivia			-0.838	(0.074)	-1.846*	(0.018)
Colombia			-0.818	(0.064)	-0.329	(0.574)
Costa Rica			-0.924*	(0.036)	-0.886	(0.199)
El Salvador			-0.743	(0.062)	-0.817	(0.058)
Guatemala			-0.888*	(0.044)	-1.367*	(0.017)
Honduras			-0.771	(0.059)	-0.469	(0.403)
Nicaragua			-0.526	(0.167)	-0.465	(0.274)
Auction year (*Reference: 2004*)						
2003	-1.865	(0.000)	-1.926***	(0.000)	-1.885***	(0.000)
2005	-0.404	(0.229)	-0.478	(0.157)	-0.473	(0.150)
2006	-0.186	(0.581)	-0.284	(0.418)	-0.256	(0.435)
2007	-0.162	(0.631)	-0.191	(0.5739	-0.192	(0.558)
2008	-0.467	(0.143)	-0.535	(0.097)	-0.478	(0.133)
2009	-0.592	(0.063)	-0.655*	(0.042)	-0.659*	(0.035)
N	1122					
Adjusted R^2	0.04		0.04		0.05	
Akaike Info Criterion	4.64		4.65		4.65	
Ramsey-RESET	9.57 (0.00)		2.37 (0.12)		6.94 (0.01)	

Notes: [a] In the interaction term the altitude variable is centred at the mean altitude of Brazilian coffee in order to get a meaningful interpretation of the main CO effects. *, **, *** denote significance at the 5 %, 1 % and 0.1% level, respectively; p-values are presented in parentheses. All models are estimated using the White Heteroscedasticity-Consistent Standard Errors and Covariance.

Source: Own calculations.

All three score models have a very low R^2 which implies that the included variables do only explain a small part of the score variance. There is no significant difference between the three models in terms of explanatory power. This is reflected in the nearly identical value of the Akaike Info Criterion which can be used in model selection among non-nested alternatives. However, the Ramsey-RESET results indicate that Model II and Modell III should be

preferred over Modell I. Due to the slightly higher R^2 and the fact that the number of significant regression coefficients is higher in Modell III, these results will be discussed in the following. The assumed positive altitude-quality relationship and the negative quantity-quality relationship are both confirmed by the data. However, in both cases the impact is rather small. With respect to the coffee variety, the coffee variety *Pacamara* achieves significantly higher scores than all other varieties. There is no significant impact of the other varieties.

Coffees from Costa Rica (Modell II), Bolivia (Model III) and Guatemala (Modell II and III) received statistically significant lower scores than coffees from all other origins. It is interesting to note that Brazilian coffees are not lower valued in the high-quality coffee market, whereas in the mass coffee market Brazilian coffee is most often not perceived as a very high-quality coffee. If we look at the change in the CO effects from Model II to Modell III, it is striking that by incorporating the interaction terms which are centred at the mean altitude Brazilian coffees are grown at (the reference category), the negative coefficient for Bolivian coffee becomes statistically significant and the one for Guatemala increases in magnitude. These changing effects are even more pronouned if a model is estimated in which the altitude variable is centred at the sample mean. This can be explained by the different altitude levels coffees are grown at across countries. On average Brazilian coffees are grown at a significant lower altitude than coffees from all other coffee origins.

The year dummies indicate that compared to the base year 2004 coffees auctioned in 2003, 2008 and 2009 received significantly lower scores. The significant coefficient for the year 2003 is no surprise. In the first competition years the threshold for coffees to receive the Cup of Excellence award was 80 points. Since 2004 only coffees with a score of 84 points and above receive the award and are auctioned thereafter.

With respect to the price regression table 4 presents different Goodness-of-Fit criteria which can be used in model selection. According to this table, the basic model can be improved by adding variety and CO effects. However, the results do also indicate that the CO effects can add more explanatory power than the variety effects.

Table 4: Measures of Goodness-of-Fit for Different Sets of Explanatory Variables[a]

	Basic Model[b]	Basic Model with Variety Effects Only	Basic Model with CO Effects Only	Basic Model with Variety and CO Effects (Model I)	Basic Model with Variety, CO and Interaction Effects (Model II)
Adjusted R^2	0.68	0.69	0.75	0.75	0.76
Akaike Info Criterion	0.53	0.49	0.26	0.27	0.26
Ramsey-RESET Test	5.90 (0.02)	0.29 (0.59)	0.53 (0.47)	0.53 (0.47)	0.83 (0.36)

[a] All models are estimated in a log-linear specification; [b] The basic model includes the following variables: quantity, SQS, ranking, organic, and auction year.

Source: Own calculations.

The estimation results for the last two models, labelled Model I and Model II are presented in table 5. Model I includes intercept dummies only, and is therefore comparable to former results by DONNET et al. (2008) and TEUBER (2010a). The second model introduces more flexibility by incorporating interaction terms between the SQS and CO variables.

Table 5:   OLS Estimates of the Price Regression Model

	Price Regression			
Dependent variable	Log(price)			
Explanatory Variables	**Model I**		**Model II**	
Constant	-3.082***	(0.000)	0.260	(0.851)
Log(quantity)	-0.385***	(0.000)	-0.379***	(0.000)
SQS	0.086***	(0.000)	0.047**	(0.003)
Organic	0.138*	(0.012)	0.131**	(0.022)
Ranking (*Reference: Rank 4th and below*)				
1st Rank	0.785***	(0.000)	0.801***	(0.000)
2nd Rank	0.275***	(0.000)	0.285***	(0.000)
3rd Rank	0.241***	(0.000)	0.250***	(0.000)
Variety (*Reference: Mix*)				
Bourbon	0.076*	(0.011)	0.074*	(0.022)
Catuai	0.064	(0.105)	0.068*	(0.079)
Caturra	0.063*	(0.006)	0.066**	(0.004)
Pacamara	0.057	(0.273)	0.051	(0.319)
Typica	0.106	(0.111)	0.103	(0.118)
Others	0.097*	(0.017)	0.086*	(0.029)
Country-of Origin (*Reference: Brazil*)				
Bolivia	-0.075	(0.111)	-0.085*	(0.046)
Colombia	-0.079	(0.078)	-0.087*	(0.034)
Costa Rica	-0.219***	(0.000)	-0.232***	(0.000)
El Salvador	-0.266***	(0.000)	-0.273***	(0.000)
Guatemala	0.226***	(0.000)	0.215***	(0.000)
Honduras	-0.389***	(0.000)	-0.403***	(0.000)
Nicaragua	-0.222***	(0.000)	-0.234**	(0.000)
Country-Specific SQS Effect (*Reference: Brazil*)				
Bolivia			0.043*	(0.017)
Colombia			0.023	(0.217)
Costa Rica			0.027	(0.185)
El Salvador			0.043**	(0.025)
Guatemala			0.027	(0.226)
Honduras			0.070***	(0.000)
Nicaragua			0.037*	(0.038)
Auction year (*Reference: 2004*)				
2003	0.057	(0.281)	0.071	(0.189)
2005	0.031	(0.463)	0.034	(0.442)
2006	0.142***	(0.000)	0.152***	(0.000)
2007	0.427***	(0.000)	0.437***	(0.000)
2008	0.523***	(0.000)	0.534***	(0.000)
2009	0.503***	(0.000)	0.508***	(0.000)
N	1122			
Adjusted R^2	0.75		0.76	
Akaike Info Criterion	0.27		0.26	
Ramsey-RESET	0.53 (0.47)		0.83 (0.36)	

Notes: *, **, *** denote significance at the 5 %, 1 % and 0.1% level, respectively; p-values are presented in parentheses. All models are estimated using the White Heteroscedasticity-Consistent Standard Errors and Covariance.

Source: Own calculations.

The SQS and the first three ranks have got a positive impact on the achieved auction price, whereas the quantity has got a negative impact. These results confirm findings from previous studies. There is no direct effect of the variety *Pacamara* on the auction price. This is in

contrast to the study by DONNET el al. (2008), analyzing a much shorter time period. In their pooled regression, *Pacamara* coffees achieved higher auction prices at a significance level of 90 %. However, in our analysis based on a larger sample the varieties *Bourbon*, *Caturra* and the group *Others* can achieve significantly higher auction prices, whereas they do not receive higher average scores in the cupping competition. It is hard to judge whether these varieties have already an established name in the market place so that consumers are willing to pay higher prices for these coffee varieties. This needs further investigation with more data becoming available for the specialty coffee market.

In Model II, the intercept and the regression coefficient for the SQS variable reflect the impact for coffees originating in Brazil, which was chosen as the reference category. Due to the reparameterization of the regression model by centring the score variable at its sample mean before calculating the interaction terms the main country effects have a convenient interpretation. They reflect the partial CO effect at the mean sample score. The results suggest that the price level as well as the impact of the SQS differs significantly across countries. All coffee origins with the exception of Guatemala are discounted compared to Brazilian coffees. The lowest price level is realized in auctions for Honduran coffee, with an average price discount of 33 % *ceteris paribus*. The highest prices are paid for coffees from Guatemala with a price premium of on average 24 %.[7]

The SQS has got the highest impact for coffee from Honduras with a 1-point increase in the SQS resulting in a price increase by 12 %. Thus, these results confirm the results by TEUBER (2010b). The SQS seems to be a more important price determinant for coffee-growing countries which are characterized by a low reputation in the marketplace such as Honduras, El Salvador and Nicaragua. On the other hand, for countries with an established reputation for producing high-quality coffee, namely Colombia and Guatemala, the SQS is less important in determining auction prices.

The results with respect to the year dummies indicate that auction prices increased through the analyzed time period. This development can certainly be due, at least to some extent, to the booming commodity prices in the years 2007 and 2008.

The quantity effect is in both regressions negative. The direct effect is that if the supplied quantity increases by 1 %, the auction price decreases by 0.385 %. This is called the

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[7] The price premium/discount is calculated according to the approach proposed by Kennedy (1981). Kennedy proposed to estimate the percentage impact of a dummy variable on the dependent variable in semi-logarithmic equations according to $\hat{p} = 100(\exp\{\hat{c} - \frac{1}{2}\hat{V}(\hat{c})\} - 1)$ with $\hat{c}$ being the OLS estimate of the coefficient of a dummy variable and $\hat{V}(\hat{c})$ being the OLS estimate of its variance.

price flexibility. However, there is also an indirect effect of quantity on the auction price via the SQS. The SQS decreases by 0.05 score points, if the supplied quantity increases by 10 %.

Hence, due to the recursive model structure the total price effect of a change in an explanatory variable must be calculated as

$$(3) \qquad \partial \log(price) \Big/ \partial z_j = \partial \log(price) \Big/ \partial z_j + \left(\partial \log(price) \Big/ \partial SQS \right) * \left(\partial SQS \Big/ \partial z_j \right)$$

with the first term on the right-hand side capturing the direct and the second term capturing the indirect impact on the auction price. In the case of CO effects, equation (3) can be expressed as

$$(3') \qquad \partial \log(price) \Big/ \partial CO = (\beta_6 + \beta_7 score) + (\beta_2 + \beta_7 * CO) * (\alpha_4 + \alpha_5 altitude) .^{[8]}$$

Direct and indirect origin effects based on the estimation results presented in Tables 3 and 5 and their relative importance in total effects are provided in Table 6.

Table 6: Direct and Indirect Origin Effects on Auction Prices, in per cent

Country	Direct Origin Effect	Indirect Origin Effect	Total Origin Effect
Reference: Brazil			
Bolivia	-8.3 %	-16.6%	-24.9 %
Colombia	-8.3 %	n.s.	-8.3 %
Costa Rica	-20.8 %	n.s.	-20.8 %
El Salvador	-24.0 %	n.s.	-23.9 %
Guatemala	24.0 %	-6.4 %	17.5 %
Honduras	-33.2 %	n.s.	-33.2 %
Nicaragua	-20.9 %	n.s.	-20.9 %

Notes: n.s. = not significant. Insignificant coefficients were set to zero.

Source: Own calculations.

With the exception of Bolivia and Guatemala only direct price effects are statistically significant. In the case of Bolivia the negative direct price effect is reinforced by a negative indirect price effect via lower average scores, wheras in the case of Guatemala the indirect negative price effect it overcompensated by the positive direct price effect resulting in a total positive origin effect. These findings indicate that at present direct origin effects are more important than indirect ones via differences in the SQS.

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[8] Due to the centring of the interaction terms at the mean values of score and altitude in Model II, the estimated coefficient β_6 equals $(\beta_6 + \beta_7 mean\ score)$ and α_4 equals $(\alpha_4 + \alpha_5\ mean\ altitude)$, respectively.

Market Segmentation

In the beginning the question was posed whether implicit prices for characteristics are stable over certain market segments. Market segmentation is typically done according to space, time or price. In our case an obvious strategy seems to be to segment according to the destination market. Hence, we tested for parameter stability across three different buyer subsamples distinguishing between Asian, European and North American buyers. This implies that we assume different consumer preferences across these three markets. At first sight, European buyer seems to be a very broad category given the rather large differences in consumer preferences between Northern and Southern European countries. However, a more detailed classification was not feasible or meaningful, since the share of buyers originating in Southern Europe is under 1 %. The majority of European buyers originate in Northern and Central Europe, with nearly half of all coffees bought by companies located in Norway. Following the approach by COSTANIGRO et al. (2007), we test for coefficient stability across the three subsamples via a Wald statistic. The test statistic is framed analogous to a Chow breakpoint point test. The results are presented in Table 7.

Table 7:   Wald Statistics (p-Values) Testing the Hypothesis of Parameter Equality Across Subsamples

	Asia	**North America**
Europe	86.01 (0.000)	66.20 (0.001)
Asia		107.69 (0.000)

Notes: The test statistic is based on White's heteroscedasticty robust estimators.

Source: Own calculations.

The results reject the null hypothesis of parameter equality across all three subsamples at the 99 % level of significance. As a consequence, buyer-specific regressions were estimated for the price regression and the results are presented in Table 8. It was decided just to focus on the direct impacts due to the low explanatory power of the score regression and the dominating role of direct impacts in total origin impacts. Again, different functional specifications were tested and the log-linear and the inverse square root performed best. For ease of comparison and interpretation, the log-linear one was chosen as the final specification.

Table 8: OLS Estimates for Segment-Specific Hedonic Functions

	Asian Market			European Market			North American Market		
Dependent variable					Log(price)				
	Coefficient	*p*-Value	**Imp.**	Coefficient	*p*-Value	**Imp.**	Coefficient	*p*-Value	**Imp.**
Constant	-1.746*	(0.074)		-3.043	(0.056)		-6.026***	(0.000)	
SQS	0.066***	(0.000)	**$0.34**	0.087***	(0.000)	**$0.50**	0.120***	(0.000)	**$0.70**
Log(quantity)	-0.342***	(0.000)	**-$0.02**	-0.372***	(0.000)	**-$0.02**	-0.379***	(0.000)	**$0.04**
Organic	0.109*	(0.034)	**$0.57**	-0.121	(0.208)	**-$0.62**	0.124	(0.150)	**$0.73**
Ranking (*Reference: 4th rank and below*)									
1st Rank	0.756***	(0.000)	**$5.64**	1.006***	(0.000)	**$9.47**	0.771***	(0.000)	**$6.47**
2nd Rank	0.308***	(0.000)	**$1.80**	0.358***	(0.000)	**$2.35**	0.378**	(0.004)	**$2.54**
3rd Rank	0.205***	(0.000)	**$1.14**	0.381***	(0.000)	**$2.53**	0.100	(0.387)	**$0.58**
Country of Origin (*Reference: Brazil*)									
Bolivia	-0.084*	(0.032)	**-$0.41**	-0.102	(0.092)	**-$0.53**	-0.096	(0.156)	**-$0.51**
Colombia	-0.015	(0.681)	**-$0.08**	-0.045	(0.470)	**-$0.24**	-0.196**	(0.002)	**-$0.97**
Costa Rica	-0.193***	(0.000)	**-$0.88**	-0.336***	(0.000)	**-$1.56**	-0.246*	(0.016)	**-$1.36**
El Salvador	-0.236***	(0.000)	**-$1.05**	-0.162*	(0.132)	**-$0.82**	-0.347***	(0.000)	**-$1.66**
Guatemala	0.251***	(0.000)	**$1.42**	0.090*	(0.039)	**$0.52**	0.226**	(0.007)	**$1.41**
Honduras	-0.386***	(0.000)	**-$1.60**	-0.222**	(0.002)	**-$1.08**	-0.493***	(0.000)	**-$2.15**
Nicaragua	-0.199***	(0.000)	**-$0.90**	-0.188**	(0.002)	**-$0.94**	-0.224***	(0.000)	**-$1.15**
Country-Specific Score Effect (*Reference: Brazil*)									
Bolivia	0.030	(0.061)	**$0.15**	-0.002	(0.951)	**-$0.01**	-0.039	(0.062)	**-$0.21**
Colombia	0.007	(0.735)	**$0.03**	-0.066**	(0.009)	**-$0.35**	-0.031	(0.287)	**-$0.17**
Costa Rica	-0.005	(0.810)	**-$0.03**	0.014	(0.629)	**$0.08**	-0.061	(0.204)	**-$0.33**
El Salvador	0.004	(0.803)	**$0.02**	-0.012	(0.698)	**-$0.06**	-0.033	(0.317)	**-$0.18**
Guatemala	-0.008	(0.596)	**-$0.04**	-0.072**	(0.003)	**-$0.38**	-0.033	(0.274)	**-$0.18**
Honduras	0.045*	(0.010)	**$0.23**	0.006	(0.802)	**$0.03**	0.007	(0.802)	**$0.04**
Nicaragua	0.014	(0.308)	**$0.07**	-0.026	(0.298)	**-$0.14**	-0.021	(0.351)	**-$0.11**
Auction year (*Reference: 2003*)									
2004	0.077	(0.224)	**$0.40**	0.187*	(0.049)	**$1.13**	0.096	(0.234)	**$0.56**
2005	-0.008	(0.876)	**-$0.04**	0.192*	(0.040)	**$1.16**	0.038	(0.660)	**$0.22**
2006	0.088	(0.106)	**$0.46**	0.360***	(0.000)	**$2.37**	0.267**	(0.003)	**$1.69**
2007	0.432***	(0.000)	**$2.69**	0.605***	(0.000)	**$4.54**	0.462***	(0.000)	**$3.25**
2008	0.488***	(0.000)	**$3.13**	0.828***	(0.000)	**$7.05**	0.670***	(0.000)	**$5.28**
2009	0.536***	(0.000)	**$3.53**	0.734***	(0.000)	**$5.93**	0.509***	(0.000)	**$3.66**
Adjusted R^2		0.77			0.72			0.77	
N		653			271			268	

Notes: ***, **,*, denotes significance at the 0.1 %, 1 %, and 5 % level, respectively; p-Values are presented in parentheses. Implicit prices (Imp.) are calculated using segment-specific mean prices.
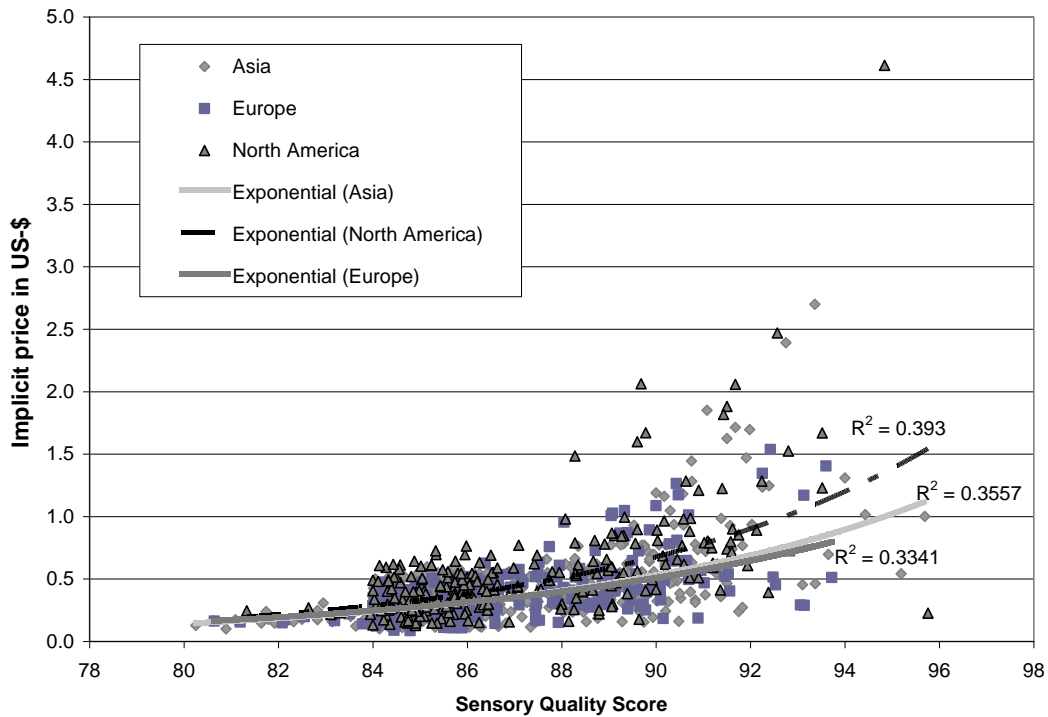
Source: Own presentation.

Besides the estimated regression coefficients and p-values the table does also provide implicit prices for each product attribute. The dummy variables for the coffee tree variety were dropped either because they had no significant impact (European and Asian subsamples) or led to multicollinearity problems with the country dummy variables (North American subsample).

If we compare the implicit prices for characteristics across the three subsamples, some interesting points can be derived. First, European buyers seem to value the 1st rank either as a quality or marketing attribute more strongly than Asian and North American buyers. Moreover, *CO* effects differ to some extent across the three market segments. Colombian coffees are clearly discounted compared to Brazilian coffees by North American buyers. This is not the case for Asian and European buyers. This result is quite surprising given the fact that the brand Juan Valdez and the term Café de Colombia are particularly prominent in the US market (KOTLER and GERTNER 2004). The results indicate further that coffees from Guatemala possess a good reputation in all three markets, reflected in the statistically significant positive price premia. However, there are also differences across the three subsamples in terms of the extent of the price premium. The largest price premium is paid by Asian buyers, followed by North American buyers and the least one is paid by European buyers. In general, *CO* effects seem to be more pronounced for the North American and the Asian market than the European market. If we consider the results with respect to the CO and ranking effects jointly, it seems to be that for the European market the ranking is a more valuable marketing tool than for the other two markets and that origin is not such a strong price determinant. Especially coffees from El Salvador and Honduras are quite heavily discounted in the North American sample. These price discounts are less pronounced in the European sample.

With regard to country-specific score effects it is striking that there are no statistically significant differences across countries in the North American sample. The effects that were found in the pooled regression (Table 5) are reflected to some extent in the Asian and European subsamples. In the Asian subsample, the SQS effect for Honduran coffee is significant larger than for the other origins and in the European sample the SQS is significantly lower for Colombian and Guatemalan coffees.

Additionally, differences across the three market segments regarding the implicit price of the SQS on average are illustrated in Figure 2. In all three markets, we can observe increasing marginal returns to the sensory quality score. However, the increase is more pronounced in the case of North American buyers than for Asian and European buyers.

Figure 2: **Implicit Price of the Average Sensory Quality Score for Asian, European and North American Buyers, Calculated Using Estimates from the Segment-Specific Models**

Source: Own presentation.

4 Concluding Remarks

The present paper adds empirical evidence on the comprehensive literature on origin effects by estimating a recursive model to investigate direct and indirect origin effects. The results for the specialty coffee market indicate that both direct and indirect origin effects are present in this market. However, in the used sample direct origin effects which can be interpreted as collective reputation effects clearly dominate the indirect effects via the SQS. Direct effects were also investigated for three different subsamples indicating that implicit prices for certain characteristics, particularly the origin vary significantly across subsamples. This is of great importance for coffee producers who want to enter new consumer markets with their coffees. Consequently, market segmentation, a topic quite extensively addressed in the hedonic literature on real estate should also be taken into account in hedonic analyses on agri-food products in order to derive more reliable and meaningful results.

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3 Concluding Discussion

In the introduction it was pointed out that GDAFPs are not only expected to enhance market efficiency and social welfare by reducing information asymmetries, but can also contribute to the preservation of cultural and biological diversity while at the same time fostering rural development. This assessment reflects the multifunctional agriculture paradigm, which is most prevalent in Europe and to a lesser extent in the US and other countries (Article (2)). According to this paradigm, the agricultural sector is not only a source of commodity output, in fact it is also a source of amenities such as biodiversity, cultural landscape, and agritourism. The research presented in this dissertation has worked out that these numerous dimensions and arguments discussed in the context of GDAFPs resulted in a plethora of results and conclusions. Moreover, since these products have been addressed by a large number of different disciplines, results and conclusions are not always easily comparable due to differing assumptions and methodologies. What can we extract from this large body of theoretical and empirical evidence?

First, geographical origin matters. The geographical origin is a product cue that has already been used in ancient times to label agri-food products and it is still a valuable marketing tool today. It has been shown in the previous chapter that products from certain origins can achieve price premia due to their established reputation and expected higher quality. It has been particularly elaborated that collective reputation built on origin is an important price determinant in the specialty coffee market. This is in line with findings for wine. However, this dissertation does not only confirm findings for wine for other products, it rather adds valuable insights on the importance of origin effects and the different channels origin influences consumers' purchase decisions and prices. It has been shown that origin effects are not one-dimensional but multi-faceted. The obtained and presented results, particularly those in articles (2), (3) and (4) indicate that consumers may be willing to pay a higher price for geographically differentiated products not only because of an expected higher product quality but because of affective and normative reasons. Ethnocentrism and the wish to support the domestic economy seem to be important determinants of consumers' attitude towards GDAFPs. In (3) and (4) it has been elaborated that this is also true for German consumers, since a hypothetical willingness to pay for local foods (protection) is mainly driven by consumer perceptions and expectations towards the positive impacts on the local economy. In addition, the results obtained in (4) suggest that German consumers do not necessarily perceive products protected under regulation (EC) No. 510/2006 as products of an

extraordinarily high quality. In fact, they expect that by purchasing these products they can support the local rural economy and help to preserve cultural and biological diversity. Thus, the policy goals of fostering rural development and secure tradition and biodiversity seems to be incorporated in consumers' purchase decisions at least for certain consumer segments. These results have been obtained for intra-regional GDAFPs, i.e. products that are sold and consumed in the region of production. On the other hand, section III has analysed origin effects in a context of inter-regional GDAFPs. Articles (5)-(8) provide valuable insights in the growing specialty coffee market and the importance of collective reputation. It has been elaborated that GIs can either be used to establish a reputation (example of Café de Marcala in Honduras), or to protect an already established reputation (example of Café de Colombia). Moreover, it has been worked out that reputation effects based on origin are not identical across markets and that currently direct price effects clearly dominate (Article (8)). This last aspect of analysing direct and indirect origin effects based on market transaction data instead of survey or stated preference data has not been addressed so far. The results indicate that in the specialty coffee market direct origin effect which can be interpreted as collective reputation effects clearly dominate. These effects seem to be of great importance for products targeting at foreign markets. Of course, a certain quality level is a prerequisite for creating an image of a high-quality producer and building up reputation. However, in the broader context of "decommodification" and product differentation it must be kept in mind that GDAFPs are by no means a self-runner. They have to be managed like a brand in order to be economically successful. Furthermore, interactions and trade-offs between product attributes have to be taken into account. The hedonic results highlight that quality is rewarded by increasing returns to the SQS and high implict prices are paid for the first three ranks in the competition. Especially, the last attribute seems to be a very valuable marketing tool. Accordingly, coffee producers can pursue on the hand a collective strategy in order to improve the collective reputation effects meaning that a higher price level can be achieved collectively. At the same time individual quality enhancement pays of by high implict prices for achieving one of the first three ranks and a high SQS. In this context, the differentiation between the mass and the specialty consumer market and the proliferation of labels seem to be important and interesting points for future research Time will tell whether each scheme will persist, some will exit the market or there will be a merging of different schemes.

Second, the findings stress that consumer perceptions towards the *terroir* concept differ across countries and regions and it is also a matter of food culture if GDAFPs are considered per se as being higher quality products. These empirical findings are of great

importance, since they question the assumption of vertical product differentiation made in most theoretical studies on GI regulations (Article (2)). It seems to be that for German consumers these products are rather horizontally differentiated, since the results suggest that not all consumers would prefer the geographically differentiated product over a non-differentiated one at equal prices. In real world scenarios, non-GI products are not automatically lower quality products. This point which has not been taken up in theoretical studies so far does also highlight that the different disciplines analyzing GDAFPs do not always correspond to each other. In fact, sometimes they even speak in different languages. This is highly relevant if we think of the theoretical models on GDAFPs presented in (2) and the empirical case studies conducted on many different products also touched upon in the same article. As in other parts of economic research, it is not always easy and feasible to convert theoretical models in testable empirical models. This point does also hold true for the analysis of GDAFPs.

Third, the empirical results derived in (3) and (4) point out that the desire for authentic and regionally rooted foods has grown. Though the results also indicate that consumers do not have an explicit image of what authenticity and rootedness actually stands for. Especially, the results presented in (4) indicate that consumers' expectations towards the product specification are in most cases rather vague and consumers' evaluation of Hessian apple wine is mostly related to its symbolic role in Hessian food culture. For certain consumer segments food has become a way to express oneself. Geographically differentiated products fit perfectly well in this changing demand pattern. But even if consumers feel "good" about buying these products, the question must be posed whether policy intervention in the present way is appropriate. Providing a regulatory framework for enhancing market efficiency by reducing information asymmetry is not questioned at all. However, the way a regulatory framework is implemented and possible alternatives must always be evaluated on the grounds of transfer efficiency. This question has not been addressed in the literature on GIs so far. From a policy maker's point of view, it seems very attractive to achieve consumer protection, rural development and biodiversity conservation by just one single policy instrument. This phenomenon of selling "policies" by stressing that several goals can be achieved by just one instrument is widespread and can be found in nearly all parts of real life. However, it is also well-known in policy evaluation that for each policy target there must be at least one policy tool, otherwise none of the goals will be fully achieved (Tinbergen Rule). The empirical evidence presented in (2) on the environmental impacts of GIs offers first hints that the protection of biological diversity may not always be guaranteed by protecting GIs. Moreover,

it must be kept in mind that traditional ways of processing are not necessarily the most energy-efficient and environmental-friendly techniques nowadays available. Tradition and authenticity are definitely cultural assets of great importance for a society. However, given the problems we face in terms of climate change and environmental degradation we must also be aware of the trade-offs between different societal goals. This is not to say that we can only decide to pursue either economic or ecological or cultural goals. In fact, the well-known sustainability concept even requires that all three dimensions are targeted jointly and there are certainly circumstances where all three goals can be achieved at the same time. Hessian apple wine seems to offer a good example in this respect. The traditional way of using "*Streuobstwiesenaepfel*" does definitely contribute to the protection of the traditional landscape and cultural and biological diversity, since in this habitat more animals are present than in apple plantations. Hence, it must be kept in mind that the crucial aspect for the success of a GI to achieve the goal of protecting cultural and biological diversity is the product specification and its practical implementation.

The producer side and the motivation to decide to apply for registration under regulation (EC) No. 510/2006 have been investigated to some extent in (4). The obtained results indicate that the primary motivation is based on the wish to protect an established reputation against imitation and fraud. Hence, this is fully in line with the theoretical literature on information asymmetry and reputation building. Geographical indications can enhance the market efficiency by reducing information asymmetries, thereby benefiting both consumers and producers of the original product. In terms of employment effects, there are several examples showing that due to the small-scale structure of production, employment is higher in GI supply chains than in more industrialized ones (see Article (2)). Based on these findings it can be conjectured that the policy objectives of fostering rural development in less-favoured regions and protecting cultural and biological diversity can jointly be achieved by GIs. However, the extent to which each policy goal can be reached clearly differs across GIs.

It has been mentioned above that converting theoretical models into feasible empirical models is not always straightforward. This is also of great relevance in section IIII. The theoretical background of estimating complete two-stage hedonic models is well-grounded in economic theory. Empirical applications of complete two-stage hedonic models are, however, rare. Data limitations often inhibit the estimation of the second stage. Consequently, first-stage estimates that are less demanding in terms of data requirements can be found for an increasing number of differentiated agri-food products, whereas second-stage estimates especially for agri-food products are seldom. These issues have been addressed in detail in

(7). This article contributes to the scientific literature by analysing the different ways a two-stage model can be specified according to the available data set and providing an empirical application for single-origin coffee data. It is necessary to emphasize that a two-stage model is not per se better or more meaningful than a first-stage hedonic pricing model. If someone is interested in the price formation of a differentiated good and the implicit pricing schedule of characteristics, first-stage models are entirely sufficient and there is no need to specify a complete hedonic model. However, if the objective is to value a non-marginal change in a certain characteristic, the second-stage becomes relevant. A further methodological refinement of investigating country-of-origin effects is implemented in article (8), in which a recursive two-stage model is estimated in order to test for direct and indirect origin effects. Additionally, this paper takes up the point of market segmentation and the calculation of implicit prices for characteristics across different consumer markets. This aspect is highly relevant for coffee as a typical export product which is targeting at very different consumer segments.

With respect to the ongoing Doha round and international trade negotiations, it has been worked out that the degree of GI protection is a controversially debated topic (Article (1)). There is no disagreement about protection per se but about the appropriate tools and the appropriate level of protection. The TRIPs agreement grants a higher protection level to wines and spirits. This higher protection level is sometimes called absolute protection, since it is even not allowed to use labels such as "Champagner-like Sparkling Wine produced in Germany". From my point of view, such an absolute protection level can not be justified on economic grounds. It is important to enable consumers to identify the original product in the marketplace. However, this does not mean that consumers cannot be given the chance to buy a Champagner-like sparkling wine produced in Germany if they want to. It seems natural that producers group, especially European ones, favour an absolute protection level. However, the argumentation put forward by producer groups should not apply to policy makers who are supposed to implement regulations that remedy market inefficiencies in the most efficient and least distorting way. An absolute protection for GI products does certainly not fulfil these requirements. This discussion refers again to the concept of *terroir* and the question whether climate and weather conditions are the main determinants of product quality or it is in fact human skills, knowledge and traditional processing practices. There is definitely no one-size-fits all anwer to this question and the quality-origin nexus must always be investigated on a case-by-case approach.

Finally, the present dissertation provides a promising example how the Internet and the

increasing availability of electronic data can contribute to facilitate market research. Article (4) relies on online-survey results. Despite the well-known limitations of online-surveys – elderly and less-educated people are still underrepresented in online-survey - they offer many advantages.[1] First, large samples can be realized in a short time period. Second, data preparation is easy and less time consuming than from written questionnaires. All articles in section III rely on freely-available data from online-auctions. This open policy allows researchers to use the data in very different ways. Additionally, in (6) the internet tool Google Earth was used in order to locate the participating coffee farms to the different growing regions in Honduras. This was necessary, since for some years the auction data just contains information on the administrative district the coffee farm is located in but no additional information on the coffee-growing regions. Hence, Google Earth was used to allocate each participating coffee farm to one of the five coffee-growing regions currently identified in Honduras.

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[1] The problem of an underrepresentation of elderly and less-educated people is just a matter of time and will disappear in the near future with the proliferation of Internet accesses and an increasing familiarity with this communication tool.

4 Annex

4.1. Limited Dependent Variable Models

In cases where the dependent variable is not metric but limited to a certain value range, it is often not possible to estimate an ordinary regression model. This is usually relevant in microeconometrics, where the behaviour of individuals, households or firms is modelled (WOOLDRIDGE 2006, 582). In microeconometric analyses, the variables of interest are commonly discrete and cannot be treated as approximately continuous. Possible models for discrete dependent variables are ordinary regression models as well as logit, probit and tobit models. These models are also called choice models or quality response (QR) models, since the dependent variable does typically measure a choice made by an individual such as the choice to vote for a certain party or to buy a certain product. Since all these models are nonlinear regression models, they cannot be estimated by ordinary least squares. Mostly, these models are estimated by maximum-likelihood (GREENE 2008, p.770).

If the dependent variable is not just categorical but ordinal, i.e. a certain ranking is inherent in the survey data, an ordinal regression can be estimated. However, in some cases even if the dependent variable is measured on an ordinal scale, a binary logit or probit model can be chosen by converting the ordinary variable in a binary one. This procedure, which prima facie results in a loss of information, can be accepted or even preferred over an ordinal regression approach, if the differentiation between two groups of interest can be enhanced by this polarisation. Hence, this approach was chosen in articles (3) and (4) based on the consideration that this procedure leads to more conservative and hence more reliable estimation results. In both papers a logit and a probit model were estimated and compared with each other. Due to the fact that the model choice did not influence the estimation results significantly, the logit model was chosen and this model will be explained in more detail below.[1]

Binary logit models are used for a wide variety of different research questions in which the dependent variable is a variable with two outcomes, e.g. the existence of a willingness to pay (WTP) for a certain product attribute vs. the non-existence of such a WTP. In general, the same objectives as in the case of ordinary regression analysis are pursued. The outcome of a discrete variable is linked to a set of explanatory variables in order to investigate

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[1] In most studies no information is given with respect to why either a logit or a probit model is chosen. This may be due to the fact that in most applications both models lead to more or less identical results. The results seem only to differ significantly (i) if the sample contains very few 0 choices or very few 1 choices, that is if one choice group is much larger than the other, and (ii) if one independent variable exhibits a large variance in the sample, especially if (i) is true (GREENE 2008, p. 774).

in which direction and to what extent these variables influence the dependent choice variable. However, in contrast to ordinary regression models, discrete choice models are analyzed in the framework of probability models, which can be expressed as follows:

$$Prob(choice\ j\ is\ taken) = Prob(Y = 1) = F(x, \beta) \qquad (4.1)$$

with j being an individual's choice among a set of alternatives, x is a vector of covariates that are considered to explain the decision (e.g., sociodemographic characteristics, attitudes) and β is a vector of unknown parameters to be estiamted (GREENE 2008, p. 771). The parameters β measure the impact of changes in x on the probability to take choice j. Several nonlinear functions have been suggested and used in empirical application for the distribution function F($\cdot$) with the normal distribution (*probit model*) and the logistic distribution (*logit model*) being the most commonly used ones. Both functions ensure that the estimated response probabilities are strictly between zero and one. Thus, the logit model is defined as

$$Prob(Y = 1) = \frac{e^{x'\beta}}{1 + e^{x'\beta}} = \Lambda(x'\beta) \qquad (4.2)$$

whereby $\Lambda(\cdot)$ denotes the logistic cumulative distribution function.

As in any nonlinear regression model it must be taken into account that the parameters of the logit model are not necessarily the marginal effects that are typically analyzed in linear regression models. Though the sign of β is sufficient for determining the direction of the impact of the explanatory variable, the magnitude of β is not useful in deriving the partial effect in quantitive terms. The partial effect of a continuous variable x_j on the response probability can be obtained from the partial derivative which is defined as

$$\frac{\partial Prob(Y = 1)}{\partial x_j} = \Lambda(x'\beta)[1 - \Lambda(x'\beta)]\beta_j. \qquad (4.3)$$

Equation (4.3) points out that the effect of x_j on the response probability will vary with the values of x and hence, it is possible to calculate marginal effects at the sample means of the data. In most applications, there are also dummy variables included as explanatory factors. Equation 4.3 cannot be applied to derive the marginal effect of a dummy variable. The marginal effect of a change in the status of a dummy variable can be derived as follows:

$$\frac{\partial Prob(Y = 1)}{\partial d = 1} = Prob(Y = 1 \mid \bar{x}_{(d)}, d = 1) - Prob(Y = 1 \mid \bar{x}_{(d)}, d = 0) \qquad (4.4)$$

For measuring the goodness of fit in limited dependent variables models several measures have been proposed. A measure often reported is the proportion of correctly predicted

observations by the model. Second, several pseudo-R^2 measures can be used to characterize the model fit. Pseudo-R^2 measures can be interpreted in the same way as R^2 measures in OLS models (WINDMEIJER 1995).

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4.2   Questionnaire Hessian Apple Wine

1.   **Haben Sie eines der folgenden Zeichen schon einmal gesehen?**

„Geschützte Ursprungsbezeichnung"   „geschützte geographische Angabe"

☐ ja
☐ nein

Falls ja bei Frage 1, weiter mit Frage 2; ansonsten weiter zu Frage 10 :

2.   **Sie haben angegeben, dass Sie eines dieser beiden Zeichen kennen. Können Sie sich noch daran erinnern, um welches der beiden Zeichen es sich gehandelt hat?**

(Beide Siegel einblenden)

☐ ja, und zwar (Mehrfachnennungen zulassen!)
   ☐ geschützte Ursprungsbezeichnung
   ☐ geschützte geografische Angabe
☐ nein

3.   **Sie haben angegeben, dass Sie eines oder sogar beide Zeichen schon einmal gesehen haben. Können Sie sich erinnern, wo genau Sie die Zeichen schon überall gesehen haben bzw. wo sie Ihnen aufgefallen sind?**

Beide Siegel einblenden
(Offene Frage)

4.   **Manchmal erinnert man sich ja nicht gleich an alles. Hier sehen Sie verschiedene Möglichkeiten, wo Sie die Zeichen „geschützte Ursprungsbezeichnung" bzw. „geschützte geografische Angabe" vielleicht schon mal gesehen haben könnten. Bitte kreuzen Sie an, wo Ihnen die Zeichen schon mal aufgefallen sind.**

Technische Anweisung: Reihenfolge wird randomisiert (außer Sonstiges)!
Mehrfachnennungen zulassen
Offene Frage bei Sonstiges: Eintrag ermöglichen
Beide Siegel zwischen Fragetext und Antwortliste einblenden
☐ auf der Verpackung von Produkten
☐ auf Plakaten
☐ im Fernsehen
☐ in Geschäften
☐ in Anzeigen in Tageszeitungen / Zeitschriften
☐ an Sonderständen / bei Aktionen
☐ im Internet
☐ Sonstiges, und zwar: _____
☐ Kann mich nicht erinnern

5.   **Können Sie mit eigenen Worten kurz beschreiben, was die Zeichen aussagen bzw. was Sie persönlich darunter verstehen?**

Beide Siegel nebeneinander zwischen Fragetext und Eingabefeld einblenden
(Offene Frage)

Geschützte Ursprungsbezeichnung:
_____

Geschützte geographische Angabe:
_____

6. **Kennen Sie Produkte, die eines der beiden Zeichen tragen?**

   ☐ nein
   ☐ ja, und zwar
   *Offene Frage*_____

7. **Haben Sie schon einmal Produkte, auf denen eines der oben genannten Zeichen abgedruckt war, gekauft?**
   ☐ nein
   ☐ ja, und zwar
   *Offene Frage*_____

8. **Da das Abdrucken der oben aufgezeigten Zeichen auf der Produktverpackung nicht zwingend vorgeschrieben ist, gibt es auch einige Produkte, die zwar als Herkunftsangaben geschützt, jedoch nicht als solche gekennzeichnet sind. Kennen Sie solche Produkte?**
   ☐ nein
   ☐ ja, und zwar
   *Offene Frage*_____

9. **Nachfolgend sind einige Aussagen zu <u>geschützten Herkunftsangaben</u> aufgelistet. Bitte geben Sie jeweils an, inwieweit Sie diesen Aussagen zustimmen.**

   Technische Anweisung: Items randomisieren

	Stimme voll und ganz zu	Stimme eher zu	Weder noch	Stimme eher nicht zu	Stimme gar nicht zu	Weiß nicht
Produkte, die als geschützte Herkunftsan-gabe gekennzeichnet sind, weisen eine besonders hohe Qualität auf.						
Produkte, die als geschützte Herkunftsangabe gekennzeichnet sind, werden besonders streng kontrolliert.						
Geschützte Herkunftsangaben tragen zur Erhaltung traditioneller Herstellungsverfahren bei.						
Geschützte Herkunftsangaben stärken die lokalen Erzeuger.						
Geschützte Herkunftsangaben bewahren traditionelles Kulturgut.						
Für geschützte Herkunftsangaben bin ich bereit, einen Aufpreis zu zahlen.						

Wenn <u>keines der Zeichen</u> laut Frage 1 bekannt (Befragte in 2 etwa gleichgroße Gruppen teilen):

Gruppe 1:

10a. **Diese beiden Zeichen sind Qualitäts- und Herkunftszeichen für Lebensmittel. Schauen Sie sich das Zeichen „<u>Geschützte Ursprungsbezeichnung</u>" bitte noch einmal genau an. Was würden Sie von einem Produkt erwarten, welches mit diesem Zeichen gekennzeichnet ist?**

Siegel "Geschützte Ursprungsbezeichnung" zwischen Fragetext und Eingabefeld einblenden
Offene Frage_____

Gruppe 2:

10b. **Die beiden Zeichen sind Qualitäts- und Herkunftszeichen für Lebensmittel. Schauen Sie sich das Zeichen „<u>Geschützte geografische Angabe</u>" bitte noch einmal genau an. Was würden Sie von einem Produkt erwarten, welches mit diesem Zeichen gekennzeichnet ist?**

Siegel "Geschützte geografische Angabe" zwischen Fragetext und Eingabefeld einblenden
Offene Frage_____

Jetzt möchten wir kurz ihre Meinung zu einem Getränk – dem Apfelwein - erfragen.

11. **Wie häufig trinken Sie Apfelwein?**
☐ mehrmals die Woche
☐ mehrmals im Monat
☐ mehrmals im Jahr
☐ nie

12. **Wo trinken Sie in der Regel Apfelwein?**
☐ zu Hause
☐ Außer-Haus, d.h. Kneipe, Gaststätte, Apfelweinfeste etc.
☐ gleichermaßen zu Hause und Außer-Haus

13. **Wo kaufen Sie in der Regel Apfelwein ein?**
☐ Getränkehandel
☐ Supermarkt/ Verbrauchermarkt
☐ Discounter
☐ Direkt vom Erzeuger
☐ Sonstiges, und zwar _____
☐ Ich kaufe keinen Apfelwein in Geschäften ein.

14. **Welche Produkteigenschaften sind Ihnen bei Apfelwein wichtig?**
Offene Frage_____

15. **Apfelwein ist ja ein typisch hessisches Produkt. Was verbinden Sie persönlich mit „Hessischem Apfelwein"?**

Offene Frage_____

16. Nachfolgend sind einige Aussagen zu <u>Hessischem Apfelwein</u> aufgelistet. Bitte geben Sie jeweils an, inwieweit Sie diesen Aussagen zustimmen.

Technische Anweisung: Items randomisieren

	Stimme voll zu	Stimme eher zu	Weder noch	Stimme eher nicht zu	Stimme gar nicht zu	Weiß nicht
Hessischer Apfelwein muss zu 100% aus hessischen Äpfeln hergestellt werden.						
Hessischer Apfelwein muss in Hessen gekeltert werden.						
Hessischer Apfelwein muss zu 100% aus Äpfeln von Streuobstwiesen hergestellt werden.						
Für die Herstellung von hessischem Apfelwein dürfen nur traditionelle Apfelsorten verwandt werden.						
Hesssicher Apfelwein ist ein fester Bestandteil hessischer Lebensart.						
Hessischer Apfelwein weist eine höhere Qualität als Apfelwein aus anderen Regionen auf.						
Durch den Kauf von Hessischem Apfelwein unterstütze ich die heimische Wirtschaft.						
Mir ist wichtig, dass hessischer Apfelwein nach traditionellen Verfahren hergestellt wird.						
Apfelwein kaufe ich immer von einem bestimmten Hersteller.						
Regionale Spezialitäten wie hessischer Apfelwein tragen zum Schutz der heimischen Kulturlandschaft bei.						
Regionale Spezialitäten tragen dazu bei, dass auch kleine Produzenten überleben können.						
Für einen Apfelwein, der als geschützte Herkunftsangabe gekennzeichnet ist, wäre ich bereit einen Aufpreis zu zahlen.						
Der Herkunftsschutz stellt sicher, dass alte Apfelsorten vor dem Aussterben bewahrt werden.						
Der Herkunftsschutz stellt sicher, das hessische Streuobstwiesen erhalten bleiben.						

17. Wer kauft in Ihrem Haushalt <u>hauptsächlich</u> die Lebensmittel ein, Sie selbst oder eine andere Person?
Technische Anweisung: Nur eine Antwort zulassen!
☐ ich selbst
☐ eine andere Person

+ Statistikfragen [Bildung, Berufstätigkeit, HH-Größe, HH-Nettoeinkommen]

4.3 Further publications

ANDERS. S., J. HARSCHE, R. HERRMANN, K. SALHOFER and R. TEUBER (2007), The Interregional and Intertemporal Allocation of EU Producer Support. *Jahrbuch für Regionalwissenschaft (Review of Regional Research)*, Vol. 27 (2): 171-193.

ANDERS. S., J. HARSCHE, R. HERRMANN, K. SALHOFER and R. TEUBER (2006), The Regional Allocation of EU Producer Support: How Natural Conditions and Farm Structure Matter. *Discussion Papers in Agricultural Economics,* No. 80, University of Giessen.

HANSEN, H, and R. TEUBER (2010), Assessing the Impacts of EU's Common Agricultural Policy on Regional Convergence: Sub-National Evidence from Germany. *Applied Economics*, forthcoming.

HANSEN, H. und R. TEUBER (2008), Methodische Ansätze zur Messung von Konvergenz – Was lehrt uns die bisherige Forschung? *WiSt – Wirtschaftswissenschaftliches Studium*, Jg. 37 (5): 263-269.

HENSELEIT, M., S. KUBITZKI, D. SCHÜTZ and R. TEUBER (2007), Verbraucherpräferenzen für regionale Lebensmittel – Eine repräsentative Untersuchung der Einflussfaktoren. *Berichte über Landwirtschaft,* Vol. 85 (2): 214-237.

KUBITZKI, S., R. TEUBER, W. SCHULZ, C. OBERBECK und R. Herrmann (2010), Verbraucherwahrnhemung und Marktchancen eines regionalen Traditionsproduktes - Empirische Ergebnisse für Hessischen Apfelwein. Göttingen: Cuvillier Verlag.

TEUBER, R. (2008), Geographical Indications and the Value of Reputation –Empirical Evidence for Café de Marcala. Contributed paper for the 12th Congress of the European Association of Agricultural Economists, Ghent, Belgium, 26.-29.08.2008. (über AgEcon abrufbar)

TEUBER, R. (2007), Café de Colombia, Café Veracruz y Café de la Montana Azul de Jamaica,. *Ensayos sobre Economia Cafetera*, Ano 20 (23): 107-126.

Eidesstattliche Erklärung

Ich erkläre, ich habe die vorgelegte Dissertation selbständig und ohne unerlaubte fremde Hilfe und nur mit den Hilfen angefertigt, die ich in der Dissertation angegeben habe.
Alle Textstellen, die ich wörtlich oder sinngemäß aus veröffentlichten Schriften entnommen sind, und alle Angaben, die auf mündliche Auskünften beruhen, sind als solche kenntlich gemacht.

Bei den von mir durchgeführten und in der Dissertation erwähnten Untersuchungen habe ich die Grundsätze guter wissenschaftlicher Praxis, wie sie in der „Satzung der Justus-Liebig Universität zur Sicherung guter wissenschaftlicher Praxis niedergelegt sind, eingehalten.

Giessen, den 2. Juni 2010