

PRODUCT ATTRIBUTE SALIENCY AND REGION OF ORIGIN: SOME EMPIRICAL EVIDENCE FROM PORTUGAL

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Abstract:

This paper empirically investigates the extent to which consumer preferences may act as promoters of regional products. Three products are studied in terms of the importance consumers attach to various product attributes with particular emphasis on region of origin information.

The estimation of a hedonic price function, which relates the price of portuguese regional products to its various attributes, provided empirical support to the hypothesis that region of origin matters to consumers.

The study shows that wine, olive oil and cheese from some regions of origin have a significant impact on price. Particularly, some regions of origin are expected to have price premiums, while others are expected to have discounts.

Keywords: Regional products; hedonic approach; wine; olive oil; cheese.

JEL codes: C21; D83; Q18.

Introduction

European Union has developed a new rural development policy in the context of Common Agricultural Policy reform. This reform has led both the public and the private sector to give more heed to regional products, feeling differentiation and quality improvement to be the best responses to the cost advantage loss due to the drop in agricultural price support. Regional products are supported by European laws (Reg. 2081/92 and 2082/92), which give producers the opportunity to freely found a collective brand and a production reference standard, enforced by the national governments through a system of public guarantees on private control activities. To qualify for the use of designation of origin label, agricultural regions must have historical tradition and geographic, cultural and social specificity (Sodano, 2001).

These region's specificities can be mobilised to qualify region's products. Given this, we can expect producers (farmers, artisans, industrial entrepreneurs) and distributors to use the territorial references to increase the value of their products and sustain differentiation towards their competitors (Salolainen, 1993; Kuznesof *et al.*, 1997; Henchion and McIntyre, 2000; Coquart and Pouzenc, 2000; Sodano, 2001).

In the regional products industry the specific capabilities require, on the demand side, social recognition of its usefulness and, on the supply side, a local collective dynamic of appropriation that qualifies the product, be for the modification of an intrinsic characteristic (as taste) or extrinsic (as packaging, labelling information or brand name) [Lockshin and Rhodus, 1993; Jennings and Wood, 1994; Gil and Sanchez, 1997; Angulo *et al.*, 2000; Orth and Firbasová, 2003].

The returns of a region's resources and capabilities depend upon the recognition by the market of the product identity (specificity), of the sustainability of the competitive advantage acquired (protection of region or product origin) and of the ability of local firms to appropriate the rents earned. The mechanism of rent appropriation corresponds to the internalisation, on the part of local producers, of a group of external effects embedded in the territory (reputation, image). However, the rent is only reached when the producer is willing to reflect the effects of a product's region of origin on price, and when the consumer values those characteristics of the region that are associated with the product, being disposed to pay a price premium (Lockshin and Rhodus, 1993; Sodano, 2001; Skuras and Vakrou, 2002; Orth and Firbasová, 2003).

As we stated above, research questions on region of origin effects are important, particularly in the context of lagged and rural regions, allowing them to take profit of opportunities available in some markets. Those economic opportunities are often associated to the fact that, for a few products, information on region of origin seems to lead to higher consumer preferences and a more positive attitude towards goods produced in such territories. This is particularly the case where some kind of “consumers’ ethnocentrism” (Orth and Firbasová, 2003) can be found. This applies also to products with a strong cultural-historical background.

The motivation for conducting this research is threefold. First, enhance our understanding of the impact of territory information on buyers’ behaviour. Particularly, the extent to which territory information (region of origin) affects regional products prices given a multiplicity of other cues. Second, research into region of origin effects also has significant implications for the decisions to be taken by both business managers and policymakers. Private intervention refers to the marketing strategies that producers’ associations or firms promoting regional products must implement in order to differentiate their products from the rivals and persuade consumers to buy them. Public intervention concerns the preservation of rural heritage, environmental protection, diversification of agricultural activities and increase of the value of regional products. Finally, the empirical evidence provided might be useful for producers’ investment decisions, retailers purchasing and selling strategies and for the design of regional products marketing campaigns according to the knowledge of consumers’ valuation of different product attributes.

Section 1 presents empirical evidence which suggests that buyers might respond to territory cues by paying more for products produced in specific regions. Section 2 refers to the research methodology used in the three studies. Sections 3, investigates the effects of extrinsic and intrinsic wine attributes on the price premiums set by retailers in a competitive market. The same research was made in section 4 for olive oil and in section 5 for cheese. Finally, we discuss our findings and suggest some marketing and policy implications that can be drawn from the studies.

1. Regional products, region of origin and the hedonic approach

Researchers from international marketing have long made clear that country of origin has a considerable influence on the evaluation of a product (Bilkey and Nes, 1982; Liefeld and Wall, 1993; Samiee, 1994; Elliott and Cameron, 1994). Approaches from other scientific areas have focused on the effect of region of origin information on the evaluation of regional products, specially wine (Gil and Sanchez, 1997; Angulo *et al.*, 2000; Skuras and Vakrou, 2002; Schamel, 2003). However, research about the importance of designation of origin on the price of other portuguese quality products are scarce.

The studies of region of origin effects seek to understand how consumers perceive products emanating from a particular region. From an information theoretical perspective, products may be conceived as consisting of an array of information cues. Each cue provides customers with a basis for evaluating the product. The study of informational cues has generated research on the impact of multiple attributes on product’s price, such as brand (Vranesevic and Stancec, 2003), region of origin and label (Angulo *et al.*, 2000; Coquart and Pouzenc, 2000; Skuras and Vakrou, 2002; Steiner, 2002), quality signals and regional reputation (Oczkowski, 1994; Combris *et al.*, 1997; Steiner, 2002; Schamel, 2003) and design (Jennings and Wood, 1994; Kawamura, 1999). The informational cue that merits our particular interest here is the designation of origin of a product, as regulated by the European Union legislation (Reg. 2081/92).

The present studies examine the relationship between the region of origin information on price, but from a seller’s, rather than a buyer’s, perspective. As mentioned, surveys and experimental research on price preferences have indicated that buyers might respond to territory cues by paying premiums for, or expecting discounts on, goods produced in different regions. Thus, if we assume a competitive market situation, price should ultimately reflect territory effects if and only if territory information has real value for consumers. In a highly competitive market, where many competitors exist and price information is readily available, sellers (retailers) will be able to charge price differentials only if they have found that

consumers are willing to pay for them. Therefore, by examining seller's pricing behaviours in a highly competitive market, we can infer the likely effects of territory information on buyers' behaviour. Market prices reflect current consumer buying behaviours, providing a clearer view of how consumers ultimately respond to territory information and other information sources (Obermiller and Spangenberg, 1989; Nerlove, 1995; Hulland, Todiño and Lecraw, 1996; Coquart and Pouzenc, 2000).

Also addressed in this research is the extent to which territory information affects product pricing, given the multiplicity of other cues that could also influence prices. In this case, region of origin information is one attribute among others, and so its relative importance versus other information attributes (brand, product age, colour, labelling information, etc.) can be assessed.

2. Methodology

To determine the implicit value of regional products (wine, olive oil and cheese) we estimate a hedonic price function. This approach has been used in economics to study the influence of agricultural and food products characteristics on price (Stanley and Tschirhart, 1991; Nerlove, 1995; Oczkowski, 1994; Combris *et al.*, 1997; Andulo *et al.*, 2000; Weemaes and Rithmuller, 2001; Schamel, 2003). Hedonic price function captures the relationship between the observed price and the amount of each characteristic contained in the product, and generally is defined as:

$$P = f(x_1, x_2, \dots, x_k)$$

where P is the observed price and x_1, x_2, \dots, x_k are the amount of the characteristics of the good.

The partial differential of the hedonic price function, that is dP/dx_i , shows the shadow price of the characteristic x_i . This differential represents consumer preferences and we can make use of the information obtained from the hedonic price to evaluate the impact of designation of origin on price of regional products. We can also use additional independent variables as shifters in equation above in order to capture other factors affecting the price (Kawamura, 1999; Schamel, 2003).

We tested a linear and a non linear model since researchers have estimated hedonic price functions in several functional forms (Angulo *et al.*, 2000; Weemaes and Riethmuller, 2001; Schamel, 2003). A linear specification has the obvious interpretation that a unit increase in an attribute causes the price to rise by an amount equal to the coefficient. In a semi-log specification, the coefficients can be interpreted as a percent of the average price. To choose between the linear or natural logarithmic forms we tested the adequacy of both hedonic models. Given the results, we choose the semi-log specification and used ordinary least squares (OLS) to estimate the hedonic price equation.

We have observed the likely extent of multicollinearity in the data by analysing the correlations between the independent variables. Most of the correlations are quite low and the variable-inflation factor (VIF) is less than 5,3, a threshold value that indicates the presence of multicollinearity (Hair *et al.*, 1995). Therefore, results from both measures indicate that, although multicollinearity can affect the model, it does not represent a severe problem here. In other words, correlation among exogenous variables is not so high as to prevent us from a precise analysis of their individual effects. Also, the examination of the estimated residuals of the hedonic price regression has shown no systematic pattern, suggesting that no heteroscedasticity is present in the data.

3. Wine study

The portuguese wines produced in regions with designations of origin can use DOC (controlled designation of origin) and VQPRD (quality wine produced in designated region). The wines with geographical indications only can put VQPRD. The regional wines cannot use DOC or VQPRD, because the producers are not willing to fulfil the required regulations, but the place where the wines are produced can be indicated. Table wines do not have any geographical indication.

The bottles have a label where some information about the wine and the firm is given: brand; region of origin; DOC or VQPRD; category (white or red); year of production; other references (grape variety, reserve, etc.).

We have collected, between September and October 2001, 711 sales price data [179 (25,2%) white wine and 532 (74,8%) red wine] in three kinds of portuguese retailers. The first type (hypermarket - *Continente*) accounts for 181 (25%) prices, the second (supermarket - *Feira Nova* and *Carrefour*) accounts for 342 (48%) prices, the third (discount store – *Pingo Doce*) accounts for 188 (27%) prices. These retailers have different points of sale all over the country (a total of 228 points of sale). All the wine products included in the study contained designation of origin or geographical indication.

The data collected for each product consisted of price (in euros), age (number of years), category (white or red), special references (reserve or grape) and designation of origin (Douro, Dão, Bairrada, Alentejo, Ribatejo, Setúbal). All the variables other than “Price” and “Age” were dummies.

The dependent variable is defined as price (P) per 75cl and logarithm of price (logP). This measure has been chosen because the majority of sample bottles are 75cl. Independent variables are categorised into three groups. The first category is characteristics of the product, which includes colour, age and special attributes. The variables in this category are:

COLOUR: dummy variable for colour (red or white);

AGE: number of years since production;

SPAT: dummy variables for the presence of special references on the label (reserve, grape).

The second category tries to capture the effects of brand and label. The variables are:

BRAND: dummy variable for wine brand (producer or retailer);

LABEL: dummy variable for two different labels (region highlighted or not).

The third category evaluates the effects of region of origin. The variables are:

DOURO: dummy variable for wine produced in Douro region;

DAO: dummy variable for wine produced in Dão region;

BAIRRADA: dummy variable for wine produced in Bairrada region;

ALENTEJO: dummy variable for wine produced in Alentejo region;

RIBATEJO: dummy variable for wine produced in Ribatejo region;

SETÚBAL: dummy variable for wine produced in Setúbal region.

A brief description of data and variables used in the analysis is shown in Table 1.

Table 1. Data Description

| Variables | Description | Mean | Std. Dev. |
|---------------------------------|--|------|-----------|
| Price | Price of wine in euros | 5,87 | 4,27 |
| LogP | Log of price | 1,77 | 1,45 |
| Colour | Red =1; White = 0 | 0,75 | 0,43 |
| Age | Number of years | 2,29 | 1,55 |
| Reserve | Detached on the label =1; not detached=0 | 0,21 | 0,41 |
| Grape | Indicated on the label | 0,16 | 0,37 |
| Brand | Producer brand =1; Retailer brand =0 | 0,93 | 0,25 |
| Label | Region highlighted =1; Region not highlighted =0 | 0,25 | 0,43 |
| Wine region of origin (Dummies) | Douro | 0,22 | 0,41 |
| | Dão | 0,12 | 0,32 |
| | Bairrada | 0,09 | 0,29 |
| | Alentejo | 0,23 | 0,42 |
| | Ribatejo | 0,09 | 0,28 |
| | Setúbal | 0,08 | 0,28 |
| | Other regions (base category) | 0,17 | 0,38 |

Notes: N = 709.

The model shows good fit with adjusted R^2 of 0,35 and very significant value of F ($p < 0,001$). Also t-tests indicate that most of the variables are individually significant. Nevertheless, only three out of six regions of origin are individually significant. The estimated hedonic price functions can be seen in Table 2.

Variable “Colour” shows that red wines have significant positive effects on price ($p < 0,001$) and confirms that consumers are willing to pay more for red wine (about 30% more than white wine). Very similar findings emerge from Orth and Krska (2002) study, about the Czech Republic, which found that colour is an important wine attribute to buyers, while Steiner (2002) clearly identified red wine as having price premiums in England and Scotland. On the contrary, other studies (Nerlove, 1995; Schamel and Anderson, 2003) conclude that red wines are sold at a discount against white ones in Sweden and Australia/New Zealand, respectively. Given the diversity of countries, these results reinforce the idea of wine as a cultural product strongly embedded in the history and culture of a “terroir”. This is the case of Portugal where consumer seems to associate red wine with tradition, better quality and typical gastronomy. Also, health reasons spread by the media could help to influence consumers’ attitude towards red wine.

Variable “Age” shows positive effect on price ($p < 0,001$), indicating that time of production is important in the price of a bottle of wine. This intrinsic attribute (age) has a clear impact on the characteristics and quality of the wine (appearance, taste, flavour) and has, in general, gained a reputation in the market as being wine produced from the highest quality grapes. To the consumer represents a saving in terms of the opportunity cost of storage, while for producer the longer he stores the wine the greater the contribution towards the cost of production.

Table 2. Estimated hedonic price function for wine

| Variables | Dependent variable LogP Parameter (t-statistic) |
|---------------|--|
| Constant | 5,633 (55,45)** |
| Colour | 0,328 (6,701)** |
| Age | 0,069 (4,934)** |
| Reserve | 0,391 (7,579)** |
| Grape | 0,579 (10,229)** |
| Brand | 0,462 (5,657)** |
| Label | -0,055 (-1,157) |
| Douro | 0,348 (5,405)** |
| Dão | 0,263 (3,509)** |
| Bairrada | 0,031 (0,376) |
| Alentejo | 0,459 (7,214)** |
| Ribatejo | 0,011 (0,136) |
| Setúbal | 0,141 (1,725) |
| N | 709 |
| R^2 Adjust. | 0,35 |
| F statistic | 33,405** |

Note: (*) and (**) indicates significance at the 5% and 1% level, respectively.

Variables “Grape” and “Reserve” show significant positive effects on price (57,9% and 46,2%, respectively), suggesting that grape names (such as Cabernet Sauvignon) or marketing indications (such as reserve) have a positive impact on price. In Portugal, Cabernet Sauvignon has become quite a fashionable grape variety in recent years, partly because it is scarce in the market and, unlike other domestic varieties, it is a foreign grape from a country with high reputation on wine. A study by Steiner (2002) points out to the interaction between grape varieties and region of origin saying that “outstanding grape varieties are shown to have a strongly positive or negative regional impact on price just as outstanding regions have a

similar grape varietal impact". On the contrary, Angulo *et al.* (2000) found that grape variety does not influence wine prices in the Spanish market. Schamel (2003) reports mixed effects (positive and negative) of grape varieties on wine prices.

Marketing indications affects consumer willingness to pay since the quality of a bottle of wine is not known until it is opened. Therefore, in addition to other cues, references like "reserve" and "garrafeira" point out to the scarcity of wine, a vintage wine of exceptional quality made in a single year or a superior quality wine with a high potential to mature that is aged in wood during varying periods of time before bottling.

Consumers evaluate more favourable the wines with producer brand than retailer brand, since it carries the assurance of quality and serves as a warranty. A brand also permits the producer to tell the market about the product and it helps purchasers to obtain the quality they want. On the other hand, the simple indication of the region of origin is not enough to become more competitive, since all the wines can use it in a more or less explicitly way. To become more competitive, the producer relies on his own brand, thus expecting to differentiate it from his rivals. The study of Vranesevic and Stancec (2003) reinforces this idea concluding that "the brand has a direct effect on perceived quality and with some products it has an even bigger effect on quality than its physical characteristics".

The label is a powerful tool to signal quality to consumers who are not familiar with wine. In this case, the influence of label design in the price of wine seems to be neutral and only regarded by the producers as an instrument to display accurate information to the consumers about the region of origin.

Wine growing area is an important wine characteristic for consumers' decisions to purchase a bottle of wine. However, the highest prices are associated to Alentejo, Douro e Dão wines, indicating that consumers are willing to pay more money when wine comes from those production areas.

These results offer some support to the proposition that, where it is not possible to distinguish objectively between products on the the basis of intrinsic quality, consumers will resort to the use of region of origin cue as a surrogate quality index. Thus, some region's physical resources (such as land and climate) and tradition (historic and cultural background) can affect buyers perceptions towards wines produced in a given region for at least some segments of potential consumers.

Another explanation concerns the image of the wine. If wines from regions of Alentejo, Douro and Dão have a positive image, then the use of that wine makes the consumer feel better about him or herself. It may also be the case that the product has the image that the consumer wants to project to other people. It may also be that specialized regional products are fashionable. If a person is concerned about what other people think, then that person may care about the region of origin in order to impress other people (Loureiro and McCluskey, 2000).

4. Olive oil study

The production of olive oil in Portugal is organised by protected designations of origin (PDO) and other types of olive oil. The PDO can only be used by producers willing to fulfil the required regulations and the place of production is indicated in the label. The other types of olive oil have no geographical indication.

We have collected 782 sales price data of olive oil (PDO and others) in a portuguese retailer chain (Pingo Doce), between May and June of 2003. The data collected for each product consisted of price (euros), acidity (degrees), type of olive oil (biological, with plants, virgin), brand (producer or retailer) and designation of origin (Trás-os-Montes e Alto Douro, Beiras e Ribatejo, Alentejo). All the variables other than "Price" and "Acidity" were dummy.

The dependent variable is defined as price (P) per 50 cl (centilitre) and logarithm of price (logP). This measure has been chosen because the weights of most of the sample packages are 50 cl Independent variables are categorised into three groups. The first category refers to the characteristics of the product, which includes the type of olive oil and the level of acidity. The variables in this categories are:

BIO: dummy variable for biological olive oil

PLANT: dummy variable for olive oil with plants

VIRGIN: dummy variable for virgin olive oil (base category)

ACID: degree of acidity

The second category includes:

BRAND: dummy variable for the type of brand (producer or retailer)

The last one intends to capture the effects of designation of origin. The variables are:

TMAD: dummy variable for olive oil produced in Trás-os-Montes e Alto Douro

BEIRIB: dummy variable for olive oil produced in Ribatejo e Estremadura

ALENT: dummy variable for olive oil produced in Alentejo

REGNO: dummy variable for olive oil without indication of region (base category)

A brief description of data and variables used in the analysis is shown in Table 3.

Table 3. Data Description

| Variable | Description | Mean | Std. Dev. |
|--------------------------------------|--|------|-----------|
| Price | Price of olive oil, in euro, per 50 cl | 3,1 | 1,11 |
| LogPrice | Log of price | 1,06 | 0,36 |
| Acidity | Degrees | 0,58 | 0,3 |
| Type of olive oil (Dummies) | Biological | 0,13 | 0,34 |
| | Plants | 0,20 | 0,40 |
| | Virgin (base category) | 0,67 | 0,47 |
| Olive oil region of origin (Dummies) | Trás-os-Montes e Alto Douro | 0,33 | 0,47 |
| | Beira e Ribatejo | 0,08 | 0,28 |
| | Alentejo | 0,24 | 0,43 |
| | No region indication (base category) | 0,35 | 0,48 |
| Brand | Producer 1; Retailer 0 | 0,89 | 0,31 |

Notes: N = 731.

The model shows good fit with adjusted R^2 values above 0,70 and very significant value of F ($p < 0,001$). Also t-tests indicate that all variables are individually significant. The estimated parameters can be seen in Table 4.

Table 4. Estimated hedonic price function for olive oil

| Variables | Dependent variable LogP Estimate (t-statistic) |
|---------------|---|
| Constant | 0,753 (19,904)** |
| ACID | -0,59 (-19,219)** |
| BIO | 0,406 (16,045)** |
| PLANT | 0,625 (21,513)** |
| BRAND | 0,355 (8,826)** |
| TMAD | 0,237 (8,307)** |
| BEIRIB | 0,224 (6,801)** |
| ALENT | 0,298 (11,501)** |
| N | 731 |
| R^2 Adjust. | 0,72 |
| F statistic | 269,08** |

Note: (*) and (**) indicates significance at the 5% and 1% level, respectively.

The impact of acidity on price is negative and it would be reasonable to expect a discount (-59% or -1,899 euros at the average price). It seems that, in the absence of other quality cues, consumers associate low levels of acidity in olive oil with higher perceptions of quality and so its price.

Consumers evaluate more positively biological and mixed (with garlic or sweet herbs, for example) olive oil than virgin (extra, extra-special) olive oil. Variables “BIO” and “PLANT” show significant positive effects on price (+40,6% and +62,5%, respectively), relative to virgin olive oil (base category). Therefore, it seems that natural and more artisan ways of production and additional ingredients improve the perceived value of the olive oil to the consumer. The method of production has a clear impact on the characteristics and quality of olive oil, while additional ingredients enhance olive oil functionality.

Consumers do not value olive oil based only on their physical characteristics but also on producer’s brand, indicating that place of production or brand reputation are important information for consumers’ decisions. Therefore, consumers are willing to pay more money for producer’s brand (+35,5% or 1,1 euros at the average price) than for retailer’s brand.

Olive oil from regions of “Trás-os-Montes e Alto Douro”, “Beiras e Ribatejo” and “Alentejo”, relative to other olive oil without mention of region (base category), are perceived as more valuable, being consumers disposed to pay a price premium (23,7%, 22,4% and 29,8%, respectively). These results offer some support to the proposition that, where it is not possible to distinguish objectively between products on the basis of intrinsic quality, consumers will resort to the use of the region of origin cue as a surrogate quality index. The relationships between region of origin, perceived product quality and willingness to pay a price premium were supported by the data.

5. Cheese study

The production of cheese in Portugal is organised by protected designations of origin (PDO), protected geographical indications (PGI) and other regional cheeses. The regional cheeses cannot use PDO or PDI, because the producers are not willing to fulfil the required regulations, but the place where the cheeses are produced can be indicated without geographical protection.

In order to define our sample we collected, between February and March 2003, 658 price data of cheese (PDO, PGI and regional cheeses) from a retailer chain (Continente) that sells quality cheese. All regions (DOP or not) and the main brands/producers of cheese are represented in the data.

The data collected for each product consisted of price (euro), milk used in the production of cheese (goat, ewe, cow, mixture), production method (cured or not cured) and designation of origin (Minho e Trás-os-Montes, Ribatejo e Estremadura, Alentejo, Beiras and Ilhas). All the variables other than “Price” were dummy.

The dependent variable is defined as price (P) per 1000 grams and logarithm of price (logP). This measure has been chosen because the weights of most of the sample packages are 1000 grams. Independent variables are categorised into two groups. The first category is characteristics of the product, which includes the kind of milk used in cheese production (goat, ewe, mixture, cow) and the production method (cured or not). The variables in this categories are:

GOAT: dummy variable for goat’s cheese

EWE: dummy variable for ewe’s cheese

COW: dummy variable for cow’s cheese

MIX: dummy variable for mixture’s cheese (base category)

CURED: dummy variable for cheese production method

The second tries to capture the effects of designation of origin. The variables are:

MTM: dummy variable for cheese produced in Minho e Trás-os-Montes

RIBEST: dummy variable for cheese produced in Ribatejo e Estremadura

ALENT: dummy variable for cheese produced in Alentejo

ILHAS: dummy variable for cheese produced in Ilhas

BEIRAS: dummy variable for cheese produced in Beiras (base category)

A brief description of data and variables used in the analysis is shown in Table 5.

Table 5. Data Description

| Variable | Description | Mean | Std. Dev. |
|-----------------------------------|---|--------|-----------|
| Price | Price of cheese in euros per 1000 grams | 12,163 | 3,98 |
| Log P | Log of price | 1,0696 | 0,3608 |
| Production Method | Scald 1; No Scald 0 | 0,57 | 0,49 |
| Type of cheese (Dummies) | Goat | 0,15 | 0,35 |
| | Ewe | 0,60 | 0,49 |
| | Cow | 0,12 | 0,33 |
| | Mixture (base category) | 0,13 | 0,34 |
| Cheese region of origin (Dummies) | Minho e Trás-os-Montes | 0,22 | 0,42 |
| | Ribatejo e Estremadura | 0,10 | 0,30 |
| | Alentejo | 0,23 | 0,42 |
| | Ilhas | 0,11 | 0,32 |
| | Beiras (base category) | 0,35 | 0,48 |

Notes: N = 658.

The model shows good fit, with adjusted R^2 values above 0,49 and very significant value of F ($p < 0,001$). The two equations envisage to evaluate the effect of retailer's format on cheese price using a linear and a non linear model. The estimated parameters can be seen in Table 6.

Table 6. Estimated hedonic price function (dependent variable P and LogP)

| Variables | Dependent variable LogP Estimate (t-statistic) |
|---------------|--|
| Constant | 2,306 (59,81)** |
| GOAT | -0,169 (-3,747)** |
| EWE | 0,329 (9,555)** |
| COW | -0,36 (-4,088)** |
| CURED | -0,122 (-4,878)** |
| MTM | 0,231 (7,897)** |
| RIBEST | 0,124 (2,964)** |
| ALENT | 0,003 (1,267) |
| ILHAS | -0,0001 (-0,015) |
| N | 658 |
| R^2 Adjust. | 0,496 |
| F statistic | 81,719** |

Note: (*) and (**) indicates significance at the 5% and 1% level, respectively.

The results indicate that cured cheeses have a discount (-12% or less 1,46 euros at the average price) because consumer perceive the no cured cheeses as more “natural”, given their artisanal way of production and the relationship with local culture.

The cheeses made of ewe's milk shows significant positive effects on price (+33% or more 4 euros at the average price), while cheeses made of cow's and goat's milk are expected to have price discounts (-36% and -17%, respectively), relative to mixed milk cheese (base category). Therefore, this intrinsic attribute (milk) has a clear impact on the characteristics and quality of the cheese (appearance, functionality and flavour) perceived by consumers and so in its price.

The place of cheese production (region of origin) is an important asset for consumers' decisions, because they are willing to pay more when cheeses come from “Minho and Trás-os-Montes” (+23%) and “Ribatejo and Estremadura” (+12%), relative to “Beiras” (base category). These results offer some support

to the proposition that, where it is not possible to distinguish objectively between products on the basis of intrinsic quality, consumers will resort to use the regions of origin cue as a surrogate quality index. The relationships between region of origin, perceived product quality and willingness to pay a price premium were only supported by the data in the regions of “Minho and Trás-os-Montes” and “Ribatejo and Estremadura”.

Conclusions

The current studies focused on actual pricing behaviour of three portuguese regional products (wine, olive oil and cheese) in a real market setting (portuguese retailers with stores all over the country). These studies have shown that products from some regions of origin have a positive and significant impact on prices that consumers appear to be willing to pay in a real market context. Specifically, consumers are willing to pay more when wines come from “Douro”, “Alentejo” and “Dão” regions; when olive oil comes from “Trás os Montes e Alto Douro”, “Beiras e Ribatejo” and “Alentejo” regions; and cheeses come from “Minho e Trás os Montes”, and “Ribatejo e Estremadura” regions.

Therefore, if the region of origin has a positive image/reputation on the market, producers from that region should give more visibility to it on the label and use that image in their marketing programs. A complementary approach to the market is the identification of consumer groups (market niches) that are willing to spend a higher share of their budget to buy products more able to attend their particular needs.

On the contrary, producers from regions with less reputation should compete on brand equity and marketing actions (market research, advertising, promotion, public relations), in order to well establish the uniqueness and the historic background of the goods they are offering to the market. Producers rather than competing for a price, should propose to consumers a concept supported on a strong ethos of making quality products. Cooperation between producers and/or public support is needed to promote the distinctive features of regions of origin, as a pre-condition to change the attitude of consumers and to get a certain scale, either in terms of goods available in the market or in terms of distribution channels.

A long term approach for producers of regions with low reputation is the introduction of additional attributes that could moderate the effects of region of origin. In the wine market product intrinsic characteristics like colour (red wine), age (more years) and special attributes (name of the grape or reserve) all have positive effects on price. Clearly, the indication of foreign grapes, very often with less emphasis on the region of origin, has a strong impact on price. Consequently, it seems that a long term investment for wine producers is the introduction of new grapes, in particular the most preferred ones. In the olive oil market, biological methods of production and ingredients that increase olive oil functionality (like garlic and sweet herbs) shows positive effect on price. In the cheese market, the milk origin (ewe) and method of production (no cured) are important attributes in the process of consumer’s decision.

The study on wine also shows that producer’s brand is a valuable attribute to the consumer, thus increasing firm’s profitability and enabling local development in the regions with less reputation on wine. The brand seems to increase the perceived quality of the wine and the probability of being purchased. Moreover, producer’s brand creates consumer loyalty and it defends the firm from the threat of competition.

These studies have several limitations, so interpreting the results requires care. First, it is important to recognise that this analysis does not provide information on demand and supply side factors likely to affect price. Second, the data used in the calculations of the models were attained from the most important portuguese retailer chains which excluded speciality stores and could affected the implicit prices of our research. Third, accounting for the nature of the market structures of the food retail proved to be a difficult task in light of the limited data available.

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