# Protection of geographical indications in trade agreements: is it worth it?

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## Highlights

- We rely on a unique dataset of firms and products concerned by Geographical Indications (GIs) in the French agri-food industry (excluding wine) for 2012-2019 to assess the impact of the inclusion of GIs in European bilateral agreements on trade margins.
- Protection of geographical indications in EU Regional Trade Agreements helps French firms to reach new markets and to sell their products at higher price.
- To be effective, the recognition of GIs in trade agreements must be accompanied by monitoring and control by partner authorities in their markets.

## Abstract

This paper estimates the impact of the inclusion of GIs in bilateral agreements on French exports of foodstuffs. We rely on a unique dataset of firms and products concerned by Geographical Indications (GIs) in the French agri-food industry (excluding wine) for 2012-2019, merged with firm-product-destination level data from French Customs and the French National Institute of Statistics. Controlling for market and firm characteristics, we compare the exports of GI firms with those of non-GI firms before and after the signing of the 13 agreements (25 destination countries) that include a list of GIs to be protected. We show that the protection of GIs in EU RTA helps French firms to reach new markets and to sell their products at higher price, but it depends on the level of protection provided by the agreement.



## Keywords

Geographical Indications, Regional Trade Agreements, Trade Margins.

## JEL

F10, F14.



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# 1 Introduction

A geographical indication (GI) is a sign used to identify a product whose quality, reputation or other characteristics are linked to its geographical origin. The purpose of using GIs for agricultural and food products is manifold (Menapace and Moschini, 2014). First and foremost, it aims to inform consumers about product attributes and to prevent misuse and counterfeiting. Second, it protects producers against the entry of low quality competitors and the erosion of the reputation of product names. Thirdly, it promotes the competitiveness of agri-food chains by enhancing product differentiation and increasing added value for producers. Finally, it aims to preserve traditional culture and rural livelihoods in producing countries.

While many countries now use geographical indications to promote their food products, the European Union is one of the most extensive users of this system, with over 3,500 products protected by a GI. Reinforced by the European quality package in 2010, the EU GI system has long been a contentious issue in European trade relationships, particularly with the United States, Canada and Australia. These tensions stem from significant differences between the approaches of the EU and these countries, as described by Josling (2006) in his paper "War on *Terroir*". While the European Union favors a *sui generis* system to protect products based on their geographical origin, the United States supports trademark laws. GIs differ from trademarks in several respects. They do not apply to a particular firm, but to a group of producers. They allow new producers to enter the market, provided they comply with the product's specifications. This makes them more accessible to small, traditional producers for whom the trademark system would be too costly. They protect not only names of origin, but also their modifiers or translations (such as Parmesan for Parmigiano Reggiano). Finally, above all, they are defined, controlled and protected by public agencies. These fundamental differences lead countries that rely on trademarks to view the European GI system as discriminatory and as an unfair non-tariff measure, or as an unfair means of promoting exports. As a consequence, different complaints have been raised at the WTO Dispute Settlement Body on this subject, by the US in 1999 and by Australia in 2003. In 2005, these disputes led the EU to allow foreign producers to apply for GI registration on the EU market (Marette et al., 2008).

While GIs for wines and spirits are well protected under the WTO [1], this is not the case for other food products, for which the protection defined in Article 22 is much more limited. It is weakly prescriptive and compatible with both trademark and GI systems. As a result, European

[1] Article 23 of the TRIPs Agreement largely prevents these products from being usurped or counterfeited

geographical indications are only protected against foreign and domestic counterfeiting on the EU market, but not on third markets.

The difficulty of reaching an agreement on the protection of GIs within the multilateral framework leads the European Union to promote GIs in its bilateral negotiations since 2010. This has led to the inclusion of lists of protected GIs in all trade agreements recently signed by the EU, such as EU-Korea (2012), EU-South Africa (2017), EU-Canada (2018) or EU-Japan (2019). Geographical indications defined in these lists are protected against misuse in partner markets. However, there are certain exceptions, such as trademarks registered prior to the signing of the agreement.

Given the sensitivity of the GI issue in trade negotiations, the inclusion of GIs in trade agreements represents a non-negligible negotiating cost for the EU, which has to make concessions in return. In this context, the real benefits of including these GI lists in bilateral agreements should be questioned. Does it really allow European GI food exporters to improve their position in partner markets? Does it have an impact on the volume or price of exported products or on the number of exporting firms?

This paper estimates the impact of GI protection under recent EU bilateral agreements on French food exports. To do so, we use a unique dataset of GI firms and products in the French agri-food industry (excluding wine) for 2012-2019, merged with firm-product-destination-level data from French customs and the French National Institute of Statistics. We rely on the difference between GI and non-GI firms in a given market to examine both the impact of the agreements on firms' likelihood to export (the extensive margin of trade), their quantity exported (the intensive margin), and their price.

This paper contributes to the literature on the impact of Geographical Indications on international trade. As shown in the meta-analysis of De Filippis et al. (2022), the impact of GIs on trade is heterogeneous, depending on both the sectors and the types of approaches used. However, whether in qualitative analyses such as Calboli and Ng-Loy (2017) or in econometric ex-post assessments such as Raimondi et al. (2020) or Duvaleix et al. (2021), the impact of GIs on trade flows is found to be positive overall. It appears more pronounced in destination using GIs *sui generi* systems (Sorgho and Larue, 2014).

A more specific literature on GIs and trade focuses on the inclusion of GIs in trade agreements. Huysmans (2022) assesses the likelihood of a product being covered by recent European trade agreements and shows that EU trade agreements are more likely to protect GIs with high sales values and from countries in southern Europe. Curzi and Huysmans (2022) estimate the impact

of GI protection within European regional trade agreements (RTAs) on the exports of European countries. Using export data on cheese, they find that the inclusion of GIs in RTAs does not lead to a significant increase in exports beyond that normally induced by trade agreements for all products, except for GIs of higher quality or with higher market shares.

Our paper addresses the same issue as Curzi and Huysmans (2022) and aims to measure the trade impact of GI protection in European trade agreements. However, it differs in several respects. First, it uses firm-level data, which allows for a more precise identification of flows concerned by geographical indications than country-level trade data as in Curzi and Huysmans (2022). Second, it relies on variation across firms rather than across countries or products. More precisely, our estimation compares the exports of French GI firms with those of non-GI firms, within a given product (defined at the 8-digit level of the product nomenclature) and destination, before and after the signature of the 13 EU RTAs containing provisions on GIs. Third, we do not limit our analysis to the cheese sector, but analyze the impact of the agreements on all agri-food products (except wine), which allows us to analyze the heterogeneity of the impact across products.

Our results show that the protection of GIs within the European RTAs allows GI firms to reach new markets and to sell at higher prices on average. The legal protection of GIs through trade agreements does not seem to have an impact on export volumes, which is consistent with the fact that GIs are subject to production constraints (linked to the location of production). Our analysis also highlights the heterogeneity of the impact of GI inclusion in trade agreements in terms of products, markets and type of agreement.

Overall, our paper argues in favor of including lists of geographical indications in European RTAs, as it helps firms to access markets and sell at higher prices by reducing competition and counterfeiting. However, it underlines the need for controls or monitoring in partner markets, as only agreements that provide *ex officio* protection of GIs are found to favor trade. It also suggests that this type of protection only has an impact on markets with a certain level of product differentiation and quality assessment.

The remainder of the paper is structured as follows. In the first section, we give more details and explanations on the inclusion of GIs in European trade agreements. In a second section, we describe the data together with descriptive statistics and present our empirical strategy to estimate the effect of geographical indications and trade agreements on exports. The third section displays our results and the fourth one concludes.

# 2 GIs in Regional Trade Agreements

## 2.1 Protection of GIs in EU trade agreements

Trade agreements signed by the EU since 2010 include the recognition of lists of geographical indications to protect against reputation abuse in third markets. This is in line with the European Union's global strategy to sign comprehensive agreements covering a wide range of non-tariff issues, from standards to intellectual property rights. The protection of EU GIs defined in these agreements goes beyond that defined in Article 22 of the TRIPS Agreement, extending the protection granted by Article 23 on wines and spirits to other food products. The RTAs thus prohibit any use of GI names for goods not originating in the place defined in the GI, as well as the use of translations or terms such as "kind", "types" or "styles". However, the agreements allow for the coexistence of European GIs with trademarks registered in third countries prior to the agreement.

While all agreements signed by the EU since 2010 include provisions to protect GIs against misuse of their reputation, the scope of protection varies from agreement to agreement.(Engelhardt, 2015). First, the lists of EU GI names to be protected, which are the result of bilateral negotiations between the partner country and the EU, are different in each agreement.[2] Second, the enforcement of GI rights varies from agreement to agreement. Some agreements, such as those between the EU and Canada, the EU and Japan, or the EU and Panama, provide not only for the protection of the GI names defined in the lists, but also for a monitoring obligation by the public administration of the third country to identify violations. This system of control *ex officio* is not easy to implement by the authorities of the partner countries, which explains why it is not included in all agreements.

The inclusion of GI protection in European Union trade agreements may seem like a rather narrow issue, given the small share of GIs in European exports. However, it is far from anecdotal and represents a red line for the ratification of agreements by certain members. This is mainly due to the concentration of GIs in the southern EU countries (Huysmans and Swinnen, 2019): France, Greece, Italy, Portugal and Spain represent more than 70% of the total production of geographical indications in Europe. For these countries, GIs represent an offensive interest in trade negotiations, especially since these are high value-added products whose production is concentrated in rural and peripheral areas. In some of these regions, GI protection in trade agreements is also perceived as compensation for the openness of European agricultural markets resulting from these agreements. The European attachment to GI protection in trade agreements is also more generally explained by

[2]Note that these lists are flexible and can be adjusted if necessary in the future.

the place these products play in the culture and identity of European members, what Huysmans (2022) refers to as *gastronationalism*.

### 2.2 European RTAs and French GIs

France has currently defined GIs for 225 food products. Of these, 54 are cheese products and 87 are meat products. The other 84 GIs belong to various sectors such as fruit and vegetables, oils, flours, honeys or prepared products. 99 of the French GIs are protected by the Protected Designation of Origin (PDO) label and 126 by the Protected Geographical Indication (PGI) label, which is less stringent in terms of technical and geographical requirements.

Over the period 2010-2020, 25 agreements have been signed by the EU. Figure 1 displays the number of French indications included in the list of GIs protected under the different agreements. As mentioned above, EU RTAs do not all contain the same list of products. Five agreements (Georgia, Moldova, Ukraine, Armenia and Iceland), recognize the full list of French foodstuff Geographical Indications. The CETA includes a list of 30 GIs, while the other RTAs only cover 9 to 13 products. Among these products, 8 are included in all the agreements and correspond for the most part to very well-known and long-established indications (*Camembert de Normandie*, *Comté*, *Roquefort*, *Reblochon*, *Jambon de Bayonne*, *Pruneau d'Agen*...). Other products, such as *Huiles Essentielles de Lavande de Haute Provence*, *Huile d'Olive de Haute Provence*, *Foie Gras du Sud Ouest* or *Huitres d'Oléron*, are included in almost all of EU agreements. Overall, cheeses account for a significant proportion of GIs protected under bilateral agreements with the European Union, particularly under the CETA (22 out of 30).

The products included in the lists represent France's offensive interests, such as dairy products. However, the fact that some agreements cover all GIs, while some of them are never exported, shows that the recognition goes beyond commercial interests.

Thanks to the agreements, European GIs benefit from protection against misuse of reputation in third markets. It can be expected that this protection will displace competing products, which will no longer be able to use the GI name (unless they are covered by a trademark registered prior to the signing of the agreement, which means that products can co-exist). It also reduces competition from new entrants, but also from other producers who used to use the GI as a generic name with terms such as "type of", "styles", etc. The effect of the agreements will depend on how strongly the GI clauses are enforced, but we can assume that this reduction in competition on partner markets will increase French exports of GI products. This is what we will test in the remainder of the paper.

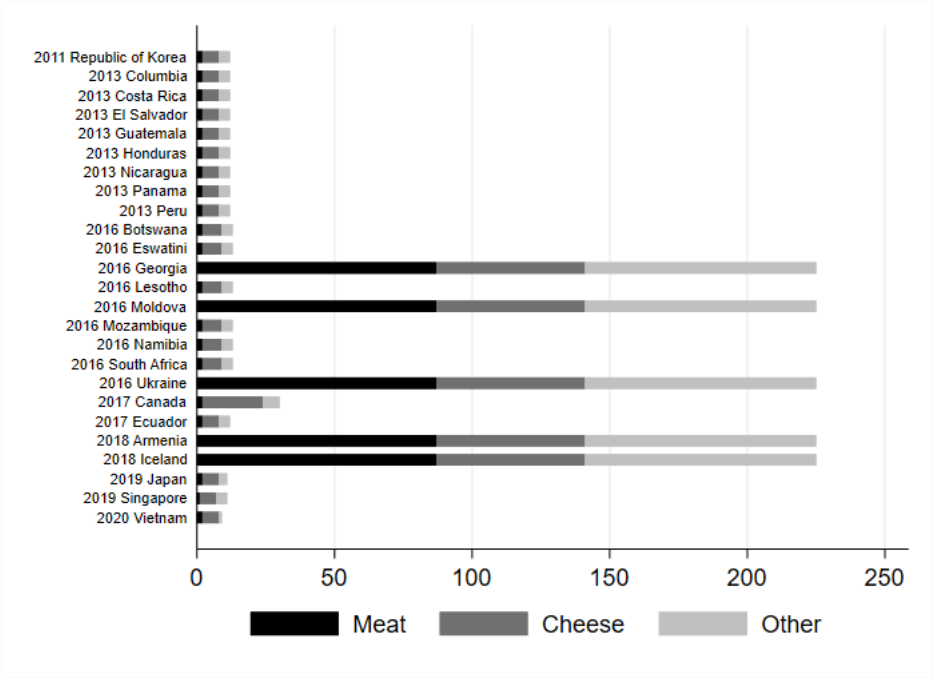


Figure 1: Number of French GIs included in RTA list

*Computation of the authors from the official text of the Agreements on the EU website*

# 3 Empirical approach

## 3.1 Firm level data

To access the impact of the inclusion of GI lists in European RTAs on French food exports, we rely on a unique and exhaustive list of French plants provided by the INAO (*Institut National de l'Origine et de la Qualité*), the mixed public-private body in charge of GI management in France since 1935. More specifically, this dataset provides, for each GI (such as *Comté* or *Jambon de Bayonne*) and year, the list of French plants authorized to produce and sell GI products, from 2012 to 2019.

These information on GI plants-products is merged with French customs trade data, which provides export value and quantity by firm, product (defined at the 8-digit European classification level -NC8), destination and year. To do so, we have to handle two challenges. First, plant information must be aggregated to firms, since a firm may have multiple production sites and plants. We use the first nine digits of the national plant code (SIRET), which is the identifier of the firm (SIREN), and assume that all exports of a firm (SIRET) that is authorized to produce

GIs in one of its plants (SIREN) benefit from GIs.[3]

Second, we need to match the GI product names with the NC8 product classification. We build a correspondence table that allows us to convert any GI product (such as *Camembert de Normandie*) to an NC8 code (such as 0406.90.82) using the GI and NC8 descriptions. As explained in Duvaleix et al. (2021), the correspondence is not always straightforward, and we have to make some assumptions to match GI names and NC8 codes. The first problem is that a GI name can correspond to two different NC8 codes, as in the case of *Comté*, which can be registered under code 0406.90.15 or code 0406.90.99, depending on its fat content (linked to its production period within the year). The second point is that an NC8 code description can correspond to both GI and non-GI varieties, as in the case of the NC8 code 0406.90.15, which corresponds to *Comté*, but also to products with the same characteristics in terms of fat or water content, but which don't benefit from a GI, such as Gruyère. In our dataset, we consider all exports of a GI-covered NC8 code by an authorized firm as actually benefiting from the GI.[4] In the end, the 225 French GIs correspond to 313 NC8 codes (out of a total of 2,313 in the agri-food sector).

We merge our dataset with firms' balance sheets from the FARE data of the French National Institute of Public Statistics (INSEE). This allows us to calculate the productivity of the firm and to restrict our sample to producing firms, excluding wholesalers for whom we cannot infer whether their exports benefit from a GI label or not. Our dataset contains a total of 2,313 agri-food exporting firms, of which 313 export GIs.

### 3.2 Descriptive Statistics

Figure 2 displays the number of observations (firm-NC8-destination) and total value of French exports of foodtsuff for each year, distinguishing flows with Geographical Indications (differentiating PGI and PDO). It appears that GIs represent only a small part of trade flows and exports. While flows and total French agri-food exports increased slightly over the period, the share of GIs remained relatively unchanged between 2012 and 2019.

Figures 3 compares the kernel density of the export quantities defined at the (firm-NC8-destination-year) level for flows with and without GIs. On average, there are no significant differences between GI and non-GI flows on all markets (Figure 3(a)). However, Figure 3(b) suggests a slight difference in trade volume between flows with GIs and flows without GIs on markets that

[3] This assumption may lead to a downward bias in our estimate of the effect of GIs on trade.

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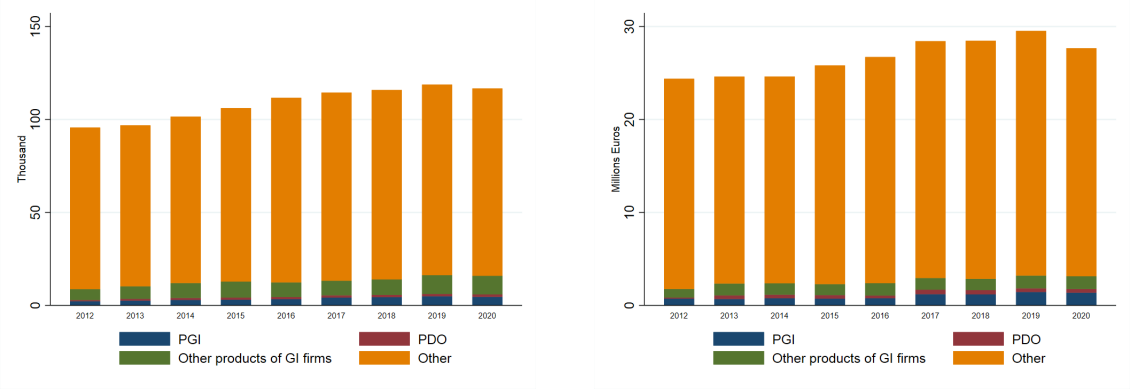



(a) Observation (b) Value

Figure 2: French agrifood exports and geographical indications

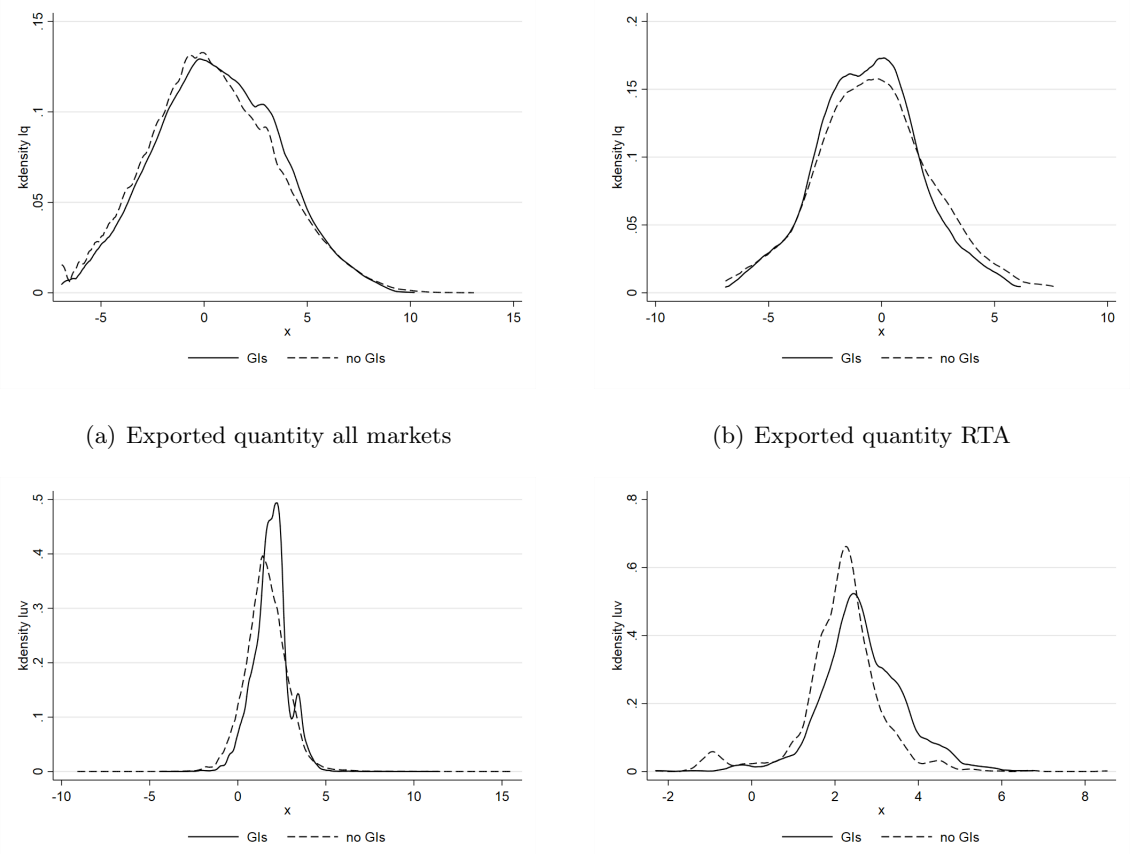
have signed trade agreements with the European Union that include lists of GIs. We observe a similar pattern in Figures 3(c) and 3(d). These statistics suggest that GIs generate flows with higher trade unit values than other products, but only on markets that protect these GIs as part of RTAs.

### 3.3 Empirical specification

We investigate the impact of Geographical Indications on the extensive margin of trade (probability of export of the firm $f$ of product $k$ to destination $j$ at year $t$), the intensive margin of trade (quantity of exports of the firm $f$ of product $k$ to destination $j$ at year $t$), and export unit values. To do so, we estimate the following equation on French agrifood firms exports :

$$Exp_{fjkt} = \alpha GI_{fkt} + \beta GI_{fkt} \times Agreement_{jkt} + \pi_{ft} + +\mu_{fj} + \nu_{fk} + \xi_{jkt} + \varepsilon_{fjkt} \quad (1)$$

where $GI_{fkt}$ is a dummy indicating whether the firm $f$ is authorized to handle GIs for the product $k$ the year $t$ and $Agreement_{jkt}$ is a dummy indicating whether the country $j$ recognizes GIs for the product NC8 $k$ the year $t$. $\pi_{ft}$ corresponds to firm-year fixed effects which allow to capture different time variant firm characteristics such as size or productivity. $\mu_{fj}$ are firm-destination fixed effects which control for any time-invariant relationship the company may have with the destination country (former advertising campaign, branding, image...). $\xi_{jkt}$ are destination-NC8-year fixed effects, which control for all characteristics of the market of country $j$ and good $k$ the year $t$ such as demand, taste for French products $k$ in country $j$ or local production. Since we




(a) Exported quantity all markets

(b) Exported quantity RTA

(c) Export unit value all markets

(d) Export unit value RTA

Figure 3: Kernel density by firm, product and destination, 2012-2019

focus on French exports, $\xi_{jkt}$ also controls for any trade costs, tariffs or non-tariff measures applied by $j$ on product $k$ the year $t$. $\nu_{fk}$ corresponds to firm-product fixed effects, controlling for all time-invariant product $k$ of the firm $f$ characteristic such as image or history. [5]

Our identification compares GI firms exports to non-GI firms exports, within a given product (defined at 8 digit of the nomenclature of product), destination and year, controlling for firms characteristics. Our variable of interest is the interaction variable $GI_{fkt} \times Agreement_{jkt}$ which will assess whether the difference between GI and non-GI flows varies after the signature of the agreements. [6] Note that we are not interested in the effect of the agreement on trade *per se*. Rather,

[5] As the NC8 codes of the European Union's product nomenclature change over time, we use the procedure developed by Le Roy et al. (2014) and use common identifiers (indexes) to track products over time.

[6] As shown by Baker et al. (2022), staggered difference-in-difference estimates could lead to biased results. These biases are all the more important than the sample under analysis contains relatively few never-treated units. In our case, we have much more non treated units than treated units (GI flows exported to country with an agreement

we are investigating the effect of GIs protection within these agreements, which is supposed to be reflected in a greater increase in trade for GI firms than for others.

The explained variable $Exp_{fjkt}$ is equal to $lq_{fjkt}$ the log of export quantities of $f$ to $j$ for the $k$ at $t$ in the intensive margin estimation. We also consider $luv_{fjkt}$, log of the export unit values of $f$ to $j$ for the $k$ at $t$, to see whether GIs have an impact on trade prices. In a last specification, to assess the effect of GIs on the probability of trade (extensive margin) we use $X_{fjkt}$ a dummy variable equal to zero if the firm $f$ exports the product $k$ to the destination $j$ at time $t$, and zero otherwise.

# 4 Results

## 4.1 Baseline

Table 1 displays the results of Equation 1 on trade patterns. In columns (1) and (2) we estimate Equation 1 on the intensive margin of trade, i.e. the quantity of export of the firm $f$ to the destination $j$ the product $k$ the year $t$. None of the coefficients is significant, meaning that GI firms do not export higher quantity to any market, whether the European Union or in general. This result is in line with Duvaleix et al. (2021) and can be explained by the fact that it is difficult to increase overall production for a given indication. On the one hand, production is limited to a specific geographical area, which restricts the possibility of significantly increasing production volumes, and on the other hand, production on the farms is itself subject to constraints imposed by the specifications of the GIs (such as livestock units per hectare, for example). As a result, GI protection in RTAs may not significantly increase the GI trade volume relative to non-GI products that face fewer production constraints.

We observe another pattern in column (3) where we estimate equation 1 on the export unit values. First, we see that GIs in general through $GI_{fkt}$ variable do not benefit from higher prices than the other firms for the same product without GI. This effect concern all markets. Looking at the markets with GI recognition, results show that the coefficient of the interaction variable $GI_{fkt} \times Agreement_{jkt}$ is positive and significant, which means that the recognition and the protection of the particular GIs in partner countries help GI firms to export at higher prices than non-GI firms exporting the same product on the same market. The value of the coefficient shows that, on average, GI firms concerned by the protection sell their product 210 Euros per tons higher than firms selling

listing GIs).

the same type of products without GIs.[7] This result is robust to the inclusion of firm-product-time and firm-destination-time fixed effects in column (4).[8] In this specification, the results show that the impact of GI protection reaches 270 Euros per ton in average for GI firms. These results can be explained by a reduction in competition for products with geographical indications following the agreement. The GI names cannot be used any more by domestic producers.[9] Unsurprisingly, our results also show that GI products benefit from a price premium on the European market where GIs are legally protected for a long time. This confirms the positive effect of including GI protection in trade agreements for GI exporters. This protection allows them to sell at a higher price than other firms on these markets, which is not the case for non protected GI names or on markets where GIs are not protected.

In column (5), we estimate Equation 1 on the extensive margin of trade, i.e. the probability for the firm to export to the destination $j$ the product $k$ the year $t$. As in columns (3) and (4), coefficient $\beta$ of the variable $GI_{fkt} \times Agreement_{jkt}$ is positive and significant, which means that GI firms have an higher probability to export to a given destination-product pair than other firms, on destination where their GI are protected by an RTA. This result confirms that the European strategy of including lists of GIs in trade agreements with its partners is worthwhile, as it brings additional trade flows, either from new GI exporting firms or from existing firms that start exporting new GI products. This result is robust to the inclusion of firm-product-time and firm-destination-time fixed effect in column (6). Again, the coefficient of the interaction $GI_{fkt} \times EU_j$ is positive and significant, which suggests that geographical indications also bring additional trade flows to the European market, which is in line with results of Duvaleix et al. (2021).

### 4.2 Robustness checks

One could argue that the lists of GIs in the various agreements are not entirely exogenous. In fact, they reflect the offensive interests of exporting countries (in our case, France) and essentially concern products for which there is a potential for export to partner countries. As we showed in

[7] From the estimation, we compute the increase in price as $\Delta(luv_{fjkt}) = exp(0.1918) - 1$

[8] Table 6 in appendix provide the results of the estimation of equation 1 using the same specification as in table 1 using NC8 codes instead on index developed by Le Roy et al. (2014) for products fixed effects. The results remain the same.

[9] Domestic products with a GI name can still exist on the domestic market if they existed before the agreement. In this case, the agreement allows the coexistence of EU GI products and domestic products with the same GI names and give access to new markets to protected GIs.

Table 1: Effect of Geographical Indications on trade patterns - baseline

| | $lq_{fjkt}$ | | $luv_{fjkt}$ | | $X_{fjkt}$ | |
|---|---|---|---|---|---|---|
| | (1) | (2) | (3) | (4) | (5) | (6) |
| $GI_{fkt}$ | 0.1981 | | 0.1669 | | 0.0147 | |
| | (0.6479) | | (0.1619) | | (0.0294) | |
| $GI_{fkt} \times Agreement_{jkt}$ | 0.1396 | 0.3816 | 0.1918*** | 0.2381** | 0.0085* | 0.0125** |
| | (0.1682) | (0.2618) | (0.0605) | (0.1017) | (0.0043) | (0.0051) |
| $GI_{fkt} \times EU_{jk}$ | 0.0481 | 0.0040 | 0.0558*** | 0.0884*** | 0.0704*** | 0.0775*** |
| | (0.0744) | (0.0944) | (0.0176) | (0.0212) | (0.0034) | (0.0037) |
| N | 637,767 | 502,451 | 637,767 | 502,451 | 13,559,707 | 12,243,139 |
| r2 | 0.86 | 0.88 | 0.89 | 0.92 | 0.50 | 0.56 |
| Destination-product-time | yes | yes | yes | yes | yes | - |
| Firm-time | yes | - | yes | - | yes | - |
| Firm-destination | yes | - | yes | - | yes | - |
| Firm-product | yes | - | yes | - | yes | - |
| Firm-product-time | no | yes | no | yes | no | yes |
| Firm-destination-time | no | yes | no | yes | no | yes |

Notes: All continuous variables are in logarithm.

Firm-time clustered standard errors in parentheses

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Section 2, lists often include the same well-known products. We propose two robustness to deal with this issue. In Table 2, we test the existence of pre-trends on partner markets for GI firms prior to the conclusion of the agreements. The table follows the specification of table 1. The variable of interest is now $GI_{fkt} \times Agreement_{jkt+1}$ which equals to one if the firm $f$ benefits from a GI for its product $k$ the year $t$ and exports to the country $j$ that will recognize the GI corresponding to the product $k$ the year after $t+1$. None of the columns exhibit a significant coefficient, suggesting that there was no pre-trend for GI firms to destinations that will recognize GI in their agreements with the European Union. Before the agreements were signed, GI firms had similar export patterns to partner countries as other firms.

In a second robustness check, we exclude firms with more than 1000 employees from our sample. We can assume that it is essentially these large firms that have the power to lobby the Ministry of Agriculture, and even the European Commission, to get their products included on the list of GIs to be protected in European trade agreements. Results presented in Table 7 in the appendix are

Table 2: Effect of Geographical Indications on trade patterns - Forward effect

| | $lq_{fjkt}$ | | $luv_{fjkt}$ | | $X_{fjkt}$ | |
|---|---|---|---|---|---|---|
| | (1) | (2) | (3) | (4) | (5) | (6) |
| $GI_{fkt}$ | 0.2005 | | 0.1693 | | 0.0149 | |
| | (0.6477) | | (0.1623) | | (0.0294) | |
| $GI_{fkt} \times Agreement_{jkt+1}$ | -0.1364 | -0.2835 | 0.0745 | -0.0153 | 0.0046 | 0.0174 |
| | (0.2530) | (0.4823) | (0.0786) | (0.0907) | (0.0070) | (0.0103) |
| $GI_{fkt+1} \times EU_{jk}$ | 0.0416 | -0.0144 | 0.0491*** | 0.0784*** | 0.0701*** | 0.0771*** |
| | (0.0748) | (0.0941) | (0.0174) | (0.0211) | (0.0034) | (0.0037) |
| N | 637,767 | 502,451 | 637,767 | 502,451 | 13,559,707 | 12,243,139 |
| r2 | 0.86 | 0.88 | 0.89 | 0.92 | 0.50 | 0.56 |
| Destination-product-time | yes | yes | yes | yes | yes | - |
| Firm-time | yes | - | yes | - | yes | - |
| Firm-destination | yes | - | yes | - | yes | - |
| Firm-product | yes | - | yes | - | yes | - |
| Firm-product-time | no | yes | no | yes | no | yes |
| Firm-destination-time | no | yes | no | yes | no | yes |

Notes: All continuous variables are in logarithm.

Firm-time clustered standard errors in parentheses

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

very similar than those displayed in Table 1, which suggests that our baseline results are not driven by large companies able to influence policymakers with their international development agendas.

### 4.3 Heterogeneity of trade impact of GIs and RTA

In Tables 3, we explore the heterogeneity of the effect of GI recognition in European RTA on trade patterns. We decompose our variable of interest $GI_{fkt} \times Agreement_{jkt}$ by sector. The results suggest that the positive effects of GI provisions in European agreements on trade unit values and probability of trade obtained in Section 4.1 are driven by the cheese sector (which, as seen in Section 2, represents a large proportion of the lists of protected GIs). Interestingly, in columns (1) and (2) the coefficient $\beta$ of the variable $GI_{fkt} \times Agreement_{jkt} \times Cheese_k$ is positive and significant at 10%, suggesting that GI protection within RTA may even induce higher trade volumes for exporters of GI cheese relative to non GI firms. For meat and other food products, none of the coefficients relating to their protection in RTA is significant: relative to other firms, those exporting GI meat or other

foodstuffs do not benefit from any advantage on partner countries after agreements are signed. This argues even more strongly for the inclusion of GI protection in European Union agreements, since it seems to favor the export volumes of certain products by GI firms in comparison to other firms.

Table 3: Effect of Geographical Indications on trade patterns - by sector

| | $lq_{fjkt}$ | | $luv_{fjkt}$ | | $X_{fjkt}$ | |
|---|---|---|---|---|---|---|
| | (1) | (2) | (3) | (4) | (5) | (6) |
| $GI_{fkt}$ | 0.1908 | | 0.1187 | | 0.0053 | |
| | (0.6674) | | (0.1549) | | (0.0288) | |
| $GI_{fkt} \times Agreement_{jkt} \times Cheese_k$ | 0.3848* | 0.4799* | 0.2339*** | 0.2269** | 0.0381*** | 0.0474*** |
| | (0.2016) | (0.2741) | (0.0790) | (0.1059) | (0.0074) | (0.0086) |
| $GI_{fkt} \times Agreement_{jkt} \times Meat\ products_k$ | -0.2215 | 0.4204 | 0.0204 | -0.2146 | -0.0063 | -0.0055 |
| | (0.3285) | (0.9984) | (0.0923) | (0.4386) | (0.0055) | (0.0064) |
| $GI_{fkt} \times Agreement_{jkt} \times Other_k$ | -1.2625* | 1.1903 | 0.2791 | -0.1518 | 0.0089 | 0.0010 |
| | (0.7035) | (1.6109) | (0.1958) | (0.5599) | (0.0139) | (0.0190) |
| $GI_{fkt} \times EU_j$ | 0.0521 | 0.0038 | 0.0569*** | 0.0886*** | 0.0703*** | 0.0774*** |
| | (0.0744) | (0.0944) | (0.0176) | (0.0212) | (0.0034) | (0.0037) |
| N | 637,767 | 502,451 | 637,767 | 502,451 | 13,559,707 | 12,243,139 |
| r2 | 0.86 | 0.88 | 0.89 | 0.92 | 0.50 | 0.56 |
| destination-product-time | yes | yes | yes | yes | yes | yes |
| firm-time | yes | - | yes | - | yes | - |
| Firm-destination | yes | - | yes | - | yes | - |
| Firm-product | yes | - | yes | - | yes | - |
| firm-product-time | no | yes | no | yes | no | yes |
| firm-destination-time | no | yes | no | yes | no | yes |

Notes: All continuous variables are in logarithm.

Firm-time clustered standard errors in parentheses

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

## 4.4 GI impact according to destinations

In Table 4 we investigate whether the positive effects of GI protection in RTA highlighted in Section 4.1 vary with the agreements. As explained in Section 2, enforcement of this protection varies from agreement to agreement, and while some (such as those with Nicaragua, Panama, Canada, and Japan) include monitoring and enforcement obligations, others do not. Table 4 replicates estimates from Table 1, distinguishing agreement with *Ex-Officio* GI protection from the others. Results show that our previous results are mainly driven by *Ex Officio* agreements. The coefficients for the other agreements are overall non significant, except in column (4). This highlights the crucial necessity of a comprehensive protection for GIs in European RTA, including clauses on monitoring

and legal action in the event of counterfeiting, to ensure that these agreements are truly effective and result in price premiums and better market access, as shown in Section 4.1.

Table 4: Effect of Geographical Indications on trade patterns - by type of agreement

| | $lq_{fjkt}$ | | $luv_{fjkt}$ | | $X_{fjkt}$ | |
|---|---|---|---|---|---|---|
| | (1) | (2) | (3) | (4) | (5) | (6) |
| $GI_{fkt}$ | 0.1981 | | 0.1670 | | | |
| | (0.6479) | | (0.1619) | | | |
| $GI_{fkt} \times$ Ex $Officio_{jkt}$ | 0.1602 | 0.4898 | 0.2424*** | 0.2612* | 0.0285*** | 0.0423*** |
| | (0.2255) | (0.3413) | (0.0778) | (0.1333) | (0.0066) | (0.0078) |
| $GI_{fkt} \times Other_{jkt}$ | 0.0813 | 0.0979 | 0.0482 | 0.1774** | -0.0059 | -0.0079 |
| | (0.2359) | (0.3930) | (0.0708) | (0.0843) | (0.0044) | (0.0053) |
| $GI_{fkt} \times EU_j$ | 0.0480 | 0.0049 | 0.0556*** | 0.0886*** | 0.0704*** | 0.0775*** |
| | (0.0745) | (0.0943) | (0.0176) | (0.0212) | (0.0034) | (0.0037) |
| N | 637,767 | 502,451 | 637,767 | 502,451 | 13,559,707 | 12,243,139 |
| r2 | 0.86 | 0.88 | 0.89 | 0.92 | 0.50 | 0.56 |
| destination-product-time | yes | yes | yes | yes | yes | yes |
| firm-time | yes | - | yes | - | yes | - |
| Firm-destination | yes | - | yes | - | yes | - |
| Firm-product | yes | - | yes | - | yes | - |
| firm-product-time | no | yes | no | yes | no | yes |
| firm-destination-time | no | yes | no | yes | no | yes |

Notes: All continuous variables are in logarithm.Firm-time clustered standard errors in parentheses
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

The impact on trade of GIs recognition in EU trade agreements may vary with consumers knowledge of GI or more generally with their taste for quality. In this last section, we test this hypothesis and investigate whether the effect of including lists of GIs in agreements is stronger in destination markets with greater vertical product differentiation. To do so, we follow the methodology developed by Khandelwal (2010) and Amiti and Khandelwal (2013) and compute the quality ladder of each market destination-product. This measure provides us with an estimate of the level of vertical differentiation of product $k$ on the market $j$ over the entire period 2012-2019. We then classify each $jk$ market according to these quality ladders to create three market groups (low, medium and high corresponding to the three thirds of the quality ladder distribution) which we interact with our variable of interest $GI_{fkt} \times Agreement_{jkt}$. The positive impact of GIs protection in trade agreements seems to only occur in markets with medium to high product differentiation. None of the coefficients are significant for markets in the third percentile of the quality ladder distribution. Thus, GI protection through trade agreements appears to be effective only in markets where consumers are able to identify and value quality differences.

Table 5: Effect of Geographical Indications on trade patterns - by ladder percentiles

| | $lq_{fjkt}$ | | $luv_{fjkt}$ | | $X_{fjkt}$ | |
|---|---|---|---|---|---|---|
| | (1) | (2) | (3) | (4) | (5) | (6) |
| $GI_{fkt} \times$ Low $ladder_{jk}$ | 0.2212 | | 0.1485 | | 0.0221 | |
| | (0.6392) | | (0.1656) | | (0.0290) | |
| $GI_{fkt} \times$ Med $ladder_{jk}$ | 0.7086 | | 0.1323 | | 0.0381 | |
| | (0.6392) | | (0.1645) | | (0.0291) | |
| $GI_{fkt} \times$ High $ladder_{jk}$ | 0.0579 | | 0.1760 | | -0.0041 | |
| | (0.6391) | | (0.1627) | | (0.0290) | |
| $GI_{fkt} \times Agreement_{jkt} \times$ Low $ladder_{jk}$ | 0.0571 | -0.0194 | 0.0101 | 0.0497 | -0.0123 | 0.0014 |
| | (0.3337) | (0.5269) | (0.1413) | (0.1840) | (0.0081) | (0.0089) |
| $GI_{fkt} \times Agreement_{jkt} \times$ Med $ladder_{jk}$ | 0.1790 | 0.9492** | 0.3405*** | 0.3172* | 0.0106 | 0.0511*** |
| | (0.2956) | (0.4125) | (0.1199) | (0.1778) | (0.0111) | (0.0132) |
| $GI_{fkt} \times Agreement_{jkt} \times$ High $ladder_{jk}$ | 0.0251 | -0.0072 | 0.1290* | 0.2320** | 0.0096** | 0.0065 |
| | (0.2343) | (0.3063) | (0.0676) | (0.1146) | (0.0046) | (0.0054) |
| $GI_{fkt} \times EU_j \times$ Low $ladder_{jk}$ | 0.1746* | 0.1007 | 0.0413 | 0.0542** | 0.0682*** | 0.0954*** |
| | (0.1036) | (0.1066) | (0.0301) | (0.0239) | (0.0047) | (0.0048) |
| $GI_{fkt} \times EU_j \times$ Med $ladder_{jk}$ | -0.2818** | 0.0906 | 0.0783*** | 0.0839*** | 0.0693*** | 0.1089*** |
| | (0.1107) | (0.1009) | (0.0251) | (0.0226) | (0.0052) | (0.0051) |
| $GI_{fkt} \times EU_j \times$ High $ladder_{jk}$ | 0.1348 | -0.1653 | 0.0514** | 0.1113*** | 0.0523*** | 0.0518*** |
| | (0.0992) | (0.1091) | (0.0247) | (0.0231) | (0.0033) | (0.0034) |
| N | 637,767 | 502,451 | 637,767 | 502,451 | 13,559,707 | 12,243,139 |
| r2 | 0.86 | 0.88 | 0.89 | 0.92 | 0.50 | 0.56 |
| destination-product-time | yes | yes | yes | yes | yes | yes |
| firm-time | yes | - | yes | - | yes | - |
| Firm-destination | yes | - | yes | - | yes | - |
| Firm-product | yes | - | yes | - | yes | - |
| firm-product-time | no | yes | no | yes | no | yes |
| firm-destination-time | no | yes | no | yes | no | yes |

Notes: All continuous variables are in logarithm.

Firm-time clustered standard errors in parentheses

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

# 5 Conclusion

This paper examines the trade impact of the inclusion of GI protection in trade agreements signed by the European Union. It draws on a unique and exhaustive dataset of the exports of French firms authorized to produce GIs. It compares the exports of GI firms with those of non-GI firms exporting the same good to the same destination the same year, before and after the signing of the agreements.

Our results show that GI protection in EU RTAs allows GI firms to sell at higher prices than

other firms on these markets (product-destination pairs). We also show that this protection gives French GI firms access to new markets. These findings can be explained by the reduction in competition from products that previously abused the name and reputation of French GIs on third markets. Some French GIs were also prevented to enter markets before the agreement because their names were already registered as a trademark. After the agreement, French GIs can co-exist with domestic trademarks, allowing new firms to enter. On the other hand, our estimates show no effect on export volumes (except for GI cheese when included in the agreements). GI firms' export volumes evolve similarly to non-GI firms after an agreement.

Our study argues for the inclusion of GIs in European Union agreements, as they have positive effects on trade by reducing competition in international markets for high value-added products generally produced in rural and peripheral areas. However, it shows that the effects of this protection vary depending on the product and the type of GIs. Most importantly, to be truly effective, the recognition of GIs in trade agreements must be accompanied by monitoring and control by partner authorities in their markets. Consumers' tastes for quality in partner countries must also be taken into account, as we show that agreements only affect the trade of GI firms in markets with a high level of overall quality and differentiation. This does not mean that it is not of interest for the European Union to negotiate the inclusion of lists of GIs to be protected in trade agreements with other countries, as this could help to disseminate its approach to GIs at the international level.

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# Appendix

Table 6: Robustness check, NC8 fixed effects

| | $lq_{fjkt}$ | | $luv_{fjkt}$ | | $luv_{fjkt}$ | |
|---|---|---|---|---|---|---|
| | (1) | (2) | (3) | (4) | (5) | (6) |
| GI_fkt | -0.0734 | | -0.0046 | | -0.0252*** | |
| | (0.0612) | | (0.0169) | | (0.0023) | |
| GI_fkt_A1_jkt | 0.0809 | 0.4238 | 0.1954*** | 0.2276** | 0.0100** | 0.0125** |
| | (0.1621) | (0.2639) | (0.0536) | (0.1026) | (0.0043) | (0.0051) |
| GI_fkt_EU | 0.0806 | -0.0022 | 0.0472*** | 0.0891*** | 0.0689*** | 0.0774*** |
| | (0.0623) | (0.0948) | (0.0154) | (0.0212) | (0.0034) | (0.0037) |
| N | 718,349 | 494,130 | 718,349 | 494,130 | 13,559,607 | 12,242,875 |
| r2 | 0.84 | 0.89 | 0.88 | 0.92 | 0.49 | 0.56 |
| destination-product-time | yes | yes | yes | yes | yes | yes |
| firm-time | yes | - | yes | - | yes | - |
| Firm-destination | yes | - | yes | - | yes | - |
| Firm-product | yes | - | yes | - | yes | - |
| firm-product-time | no | yes | no | yes | no | yes |
| firm-destination-time | no | yes | no | yes | no | yes |

Notes: All continuous variables are in logarithm.

Firm-time clustered standard errors in parentheses

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table 7: Robustness check, exclusion firms with more than 1,000 employees

| | $lq_{fjkt}$ | | $luv_{fjkt}$ | | $luv_{fjkt}$ | |
|---|---|---|---|---|---|---|
| | (1) | (2) | (3) | (4) | (5) | (6) |
| $GI_{fkt}$ | 0.1240 | | 0.1841 | | 0.0147 | |
| | (0.6671) | | (0.1614) | | (0.0294) | |
| $GI_{fkt} \times Agreement_{jkt+1}$ | 0.2010 | 0.4077 | 0.2052*** | 0.2988** | 0.0085* | 0.0125** |
| | (0.1887) | (0.3117) | (0.0727) | (0.1349) | (0.0043) | (0.0051) |
| $GI_{fkt} \times EU_j$ | 0.1589* | 0.2115** | 0.0487** | 0.0836*** | 0.0704*** | 0.0775*** |
| | (0.0813) | (0.0986) | (0.0219) | (0.0260) | (0.0034) | (0.0037) |
| N | 539,850 | 410,885 | 539,850 | 410,885 | 13,559,707 | 12,243,139 |
| r2 | 0.86 | 0.89 | 0.89 | 0.92 | 0.50 | 0.56 |
| destination-product-time | yes | yes | yes | yes | yes | yes |
| firm-time | yes | - | yes | - | yes | - |
| Firm-destination | yes | - | yes | - | yes | - |
| Firm-product | yes | - | yes | - | yes | - |
| firm-product-time | no | yes | no | yes | no | yes |
| firm-destination-time | no | yes | no | yes | no | yes |

Notes: All continuous variables are in logarithm.

Firm-time clustered standard errors in parentheses

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$