

An Empirical Investigation in the Relationship Between PDOs/PGIs and Trademarks

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Abstract This paper examines empirically the relationship between geographical indications and trademarks. While protection via geographical indications (GIs) requires collective investment in time and money by different stakeholders, trademarks can be applied and used by single entities such as individuals and firms. Their interplay however has only been recently examined in the theoretical literature. We analyze trademark registrations within the domestic market, European market, and the US market. This type of analysis provides an additional insight as protected denomination of origin (PDOs)/protected geographic indication (PGIs) regime is not recognized across all markets. We find positive, though small, correlations between PDOs/PGIs and trademarks regardless of the trademarks' jurisdiction. While a positive relationship is encouraging in terms of policy, the small coefficients warrant attention as to how strong is the relationship between GIs and private investments in product differentiation.

Keywords Trademarks · PDOs/PGIs · Domestic market · OHIM · USPTO

JEL Classification O34 · O38

Introduction

Geographical indications (GIs) are a type of intellectual property (IP) available to agricultural and food products used to differentiate them based on the region they are

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produced. While there have been various definitions of GIs, the one most commonly implied in policy and scholarly discussions is by the World Trade Organization's (WTO) Trade-Related Intellectual Property Rights (TRIPS) agreement which defines them as "indications which identify a good as originating in the territory of a Member, or a region or locality in that territory, where a given quality, reputation or other characteristic of the good is essentially attributable to its geographical origin."

For the purposes of our paper, we focus here on products with either protected denomination of origin (PDOs) or protected geographic indication (PGIs). The difference between the two is the strength. For PGIs, one or some of the production stages of the product need to occur in a certain region; conversely, for PDOs, all production stages need to occur in that certain region. Hereafter, we will jointly refer to them as PDOs/PGIs unless otherwise stated.

The other major types of IP where producers have available in protecting their brands are trademarks. A trademark need not be just a word text. Specifically, a trademark can be "a word, phrase, symbol, design, color, smell, sound, or combination thereof that identifies and distinguishes one's goods and services from those of others." Graham et al. (2013).

There are two key differences between trademarks and PDOs/PGIs. First, for an entity to claim a trademark name, it does not need to show any minimum quality levels or attach meaning to the trademark name. Conversely, in the case of PDOs/PGIs, the applicant needs to show that the product is linked to a specific geographical region. Therefore, the investment to claim a PDO or a PGI is significantly greater than filing for a trademark.¹ Second, a trademark is usually applied by an individual or an entity; subsequently, that entity has the rights to the trademark, and therefore, the option to exclude anyone it wishes. Usually, the trademark owner will be the sole user or in certain occasions can license the use of the trademark. On the other hand, applications for PDOs/PGIs are usually a collective effort by groups of farmers with the frequent participation of public institutions such as municipalities. Once a PDO/PGI is granted, all producers within the region can produce the good as long as they satisfy the quality standards. Therefore, while a trademark has the nature of a private good, a PDO/PGI has the notion of a club good (Josling 2006).

These two types of IP are the main tools available to farmers, producers, and firms to protect and market their agrifood products. However, given their significant differences, to date, there has not been an attempt to empirically examine their relationship. Specifically, at a first stage, it is important to examine whether they depict a positive or negative correlation. If they depict a positive correlation, then this is a first indication that collective investment in product differentiation (PDOs/PGIs) is associated positively with private investment (trademarks). Conversely, if their correlation is negative, then this could imply that these two types of investment move toward opposite directions.

In this paper, we provide empirical insights in the relationship between trademarks and PDOs/PGIs. We not only examine trademark registrations in the home country but also in jurisdictions outside the home country where GIs are recognized and in the USA

¹ Further, it can be the case that a PDO/PGI could take time in getting awarded as there might be conflict between parties that can legally produce the product and parties that cannot. For an interesting case study, see Rippon (2013).

where GIs are not. Specifically, we examine trademarks in three jurisdictions: the home country, the Office for Harmonization of Internal Markets (OHIM) which covers all European Union (EU) countries, and the United States Patent and Trademark Office (USPTO) which PDOs/PGIs are not recognized. Examining trademark activity beyond the country's borders is crucial, as studies have stressed the importance of exports in GI-related products (Defrancesco et al. 2012).

We gather data from two main sources: the European Commission for data on PDOs/PGIs and the IP Statistics Data Center of the World Intellectual Property Organization for trademarks. An important step in the analysis was to match those trademark classes that correspond to the PDO/PGI product categories. We discuss in detail in “[Data Construction](#)” section how the matching procedure took place.

We find that 13 European countries account for approximately 92 % of all PDOs/PGIs. By focusing on these countries, we show that the relationship between trademarks and PDOs/PGIs is positive and significant regardless of the jurisdiction that we are focused on. Specifically, we find that the correlation between trademarks in the domestic market, by domestic entities is positively correlated with PDOs/PGIs. A similar magnitude and significance holds when we examine trademarks at the OHIM and at the USPTO where in the latter PDOs/PGIs are not recognized. These results imply that private investment in branding, approximated by trademarks, and collective investment in quality attributes, approximated by PDOs/PGIs, to be associated positively.

While our results provide encouraging insights with respect to policy, they should still be interpreted cautiously. The positive relationship that we find between PDOs/PGIs is rather small and indicates that any response of trademarks due to collective investments in branding/marketing efforts is rather limited. Hence, future policy steps should take this into account and be more directed in linking collective investments with private incentives to further invest in marketing/branding activities.

Right from the outset, we should stress that our analysis should not be viewed through a causal lens. Establishing causality between PDO/PGI and trademarks would require more detailed data both at the product level and the timing when each trademark and PDO/PGI is registered. One then could be able to estimate to what extent trademarks filed by firms and farmers increase after the registration of a related PDO/PGI.² Therefore, in this paper, we merely examine how these two types of IP are associated and not whether and how the one causes the other.

The next section discusses the literature and frames our question. “[Data Construction](#)” section presents in detail the data construction. “[Summary Statistics](#)” section presents summary statistics and descriptive findings. The following section outlines the results from the regression analysis. Before the paper concludes, we discuss policy implications.

Literature Review

In 2010, agrifood products that were protected under GIs had sales within the European Union countries of €54.3 billion (Chever et al. 2012). This constitutes a 5.7 % of

² We would like to thank an anonymous referee for this comment.

overall sales in the food and drink sector as the total was estimated at €956 billion. While this is not a big share, a number of studies have stressed the importance of PDOs/PGIs as a tool to provide sustainability in rural areas through an increase in product differentiation (Belletti et al. 2015; Biénabe and Marie-Vivien 2015).

However, even though the underlying assumption that a PDO/PGI label will provide higher perceived quality to consumers is often in support of this type of IP, the literature on the consumers' willingness to pay (WTP) for PDOs/PGIs is rather mixed. Bonnet and Simion (2001) did not find any significant WTP for French Camember cheese in the French national market. Fotopoulos and Krystallis (2003) similarly did not find significant WTP for PDO apples in Greece. Conversely, Galli et al. (2011) found significant positive WTP for PDO cheeses in Italy. For a comprehensive meta-analysis of the WTP of PDOs/PGIs see Deselnicu et al. (2013).

A major policy issue that has risen with PDO/PGI is whether they provide incentives to agrifood stakeholders (farmers, cooperatives, firms) to further invest in branding/marketing activities. Finding marketing/branding activity in bulk is a daunting task. However, trademarks can readily provide us with insights on whether agrifood actors actually invest in such activities.

Trademarks have been found to be positively correlated with a firm's market value (Sandner and Block 2011); further, Block et al. (2014) showed that they provide a positive sign for venture capital valuation. These studies indicate that trademarks can be valuable intangible assets when associated with a particular product.

To date, the interaction between PDO/PGI and trademarks has only been theoretically examined. Kireeva (2009) discusses international aspects of both GIs and trademarks and publicized cases where the two collided in the court. Menapace and Moschini (2011) examine in a theoretical model these two types of IP. They find that GIs have an additional positive consumer welfare effect and that in certain cases they can function as complements.³ On the other hand, Costanigro et al. (2012) show that trademarks and GIs can function as substitutes in cases where producers have already incurred private investment and a quality signal through trademarks.

The goal of this study is to examine empirically the relationship between PDO/PGI and trademarks. On the one hand, the first depicts a collective investment in branding and marketing activities of the agrifood product. On the other, trademarks indicate private investments in such activities. We provide insights whether these two types have a positive or negative relationship. From a policy perspective, it is important to have an estimate whether private investment is positively associated with public investment in marketing/branding activities.

Before concluding this section, it is interesting to discuss how our study relates to the literature on research and development (R&D) investments. There is a large literature that examines whether public and private investment in R&D is positively or negatively associated (see David et al. 2000 and the references therein). On the one hand, public investment in R&D could motivate private firms to engage in R&D in fields where early investments, undertaken by the government, cannot be appropriated. On the other hand, public R&D could crowd out private investment in R&D. Both

³ In their follow-up study, (Menapace and Moschini 2014) they provide additional insight with respect to welfare effects and the strength of GIs.

R&D and marketing are ways where firms can add value to their supply chain; thus, the interplay between public and private investments is an important policy issue.

Data Construction

Our primary task was to collect data on (i) PDOs/PGIs and (ii) trademarks. Such data were collected from different data sources. First, we acquired information on how many PDOs/PGIs each country registers annually. This information was extracted from the European Commission's website Database of Origin and Registration.⁴ As of 2012, there have been 1076 PDOs and PGIs registered.⁵ Countries that recognize the PDO/PGI regime can also file for such indications even if they are outside Europe. However, the bulk of PDOs/PGIs has been filed and eventually registered by European countries. Figure 1 shows the map of Europe and how many PDOs/PGIs each country has registered though 2012.

As can be seen, most of these geographic indications have been filed by a small number of countries. Specifically, the Mediterranean countries have the highest frequency for PDOs/PGIs, probably as a result of extensive promotion campaigns organized by governmental agencies in these countries.⁶ Countries such as Germany and UK have significant presence. As the majority of PDOs/PGIs is held by a small number of countries, we focus on 13 European countries that cumulatively account for 92 % of total PDOs/PGIs. Table 1 shows in detail which countries we are focused on.

Second, we collected trademark flows from World Intellectual Property Organization (WIPO) IP Statistics Data Center.⁷ Specifically, we collected how many trademarks each country registered annually in a specific jurisdiction. Specifically, we are interested in three jurisdictions: the home country, OHIM, and USPTO. With respect to the home country, the interest is whether PDO/PGI is positively (or negatively) associated with domestic investment in branding and marketing efforts captured by domestic trademark registrations. Second, the OHIM office is of special interest as a registered trademark, there is enforceable to all EU countries; for this reason a trademark registered at OHIM is also called a community trademark. This type of trademark can provide insights of the marketing/branding activities of agrifood actors in the EU market. Countries in the EU however all recognize PDOs/PGIs. Therefore, we are interested in examining trademark behavior in a market that is significant enough for European countries but does not recognize PDOs/PGIs. The ideal candidate is naturally the USA. Therefore, the third office of interest is the USPTO.

The most important challenge was to match trademark data with PDO/PGI data. With respect to PDOs/PGIs, this regime is virtually eligible to all agricultural products and foodstuffs except wines.⁸ Table 2 shows the full picture of PDO/PGI products by

⁴ <http://ec.europa.eu/agriculture/quality/door/list.html>

⁵ We should note that there is one more type of geographic indication for these agrifood products. It is called traditional specialties guaranteed (TSG). There have been 38 TSGs registered. Since they are relatively small in number, we do not examine them.

⁶ The authors would like to thank one an anonymous reviewer for bringing this to their attention.

⁷ <http://ipstats.wipo.int/ipstatv2/index.htm?tab=trademark>

⁸ Wines have their own GI regimes, which can also vary by country. For more, see Skuras and Vakrou (2002) and the references therein.

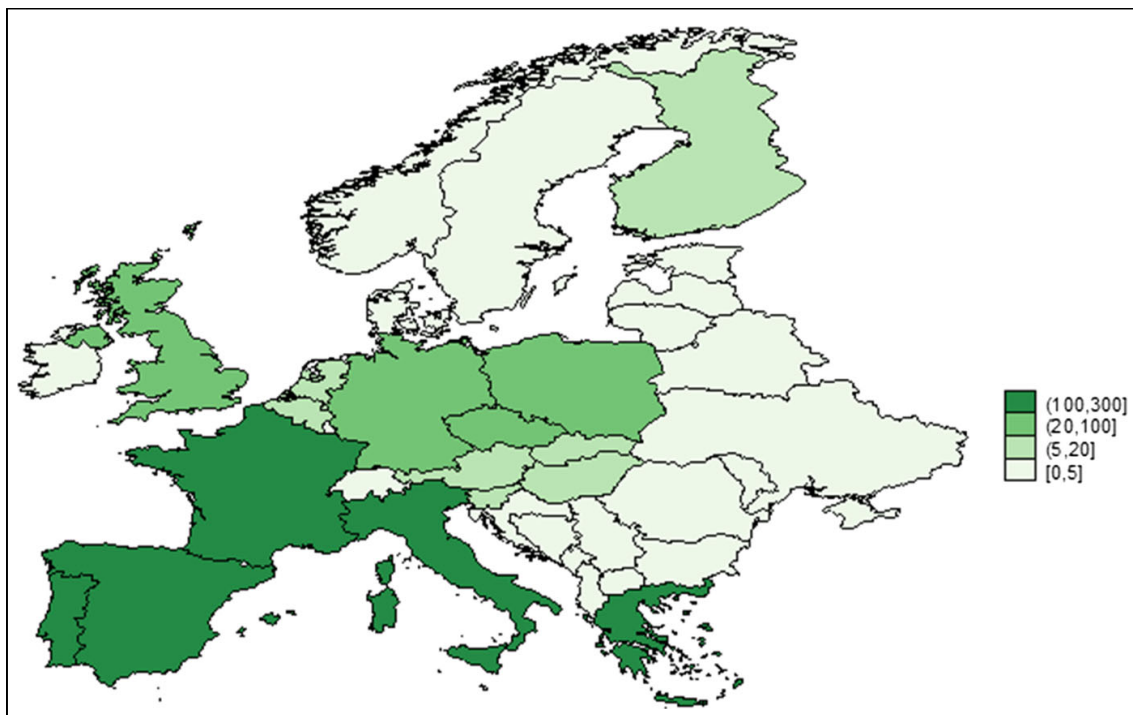


Fig. 1 Number of PDOs/PGIs by European country (1996–2012)

product category. As can be seen the overwhelming majority of PDOs/PGIs is located in just a handful of product categories. Specifically, the most frequent categories are fruits and vegetables, cheeses (fresh and processed), meat products, and oils. Specifically, 92.5 % of all PDOs/PGIs in these 13 countries are located in class 1.

On the other hand, when an entity files for a trademark, it needs to specify for which classes it needs the protection. The trademark class taxonomy most commonly used is

Table 1 Frequency of PDOs/PGIs and trademarks by country

Country	# of PDOs/PGIs	# of trademarks at USPTO	# of trademarks at OHIM	# of trademarks at home country
Austria	14	151	1878	–
Czech Republic	11	14	434	9667
Germany	46	1414	11,773	55,299
Spain	146	646	6253	25,980
Finland	4	58	597	2626
France	185	1113	4696	–
Greece	93	102	677	–
Hungary	11	14	269	3373
Italy	239	1649	7771	–
Netherlands	8	521	2056	–
Portugal	117	70	863	9725
Slovakia	6	2	101	3205
UK	40	1208	5083	–

Table 2 Frequency of PDOs/PGIs by product category

Product Category	Frequency	Percent (%)
Class 1.1. Fresh meat (and offal)	126	12.7
Class 1.2. Meat products (cooked, salted, smoked, etc.)	117	11.8
Class 1.3. Cheeses	191	19.2
Class 1.4. Other products of animal origin (eggs, honey, various dairy products except butter, etc.)	25	2.5
Class 1.5. Oils and fats (butter, margarine, oil, etc.)	113	11.4
Class 1.6. Fruit, vegetables and cereals fresh or processed	285	28.7
Class 1.7. Fresh fish, molluscs, and crustaceans and products derived therefrom	25	2.5
Class 1.8. Other products of Annex I of the Treaty (spices etc.)	38	3.8
Class 2.1. Beers	20	2.0
Class 2.4. Bread, pastry, cakes, confectionery, biscuits and other baker's wares	40	4.0
Class 2.5. Natural gums and resins	2	0.2
Class 2.6. Mustard paste	2	0.2
Class 2.7. Pasta	4	0.4
Class 3.1. Hay	1	0.1
Class 3.2. Essential oils	3	0.3
Class 3.5. Flowers and ornamental plants	1	0.1
Class 3.6. Wool	1	0.1

the NICE classification per the Nice Agreement of 1957.⁹ Overall, there are 45 NICE classifications, 34 in goods and 11 in services. In total, only NICE classifications 29 through 33 relate to food products. After a cursory review of both the PDO/PGI product categories and the trademark NICE classes, we consider only the trademark NICE classes 29 and 30.¹⁰ Further, to be consistent with the PDOs/PGIs classification, we only include class 1. We should note even after focusing on the 13 most active countries in terms of PDOs/PGIs and just on product category 1, we still account for 85.5 % of all registered PDOs/PGIs.

A significant drawback is that WIPO distinguishes trademark flows by NICE classes after 2004. Therefore, our effective time period of joint analysis of trademarks and PDOs/PGIs is the time period 2005–2012. A final drawback was that a number of countries in the sample, WIPO did not have full information for the entire period. In other words, for six out of 13 countries, we cannot know how many trademarks they had been registering within the home countries. Hence, our analysis of PDOs/PGIs and home-registered trademarks takes place for the seven countries which we have full data.

Finally, we collected GDP per capita information from the World Bank.¹¹

⁹ For more, see <http://www.wipo.int/classifications/nice/en/>.

¹⁰ Class 29 refers to “Meat, fish, poultry and game; meat extracts; preserved, dried and cooked fruits and vegetables; jellies, jams, compotes; eggs, milk and milk products; edible oils and fats” and Class 30 to “Coffee, tea, cocoa, sugar, rice, tapioca, sago, artificial coffee; flour and preparations coffee, tea, cocoa, sugar, rice, tapioca, sago, artificial coffee; flour and preparations powder; salt, mustard; vinegar, sauces (condiments); spices; ice” according to WIPO website (see previous footnote).

¹¹ <http://data.worldbank.org/>

Summary Statistics

The frequency of the four variables of interest by country is displayed in Table 1. The number of PDOs/PGIs is counted as the number of PDOs/PGIs that has been registered through 2012. The number of trademarks is counted as the number of registered trademarks in each jurisdiction for the years 2005–2012. The frequency of PDOs/PGIs by country mirrors the findings of Fig. 1. As for certain countries, data are incomplete for the domestic office; the information for the case of domestic trademarks is displayed as missing.

From this table, there are three simple, but noteworthy, findings. First of all, the number of trademarks regardless of the jurisdiction is always greater than the number of PDOs/PGIs except in the case of USPTO for Portugal and Slovakia. This comparison mirrors the fact that only 5.7 % of agrifood sales are covered by PDOs/PGIs (Chever et al. 2012). Therefore, a lot more agrifood products seek for brand protection via trademarks, a much simpler and less costly way to acquire IP.

Second, in all the cases where there is available information for domestic trademarks, these exceed both the trademarks registered at OHIM and USPTO. Further, trademarks registered at OHIM always exceed trademarks at USPTO. These comparisons are to be expected as domestic firms, and individuals are more likely to claim trademarks first within their own country, next to the closest to them market, that is the European one, and finally to more distant markets such as the USA.

Third, while certain Mediterranean countries, such as France and Italy have strong presence in both the USPTO and OHIM; Greece has less in both while Spain has strong in OHIM but much smaller in USPTO. Conversely, Germany and UK which have significantly less PDOs/PGIs have very strong presence in both OHIM and USPTO.

These three simple findings show that European countries are active in branding their agrifood products both within their own countries, the European, and the US market.

Regression Analysis

Since our primary objective is the relationship between PDOs/PGIs and trademarks, we first examine their correlations in Table 3. The correlation coefficients in all cases are positive and significant indicating that trademarks and PDOs/PGIs are associated positively.

To further explore this positive relationship, we perform a regression analysis to also take into account the time dimension and the relative wealth of each country. Our model is the following:

$$\text{Trademarks}_{i,t} = \beta_0 + \beta_1 \text{PDO_PGI}_{i,t} + \beta_2 \text{GDPPerCapita}_{i,t} + \gamma \text{YearDummy}_t + \varepsilon_i$$

where $\text{Trademarks}_{i,t}$ is the number of trademarks that have been registered by country i at year t . We consider separately trademarks in the home country, OHIM and USPTO, respectively. $\text{PDO_PGI}_{i,t}$ is the number of PDOs/PGIs that have been registered from 1996 through year t from country i . YearDummy_t is a set of year dummies covering the

Table 3 Regression analysis. Regression analysis between PDOs/PGIs and trademarks

Variables	(1) Home trademarks	(2) OHIM trademarks	(3) USPTO trademarks
PDOs/PGIs	0.00681*** (0.00183)	0.00888*** (0.00148)	0.0134*** (0.00133)
GDPPerCapita	6.64e-05*** (1.25e-05)	0.000119*** (1.10e-05)	0.000149*** (9.58e-06)
Constant	5.340*** (0.288)	2.206*** (0.312)	-2.037*** (0.340)
Observations	56	104	104

Notes: All regressions are estimated via negative binomial. Column 1 considers trademarks in the home country. Column 2 considers trademarks registered at OHIM. Column 3 considers trademarks registered at USPTO. Heteroskedastically robust standard errors are reported in parentheses. *, **, and *** indicate statistical significance at the 10, 5, and 1 % levels, respectively

years 2005 through 2012. Finally, $GDPPerCapita_{i,t}$ is the GDP per capita of country i at year t . The above simple regression model can provide us with information regarding whether PDOs/PGIs are positively associated with trademarks after we have controlled for country and time dimensions.

Since trademarks are a count variable, the most appropriate technique is not ordinary least squares but rather negative binomial or poisson (Cameron and Trivedi 2013). Here, we estimate the model via negative binomial.¹² Results are displayed in Table 3. Column 1 considers trademarks registered in home country, column 2 in OHIM, and column 3 in USPTO. The coefficients from a negative binomial regression should be interpreted after they have been exponentiated. For instance, in the case of column 1, a 100 % in PDOs/PGIs will result in $\text{Exp}(0.00681)^{-1} = 0.5$ % increase in trademarks registered in home country. Therefore, while in all jurisdictions trademarks and PDOs/PGIs have a statistically significant association, the absolute magnitude of this association is rather small.

Policy Discussion

The above regression findings provide us with an interesting insight. The small in magnitude coefficient mirrors the fact that only a small portion of agrifood products are protected via PDOs/PGIs. Therefore, even significant changes in the number of PDOs/PGIs will not be associated with sizeable changes in trademark activity. However, the statistical significance implies that these two types of IP do have a strong relationship for the subset of products that are covered by PDOs/PGIs. This simple finding indicates that collective investments in branding/marketing activity are positively correlated with private investment in such activities. This is important with respect to policy as it shows that the institution of PDO/PGI interacts positively with private efforts to enhance agrifood products' perceived quality.

¹² Results from Poisson estimation are qualitatively similar and available upon request.

While this is an encouraging finding, we should also note that the coefficients are small in magnitude and that in absolute numbers the trademarks filed in foreign markets (OHIM and USPTO) are small. Therefore, while there could be a positive response of private investment in such collective efforts, this is small in magnitude. Future policy steps therefore should also take into account how they can maximize private investment in marketing efforts when they consider refinement of PDO/PGI or further support for product differentiation. In other words, policy initiatives should attempt to link collective investments with private incentives to invest.

Conclusion

PDOs/PGIs have been a central issue of policy discussions in the agrifood sector. The main argument in favor of PDOs/PGIs is that they can provide agrifood products with a quality attribute which can be signaled effectively to consumers. The other type of IP which is most frequently used to protect a brand name is trademarks. While there are notable differences between these two types of IP, only recently, the theoretical literature has examined the interplay of these two most important types of IP for agrifood product differentiation.

In this paper, we examine the association between PDOs/PGIs and trademarks registered in three different jurisdictions; namely, the home country, the OHIM, and the USPTO. Each jurisdiction provides valuable insights in the relationship between PDOs/PGIs and trademarks. Trademarks in home country yield the intensity of branding in the local market; trademarks in OHIM show intensity in the European market which is significant and recognizes PDOs/PGIs. Further, trademarks in USPTO examine the branding activity when PDOs/PGIs are not recognized.

Our results show for the 13 European countries, most active in PDOs/PGIs that regardless of jurisdiction, trademarks, and PDOs/PGIs are positively and significantly associated. This result implies that collective investment in product differentiation, approximated by PDOs/PGIs, is associated positively with private investment approximated by trademarks.¹³ While this is an encouraging finding, it should be interpreted with caution as the relationship is small in magnitude, and more research is warranted at a finer level of disaggregation. Finally, these first empirical results point that there is an underlying relation between trademarks and PDO/PGI which are both employed for product differentiation, and therefore, future policies in the agrifood sector should take it in consideration.

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¹³ This result is in line with a related literature on the positive association between public and private association in R&D (David et al. 2000).

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