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## Utilization of Food Quality Labels Included in the European Union Quality Schemes

Tomáš Sadílek

*University of Economics, Prague, Faculty of Business Economics, Department of Marketing, Czech Republic  
tomas.sadilek@vse.cz*

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### ABSTRACT

The paper deals with European Union quality schemes of Protected Designation of Origin, Protected Geographical Indication and Traditional Speciality Guaranteed labels. This paper aims to analyse the share of PDO, PGI and TSG labels in EU countries, selected product categories and their structure, and explains the relationships between country of product origin and number of registered product names. Secondary data from the Database of Origin and Registration are used. As the results show, the highest number of product names is registered under the PDO label, followed closely by the PGI label. The dominant country is Italy followed by other Mediterranean countries such as France, Spain, Portugal and Greece.

**Keywords:** *Labels; Quality; DOOR database; EU; Food.*

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## 1 Introduction

The added value and importance of quality labels is to assist imperfectly informed consumers in their decision-making process because it structures the information environment. Offering food products with specific, identifiable characteristics, along with providing more information and guarantees, has become necessary in order to satisfy consumers and reduce their uncertainty. To allow producers to use the added value of their products as effectively as possible, and to facilitate consumers' choice of food products, in 1992 the EU established a quality labels system known as Protected Designation of Origin (PDO), Protected Geographical Indication (PGI) and Traditional Speciality Guaranteed (TSG), in order to protect the names of these products (EUFIC, 2013; European Commission, 2012a). These three schemes have built on a long history of regional and traditional specialities, especially in Southern European countries (Teuber, 2014). The PDO, PGI and TSG labels aim to provide consumers with clear information on the product origin or speciality character, enabling them to make more informed purchases and the best possible choices (Verbeke et al., 2012). A list of products assigned the quality labels PDO, PGI or TSG is included in the DOOR database.

The EU quality labels scheme identifies agricultural products and foodstuffs farmed and produced to exacting specifications. It includes Protected Designation of Origin (PDO) and Protected Geographical Indication (PGI) for agricultural products and foodstuffs as well as for wine and spirits (there are different rules for wine and spirits, and they are not included in our analysis), and Traditional Speciality Guaranteed (TSG) for agricultural farm products and foodstuffs. While a PDO covers agricultural products and foodstuffs which are produced, processed and prepared in a given geographical area using recognised know-how, a PGI indicates a link with the geographical area in at least one of the stages of production, processing or preparation. The link with the area is therefore stronger for PDO; PGI is a more flexible regulation. For PDO food products, management conditions are regulated by very strict rules, with the aim of obtaining a high-quality process (European Commission, 2013c). A TSG highlights a product's traditional character, in either its composition or means of production. According to regulations since 2013 concerning EU quality schemes, for agricultural products and foodstuffs to be "traditional", proven usage on the market for at least 30 years is now required (European Commission, 2012a; Becker et al., 2008; Fandos et al., 2006).

There is a lack of studies evaluating the number and structure of products names assigned the PDO, PGI and TSG labels. A knowledge gap regarding a systematic, broad analysis of the PDO, PGI and TSG labels included in the DOOR database was identified. This paper aims to analyse the share of PDO, PGI and TSG labels in EU countries, selected product categories and their structure, and explain the relationships between country of product origin and number of registered product names. This paper can provide a basis for discussions about the usefulness of these food quality labels both as a marketing tool for food producers, and as a tool for promoting food quality and market transparency for consumers.

The rest of the paper is structured as follows: the next section presents a literature review, then the Materials and Methods section presents the dataset and methods of statistical analysis. The Results section describes the main findings of the paper and discusses the measurement of variables. The Discussion section compares the findings of the research with articles published previously, as well as how the PDO, PGI and TSG labels affect consumers. Conclusions and propositions for future research are offered in the Conclusion section.

## 2 Literature Review

With the renewed consumer interest in traditional foods, food producers all across Europe are discussing whether the increased use of EU quality schemes (PDO, PGI and TSG) would be a useful tool in their overall marketing strategy, and authorities are interested in the function of these schemes as an aid for consumer decision-making (Grunert and Aachmann, 2016). However, awareness of the PDO, PGI and TSG brands among EU countries is rather low (Fotopoulos, 2001; Velčovská, 2018).

According to Grunert (2005), food quality labels are an ambiguous category that covers many different things. They can be divided into obligatory (determined by legal rules and compulsory for all products in a given product category) and voluntary food quality labels (bring a competitive advantage for a product), into general (address all product quality characteristics) and specific food quality labels (focused only on quality characteristics), or into regional, national, international and global food quality labels. They can cover quality, safety, organic origin and other characteristics of the product (Grunert, 2005). The following authors offer more about the influence of quality labels on regional distribution:

EUFIC, 2013; Parrot et al., 2002; O'Connor and Company, 2005; Espejal et al., 2008; Košičiarová et al., 2016; Fandos-Herrera, 2016.

Different food labelling schemes can co-exist, with the aim of informing customers and ensuring trust in different quality characteristics of food products. But consumers clearly value labelling schemes that are regulated by EU law (Gracia and de-Magistris, 2016) and involve the Protected Designation of Origin (PDO), Protected Geographical Indication (PGI), or Traditional Speciality Guaranteed (TSG) labels.

Research studies dealing with the topic of food quality labels are focused only on partial aspects of quality labels, such as the analysis of food products registered as PDO, PGI and TSG in selected countries (Nagyová et al., 2011), customer loyalty and buying intention for the PDO label (Espejal et al., 2007), consumer awareness and perception of labels (Verbeke et al., 2012; Chrysochou et al., 2012), consumer behaviour (Graham et al., 2012; Ni Mhurchu, 2018; Parrot et al., 2002), customer satisfaction (European Commission, 2013b), and the impact of labels on customer loyalty (Blaikie, 2003). However, food quality is typically defined in terms of "taste", and a "good product" is associated with a "proper production method", "natural/organic" and "freshness" (Velčovská, 2018). For most consumers, quality and safety are clearly related. Nowadays, consumers primarily expect their food to be safe, wholesome, tasty, and typical, i.e. linked to tradition and the land (Lazzaroni, et al., 2013; Popescu et al., 2011).

### 3 Materials and Methods

#### *Data collection*

The main research question is to define what influences utilization of food quality labels included in the European Union quality schemes in European countries. Secondary data from the Database of Origin and Registration (DOOR) were used. Data are available on the following link: <http://ec.europa.eu/agriculture/quality/door/list.html>. The electronic DOOR database includes a list of product names (agricultural products and foodstuffs) registered as PDO, PGI or TSG, as well as names for which registration has been applied. PDO and PGI also cover wine and spirits; however, there are different rules for those products (Regulation (EC) No 1234/2007 for wines, Regulation (EEC) No 1601/91 for aromatized wine products, and Regulation (EC) No 110/2008 for spirits) and they, along with other products covered by Regulation 1151/2012, are not included in the DOOR database (Fandos et al., 2006). Geographical indications protected in the European Community for wines originating in member states and third countries are registered in the E-BACCHUS database; geographical indications for spirits are listed in the E-SPIRIT-DRINKS database.

As an exclusion criteria for searching in the DOOR, only data regarding EU countries and data for already registered product names were used in the analysis, because it is possible to search for product names that are already registered or for which a registration was applied or published. In October 2018, the DOOR database included a total number of 1,514 items, but some of them are on a waiting list and it is uncertain whether they would be accepted (Espejal et al., 2008; Lucatelli, 1999). Therefore, in our analysis we have performed the calculations using the sample of registered items only, i.e. 1,356 items. We should note that the database includes not only European countries; China is also represented by 10 certified product names; Thailand has three PGI labels; and Vietnam, Colombia, and India each have one registered product name.

The data processing and statistical analysis use a methodology similar to that of the article by Velčovská and Sadílek (2014). The purpose of the analysis is to determine and explain the relationships between country of product origin and number of registered product names, as well as the share of PDO, PGI and TSG labels in EU countries. In the analysis, we proceeded with descriptive statistics and contingency tables, where we tested relationships using the chi-squared test.

### 4 Results

#### *Sample characteristics*

Research outcomes correspond with the date of 5<sup>th</sup> October 2018, when 1,356 product names certified with the PGI, PDO or TSG label were registered in the DOOR database. The sample structure is presented in Table 1.

**Table 1.**  
Sample Characteristics, (n = 1,356, in percent), first 90% of cases

| Type of Label | PGI   | 45.05 | Country        | Italy | 20.90  |
|---------------|---|-------|----------------|-------|--------|
|               |   | PDO   |                | 50.88 | France |
|               | TSG   | 3.98  | Spain          | 14.2  |        |
| Product Class | 1.6 Fruits. vegetables and cereals            | 27.3  | Portugal       | 10.0  |        |
|               | 1.3 Cheeses                                   | 17.3  | Greece         | 7.6   |        |
|               | 1.2 Meat products                             | 13.2  | Germany        | 6.5   |        |
|               | 1.1 Fresh meat                                | 11.4  | United Kingdom | 4.4   |        |
|               | 1.5 Oils and fats                             | 9.5   | Poland         | 2.7   |        |
|               | 2.4 Bread. pastry. cakes. other baker's wares | 5.5   | Czech Republic | 2.1   |        |
|               | 1.8 Other products of Annex I*                | 4.2   | Slovenia       | 1.6   |        |
|               | 1.4 Other products of animal origin**         | 3.3   | Other          | 12.8  |        |
|               | Other   | 9.25  |                |       |        |

\* Species, condiments, ciders, teas, etc.;

\*\* eggs, Honey, various milk products excluding butter etc.

In Table 1, the PDO label has the highest share, followed by the PGI label. The number of registered PGI (611, i.e. 45.05%) and PDO labels (691, i.e. 50.88%) is relatively balanced, with a slight predominance of PDO. There are only a few product names registered as TSG (54, i.e. 3.98%). Based on product class, most of the labels were awarded for fruits, vegetables and cereals. The most frequently certified product names come from Italy (284 product names registered as PGI, PDO or TSG, i.e. 20.94% from all registered product names), France (233 product names) and Spain (193 product names), the largest Mediterranean countries.

#### *Product names by country characteristics*

However, if we do a comparison by a country's population, geographic size, arable land and number of agricultural holdings, the order of countries is a bit different. In that case, the smallest countries in the European Union have the largest shares of registered product names in the DOOR database. We chose four metrics: Number of registered product names per million inhabitants, number of registered product names per 1,000 square kilometres of geographic size, number of registered products per 1,000 square kilometres of arable land, and number of registered product names per 1,000 agricultural holdings. This is presented in Table 2. According to the first three metrics, Luxembourg and Cyprus have the highest number of registered product names. For instance, Cyprus has 5.78 registered product names per one million inhabitants, which is almost 77 times more than Spain, 100 times more than Italy and 112 times more than France. Here, we can see that the number of registered products is quite relative, and smaller countries have more registered product names if it is recalculated. And if we calculate per 1,000 square kilometres of arable land, Cyprus has 356 times more registered product names than Spain, 270 times more than Italy and 149 times more than France. The number of registered product names per 1,000 agricultural holdings varies a bit, because the structure of agricultural companies is different in each country and is greatly influenced by historical developments and the country's culture. Therefore, Luxembourg dominates in this category (2.38 registered product names per 1,000 agricultural holdings), followed by Slovakia (0.21) and the Czech Republic (0.19 registered product names per 1,000 agricultural holdings). This difference is based on the relatively smaller number of large agricultural companies that are continuing in businesses started in the era of socialism, prior to 1989.

**Table 2.**

Product names registered in the DOOR database by a country's population, geographic size, arable land and number of agricultural holdings (n = 1,356, in percent)

|                | Total | Number of registered product names per million inhabitants | Number of registered product names per 1,000 sq km of geographic size | Number of registered product names per 1,000 sq km of arable land | Number of registered product names per 1,000 of agricultural holdings |
|----------------|-------|--|---|---|---|
| Luxemburg      | 4     | 8.3056   | 1.9335  | 7.8616  | 2.3810  |
| Cyprus         | 5     | 5.7870   | 0.5405  | 4.1459  | 0.1412  |
| Latvia         | 6     | 2.6028   | 0.0774  | 0.3949  | 0.0611  |
| Slovenia       | 25    | 2.4155   | 0.2466  | 2.5381  | 0.0691  |
| Lithuania      | 7     | 1.7902   | 0.0766  | 0.2163  | 0.0291  |
| Croatia        | 21    | 1.2180   | 0.0883  | 0.5048  | 0.0317  |
| Ireland        | 7     | 1.0294   | 0.0712  | 0.4619  | 0.0358  |
| Slovakia       | 19    | 0.9183   | 0.1020  | 0.3483  | 0.2119  |
| Finland        | 10    | 0.9055   | 0.0148  | 0.1998  | 0.0919  |
| Denmark        | 7     | 0.8612   | 0.1124  | 0.1966  | 0.1289  |
| Bulgaria       | 7     | 0.7092   | 0.0450  | 0.1416  | 0.0197  |
| Austria        | 16    | 0.5645   | 0.0596  | 0.3445  | 0.0356  |
| Hungary        | 15    | 0.5117   | 0.0537  | 0.1065  | 0.0102  |
| Sweden         | 8     | 0.4895   | 0.0111  | 0.1735  | 0.0744  |
| Portugal       | 139   | 0.4859   | 0.0546  | 0.2756  | 0.0189  |
| Czech Republic | 34    | 0.4705   | 0.0634  | 0.1509  | 0.1901  |
| Greece         | 107   | 0.4643   | 0.3790  | 0.1324  | 0.0070  |
| Belgium        | 19    | 0.4367   | 0.1639  | 0.5855  | 0.1323  |
| Netherlands    | 15    | 0.2893   | 0.1214  | 0.3893  | 0.0741  |
| Romania        | 5     | 0.2561   | 0.0210  | 0.0512  | 0.0014  |
| Poland         | 41    | 0.1301   | 0.0160  | 0.0426  | 0.0035  |
| Spain          | 196   | 0.1070   | 0.0100  | 0.0291  | 0.0052  |
| Italy          | 299   | 0.0828   | 0.0166  | 0.0528  | 0.0049  |
| United Kingdom | 72    | 0.0757   | 0.0201  | 0.0811  | 0.0270  |
| France         | 249   | 0.0742   | 0.0091  | 0.0221  | 0.0106  |
| Germany        | 91    | 0.0603   | 0.0140  | 0.0404  | 0.0175  |
| Total          | 1424  | 0.0035   | 0.0035  | 0.0035  | 0.0035  |

Source: (Eurostat 2018a, 2018b, 2018c)

The frequency of the PGI, PDO and TSG labels according to country is based on the list of all countries and product names registered in the DOOR database. For a ranking of all countries according to total number of product names registered as PGI, PDO and TSG, see Table 4. Fields with the highest number of product names registered under PGI, PDO and TSG are highlighted in grey. Because of this duplication, the sum of percentages for TSG is higher, and the total sum of percentages is higher than 100%.

Concerning the number of product names registered under the EU quality scheme in European countries, the 28 EU countries have the highest percentage of registered product names, accounting for 98.7%, 97.6% and 100% of the product names registered as PDO, PGI and TSG, respectively. Based on the share of product names registered as PDO, PGI and TSG in the DOOR database, the largest cluster is the Mediterranean countries (Italy, France, Spain, Portugal and Greece). These countries together account for 69.9% of registered product names in the database. One reason for these results is the high level of guidance and interaction; applicants are helped to complete the application and given the best chance of success (Albuquerque et al., 2018; Becker and Staus, 2008).

The second largest group is the Western European countries (Germany, United Kingdom, Benelux) and the third largest is the Central and Eastern European countries (Poland, Czech Republic, Slovenia). The Scandinavian countries account for a small number of registered product names in the DOOR database.

#### *The most common product classes*

Based on Table 3, the most common product class is 1.6 (fruits, vegetables and cereals), which is dominant in Italy, Spain and Greece. Italy, Portugal, France and Germany have the highest number of registered product names in class 1.2 (meat products), while France, Spain and Portugal dominate in class 1.1 (fresh meat), and Italy, Spain and France dominate in class 1.3 (cheeses). As we expected, the Czech Republic, Germany and Belgium excel in class 2.1 (beers).

**Table 3.**

The fifth most common product classes by product names registered in the DOOR database (n = 1,356, in percent)

| Country        | 1.1 Fresh meat | 1.2 Meat products | 1.3 Cheeses | 1.6 Fruits, vegetables and cereals | 2.1 Beer |
|----------------|----------------|-------------------|-------------|------------------------------------|----------|
| Italy          | 3.61           | 21.72             | 21.99       | 29.40                              | 0.00     |
| France         | 46.39          | 9.60              | 22.41       | 14.70                              | 0.00     |
| Spain          | 12.05          | 8.59              | 11.62       | 16.27                              | 0.00     |
| Portugal       | 18.67          | 20.71             | 4.98        | 7.35                               | 0.00     |
| Greece         | 1.20           | 0.00              | 8.71        | 11.81                              | 0.00     |
| Germany        | 3.01           | 9.09              | 3.73        | 6.04                               | 34.62    |
| Czech Republic | 0.00           | 2.53              | 1.24        | 0.79                               | 34.62    |
| Belgium        | 0.00           | 1.52              | 0.41        | 1.05                               | 19.23    |

To discover the dependency between country of origin and the most often registered product class, we proceeded with a chi-squared test at the significance level  $\alpha = 0.05$ , sig F = 0, and we can confirm that there are dependencies between the set variables (country of origin and the most often registered product class). In the next step, the degree of association was measured between the same variables using the Pearson contingency coefficient. Pearson C = 0.693, which means a strong positive dependence between country and the most often registered product class, i.e. each country has one important product class in which most domestic product names are registered. Like the analysis of label use according to country of origin, we found that most product types are registered in Italy, France and Spain. The most likely explanation is the importance of these national food products in the global marketplace, where products like olive oil, cheese, vegetables and fruits play an important role, and these countries have a strong tradition of using this type of quality label (Verbeke et al., 2012). Furthermore, this confirms findings of Albuquerque et al. (2018) that most geographical indications have been registered in France, Italy and Spain, on account of the robust institutional frameworks and the importance of product origins and terroir in those countries.

#### *PGI, PDO and TSG according to country*

In Table 4, 24 of 27 EU countries have registered their product names as PGI, PDO or TSG in the DOOR database. The first six countries ranked in Table 4 (i.e. 22% of all EU countries) obtained the PDO, PGI or TSG labels for 80% of the product names registered in the DOOR database (interestingly, the Pareto rule is shown here). The first three countries in the ranking, Italy, France and Spain, have more than 50% of all registered product names. Italy has the highest number of product names registered as PDO; France is first in the number of PGI labels. Interestingly, most TSG labels belong to countries in weaker positions in the overall ranking, i.e. Poland, Slovakia, Belgium and the Czech Republic.

To discover reciprocal dependences of the tracked characters, we proceeded with a chi-squared test at the significance level  $\alpha = 0.05$ , sig F = 0, and we can confirm that the variables depend reciprocally. The highest distribution of all labels is in Italy, France and Spain. This is influenced by well-known gastronomic specialities as well as the national cuisines of these countries, which have built on a long history and are popular around the world (Velčová and Sadílek, 2014). Overall, these countries have a greater impact on the global food marketplace compared to countries such as Luxembourg, Ireland and Lithuania, whose food products are not so popular in customers' minds, or Belgium, Poland and Norway, countries without a strong emphasis on using these quality labels in their agricultural and food quality policies (Verbeke et

al., 2012). Relationships in the sample are described by the Pearson contingency coefficient (0.520) and Cramer's contingency coefficient (0.430), and thus there is a weak dependence between the number of product names registered in the database and country of origin. This finding is also confirmed by previous research of Velčovská (2012) and Becker (2009) indicating that Southern European countries such as Italy and Spain are clearly PDO oriented, in contrast to the Northern and Eastern European countries, which are oriented more towards food quality assurance, and are catching up with respect to the PDO label.

**Table 4.**  
Number of product names registered as PGI, PDO and TSG according to country, (n = 1,356, in percent)

| Country           | PGI          | PDO          | TSG          | Total        |
|-------------------|--------------|--------------|--------------|--------------|
| 1. Italy          | 8.63         | 12.17        | 0.15         | <b>20.94</b> |
| 2. France         | 9.88         | 7.23         | 0.07         | <b>17.18</b> |
| 3. Spain          | 6.49         | 7.45         | 0.29         | <b>14.23</b> |
| 4. Portugal       | 5.24         | 4.72         | 0.07         | <b>10.03</b> |
| 5. Greece         | 2.06         | 5.53         | 0.00         | <b>7.60</b>  |
| 6. Germany        | 5.60         | 0.88         | 0.00         | <b>6.49</b>  |
| 7. United Kingdom | 2.43         | 1.77         | 0.22         | <b>4.42</b>  |
| 8. Poland         | 1.47         | 0.59         | 0.66         | <b>2.73</b>  |
| 9. Czech Republic | 1.70         | 0.44         | 0.35         | <b>2.14</b>  |
| 10. Slovenia      | 0.81         | 0.59         | 0.22         | <b>1.62</b>  |
| 11. Belgium       | 0.74         | 0.22         | 0.37         | <b>1.33</b>  |
| 12. Austria       | 0.44         | 0.66         | 0.07         | <b>1.18</b>  |
| 13. Hungary       | 0.52         | 0.44         | 0.07         | <b>1.03</b>  |
| 14. Netherlands   | 0.37         | 0.44         | 0.07         | <b>1.03</b>  |
| 15. Slovakia      | 0.74         | 0.07         | 0.22         | <b>1.03</b>  |
| 16. Finland       | 0.15         | 0.37         | 0.22         | <b>0.74</b>  |
| 17. Lithuania     | 0.29         | 0.07         | 0.15         | <b>0.52</b>  |
| 18. Sweden        | 0.22         | 0.15         | 0.15         | <b>0.52</b>  |
| 19. Bulgaria      | 0.15         | 0.00         | 0.29         | <b>0.44</b>  |
| 18. Denmark       | 0.44         | 0.00         | 0.00         | <b>0.44</b>  |
| 19. Ireland       | 0.29         | 0.07         | 0.00         | <b>0.37</b>  |
| 20. Latvia        | 0.07         | 0.07         | 0.22         | <b>0.37</b>  |
| 21. Cyprus        | 0.29         | 0.00         | 0.00         | <b>0.29</b>  |
| 22. Luxembourg    | 0.15         | 0.15         | 0.00         | <b>0.30</b>  |
| 24. Romania       | 0.15         | 0.07         | 0.00         | <b>0.22</b>  |
| Total             | <b>50.96</b> | <b>45.06</b> | <b>3.98*</b> | <b>100*</b>  |

\* The Czech Republic and Slovakia has registered four same product names as TSG.

In the last step of the analysis, EU countries were compared by number of product names registered in the individual product classes, in order to find out which product class is most typical in each country. Because of the excessive number of items in the DOOR database, we decided to focus only on countries that have registered more than 15 product names. This is the first ten countries mentioned in Table 4, which have registered 87% of items (1,180) as PGI, PDO or TSG (in October 2018).

## 5 Discussion

The aim of this paper was to analyse the share of PDO, PGI and TSG labels in EU countries, selected product categories and their structure, and explain the relationships between country of product origin and number of registered product names. In the literature, PDOS, PGIs and TSGs are usually modelled as a signal of high quality in a vertical differentiation context. In some countries, the importance of PDOS, PGIs and TSGs is very high. It is influenced mostly by factors such as climate and technology, culture, and tradition.



### *Climate and technology*

The highest number of registered products (in France, Italy, Spain, Portugal and Greece) is in countries with suitable soil, climate and natural conditions for the production of high-quality food products such as fruits, vegetables and cereals, cheese, wine, meat products, and olive oil. Climate factors are closely connected with technological factors, typically for registered cheeses. These might be explained by the more complex processing steps, which are strongly affected by the evolution of technology, and thus the need for adaptation, technological innovations or simply to react to customer needs (see Belletti et al., 2017; Bérard et al., 2016; Clark and Kerr, 2017). Furthermore, it also demonstrates that the concept of collective quality marks appears to be well known in Mediterranean countries, and the producers in general are well prepared for building up a consortium and registering their products (Becker et al., 2008). According to Grunert et al. (2016), this could also be a result of the higher levels of awareness in Southern Europe compared to other regions of Europe. This is also supported by robust institutional frameworks and the importance of product origins and terroir in those countries (Quiñones Ruiz et al., 2018; Allaire et al., 2011; Kireeva, 2011; Marie-Vivien et al., 2017). There is also a real impact on national economies because smaller producers of agricultural and food products can benefit from the well-established reputation of known, EU-wide quality labels and can manufacture products with added value that differ from their competitors. Furthermore, it can have a positive impact on regional development in the form of new jobs. Thus, an adaptive governance regulating the stability of material and information flows is needed to gauge the territorial identity of the product, prevent over-exploitation of local resources and ensure a fair distribution of the costs and benefits among involved stakeholders (Brunori et al., 2016).

### *Culture*

Culture and cultural ethnocentrism, which involve the translation of cultural and ethnic identity feelings into purchasing behaviour that favours national over foreign products, explains the distribution of quality labels in the Mediterranean countries (Resano et al., 2007; Shimp and Sharma, 1987). For Mediterranean cuisine, food quality and traditional gastronomy play an important role (Verbeke et al. 2012). In addition, North and South are divided by different policy approaches towards enhancing food quality. Whereas in Mediterranean countries the terroir concept is well-established and used extensively by agricultural producers, Northern European countries have instead focused on other food quality assurance schemes (FQASs) and organic production. Similar reasoning is put forward by Parrott et al. (2002) and Teuber (2011). They argue that the apparent differences between “Northern” and “Southern” European countries in terms of PDO/PGI-use result from notable differences in their food culture and agricultural systems. They characterize the “Northern” culture as functional and commodity-driven, whereas the “Southern” one is based on locality and artisanal production. This is also supported by our research findings. The number of registered product names in each country influences consumer interest in the origin of foods and in support for the local economy in food production (Lusk et al., 2006). Consumers might prefer products from certain regions or countries since they are believed to be simply better (more tasty, safer, healthier, more sustainable) (Dekhili et al., 2011), or products from their own region or country, because of loyalty and/or animosity towards others, or because of a related preference to support the local economy rather than remote or foreign economies. Food quality labels take advantage of consumer beliefs that the quality label signals better or superior quality, and the belief that the quality label signals a distinct product character (Verbeke et al., 2012). Establishing associations with the region of origin may be useful for the promotion and communication of typical products in the domestic market as well as in the export market. Moreover, cross-product communication campaigns can be a way to effectively manage regional images as a valuable resource. This requires that several food quality labels share the same values of their region of origin and that these values are symbolized by the same specific landmark.

### *Tradition*

A long tradition of quality schemes and traditional know-how for the production of food products is typical in leading countries such as France, Italy and Spain. They have a large share of wine and cheese that is sold under PGIs and PDOs. Furthermore, in Southern Europe customers are willing to pay more to acquire a good of a particular origin, but in Northern Europe quality is associated primarily with a set of rules on safety, integrity, or conformity to industrial processes, and there is no need to support the traditional know-how of certain geographical origins (Lucatelli, 1999).

### *Limitations of the study*

Further investigations should address consumer preferences, knowledge and attitudes, especially in areas with a lower number of registered product names, such as Northern Europe or Eastern Europe. Moreover, the investigation and registration of product names should be encouraged among all EU countries to allow the maintenance of important elements of the history, culture and heritage of local areas, regions and

countries. It is primarily different consumer cultures that influence the number of registered labels in different countries (Mediterranean countries versus Northern Europe). Aside from the theoretical and practical contributions of the study, there are some limitations. The sample size of product names from the DOOR database is related to 5<sup>th</sup> October, 2018 but the number of PGI, PDO and TSG labels registered in the DOOR database is continuously increasing, and the distribution of the labels between countries may change slightly. The numbers of registered products are quite relative, and smaller countries have more registered product names if it is recalculated. Further, we used only basic statistical methods in the study, and in future, it would be better to investigate how the number of certified product names is changing over time.

#### *Practical implications*

To local food producers, the findings provide a deeper insight into the EU market for food certified by the PDO, PGI and TSG labels. They could stimulate their efforts toward product certification. The PDO, PGI and TSG schemes bring benefits to consumers as well as producers, because consumers are buying a product with specific value-added qualities. Findings of this study can be used by traditional food producers in order to better understand consumers' motives and adapt their marketing strategies accordingly. The recommendation for producers should be to implement their marketing strategies and clearly label products, because effective marketing communication systems play a very important role in this context. Marketing strategies should cover promotion of EU food quality labels, which help to increase consumer satisfaction (affective evaluation) and support differential characteristics that provide sensory factors like shape, colour, taste and smell. All these factors improve the added value of EU food quality labels, which results in higher behavioural and attitudinal consumer loyalty. In fact, consumer attitudes to these kinds of products will increase the intention to repurchase. It is also important to communicate these quality labels with an emphasis on place and country of origin, culture, tradition, environmental factors and so on, in order to achieve higher product acceptance and market success. On the one hand, it would be easier to achieve greater levels of differentiation and foster higher levels of satisfaction, loyalty and consumer buying intention (Espejal, 2008). On the other hand, according to Grunert and Achmann (2016), the role of EU quality labels in consumer decision-making is still relatively low. Similarly, sustainability labels in European Union (Fair Trade, Rainforest Alliance, Carbon Footprint, and Animal Welfare) currently do not play a major role in consumers' food choices (Grunert et al., 2014). Samant and Seo (2016) demonstrated that the effects of sustainability-related label claims on quality perception became significantly more pronounced when consumers understood and trusted the label claims (Bryla, 2017).

## **6 Conclusion**

The presented paper deals with an analysis of EU quality label schemes known as PDO, PGI and TSG, which are used in the agricultural and food products sector. Data from the DOOR database and statistical methods were used for obtaining outcomes. The main contribution of the paper is a comprehensive view on the topic, a comparison of summarized data according to selected criteria including country of origin, type of label and product class, and statistical testing of the relationships between number of registered labels and the mentioned criteria. As the results show, the highest number of product names is registered under the PDO label, closely followed by the PGI label. There are only a few product names registered as TSG. The dominant country is Italy, followed by other Mediterranean countries such as France, Spain, Portugal, and Greece. The reason for this could be the long history of regional and traditional specialties in these countries and the greater importance of these products (such as olive oil, cheese, and vegetable products) on the global marketplace (Sadílek, 2016). Based on product class, the most common classes are fruits, vegetables and cereals (for PGI, PDO), cheeses (PDO) and meat products (TSG, PGI) because these product classes are very typical for countries with the highest share of product names in the DOOR database. Different product classes dominate in various countries, but the most frequent classes are fruits, vegetables and cereals (Italy, Spain, Greece and Poland) along with meat products (Portugal and Slovenia), consistent with previous results. Beer is the most typical product class in the Czech Republic. Statistical testing confirmed a weak dependence between number of product names registered as PDO, PGI and TSG and country of origin, a moderate dependence between type of label and product classes where the label is used, and a strong dependence between country of origin and the most often registered product class.

Original and traditional agricultural and food products can be perceived as an important part of the tradition and image of a region. The PDO, PGI and TSG schemes bring benefits to consumers as well as producers. Consumers are assured they are buying a genuine product with specific value-adding qualities.

Producers benefit through fair competition, protection, and promotion of their products. To take full advantage of these benefits, producers should communicate their products with the value-adding attributes and highlight the specific character of their products to consumers, enabling them to make more informed purchases and the best possible choices. This can increase the marketing usefulness of these quality schemes to food producers for promoting food quality to consumers. The aim of the communication campaign should be to build awareness, credibility and favourable perceptions about the quality and distinctiveness of PDO, PGI and TSG products, and to stimulate consumer interest in such products.

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