



EJM
37,5/6

690

Received May 2001
Revised August 2001

Consumer evaluations of product certification, geographic association and traceability in Greece

Efthalia Dimara and Dimitris Skuras
Department of Economics, University of Patras, Greece

Keywords Certification, Consumer behaviour, Quality, Wine and spirits, Greece

Abstract Certification, geographic association and traceability of food and drink products are quality cues that have not been extensively researched by the current academic literature. These quality cues are highly valued by consumers possessing certain socio-economic and demographic characteristics that form distinct and clearly-defined market segments. A sample of 744 Greek wine consumers is used to assess the factors influencing consumer evaluations towards quality cues. An ordered probit model with sample selectivity reveals that these attributes are valued as highly important by consumers possessing certain socioeconomic and demographic characteristics. The type and source of information received by consumers, their place of origin, income, age, sex, education and marital status all exert an independent effect on the evaluation process. The use of such quality cues may be potentially useful in creating niche markets and advancing rural localities through the support of small producers utilizing local raw materials and production techniques.

Introduction

The European Union (EU) has recognized and supported the potential of differentiating quality products and services on a regional basis. In 1992, EU regulation 2081/92 introduced an integrated framework for the protection of geographical indications and designations of origin for agricultural products and foodstuffs. Consequently, the EU's Committee of the Regions (1996) urged the Commission of the EU to strengthen its support to the promotion and protection of local products. Similarly, the OECD (1996) has argued that the creation of niche markets for agricultural products constitutes a potentially successful rural development policy and, on the basis of case studies of best practice has identified certain key elements for success.

This work arises out of a programme of collaborative research by the following: the Department of Geography at the Universities of Coventry, Leicester, Lancaster, Caen, Valencia, Galway and Trinity College Dublin; the Scottish Agricultural College (Aberdeen); Institute of Rural Studies (Aberystwyth); CEMAGREF (Clermont-Ferrand); Teagasc (Dublin); Department of Economics (University of Patras); and Seinajoki Institute for Rural Research and Training (University of Helsinki). The research is being funded under the EU's FAIR programme (FAIR3-CT96-1827). The authors also wish to thank two anonymous referees for very helpful comments.



By the end of 2000, 526 registered names made up the list of agricultural products and foodstuffs protected by certified geographical indications and designations of origin, revealing that producers cannot afford to ignore the growing concerns of consumers over food quality. Recently, certification took on an international dimension. In 1999, the World Trade Organisation (WTO) negotiations on the application of the Agreement on Trade-Related Aspects of Intellectual Property Rights specified that non EU member countries which are members of the WTO, can register products as protected denomination of origin or protected geographical indication and also submit objections to the registration of EU certified products, where they have a legitimate interest in doing so. Taking into account the aforementioned historical presentation of the development of certified products in the EU, it is expected that certification and the so related marketing cues of geographic indication and traceability will play a very important role in the marketing of agricultural products and foodstuffs at a European and international level.

Certification obligates a quality control process to oversee effective implementation of required production conditions and assure quality standards. In that sense, a quality assurance scheme guarantees certain standards for a product's physical properties and characteristics. Thus, a quality mark or certificate designed principally for consumers, acts as a quality cue encompassing a range of individual food characteristics and properties such as freshness, aroma, taste, appearance, texture, etc. Consumers are increasingly concerned to know where products come from and how they are produced, not only for "health" and "safety" reasons but also in terms of satisfying a current "nostalgia" which harks back to a perceived time of "real" and "wholesome" foods (Gilg and Battershill, 1998; Ilbery and Kneafsey, 1998). The product's geographic association irrespective of certification, and the option provided to consumers to trace up the product's original producer may be considered as quality cues by making reference to socially constructed concepts such as "authentic", "healthy" and "traditional" (Ilbery and Kneafsey, 1998). Thus, besides certification, geographic association, being or not being certified, and traceability may also operate as quality cues that embrace specific quality characteristics without making direct reference to specific quality properties.

Despite the wealth of published research concerning factors affecting food decisions, consumer preferences for food, consumer attitudes and perceptions towards food quality attributes and cues, there is very little work attempting to identify the consumer's attitudes towards quality surrogate cues such as certification, geographic association and traceability. Within this context, the aim of this paper is to examine the factors influencing consumers to rely on these quality cues when purchasing a product, especially in the context of a market segmentation perspective. The focus of this work is in product marketing and consumer behavior and thus, the interest lies in the relation

between the use of quality cues and the decision to purchase and consume the product. Such a relation has direct impacts on business strategies targeting specific segments of the market. The specific aims of this article, therefore are first, to review briefly the current status in the literature of quality foods and the use of quality cues. Second, to examine the statistical significance of factors influencing consumers to place importance on certification, geographic association and traceability within the general framework of a purchasing behavior model. Finally, the discussion section of this paper attempts to link research findings with potential marketing strategies, especially in the context of lagging rural areas within the EU.

Quality, food products and quality cues

Long established research has set the basis for the development of a quality perception process distinguishing between quality cues and quality attributes (Steenkamp, 1990). Perceived quality is related to the product's ability to provide satisfaction (Monroe and Krishnan, 1985) and a consistent level of performance, taste, freshness, aroma and other properties of the product (Rosen, 1984; O'Neill and Black, 1996). Quality cues are what the consumer observes, and quality attributes are what the consumer wants. Quality cues can be categorized as intrinsic and extrinsic. Intrinsic cues are those that are part of the physical product and cannot be changed without also changing the physical product itself (Ophuis and van Trijp, 1995). Extrinsic, are those cues which are related to the product but are not physically part of it. Well-known intrinsic cues are the color, aroma, taste, etc. and extrinsic cues mostly refer to price, brand name, country of origin, etc.

In the context of this work, certification, geographic association and traceability are regarded as extrinsic quality cues. Certification, however, is a regulated extrinsic quality cue in the sense that it cannot be used by any business unless its product conforms to specific standards and is granted permission by a regulatory authority, agency or institution. On the other hand, geographic association may be characterized as a semi-regulated quality cue in the sense that it can be used by any business provided that it uses raw material or is located in a specific geographic region. Finally, traceability is a non-regulated quality cue and it is solely upon the business to decide whether to use it or not.

In the course of this study, certification refers to the quality marks awarded to agricultural and food products by the Commission of the EU according to the regulations introduced in 1992 as well as those existing earlier than 1992 for certain products including quality wine. These regulations define a broad set of four types of quality marks that aim to distinguish particular products that maintain special quality characteristics from similar products belonging to the same category. The four quality marks currently recognised by the EU include protected designations of origin (PDO), protected geographic indications (PGI),

traditional specialty guaranteed (TSG) products and organic products. The awarding of such symbols embraces the notion of specification and association, i.e. the use of specific production methods and raw materials from a particular geographical area. Association refers to the use of materials from a specific geographical area without being awarded a certification. For example, in the case of wine, Fischer *et al.* (1999) argue that focusing on geographic origin alone would be rather confusing for consumers, because wines differ substantially regarding their sensory appearance within the same vineyard designation. Wine estate and vintage may adequately complement a product's description of geographic association by allowing consumers to trace the exact location of production. A product's traceability is assured when specific reference to the producer of the original material and of the final product (if different) is clearly indicated on the product's label or on the product's packaging material in general.

From the consumer and marketing point of view, quality is a complex and contested notion, which is socially constructed and thus, highly variable among different socio-cultural contexts and its evaluation may be defined as an attitudinal construct (Oliver, 1997). Attitude is a psychological tendency that is expressed by evaluating a particular entity with some degree of favor or disfavor (Eagly and Chaiken, 1993). Attitudes embody positive or negative feelings about the object in question, beliefs or ideas about it and a tendency to behave in a particular way towards it. Attitude and intention surveys have a long history in consumer behavior and marketing, complementing economic theory, which does not always provide a wholly convincing account of consumer's actions. Attitude surveys lead to a more adequate explanation and prediction of consumers' food choices and have been extensively used for comparing or predicting consumer behavior. A range of factors has been postulated to be associated with consumer's food choices.

Asp (1999) argues that consumers develop their own systems of deciding what to eat and how to follow the food guide pyramid, and thus, it is difficult to know which factors or combinations of factors that influence those decisions are most important. Economic, cultural, psychological and lifestyle factors as well as food trends are among the factors likely to influence consumer attitudes towards food attributes and cues. The individual consumer's disposal income is a major determinant of the demand for food, and an important factor influencing price-quality effects among consumers and their attitudes towards certain food product properties (Deaton, 1987, 1988; Dong *et al.*, 1998).

Information about the product has potentially important influences on perception of quality and preference (Dransfield *et al.*, 1998). Information refers to both the source and type of acquired knowledge. A wide range of sources of information on food are used by consumers including TV/radio, magazines, newspapers, etc. (Lappalainen *et al.*, 1998). The cause of information is important because individuals process information according to its perceived

cause and consider information provided by the factual performance of the entity in question more reliable than information provided by other factors (Mizerski, 1982). In general, personal or neutral information is more reliable and more influential than non-personal and market oriented information (Engel and Blackwell, 1982). Information of a neutral nature, such as that provided by the news media or other objective sources, is more effective because it is considered more credible than advertising or other market oriented sources (Chang and Kinnucan, 1991).

Finally, a number of social, demographic and cultural consumer characteristics may influence the formation of attitudes towards food choice and the demand for specialty products. Taking into account that certification, geographic association and traceability may act as risk reducing food choice strategies, socio-demographic characteristics associated with risky or riskless decisions may influence consumer's attitudes towards their importance. In many economic, psychological and social studies, the consumer's formal education, age, sex, marital status, occupation and place of origin have been found to exercise an independent effect on attitude formation towards risk and food choice.

Data and model

In order to examine consumer attitudes towards certification, geographic association and traceability, a survey of wine consumers was designed and carried out, among other research activities, in the framework of a research project financed under the EU's FAIR programme. Quality wine production, in contrast to table wine production, is considered as an alternative business strategy increasing survival and competitiveness of the wine producing industry. Thus, wine producers in Greece have taken advantage of the long established regulation concerning denomination of origin and geographic indication as well as recent EU regulations concerning organic production. Furthermore, there is an increasing trend of producing brands associated with specific geographic regions and specific producers (small producers) within these areas, irrespective of obtaining an EU or other quality marks.

Residents in the urban centers of Athens, Patras and Tripoli were selected as representatives of consumers in very large (metropolitan), large and smaller towns. Data were collected by questionnaires and a face to face interview of respondents with trained personnel. The questionnaire included both structured and semi-structured parts, in order to allow quantitative and qualitative analysis. A total of 744 questionnaires were collected in the three study regions. In order to achieve the highest possible coverage of the variance in purchasing behavior we decided to diversify questionnaire collection according to the place of purchase. Thus questionnaires were collected from regular places of purchase such as small and big supermarkets, from specialist outlets, and from restaurant and tavernas.

The aim of this work is to assess whether the three quality cues under consideration play an important role in the consumer's decision to purchase and consume a quality wine. For this reason, each surveyed consumer was offered to select a single category from a set of ordered responses (non-important, important, very important) for each of the three quality cues, namely certification, association and traceability. Thus, the importance measurement serves better the aims of our survey than the "like-dislike", "good-bad", and "favorable-unfavorable" measurements usually employed in similar marketing surveys.

The present survey was conducted among a randomly selected sample of wine consumers. The sample of 744 consumers contained 104 consumers that do not consume quality wine and consume exclusively table wine, and 640 consumers that buy at least some quality (certified) wine. Table wine, a notable example of which is Greek retsina, is not certified and, usually, not associated to any geographical region, any specific grape producer or any vineyard. Thus, consumers that consume exclusively table wine are not able to provide meaningful rankings on quality cues such as certification or geographic association. Thus, we face a sampling problem. If the analysis is restricted exclusively to the sub-sample of quality wine consumers that can provide rankings of their attitudes towards certification, association and traceability, the well-recorded selectivity bias may be introduced (Heckman, 1979). We decided to carry out the statistical analysis to the whole sample of consumers and correct for selectivity bias following standard statistical techniques. The ordinal qualitative nature of the dependent variable (non-important-important-very important) and the possible selectivity bias can be appropriately confronted if an ordinal probit model with selectivity is estimated. The statistical properties of the estimated model are given in the Appendix. Basically, the adopted procedure develops in two stages.

At the first stage we estimate a probit model that "forecasts" whether a consumer, randomly drawn out of the sample, is a quality wine consumer or not. The dependent variable of this probit model is a zero-one variable for non-consumers and consumers of quality wine correspondingly. This stage is not the focus of our work but we use its results to the second stage of the analysis. However, for reasons of completeness and clarity of our analysis we present the results of this stage as well. At the second stage we estimate three ordinal probit models of the rankings of consumers, one model for each of the three quality cues (certification, association and traceability). The dependent variable of the three ordinal probit models is the ranking (non-important, important, very important recoded as zero, one, two) assigned by each quality wine consumer for each one of the three quality cues (certification, geographic association and traceability) correspondingly. At this stage we use estimates of the first probit model to take into account the fact that we have confined our analysis to quality consumers only, i.e. take into account that we have

“selected” a sub-sample of the original sample with certain characteristics. The three ordinal probit models of this stage are central to our work as they are used to estimate the effect of various socio-economic variables on the probability that each of the three quality cues (certification, association and traceability) is valued as highly important by consumers.

Results and discussion

Table I presents definitions and descriptive statistics of the explanatory variables used in the probit selection model between quality and table wine consumers as well as of those used in the ordinal probit model, for the sub-samples of quality wine consumers and non-consumers. The sub-sample of quality wine consumers contains on average, younger people (AGE), and proportionately more males (SEX), single (MARITAL STATUS), and of urban origin consumers (ORIGIN). Furthermore, for quality wine consumers, information concerning the product is mainly received from the product's label (LABEL INFO) and less by reading relevant columns in media (MEDIA INFO) or talking with friends and sellers (PERSONAL INFO).

Table II presents estimates of the probit selection coefficients. As it was explained above, this is a probit model with a dependent dichotomous variable indicating a consumer of quality wine or no (one-zero). This probit model is used to “forecast” whether a randomly drawn consumer is a quality wine consumer or not and its estimates are used to “correct” the ordered probit model of the second stage of the analysis. However, it is interesting to present its results here. The chi-square test rejects the null hypothesis that all coefficients on the explanatory variables are simultaneously equal to zero. The model correctly predicts 88.8 percent of all cases (661 out of 744). A wide range of socio-economic characteristics distinguishes quality wine consumers from table wine consumers. The older the consumer, the lower the probability that he/she is a quality wine consumer. This is due to the fact that quality certification for wine is a relatively new concept in Greece and thus, it is more probable that older people are not accustomed to it and continue consuming table wine. Holding a higher education degree increases the probability to consume quality wine, while if the respondent's origin is from a rural area the corresponding probability decreases. Chaney (1996) argues that particular lifestyle attributes, reflecting a manner and way of consuming food, are an indicator of socio-cultural status. In that sense consumption of denominated food and drink may be a statement of taste, fashion, sophistication and other related issues covered up by a specific lifestyle. Such a lifestyle is associated more with educated and high income, urban based consumers. Finally, preference to white wine increases the probability that quality wine is consumed.

The ordered probit model of the importance evaluation is estimated on the subsample of the 640 quality wine consumers only, after correcting for

Variable name	Variable definition	Frequencies and means (standard deviations) ^a		
		Quality wine consumers	Table wine consumers	All consumers
AGE	Respondent's age in years	36.02 (11.30)	42.11 (16.67)	36.87 (12.37)
SEX	1 if respondent is female	1 = 352, 0 = 288	1 = 75, 0 = 29	1 = 427, 0 = 317
EDUCATION	1 if respondent has third level education	1 = 435, 0 = 205	1 = 90, 0 = 14	1 = 525, 0 = 219
MARITAL STATUS	1 if respondent is not married	1 = 333, 0 = 307	1 = 48, 0 = 56	1 = 381, 0 = 363
ORIGIN	1 if respondent comes from a rural area	1 = 243, 0 = 397	1 = 62, 0 = 42	1 = 305, 0 = 439
INCOME	Respondent's family after-tax income in million Gr.Dr.	5.09 (3.33)	5.13 (2.99)	5.10 (3.28)
WINE TYPE	1 if respondent is red wine "lover"	1 = 230, 0 = 410	1 = 62, 0 = 42	1 = 292, 0 = 452
MEDIA INFO	1 if respondent derives information on wine from media	1 = 250, 0 = 390	1 = 50, 0 = 54	1 = 300, 0 = 444
PERSONAL INFO	1 if respondent derives information from friends	1 = 218, 0 = 422	1 = 45, 0 = 59	1 = 263, 0 = 481
LABEL INFO	Number of information items read from wine labels	4.92 (2.28)	0.1 (0.27)	4.24 (2.70)
<i>n</i>	Sample size	640	104	744

Note: ^aFrequencies are reported for dichotomous variables. Means and standard deviations in parentheses are reported for continuous variables

Table I.
Definitions and
descriptive statistics
of all explanatory
variables

selectivity bias using the estimates of the previous probit model. The results of estimating an ordinal probit model for each one of the examined quality cues, namely certification, association and traceability are presented in Table III. The *t*-values for the selectivity coefficient (ρ) indicate the presence of selectivity bias for certification, but not for association and traceability. Therefore, the subsample limited to quality wine consumers is not a random sample, at least as concerns evaluation of the certification quality cue.

The model's parameter estimates indicate the direction of the effect of the eight explanatory variables (EDUCATION, MARITAL STATUS, ORIGIN, INCOME, WINE TYPE, MEDIA INFO, PERSONAL INFO, LABEL INFO) on the response probabilities (non-important, important, very important), but do not directly represent the actual probability changes. Estimating the marginal effects of the explanatory variables on the probability of getting one of the

Table II.
Parameter estimates of the probit model between consumers and non-consumers of quality wine

Variable name	Parameter estimates of the probit model	
	Estimated coefficient	Asymptotic <i>t</i> -value
Constant	2.886	11.080
AGE	-0.015	-3.102
SEX	-0.390	-3.093
EDUCATION	-0.801	-5.083
ORIGIN	-0.416	-3.185
WINE TYPE	-0.407	-3.239

Notes: Log-likelihood = -261.377; restricted log-likelihood = -301.002; chi-squared = 79.251; correct predictions = 88.84 percent

Table III.
Ordinal probit parameter estimates for responding that certification, geographic association and traceability cues are "very important"

Variable names	Certification	Association	Traceability
Constant	1.418 (4.672)**	0.458 (2.629)**	-0.072 (-0.127)
EDUCATION	-0.873 (-7.395)**	-0.150 (-1.392)	-0.001 (-0.998)
MARITAL STATUS	-0.564 (-4.955)**	-0.146 (-1.379)	-0.086 (-0.823)
ORIGIN	-0.203 (-1.926)**	-0.209 (-2.202)**	-0.155 (-1.893)*
INCOME	-0.112 (-6.323)**	-0.013 (-0.964)	-0.023 (-1.744)*
WINE TYPE	-0.064 (-0.631)	-0.074 (-0.763)	-0.072 (-0.748)
MEDIA INFO	0.505 (4.387)**	0.134 (1.185)	0.232 (2.062)**
PERSONAL INFO	0.307 (2.765)**	0.325 (2.990)**	0.252 (2.297)**
LABEL INFO	0.237 (9.463)**	0.096 (4.018)**	0.023 (8.116)**
μ	1.717 (21.177)**	1.391 (21.196)**	1.517 (20.575)**
ρ	0.793 (5.678)**	-0.169 (-0.313)	-0.290 (-0.552)
Log-likelihood	-521.678	-640.5608	-601.131
Restricted log-likelihood	-607.353	-726.28	-686.806
Correct predictions (per cent)	64.06	51.41	53.13

Notes: Figures in parentheses are *t*-values, single and double asterisks indicate statistical significance at the $p = 0.10$ and 0.05 levels, respectively

three evaluation responses represents the probability changes. In the Appendix we present the statistical estimation of marginal effects for a three category ordinal response (non-important, important, very important recoded as zero, one and two). For the two continuous explanatory variables (INCOME, LABEL INFO), the marginal effects show the percentage change in the probability that the specific response is selected given a change in the variable. For the six dummy explanatory variables (EDUCATION, MARITAL STATUS, ORIGIN, WINE TYPE, MEDIA INFO, PERSONAL INFO), the marginal effects are analyzed as discrete or relative changes when the respective dummy takes its two different values, 0 and 1 respectively (Greene, 1997). The marginal effects of the independent variables on the probabilities are presented in Table IV for the highly important category only.

The probability that certification is a very important quality cue that highly influences the decision to purchase the product increases if the consumer has higher education, is not married or is of a rural origin. Income inversely affects the probability of stating that certification is a highly important cue. If the consumer receives information concerning wine from the media, the probability that certification is valued as a very important quality cue decreases but it increases when information is received by personal contacts and the product's label. Respondents receiving information from specialist columns in magazines and newspapers have a better knowledge of the wine's quality in general, and thus, do not rely on certification or traceability as quality assurance schemes. For high-income consumers the product's price is probably a better signal of

Variable name	Certification	Association	Traceability
EDUCATION = 0	-0.459		
EDUCATION = 1	-0.113		
EDUCATION change	0.346		
MARITAL STATUS = 0	-0.107		
MARITAL STATUS = 1	-0.057		
MARITAL STATUS change	0.050		
ORIGIN = 0	-0.095	-0.038	-0.006
ORIGIN = 1	-0.050	-0.046	-0.007
ORIGIN change	0.045	-0.008	-0.001
INCOME	-0.019		-0.003
MEDIA INFO = 0	0.075		0.025
MEDIA INFO = 1	0.040		0.017
MEDIA INFO change	-0.035		-0.008
PERSONAL INFO = 0	0.026	0.087	0.030
PERSONAL INFO = 1	0.068	0.052	0.013
PERSONAL INFO change	0.042	-0.035	-0.017
LABEL INFO	0.040	0.022	0.019

Note: The Table includes values only where the corresponding *t*-values reported in Table III are statistically significant and thus WINE TYPE is not included

Table IV.
Change in
probability
(marginal effects) of
a "very important"
response caused by
a change in
explanatory
variables

quality than the respective certification. As a result, consumers responding that certification is a very important factor in their purchasing decision may be sketched as highly educated, single and of a rural origin that collect information from friends and the product's label and packaging. For such consumers, certification is a risk reduction strategy assuring the quality of the product, independently of its intrinsic quality cues such as taste, aroma and color. Furthermore, the trend dominating the media and many sellers to highlight the product's certification and the product's awards as a proof and guarantee of quality may influence this market segment to state that certification is an important attribute.

The probability that geographic association is a very important factor in the purchasing decision, is influenced only by the consumer's origin and the information received by personal contacts and the product's label. For consumers coming from urban places and receiving information from the product's label, the probability to state that geographic association is a very important quality cue increases. The probability of choosing traceability as a very important quality cue increases for consumers with an urban origin, and with the amount of information received by the product's label and decreases for consumers receiving information from the media. It may be argued that association and traceability target a specific segment of the market comprised of "urban consumers" that rely on information received by the product's label rather than relevant information received by the media or personal contacts.

Consumers of an urban origin place high importance on both geographic association and traceability and this deserves further examination. Food and drink has acquired a high public profile in Europe and other developed market economies and urban consumers, in particular, are increasingly concerned to know where food and drink comes from and how it is produced (Bell and Valentine, 1997; Gilg and Battershill, 1998). Furthermore, the growing interest to culinary heritage demands the use of regionally denominated products for the preparation of food. Finally, a tentative explanation may be searched in the growing body of the rural sociology and geography literature that views locally produced food as an expression of cultural identity (Nygård and Storstad, 1998), whereby commoditization of local culture revalorize place through its cultural identity (Ray, 1998). Hopkins (1998) argues that society feeds on signs and symbols which may be used to market local culture, a process described as cultural relocalization by Ilbery and Kneafsey (1999).

Conclusions and implications for marketing

The importance of certification, geographic association and traceability as extrinsic quality cues varies among consumers and thus the use of such quality cues targets specific segments of the market. Certification clearly targets the highly-educated, single consumer that does not spend time to receive information from specialist columns in the media but relies on information

received from personal contacts and the product's label. Geographic association and traceability target consumers that, due to their urban origin, are seeking the authentic and traditional product from the product's label. Rural businesses may adopt the use of such quality cues and create products directed to specific segments of the market. Taking into account that certification is a strictly regulated quality cue, the supply of products bearing this quality cue may be controlled in favor of businesses located in rural and lagging areas of the EU. The same effect is attained when the semi-regulated and the non-regulated quality cues of geographic association and traceability are used. It may be argued that the persistence of EU's rural development policy to establish certified quality marks and link the production of food and drink with specific localities may work in favor of rural businesses that will adopt such quality cues and create "niche" markets for their products. It must be stressed that certification, geographic association and traceability act as quality assurance schemes that directly reduce the risks associated with the consumption of new products. Such quality cues signal to consumers concepts of an authentic, healthy, safe, and traditional product within a psychological framework of nostalgia for the foregone "green and pleasant land".

Locally produced quality foods and drinks with designations of authenticity of geographical origin are transferred to the regional and national markets (Battershill and Gilg, 1996; Young and Morris, 1997; Marsden, 1998). In this endeavor, localities retain more economic benefits and control over the types of economic activity, which occur. Within this context, quality products and services have considerable potential as a rural business development tool in lagging and rural regions. However, the exact effects of linking product and place and using quality cues such as certification, geographic association and traceability on production and demand have not been fully explored in the academic literature. Further research is required to identify the factors influencing the use of place of origin at a regional and local level, as opposed to the well researched use of country of origin at a macro level and for products directed to the international market (Verlegh and Steenkamp, 1999). Future research should also identify the impacts of using quality assurance marks and extrinsic quality cues on the demand for agricultural products and foodstuffs and examine the impacts of adopting such quality cues on business survival and growth.

References

- Asp, E.H. (1999), "Factors affecting food decisions made by individual consumers", *Food Policy*, Vol. 24, pp. 287-94.
- Bell, D. and Valentine, G. (1997), *Consuming Geographies: We Are Where We Eat*, Routledge, London.
- Chaney, D. (1996), *Lifestyles*, Routledge, London.
- Battershill, M. and Gilg, A. (1996), "Traditional farming and agri-environment policy in southwest England: back to the future?", *Geoforum*, Vol. 27, pp. 133-47.

- Chang, H. and Kinnucan, H. (1991), "Advertising, information and product quality: the case of butter", *American Journal of Agricultural Economics*, Vol. 73, pp. 1195-203.
- Committee of the Regions (1996), "Promoting and protecting local products", Opinion of the Committee of the Regions, CDR 54-96, Luxembourg.
- Deaton, A. (1987), "Estimation of own-and cross-price elasticities from household survey data", *Journal of Economics*, Vol. 36, pp. 7-30.
- Deaton, A. (1988), "Quality, quantity, and spatial variation of price", *American Economic Review*, Vol. 78, pp. 418-30.
- Dong, D., Shonkwiler, J. and Capps, O. (1998), "Estimation of demand functions using cross-sectional household data: the problem revisited", *American Journal of Agricultural Economics*, Vol. 80, pp. 466-73.
- Dransfield, E., Zamora, F. and Bayle, M.-C. (1998), "Consumer selection of steaks as influenced by information and price index", *Food Quality and Preference*, Vol. 9, pp. 321-6.
- Eagly, A.H. and Chaiken, S. (1993), *The Psychology of Attitudes*, Harcourt Brace Jovanovich, Orlando, FL.
- Engel, J.F. and Blackwell, R.D. (1982), *Consumer Behavior*, Dryden Press, Chicago, IL.
- Fischer, U., Roth, D. and Christmann, M. (1999), "The impact of geographic origin, vintage and wine estate on sensory properties of *Vitis vinifera* cv. Riesling wines", *Food Quality and Preference*, Vol. 10, pp. 281-8.
- Gilg, A. and Battershill, M. (1998), "Quality farm food in Europe: a possible alternative to the industrialised food market and to current agri-environmental policies: lessons from France", *Food Policy*, Vol. 23, pp. 25-40.
- Greene, W. (1997), *Econometric Analysis*, Prentice-Hall, Englewood Cliffs, NJ.
- Heckman, J. (1979), "Sample selection bias as a specification error", *Econometrica*, Vol. 46, pp. 153-61.
- Hopkins, J. (1998), "Signs of the post-rural: marketing myths of a symbolic countryside", *Geografiska Annaler B*, Vol. 80, pp. 65-81.
- Ilbery, B. and Kneafsey, M. (1999), "Niche markets and regional specialty food products in Europe: towards a research agenda", *Environment and Planning A*, Vol. 31, pp. 2207-22.
- Ilbery, B. and Kneafsey, M. (1998), "Product and place: promoting quality products and services in the lagging rural regions of the European Union", *European Urban and Regional Studies*, Vol. 5, pp. 329-41.
- Lappalainen, R., Kearney, J. and Gibney, M. (1998), "A pan EU survey of consumer attitudes to food, nutrition and health: an overview", *Food Quality and Preference*, Vol. 9, pp. 467-78.
- Maddala, G.S. (1983), *Limited-dependent and Qualitative Variables In Econometrics*, Cambridge University Press, New York, NY.
- Marsden, T. (1998), "New rural territories: regulating the differentiated rural space", *Journal of Rural Studies*, Vol. 14, pp. 107-17.
- Mizerski, R. (1982), "An attribution explanation of the disproportionate influence of unfavorable information", *Journal of Consumer Research*, Vol. 9, pp. 123-40.
- Monroe, K.B. and Krishnan, R. (1985), "The effects of price and subjective product evaluations", in Jacoby, J. and Olson, J. (Eds), *Perceived Quality*, Lexington Books, Lexington, MA, pp. 209-32.
- Nygård, B. and Storstad, O. (1998), "Deglobalisation of food markets? Consumer perceptions of safe food: the case of Norway", *Sociologia Ruralis*, Vol. 38, pp. 35-53.

- OECD (1996), "Agricultural adjustment and diversification: implications for the rural economy", Working Party on Agricultural Policies and Markets, AGR/CA/APM(96)5, OECD, Paris
- Oliver, R.L. (1997), *Satisfaction: A Behavioral Perspective on the Consumer*, McGraw-Hill, New York, NY.
- O'Neill, M. and Black, M. (1996), "Current quality issues in the Northern Ireland tourism sector", *The Total Quality Magazine*, Vol. 8, pp. 15-19.
- Ophuis, P.A. and van Trijp, H. (1995), "Perceived quality: a market driven and consumer oriented approach", *Food Quality and Preference*, Vol. 6, pp. 177-83.
- Ray, C. (1998), "Culture, intellectual property and territorial rural development", *Sociologia Ruralis*, Vol. 38, pp. 1-19.
- Rosen, D. (1984), "Consumer perceptions of quality for generic grocery products: a comparison across product categories", *Journal of Retailing*, Vol. 60, pp. 64-80.
- Steenkamp, J.-B. (1990), "Conceptual model of the quality perception process", *Journal of Business Research*, Vol. 21, pp. 309-33.
- Trost, R.P. and Lee, L.F. (1984), "Technical training and earning: a polychotomous choice model with selectivity", *Review of Economics and Statistics*, Vol. 56, pp. 151-6.
- Verlegh, P.W.J. and Steenkamp, J.B. (1999), "A review and meta-analysis of country-of-origin research", *Journal of Economic Psychology*, Vol. 20, pp. 521-46.
- Young, C. and Morris, C. (1997), "Intra-industry linkages in the agro-food chain: new forces for regulating aspects of food production", paper presented to the RGS-IBG Conference, Exeter, January.

Appendix

In consumer theory, the evaluation of a marketing cue is assumed to maximize consumer satisfaction (or overall utility) and is reflected by the choice of one of the ordered set of the j alternatives of non-important, important and very important ($J = 0, 1, 2$). We assume that the consumer's satisfaction (utility) is represented by a well-behaved preference function, U^* as in the original model for polychotomous ordinal responses presented by Trost and Lee (1984). With case subscripts suppressed, the maximum utility attained by selecting a choice j , U_j^* , is postulated to be linearly associated with exogenous variables:

$$U_j^* = \beta'x + e_j, \quad (A1)$$

where x is a $K \times 1$ vector of exogenous variables, β is a vector of unknown parameters to be estimated, and e_j is a random error assumed to be identically normally distributed with zero mean and unit variance. U_j^* is unobserved. What we do observe is:

$$\begin{aligned} U_0 &= 0 \text{ if } U_j^* \leq 0 \text{ (non-important)} \\ U_1 &= 1 \text{ if } 0 < U_j^* \leq \mu \text{ (important)} \\ U_2 &= 2 \text{ if } \mu \leq U_j^* \text{ (very important)} \end{aligned}, \quad (A2)$$

which is actually a form of censoring and the μ is an unknown parameter to be estimated with β .

In theory, a consumer of quality wine considers the importance for each quality cue and chooses the utility maximizing position. The probability that an alternative k is chosen is $P_k > P_j \forall j, j \neq k$, where:

$$P_k = \Pr[U_k > \max(U_0, U_1, U_2)]. \quad (A3)$$

Due to the fact that the sample includes quality and table wine consumers, selectivity bias may have been introduced. The selection bias should be eliminated in order to assure randomness of responses. Selectivity bias may be corrected by adding a selection mechanism (Greene, 1997):

$$\begin{aligned} w^* &= \alpha/z + u \\ w &= 1 \text{ if } w^* > 0 \\ w &= 0 \text{ if } w^* \leq 0 \end{aligned}$$

and , (A4)

$$\begin{aligned} \text{Prob}(w = 1) &= \Phi(\alpha/z) \\ \text{Prob}(w = 0) &= 1 - \Phi(\alpha/z) \end{aligned}$$

where w^* is the unobservable utility by the i th consumer from consuming a quality product instead of consuming the standard product, z is a set of exogenous variables, $\Phi(\cdot)$ is the cumulative distribution function for a standard normal variable and $u \approx N(0,1)$. Let $w = 1$ if the consumer consumes quality wine and 0 otherwise. The model in equation (A4) is a univariate probit model and U_k is observed if and only if $w = 1$. Equation (A1) may be respecified as a sample selection problem (Heckman 1979):

$$E[U|x, w^* > 0] = \beta'x + E[e|x, w^* > 0]. \tag{A5}$$

If e and u are bivariate normally distributed with correlation coefficient ρ , then equation (A5) becomes:

$$E[e|x, w^* > 0] = E[e|x, u > -\alpha/z] = \rho\lambda, \tag{A6}$$

where λ is defined as the ratio of the density and the cumulative distribution function for a standard normal variable:

$$\hat{\lambda} = \frac{\phi(-\hat{\alpha}/z)}{\Phi(\hat{\alpha}/z)}. \tag{A7}$$

Equation (A1) for quality wine consumers becomes:

$$U_j^* = \beta'x + \rho\lambda + e_j. \tag{A8}$$

This may be estimated if a consistent estimate of λ is obtained. Consistent estimates of λ are obtained by estimating the ordinary probit in equation (A4) for all sample observations to compute consistent estimates of α that are used in equation (A7) to estimate λ . Equation (A8) is then estimated using the subsample of quality wine consumers as an ordered probit model by replacing λ with the consistent estimates derived by equation (A7). The selectivity bias test is then equivalent to a t -test of the null hypothesis that ρ equals zero. The probability that a consumer chooses one of the three classes available for each quality attribute is given by:

$$\begin{aligned} \text{Prob}(j = 0) &= 1 - \Phi(\beta'x + \rho\lambda) \\ \text{Prob}(j = 1) &= \Phi(\mu - \beta'x - \rho\lambda) - \Phi(-\beta'x - \rho\lambda), \\ \text{Prob}(j = 2) &= 1 - \Phi(\mu - \beta'x - \rho\lambda) \end{aligned} \tag{A9}$$

where $\Phi(\cdot)$ is the standard normal cdf and $0 < \mu$ in order for the three probabilities to be positive. For estimation we let a binary variable S_{ij} take the value of one if the i th respondent chooses category j , zero otherwise. The likelihood function for equation (A9) is:

$$L(\beta, \mu, \rho) = \prod_{i=1}^n \prod_{j=0}^2 (P_{ij})^{S_{ij}}, \quad (\text{A10})$$

and the log likelihood function is given by:

$$L^* = \log L(\beta, \mu, \rho) = \sum_{i=1}^n \sum_{j=0}^2 S_{ij} \log(P_{ij}). \quad (\text{A11})$$

Consistent and asymptotically efficient estimates of the model parameters (β, ρ, μ) are obtained by maximising the likelihood function (Greene, 1997; Maddala, 1983). By differentiating equation (A9) and taking into account selectivity bias, we find the marginal effects of the regressors on the probability as:

$$\begin{aligned} \frac{\partial \text{Prob}(j=0)}{\partial x} &= -\phi(\beta'x + \rho\lambda)\beta \\ \frac{\partial \text{Prob}(j=1)}{\partial x} &= [\phi(-\beta'x - \rho\lambda) - \phi(\mu - \beta'x - \rho\lambda)]\beta, \\ \frac{\partial \text{Prob}(j=2)}{\partial x} &= \phi(\mu - \beta'x - \rho\lambda)\beta \end{aligned} \quad (\text{A12})$$

where $\phi(\cdot)$ is the standard normal pdf evaluated at the means, \bar{x} and $\bar{\lambda}$. The change in probability is a function of the probability itself which, when multiplied by 100 is the percentage change in the probability that the specific response is selected given a change in the variable. For dummy independent variables the marginal effects are analyzed as discrete or relative changes when the respective dummy takes its two different values, 0 and 1 respectively (Greene, 1997). The marginal effects of the regressors on the probabilities are presented in Table IV for $j = 2$ (the highly important category).