

Ribeiro, José Cadima; Santos, José Freitas

Conference Paper

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44th Congress of the European Regional Science Association: "Regions and Fiscal Federalism", 25th - 29th August 2004, Porto, Portugal

Provided in Cooperation with:

European Regional Science Association (ERSA)

Suggested Citation: Ribeiro, José Cadima; Santos, José Freitas (2004) : Region's reputation and the price of regional products: a hedonic analysis of Portuguese quality cheese, 44th Congress of the European Regional Science Association: "Regions and Fiscal Federalism", 25th - 29th August 2004, Porto, Portugal, European Regional Science Association (ERSA), Louvain-la-Neuve

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Region's reputation and the price of regional products: a hedonic analysis of Portuguese quality cheese

J. Cadima Ribeiro

Escola de Economia e Gestão and NIPE
Universidade do Minho
Campus de Gualtar
Portugal – 4710 – 057 Braga
Tel: + 351 253604511
Fax: + 351 253676375
E-mail: jcadima@eeg.uminho.pt

J. Freitas Santos

ISCAP/IPP and NIPE/EEG/UM
Rua Jaime Lopes de Amorim
Portugal – 4465 S. Mamede de Infesta
Tel: + 351 229050000
Fax: + 351 229025899
E-mail: jfsantos@iscap.ipp.pt

Abstract

Resources (tangible and intangible) can be mobilised to increase region's reputation and confer a competitive advantage to certain products with origin in that region. The returns of a region's resources depend upon the ability of local firms to appropriate the rents earned and whether the consumers value the characteristics of the region that are associated with the product, being disposed to pay a price premium. The estimation of a hedonic price function, which relates the price of portuguese regional cheeses to its various attributes, provided empirical support to the hypothesis that regional designation of origin matters to consumers. The study shows that some designations of origin, cheese characteristics (cured or not) and milk types have a significant impact on price.

Particularly, while cheeses from regions of "Minho e Trás-os-Montes" and "Ribatejo e Estremadura" are expected to have price premiums, cheeses from regions of "Alentejo" and "Ilhas" are expected to have discounts, relative to "Beiras" (base category). Also, ewe's cheese and no cured cheese have positive effect on price.

Introduction

As underlined by MAILLAT (1995, p. 157), the changes in spatial hierarchies observed since the beginning of the 1970s, “have prompted researchers to formulate new explanations for, and to inquire about, the role played by territory”. Research that was subsequently conducted allowed to understand territory should not be considered as something given *apriori* but rather a specific resource, result of a historic and cultural (collective) construction process (GAFFARD, 1992; MAILLAT, 1995). This same concept had been developed some years before by other authors, namely SIMÕES LOPES (1979, p.23), that referred space had nothing to do with “a blank sheet on the one individual actors and institutions developed theirs actions”.

Instead of the old-fashioned idea of neutrality of the space, in the path of the authors already mentioned, RATTI (1995, p. 6) proposes the concept of "active space" as being the "outcome of a field of forces where the level of output depends on the capacity to produce a mix of cohesion, innovation and of strategic behaviours in a sistemic-evolutionary context”. Referring to the same issue, to DELAPLACE (1995, p. 4) the team of actors with whom the company maintains a demand (customers, competitors), productive (suppliers) institutional or cultural (political, social and cultural institutions) relationship, constitutes what she calls a "space-relational horizon". CREVOISIER (1995, p. 5), in the same sense, defends a notion of territory that includes the physical dimension of the space, and, at the same time, a "framework to explain the socio-economic interactions".

These various notions of territory not only include the geographical space, but also the resources (tangible and intangible) and capabilities which give a competitive advantage to the products with origin in a certain region. The returns of a region’s resources depend upon the ability of local firms to appropriate the rents earned and whether consumers value the characteristics of the region that are associated with the product, and are willing to pay a price premium.

The motivation for conducting this research is threefold. First, to enhance our understanding of the impact of territory information on buyer behaviour. Specifically, the extent to which territory information (designation of origin) affects cheese prices given other cues. Second, to measure the implicit value of the most important cheese attributes through the estimation of a hedonic price function, which relates the price of a product to

its different attributes. Third, to provide empirical evidence that might be useful for producers' long-term investment decisions, for the support of local development strategies and for the design of institutional competitive actions.

Section 1 of this paper describes the different types of resources and capabilities that can be found in a region and, on the other hand, explains how these assets can increase the value of regional products. In section 2 we present empirical evidence that suggests that buyers might respond to territory cues by paying more for products produced in specific regions. In section 3 we present the hypotheses underlying the study. In section 4 we refer to the research methodology. In section 5, based on experimental research, we investigate the effects of the region of origin and other attributes on the Portuguese quality cheese prices set by a hypermarket chain in a competitive market. Finally, we discuss our findings and describe the policy implications that can be drawn from the study.

1. Regional products and local development

Resources are inputs into the economic activity of a territory. But, on their own, few public or private resources are productive. Economic activity requires the co-operation and co-ordination of sets of resources. For instance, the cultural goods production are configured by the conjunction of financial, physical, human, institutional, technological and reputation resources, which define the concrete reality of each specific territory.

Some regions, however, could be well endowed with resources but poor in capabilities. A capability is the ability for a set of resources to perform some task or activity at the highest standards. For example, the improvement of the region's image and reputation depend on the ability of local administration to manage the region's resources, the interest of business leaders (domestic and foreign) to establish networks (social, organisational) and the efforts of several others stakeholders to promote the region.

Resources are the source of a territory's capabilities, while capabilities are the main source of competitive advantage of the territory (GRANT, 1991; KANTER, 1995; MAILLAT, 1995; FREITAS SANTOS, 1997).

Table I – Region’s resources and capabilities

Resources	
Type	Examples
Financial	Region’s borrowing capacity, local and regional taxes, subsidies, state financial transfers
Physical	Climate, ecology, land, infrastructures, hospitals, schools
Human	Local politicians, business leaders, entrepreneurial capacity, work force skills and practices, cost of labour
Institutional	Local administration, central government agencies, chambers of commerce, business associations, banks
Cultural	Historical identity, architectonical heritage, traditions, gastronomy
Technological	Resources for innovation, universities, research units, scientific parks
Capabilities	
Type	Examples
Ability to mix resources/assets (financial, physical, human, institutional, cultural, technological)	Region’s reputation and image (domestic and international) Favourable industrial atmosphere Competence in research and innovation

Source: Adapted from GRANT (1991); KANTER (1995); FREITAS SANTOS (1997).

Some resources are easy to identify and to evaluate, such as financial resources and physical assets. Others are less visible and difficult to appraise, like human capital (people’s skills, knowledge, reasoning and decision-making abilities) or reputation (GRANT, 1991; FREITAS SANTOS, 1997).

In brief, regions are not mere geographical spaces, as they are also endowed with resources and capabilities in varying amounts and value. As a result of this, territories generate specific capabilities that can be mobilised to qualify a region’s products. Regional products seem to be a paradigmatic case: i) they are based upon a geographic specificity in the production process and/or in the raw agricultural input; ii) they must have historical background (existence of the product in the past, with characteristics similar to the present); iii) they must have cultural value that can be easily associated with particular celebrations or to local gastronomic customs (SODANO, 2001).

Given this, we can expect producers (farmers, artisans, industrial, 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; DINIS, 2000; BLUNDEL, 2002).

Therefore, regional products require, on the demand side, social recognition of its usefulness and reputation and, on the supply side, a local collective dynamic of appropriation that qualifies the product, be for the preservation of an intrinsic characteristic (taste, texture, colour, form) or extrinsic (brand name, manufacturer name, region of origin, reputation) [LOCKSHIN and RHODUS, 1993; JENNINGS and WOOD, 1994; GIL and SANCHEZ, 1997; ANGULO *et al.*, 2000; BIANCHI, 2001].

The returns of a region's resources and capabilities depend upon the sustainability of the competitive advantage and the ability of local firms to appropriate the rents earned. The competitive advantage that benefits products with origin in a specific territory is considered to be a rent, which corresponds to the internalisation, on the part of local producers, of a group of external effects embedded in the territory. However, this rent is only reached when the producer is willing to reflect the effects of a product's region of origin in the 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; HULLAND, TODIÑO and LECRAW, 1996; BIANCHI, 2001; SKURAS and VAKROU, 2002).

Research questions on region of origin effects are important, particularly in the context of rural communities and less industrialised regions, since information on region of origin in certain products seems to lead to higher consumer preferences and a more positive attitude towards goods produced in such regions. Research into region of origin effects also has significant implications for the decisions made by, both, business managers and government policymakers.

2. Designation of origin, price 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; 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; CADIMA RIBEIRO and FREITAS SANTOS; 2003). However, research about the importance of designation of origin on the price of cheeses is quite scarce.

The study of region of origin effects seeks 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; STEINER, 2002; SKURAS and VAKROU, 2002), quality signals and regional reputation (SCHAMEL, 2003; CADIMA RIBEIRO and FREITAS SANTOS, 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 defined by the European Union regulation (Reg. 2081/92).

The present study examines the relationship between the region of origin information and price, but from a seller's rather than a buyer's, perspective. Surveys and experimental research on price preferences have indicated that, potentially, 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 attitudes. Market prices reflect actual consumer buying behaviours, providing a clearer view of how consumers ultimately respond to territory information and other information sources (HULLAND, TODIÑO, LECRAW, 1996).

Also addressed in this research is the extent to which territory information affects product pricing, given other cues that could also influence prices. In this case, region of origin information has not been artificially highlighted, and so its relative importance versus other information sources (cheese characteristics) can be assessed.

To determine the implicit value of cheese we have estimated 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; CADIMA RIBEIRO and FREITAS SANTOS, 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:

$$P = f(x_1, x_2, \dots, x_k) \quad (1)$$

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 (1), that is dP/dx_i , shows the shadow price of the characteristic x_i . This differential represents consumers' preference and we can make use of the information obtained from the hedonic price to evaluate the impact of designation of origin on price. We can also use additional independent variables as shifters in equation (1) in order to capture other factors affecting the price (KAWAMURA, 1999; SCHAMEL, 2003). In this study, factors are categorised into two groups: characteristics of the cheese and designation of origin. Therefore the hedonic price function is:

$$P = f[x(x_1, x_2), y(y_1)] \quad (2)$$

The first category of independent variables contains two sub-categories: x_1 is the kind of milk from which the cheese was made (goat, ewe, mixture, cow) and x_2 is the production method (cured or not). The second category (y_1) captures the effects of designation of origin on price.

Equation 2 has been estimated for portuguese cheese prices. As price data is a quantitative variable we used ordinary least squares (OLS) to estimate the hedonic price equation.

3. Hypotheses

A review of empirical evidence and qualitative research (depth interviews) uncovered main factors that might influence the extent to which an effect of region of origin can be observed in the price of a particular product. Factors relevant to the current study include the designation of origin and product characteristics. The effect of each of these factors on the price premiums set by retailers in a competitive market is investigated.

Hypothesis 1 – No cured cheeses will command higher prices than cured cheeses.

We expected that consumers evaluates more positively the no cured cheeses, due to a longer time of maturation and consistence of the paste (soft cheese), which are often associated with higher perception of quality. Approaching the evolution of UK consumers' tastes, BLUNDEL (2002, p. 23) mentions the “recent increase in demand for organic products, including cheese”. Due to a lack of previous empirical studies, qualitative research (depth interviews) was made to generate this hypothesis.

Hypothesis 2 (a) – Cheeses made with goats' milk will command higher prices than cheeses made with mixtures' milk (base category).

Hypothesis 2 (b) – Cheeses made with ewes' milk will command higher prices than cheeses made with mixtures' milk (base category).

Hypothesis 2 (c) – Cheeses made with cows' milk will command higher prices than cheeses made with mixtures' milk (base category).

We expected that consumers evaluate more positively cheeses made with certain kind of milk than others, because milk has a great influence on the chemical characteristics and functionality of the cheese and determines flavour variations. The importance of high quality milk to produce good cheese is well underlined in the research conducted by BLUNDEL (2002) regarding the survival trajectory of two Cheshire (UK) cheese makers. This same point of view is addressed by BIANCHI (2001) dealing with the production of

(italian) mozzarella cheese. Anyway, due to the scarce empirical information available on this issue qualitative research (depth interviews) was made to generate this hypothesis.

Hypothesis 3 (a) – Cheeses from region of “Minho e Trás-os-Montes” will command higher prices than cheeses from “Beiras” region (base category).

Hypothesis 3 (b) – Cheeses from region of “Ribatejo e Estremadura” will command higher prices than cheeses from “Beiras” region (base category).

Hypothesis 3 (c) – Cheeses from region of “Ilhas” will command higher prices than cheeses from “Beiras” region (base category).

Hypothesis 3 (d) – Cheeses from region of “Alentejo” will command higher prices than cheeses from “Beiras” region (base category).

Products from certain regions with a high reputation may be preferred to those from regions with a lower reputation. These preferences are likely to lead to willingness to pay more for products from protected designation of origin (PDO) or protected geographical indication (PGI), and this should be reflected in higher selling prices (at least in a highly competitive market) [LOCKSHIN and RHODUS, 1993; SALOLAINEN, 1993; KEOWN and CASEY, 1995; GIL and SANCHEZ, 1997; ANGULO *et al.*, 2000; BIANCHI, 2001; BLUNDEL, 2002; SKURAS and VAKROU, 2002; CADIMA RIBEIRO and FREITAS SANTOS, 2003].

4. Methodology

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 table II we present the production of cheeses in Portugal (1998/2001) by protected designations of origin (PDO) and protected geographical indications (PGI).

Table II – Portuguese Production of Cheese from Protected Designations of Origin and Protected Geographical Indications (1998/2001)

Protected Cheese Names	Production 1998/1999		Production 1999/2000		Production 2000/2001	
	Tons	%	Tons	%	Tons	%
Terrincho (DOP)	31,98	2,6	26,562	1,95	30,855	2,02
Cabra Transmontano (DOP)	1,734	0,14	6,702	0,49	7,281	0,48
Rabaçal (DOP)	-	-	0,218	0,02	0,753	0,05
Serra da Estrela (DOP)	46,688	3,7	47,0	3,4	64,442	4,23
Castelo Branco (DOP)	45,78	3,6	65,625	4,8	55,125	3,6
Amarelo da Beira Baixa (DOP)	69,36	5,5	73,6	5,4	51,6	3,4
Picante da Beira Baixa (DOP)	27,65	2,2	23,45	1,72	27,3	1,79
Azeitão (DOP)	68,401	5,4	55,482	4,07	77,857	5,1
Évora (DOP)	32,0	2,5	48,516	3,55	48,516	3,2
Nisa (DOP)	85,35	6,8	120,271	8,8	110,882	7,3
Mestiço de Tolosa (PGI)	0,329	0,06	7,369	0,5	8,65	0,57
Serpa (DOP)	33,0	2,6	20,0	1,4	62,0	4,06
São Jorge (DOP)	656,05	52,3	689,312	50,6	812,224	53,2
Pico (DOP)	157,8	12,6	181,0	13,3	168,5	11,0
Total	1256,122	100,0	1364,107	100,0	1525,985	100,0

Source: MADRP (2001, 2002, 2003).

Based on the information from the Portuguese Agricultural Ministry, it can be concluded that the production of cheese increased in the period between 1999 and 2001. The highest production was noted in DOP São Jorge, which accounts for more than 50% of total production of quality cheese in Portugal. The other DOP regions have small impact in the market and maintained or slightly increased or decreased the production of cheese along the period.

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

Table III – Data Description

Variable	Description	Mean	Std. Dev.
Price	Price of cheese in euros per 1000 grams	12,163	3,98
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 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 III.

5. Results

The hypotheses were tested using OLS regression hedonic price functions. We used a linear and a non linear model since researchers have estimated hedonic price functions in several functional forms: linear, loglinear, polynomial, multinomial (ANGULO *et al.*, 2000; WEEMAES and RIETHMULLER, 2001; SCHAMEL, 2003).

Before testing the hypotheses we analysed the likely extent of multicollinearity in the data by correlating 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 in this case. In other words, correlation among exogenous variables is not high enough to prevent us from a precise analysis of their individual effects.

The estimated parameters can be seen in Table IV. Overall, 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.

Hypothesis 1 states that no cured cheeses will command higher prices than cured cheeses. This hypothesis is supported by the data. So, we expect that cured cheeses have a discount (-12% or less €1,46 at the average price) because consumer perceive the no cured cheese as more "natural", because of their artisanal way of production and the relationship with local culture.

Hypothesis 2 states that milk origin positively affects the price of cheese. This hypothesis is partially supported by the data. Variable "Ewe" shows significant positive effects on price (+33% or more €4 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.

Table IV – Estimated hedonic price function (dependent variable P)

Variables	Dependent variable P Estimate (t-statistic)	Dependent variable LogP Estimate (t-statistic)
Constant	10,254 (27,629)**	2,306 (59,81)**
GOAT	-1,37 (-3,15)**	-0,169 (-3,747)**
EWE	3,816 (11,513)**	0,329 (9,555)**
COW	-4,349 (-5,131)**	-0,36 (-4,088)**
CURED	-1,503 (-6,247)**	-0,122 (-4,878)**
MTM	3,456 (12,272)**	0,231 (7,897)**
RIBEST	2,016 (5,015)**	0,124 (2,964)**
ALENT	0,598 (2,046)*	0,003 (1,267)
ILHAS	1,273 (1,459)	-0,0001 (-0,015)
N	658	658
R ² Adjust.	0,563	0,496
F statistic	106,9**	81,719**

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

Hypothesis 3 (a) and (b) states that cheeses from regions of “Minho and Trás-os-Montes” and “Ribatejo and Estremadura” will command higher prices than cheeses from other regions. This hypothesis is supported by the data, indicating that the place of cheese production is an important asset for consumers’ decisions. Also, that consumers are willing to pay more when cheeses come from “Minho and Trás-os-Montes” and “Ribatejo and Estremadura”, relative to “Beiras” (base category). On the contrary, hypothesis 4 (c and d) are not supported by the data. Thus, while cheeses from regions of “Minho and Trás-os-Montes” and “Ribatejo and Estremadura” are expected to have price premiums (+23% and +12%, respectively), we can say nothing regarding cheeses from regions of “Ilhas” and “Alentejo”.

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”.

Conclusion

The current study focused on present pricing behaviour of quality portuguese cheeses in a real market setting. The research has shown that region reputation (designation of origin) has a positive and significant impact on the prices of cheeses from the regions of “Minho and Trás-os-Montes” and “Ribatejo and Estremadura”. Other cheese attributes that have shown positive effect on price were ewe milk and method of production (less cured), while goat’s and cow’s cheeses were expected to have discounts.

The study also shows that cheeses from certain regions of origin are better priced than others and that those origins have a significant impact on prices. According to this, in a real market context, it seems consumers are willing to pay more for a differentiate and traditional regional product. Therefore, in marketing terms, if the region of origin has a positive image/reputation on the cheese market, producers from that region should give more visibility to it on the label and use that reputation in theirs advertising 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 theirs particular needs” (Dinis, 2000, p. 547).

The producers from regions with less reputation on cheese production should compete on brand equity and marketing actions (market research, advertising, promotions, public relations), in order to well establish the uniqueness and the historic background of the goods they are offering to the market. Has underlined by BUNDEL (2002, P. 24), rather than competing “for a price”, producers should propose to consumers a concept of consumer behaviour, supported (in this particular case) on “a strong ethos of making cheese in a traditional way”. In such competitive markets as the ones we have nowadays, to be succeeded, co-operation between producers or public support is certainly needed. This co-

operation and/or public support is necessary to establish 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 or in terms of distribution channels.

This study has 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 model was attained from only a retailer chain (Continente) which 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.

Further research on this subject should consider other regional product types and goods categories less studied (such as honey and olive oil), since it is known, from the literature on region and country of origin, that effects and their sizes vary according to products and products category.

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