The impact of protecting EU Geographical Indications in trade agreements

Martijn Huysmans* (Utrecht University)
Daniele Curzi (University of Milan)

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*Corresponding author: m.huysmans@uu.nl, PO Box 80125, 3508 TC Utrecht, NL

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Abstract

To protect distinctive regional foods, the European Union (EU) has a legal scheme covering over 1,000 Geographical Indications (GIs) for food items such as Parma ham and Gouda Holland. Using Eurostat Comext export data 2004-2018 for cheeses at the CN8 level, this paper tests whether past protection of GIs through 11 Free Trade Agreements (FTAs) has increased trade in them. The answer matters for trade policy, since the protection of at least some GIs has been a red line in EU FTA negotiations. The analysis is set in a standard gravity-model framework, using a pseudo-Poisson maximum likelihood (PPML) approach to account for the issue of zero-trade flows. We find that legal protection of GIs in FTAs does not significantly increase trade in them. Our main suggested policy implication is that the EU should focus on external promotion of its GIs rather than asking trading partners for stronger legal protection.

Keywords Trade agreements • Geographical Indications • Intellectual Property • EU

JEL codes D72 • F13 • O34 • Q17

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† Assistant Professor, Utrecht University School of Economics. Email: m.huysmans@uu.nl. Mailing address: PO 80125, 3508 TC Utrecht, The Netherlands.
‡ Research Fellow, University of Milan.

1 Introduction

A Geographical Indication (GI) is a product with "a given quality, reputation or other characteristic of the good […] essentially attributable to its geographical origin" (WTO, 1994: Art. 22). In the EU, there are three GI schemes: one for wine, one for spirits, and one for food. An example of a food GI is the blue cheese Gorgonzola, which in the EU can only be produced according to the product specification and in a number of Italian provinces around the town of Gorgonzola. Through protection on the EU Single Market, such regional specialty foods can maintain higher prices, and consumers who care about quality and origin can make an informed choice (DG AGRI, 2012; European Union, 2012; Raustiala & Munzer, 2007).

Within the EU, protection is not perfect, and fraud does occur: "The value of GI infringing products in the EU was approximately € 4.3 billion in 2014, which is approximately 9.0% of the EU GI product market" (EUIPO, 2016: 7).

Outside of the EU, even leaving fraud aside, protection is not guaranteed. Indeed, GIs for food are not well protected outside of the EU single market, because they do not fall under Article 23 of the WTO Trade Related Aspects of Intellectual Property (TRIPS). According to the EU, this means that "it is not rare that certain EU GI products suffer from […] abuse of reputation in third markets" (DG AGRI, 2012: 5). On top of the potential economic consequences, "GIs carry a strong political weight in international negotiations, in particular for certain Member States who see it as a crucial offensive interest" (DG AGRI, 2012: 4). All of this implies that "today, it would not be conceivable to negotiate a Free Trade Agreement (FTA) without an appropriate chapter on GIs" (DG AGRI, 2012: 4). However, whether protection in FTAs actually leads to more extra-EU GI exports is an open empirical question.

In recent trade agreements, the EU has achieved increased external protection for FTA-specific lists of its food GIs. The lists vary from one FTA to the next, but products like Gorgonzola, Comté, Parmigiano Reggiano and Prosciutto di Parma have been included in all recent EU FTAs. The lists are highly contentious: both Greece and Italy for instance have threatened not to ratify CETA (the Comprehensive Economic & Trade Agreement between the EU and Canada) because of insufficient GI protection (Malkoutzis, 2016; Reuters, 2018).

This paper contributes to the literature by testing empirically whether past protection of GIs through 11 FTAs has increased trade in them. Of course, in order to produce a policy relevant

answer our methods will control for the increase in exports of comparable non-GI products, among other things.

The answer matters for EU trade policy, since the protection of at least some GIs has recently been a red line for the EU to conclude an FTA. Negotiations with Australia, started in July 2018, are interesting to follow in this regard, since it previously opposed stronger protection of GIs at the WTO level. In any case, the mandate given by the Council (2018) stipulates that the Commission should seek GI protection. Any Brexit deal will also have to include an agreement on GIs (European Commission, 2017).

Despite the importance of this issue, there is almost no research yet on whether protecting GIs through FTAs actually increases GI exports. In this paper we try to empirically assess the actual trade effect of GI protection in recent EU FTAs. We focus on the EU cheese sector, which covers a high share of total EU GIs (about 16% by number of GIs), and for which the classification of trade data is more detailed than for instance dried meat products. In 2007, cheese GIs accounted for over one third of EU GI turnover (DG AGRI, 2012: 4). At 44%, the price premium for GI cheeses is fourth among 6 categories analyzed in a meta-study by Deselnicu et al. (2013: 212-213). These numbers suggest that cheese is a large and representative category among EU GIs.

We use data from EUROSTAT Comext at the CN 8-digit level on cheese exports from EU 28 countries to the top 36 trading partners, within the period 2004-2018. Data on GIs are taken from the EU DOOR database. GIs have been manually classified at the CN 8-digit level (e.g.: Parmigiano Reggiano = 04069061; Feta = 04069032), while 11 FTA specific lists of protected GIs had been coded manually from the agreement annexes (Huysmans, 2019). The idea is to disentangle the effect of being a listed GI on top of having a GI. We know from the literature that the latter has a positive effect (Raimondi et al., 2019), but the question we seek to address here is whether legal protection through FTAs has any additional effect.

In terms of methods, we use a standard gravity model. In particular, we adopt a pseudo-Poisson maximum likelihood (PPML) approach for panel data, with fixed effects for exporter-importer, exporter-product-time and importer-product-time and accounting for the issue of zero-trade flows. These effects control for average trade levels as well as the impact of FTAs on all products (whether listed GI or not).

Our main results suggest that, on average, being listed in FTAs ensures a positive trade effect for protected GIs. However, when controlling for the exporting countries' GI endowment, we

do not find a significant additional effect of GI protection. In other words, the higher protection guaranteed by the FTAs on a selected list of GI products does not provide any further trade effect with respect to the effect that is already provided by the GI certification per se.

2 Related literature

For wine, trade data differentiates between GI wine and non-GI wine. GI wine has higher unit values, indicating a quality premium (Agostino & Trivieri, 2014, 2016). However, since wine already enjoys a high default protection under TRIPS article 23, wine trade data cannot inform us about the effect of external protection of GIs through FTAs.

In 2010, about 1B€ out of 16B€ of EU food GIs was exported outside of the EU, about 3B€ was exported within the EU, and the remaining 12B€ consumed domestically (Chever et al., 2012: 20). Using Italian firm-level export data, Curzi & Olper (2012) find evidence of higher export performance for "made in Italy" and PDO products, although the result for PDO products is not statistically significant.

Sorgho & Larue (2014) study the impact of GIs on intra-European agri-food trade for a limited panel comprised of the EU27 countries for the years 1999, 2004 and 2009 – Croatia only joined the EU in 2013. A first limitation is that the EU started with food GIs in 1996, so data going further back would have been better to assess the true trade creation effect. A second limitation is that given free movement of goods within the Single Market, intra-EU trade figures are not true customs data but rather based on statistical estimates. A third limitation is that their dependent variable (agri-food trade) and main independent variable (total GIs across categories) are very aggregated, likely attenuating results. Finally, they do not include exporter-importer fixed effects. In terms of substance, Sorgho & Larue (2014) find that GIs lead to trade creation when both the exporting and importing countries have GIs. They attribute this to taste effects: importing countries with their own GIs prefer quality food items and hence import more from GI-producing exporters. As to extra-EU exports, they speculate that "The […] recognition of GIs […] by non-EU countries should have a positive effect on EU exports" (Sorgho & Larue, 2014: 10). It is precisely this hypothesis that we seek to test.

Moving to a more disaggregated analysis, Sorgho & Larue (2018) consider cross-sectional intra-EU trade for 2019 at HS2 level. This includes for instance the category HS04 of dairy products. Given the cross-sectional approach, the validity of the estimated effects can be

questioned. However, they do show that effects differ across HS2 categories, which is a limitation of our approach focusing on the specific HS4 category of cheese, HS0406.

Focusing on a cross-section of 220 French firms exporting cheese in 2012, Duvaleix-Treguer et al. (2018) find that cheeses with PDOs have higher unit values (prices per kilo; an indication of quality) and more export destinations (extensive margin). Comparing EU to non-EU destinations, they find larger estimates for EU destinations. In the conclusion of their paper, they suggest to evaluate the impact of GI protection in FTAs. We take up this suggestion.

Another study looking at cheeses specifically was commissioned by the Consortium for Common Food Names (CCFN), a US-based anti-GI lobby group. Through a combination of models and case studies on the protection of Feta and Parmesan within the EU, it predicts a 13% increase in exports of EU GI cheeses to the US, should the US start protecting all EU GI cheese names (Informa Economics, 2016: 1). This study has two main limitations. First, it assumes the US would also have to stop using partial GI names that are currently not protected even within the EU, such as "Brie" in "Brie de Meaux", or "Gouda" in "Gouda Holland". Second, it relies heavily on Feta and Parmesan, two highly contested products even within the EU, which are likely not representative of other cheeses. For one thing, the protection of "Parmesan" as the translation of "Parmigiano Reggiano" is exceptional. All-in-all, the 13% increase in GI sales after external protection seems an unrealistically high best case, from the EU point of view.

Mitchell (2016) conducts an exploratory analysis related to CETA. Using Euromonitor data on the size of the Canadian domestic market for a limited number of tariff lines, she seeks to identify the maximum potential diversion away from domestic Canadian producers and non-EU exporters to the benefit of EU GI exporters.

Raimondi et al. (2019) find that having GIs in a tariff line, irrespective of external protection of the GIs, increases both trade and unit values.

There is an extensive literature on trade and quality (see e.g. Crozet et al., 2012; Melitz, 2003). One conclusion from this literature is that high-quality goods – such as GIs, presumably – will make up a larger share of exports the larger per-unit trade costs and the lower ad valorem tariffs (Hummels & Skiba, 2004). This would imply that after an FTA with ad valorem tariff decreases, irrespective of GI protection, GI products would make up a larger share of exports. On how trade costs and quality interact in the setting of markups, see Chen & Juvenal (2019).

3 Protection of GIs within the EU

The efficiency argument for GIs is the information problem of consumers not knowing ex-ante whether a product is high quality. In the absence of credible certification or private brands this can lead the market for high quality products to disappear (Akerlof, 1970). If private brands are too costly for small producers, a government system with a collective GI may hence be an efficient way to provide quality (Lence et al., 2007; Moschini, Menapace & Pick, 2008). Historically, GIs have been created to avoid or stop declines in reputation due to the entry of lower-quality producers using names like Burgundy, Port, and Chianti (Meloni & Swinnen, 2018).

In addition to arguments of efficiency, the EU also justifies its GI policy as protecting rural livelihoods and preserving culture (Broude, 2005; DeSoucey, 2010; European Union, 2012).

Even within the EU the protection of some GIs has been contested, especially where products were involved that some member states considered generic. Feta cheese is probably the main example. Before it became a Greek PDO in 1996, cheese called Feta was also produced in countries like Germany, Denmark and France (Evans & Blakeney, 2006: 591-593). With Feta a protected GI across the single market, these producers had to start marketing their product under alternative names, such as white salad cheese. In 1999, the PDO was annulled after a successful case brought to the European Court of Justice (ECJ) by Germany and Denmark. However, in 2002 the Commission reinstated the PDO, and an appeal of Germany and Denmark at the ECJ failed. Since then, Feta PDO has been protected in all EU trade agreements, although existing producers were grandfathered in the agreements with Canada, South Africa, Vietnam, and Japan (Huysmans, 2019).

Increasingly, developing countries are also registering GIs in the EU and setting up their own systems (Egelyng et al., 2017; Marie-Vivien & Biénabe, 2017). Examples of GIs registered in the EU include Darjeeling tea from India and Café de Colombia.

In trade, some argue that GIs can be seen as a product standard and hence a non-tariff barrier (Beghin et al., 2015; Chambolle & Giraud-Héraud, 2005; Swinnen & Vandemoortele, 2011).

Protection within the EU single market also implies to imports from outside the EU. A well-known case here is for Parmesan cheese. Kraft had to change the name of one of its products to Pamesello in order to be allowed to continue selling it in the EU (Babcock & Clemens, 2004:

10). After a bilateral agreement in which an EU trading partner protects Parmigiano Reggiano (and its translation Parmesan), the renaming will also have to take place in that market.

4 Protection of GIs in trade agreements

Through recent trade agreements, the EU has upgraded the protection of selected GIs from TRIPS Article 22 to Article 23. Under Article 23, "*The use of a GI is not permitted when the true origin of the good is indicated or when the GI is used in translation or is accompanied by expressions such as "kind", "style" or "type*"" (WTO, 1994). This protection is much stronger than Article 22, under which GI producers have to prove consumers are being misled (Addor & Grazioli, 2002).

The EU's recent bilateral success follows unsuccessful attempts at extending the protection of Article 23 to foodstuffs at the WTO (Evans & Blakeney, 2006; Goldberg, 2001; Huysmans, 2019). Just like protection of GIs within the EU single market functions as a non-tariff barrier to trade, one can consider the external protection of GIs as a non-tariff export promotion measure. The presumed goal is for EU exports of GI products to increase, as they displace competing products that can no longer use the GI name (Informa Economics, 2016).

Especially the US is against further GI protection (Hughes, 2006; Josling, 2006; Marette et al., 2008; Matthews, 2016; Montén, 2006; O'Connor & De Bosio, 2017; Raustiala & Munzer, 2007; Vittori, 2010). In an article for the *Financial Time*, Beattie (2019) speaks of "an unbridgeable philosophical gulf" between the US and the EU. US producers, but also the US Department of Commerce, feel that the EU is simply trying to protect its producers in a way that does not really benefit consumers. If the products really are superior, they should simply get a private brand or trademark. In response, the EU argues that such private branding is too expensive for traditional small producers.

Some EU countries have many more GIs. Five countries have over 70% of EU GIs: France, Greece, Italy, Portugal, Spain (Huysmans & Swinnen, 2019). Naturally, these countries have more interest in the external protection of EU GIs (Huysmans, 2019).

On its website, the EU Commision Directorate General for Trade writes the following about GI exports: "geographical names with commercial value are exposed to misuse and counterfeiting. The abuse of geographical indications limits access to certain markets and undermines consumer loyalty. Fraudulent use of geographical indications hurts both producers and consumers". The stated objective of GI trade policy is hence to protect foreign consumers from

misinformation and EU producers from unfair competition. To the extent that such unfair competition exists and protection would be effective, the indirect objective is hence to increase EU GI exports. As appears from the literature review above, little research actually investigates the trade effects of GIs outside of the EU. And to the best of our knowledge, we are the first to disentangle the actual protection of food GIs in trade agreements from their mere existence.

4.1 Hypotheses for testing

Our review of the literature and the arguments made above lead to the following hypotheses for testing.

H1. The protection of EU GIs in third countries leads to increased exports.

H2. The protection of EU GIs in third countries leads to higher prices (unit values).

Given that GIs may indicate quality, and that in addition their existence may have a causal effect per se on exports, it is important to control for countries' GI endowments when testing H1. Furthermore, tariff and non-tariff barrier decreases in FTAs will lead to increased exports for all products. As explained in the empirical section, fixed effects will be used to control for this and other potential identification issues. What we are interested in is the effect of GI protection per se, not of simply having a GI or of tariff reductions.

5 Data

Our analysis considers extra-EU exports of cheese, and covers the period 2004-2018. Our focus on cheese is motivated by the fact that this category of products comprises a large share of EU GIs. Several countries, and in particular France, Italy, Greece and Spain, consider some of their domestically produced cheeses important national heritages (DeSoucey, 2010; Huysmans, 2019). Some of these products are also exported worldwide, and thus represent an important source of income. However, as a result of their notoriety and reputation, EU GIs cheeses are among the most counterfeit agri-food products worldwide. If we take for instance cheeses like Parmigiano Reggiano, Feta or Roquefort, it is not unusual to find similar products produced in extra-EU countries using similar names. This is because, thanks to their widespread consumption, these cheeses are often associated to a wider product category rather than to a specific (GI) product. The presence of several imitations has therefore triggered a high interest of EU countries to protect their GI cheeses, in particular within bilateral FTA agreements. As the objective of this paper is to study to what extent the protection of GIs in the EU FTAs affects

the exports of listed products, we believe that the cheese sector represents the perfect setting for our analysis.

5.1 Data on GIs

A key point of our study is represented by the classification of the EU GI cheeses consistently with the trade data classification (i.e. CN 8-digit).[1] Previous studies in the literature dealing with a similar topic have used different strategies to address this issue. Agostino and Trivieri (2015), who work on EU wine exports, used the official product COMEXT CN 8-digit classification, as for wines it is specified whether products are GI or not. Duvaleix-Treguer et al. (2018) for French cheese, working with firm level data, took this information directly from the list of producers. Finally, Raimondi et al. (2019) built an original classification, by associating manually all the EU GIs with the corresponding HS 6-digit product category.

In this paper we follow the strategy of Raimondi et al. (2019), refining their classification for cheeses going into a higher level of detail. We classify all 235 EU cheese GIs registered by 2018 at the CN 8-digit level. Working at this level of detail is important because it allows us having a more precise identification of the products, which is essential in our analysis as we deal with very specific products (i.e. those that are included in FTA provisions). Following Raimondi et al. (2019), we first collected data on all the cheeses associated with a GI label for all the EU countries from DOOR database. In a second step we then manually associated each product to the corresponding CN-8 digit category (e.g. Parmigiano Reggiano has CN8 code: 04069061).

Data on GIs have been then used in our empirical analysis with a double objective: first, we consider the total number of GIs in each CN 8-digit category listed for protection in a bilateral FTA. This represents our core variable, which captures whether being listed in a bilateral FTA provision may affect exports. Second, we consider the total number of GIs registered by EU member in each product category. We refer to this variable as the GI endowment, which suggests to what extent cheese GIs are important for the different EU Member States.

[1] Note that the DOOR database, from which we collected data on EU GIs, does not provide an official product classification. It only provides broad product categories that do not map to HS trade classifications. Further note that as of 1 Jan 2020, the Commission has transitioned from the DOOR database to the eAmbrosia database.

5.2 Dependent variable: Trade data

We gathered data on bilateral exports of cheese for all the EU countries at the CN 8-digit (HS4 chapter 0406) level from EUROSTAT COMEXT for the period 2004-2018. Our analysis firstly considers as dependent variable bilateral exports' value in euros at the 8-digit level.

Second, we also consider extensive and intensive trade margins. However, we do not rely on widely diffused trade margins measures such as the simple count of exported products or some export concentration index (Cadot et al., 2011; Persson and Wilhelmsson, 2016). This is because such measures, although very clear, have the drawback that they consider that all exported products have the same economic weight. To overcome this limitation, we follow Feenstra and Kee (2008), who developed a theoretically-founded procedure to decompose bilateral trade values into their respective extensive and intensive margins considering the economic weight of the exported products. This procedure is close to the count of the number of the exported varieties, but it considers the weight that exported products have with respect to the overall imports in a given country.

Specifically, the extensive margin is measured as follows: Consider $R_{ij,t}^{h4}$ as the set of categories exported by country *i* to country *j* in a given year *t* within a HS 4-digit category. Let define R_{jW}^{h4} as the set of categories that are exported worldwide to country *j* over all the considered period in the same HS 4-digit category. Finally, consider $\bar{V}_{jW,h8}^{h4}$ as the average value of overall worldwide exports to destination *j* for a product *h8* (8-digit) over all the considered period. The extensive margin is then measured for each HS 4-digit category as follows:

$$EM_{ijh4,t} = \frac{\sum_{h8 \epsilon R_{ij,t}^{h4}} \bar{V}_{jW,h8}^{h4}}{\sum_{h8 \epsilon R_{jW}^{h4}} \bar{V}_{jW,h8}^{h4}} \quad (1)$$

Now consider $\bar{V}_{ijh8,t}^{h4}$ as the value of country *i* exports to *j* for a product *h8* in the year *t*. The bilateral intensive margin for the HS 4-digit industry is then defined as follows:

$$IM_{ijh4,t} = \frac{\sum_{h8 \epsilon R_{ij,t}^{h4}} \bar{V}_{ijh8,t}^{h4}}{\sum_{h8 \epsilon R_{ij,t}^{h4}} \bar{V}_{jW,h8}^{h4}} \quad (2)$$

The intensive margin thus correlates exports from country *i* to country *j* in a given period for a set of products, with the average value of worldwide exports to *j* for the same product category. In practice, it estimates the market share of country *j* within the product categories exported to *j*.

Finally, our analysis also considers as dependent variable the bilateral exports' unit value, which is estimated as the ratio between export value and export quantity and sometimes used as a measure of quality (Khandelwal, 2010).

5.3 FTAS and GI Provisions

Table 1 gives an overview of FTAs with GI provisions. For each FTA, it lists the type, the year negotiations were completed, the year the FTA came into provisional effect, and the number of EU food GIs protected by the FTA. The data come from Huysmans (2019).

Table 1. FTAs with GI provisions

Partner	Type	Negotiated	Provisional	Listed GIs
South Korea	FTA	2009	2011	60
Andean	FTA	2010	2013	34
Central America	AA	2010	2013	88
Ukraine	DCFTA	2012	2016	811
Georgia	DCFTA	2013	2014	805
Moldova	DCFTA	2013	2014	852
South Africa	EPA	2014	2016	110
Canada	CETA	2014	2017	143
Singapore	FTA	2014		83
Vietnam	FTA	2015		59
Japan	EPA	2017	2019	78

The EU uses different names for its FTAs. Those with South Korea, the Andean countries (Columbia, Peru and since 2017 Ecuador), Singapore and Vietnam are called FTAs. The FTA with the Central American countries (Costa Rica, El Salvador, Guatemala, Honduras, Nicaragua and Panama) is called an Association Agreement (AA). Deep and Comprehensive Free Trade Agreements (DCFTAs) have been concluded with Georgia, Moldova and Ukraine. Canada and the EU agreed on a Comprehensive Economic and Trade Agreement (CETA). Economic Partnership Agreements (EPAs) where signed with the South African Development Community and with Japan.

In the empirical analysis, GIs are counted as listed as of the year the relevant FTA becomes provisional. Not listed in the table, but accounted for in the empirical analysis is the 2011 agreement whereby Switzerland protects all EU GIs.

The agreements differ qualitatively in terms of the strength of protection. Differences include "the scope of protection granted, the enforcement of the rights emanating from GIs, and

registration and control procedures" (Engelhardt, 2015: 796). For instance, some provide for *ex officio* protection, where the administration has to actively prevent breaches (Engelhardt, 2015: 786). In other cases, a limited number of products are subject to grandfathering clauses. For instance, under CETA existing Canadian producers calling their cheese "Feta" retain the right to do so. Yet over the 11 FTAs listed in Table 1, only 27 cases of such partial protection exist (Huysmans, 2019). While the strength of protection is clearly important, no comprehensive quantitative indicators of the strength of protection have been developed. Hence we leave the inclusion of controls for the level of protection for future research.

6 Empirical estimation and hypotheses

The objective of this paper is to empirically analyse the export performance of GI cheeses that are included in EU bilateral FTAs provisions, which thus receive higher protection. We rely on a structural gravity-type model, which is one of the most widely used methodologies to properly test the relationship between bilateral trade flows, trade costs and importing and exporting countries characteristics. Specifically, our analysis relies on two main structural gravity equations:

$$X_{ijht} = \beta_0 + \beta_1 ListedGI_{ijh8t} + \epsilon_{ih8t} + \epsilon_{jh8t} + \epsilon_{ij} + \varepsilon_{ijht} \quad (3)$$

where *X* is our dependent variable, *i* refers to exporting country, *j* to an (extra-EU) importing country, *h* to a product category and *t* to a given year. As explained in section 4, our dependent variable *X* is, alternatively, export value, extensive margin, intensive margin and unit value. It is worth highlighting that the former and the latter dependent variables refer to 8-digit product categories, while trade margins are built at the 4-digit level. $\beta_1 ListedGI_{ijh8t}$ represents our main variable of interest, and accounts for the number of GI cheeses that are included in bilateral FTA provisions between an EU country *i* and the importing country *j*, for a product category *h8* at time *t*. Our analysis explores the bilateral trade variability through country pair (exporter-importer) fixed effects ϵ_{ij}. Following the structural gravity literature, we also account for multilateral trade resistance (see Anderson and Van Wincoop, 2003), using two set of three-way fixed effects terms ϵ_{ih8t} and ϵ_{kh8t}, which account respectively for exporter-product (8-digit)-time fixed effects and importer-product (8-digit)-time fixed effects. Finally, ε_{ijht} is the error term.

Our second structural gravity equation of interest is the following:

$$X_{ijht} = \beta_0 + \beta_1 ListedGI_{ijh8t} + \beta_2 GIendowment_{ih8t} + \epsilon_{ih6t} + \epsilon_{jh6t} + \epsilon_{ij} + \varepsilon_{ijht} \quad (4)$$

Equation (4) adds with respect to (3) the $GIendowment_{ih8t}$ variable, which refers to the number of GIs registered in the EU country *i*, in the product category *h8* at time *t*. The main difference between (3) and (4) lies in the product fixed effects, which account for multilateral resistance. Equation (4) still includes three-way fixed effect as in equation (3), with the only difference that the product category variability is at the 6-digit level. This difference is due to the fact that $GIendowment_{ih8t}$ would otherwise be absorbed in the fixed effect ϵ_{ih8t}. We believe that it is important to consider both these gravity equations, as, on the one hand, equation (3) provides a *pure* test on the effect of being listed in FTA provisions on GI cheeses export performance. On the other hand, equation (4) allows controlling for the regular GI endowment in the EU exporting countries. The addition of this variable should alleviate any concerns of potential omitted variable bias in equation (3), where the GI endowment should be captured by the fixed effects. To the extent that GIs may be associated with higher quality products, the inclusion of this variable allows also controlling for the average quality of EU countries' cheeses exports.

In both equations, our main coefficient of interest is β_1. It is worth highlighting that the inclusion of country-pair fixed effects (ϵ_{ij}) allows our structural gravity equation to identify β_1 exploring the bilateral variation in the number of GI cheeses that are included in FTA provisions over the considered period. Specifically, the effect revealed by the estimation of β_1 should be interpreted taking as a reference those products that are not included in FTA provisions (either GI or not-GI). This is particularly true when estimating equation (3), where the regular exporting country GI cheese endowment should be captured by the three-way fixed effects ϵ_{ih8t}. When estimating equation (4), we explore bilateral variation in wider product categories (HS 6-digit), but we control for exporting countries GI cheese endowment. In this case, β_1 accounts for additional effect of FTA provisions on GI exports that goes beyond the potential effect exerted by the regular GI endowment, which has been for instance recently estimated in Raimondi et al. (2019).

Our preferred method to estimate equations (3) and (4) is the Poisson Pseudo Maximum Likelihood (PPML) estimator. As our empirical analysis considers zero trade flows, the PPML estimator has been proved to be particularly suitable in this case. This is because, first, it allows avoiding the well-known incidental parameter issue occurring in a panel fixed effects model when running for instance a probit model in the first stage of a Heckman selection model in presence of many zeros. Second, as highlighted by Santos Silva and Tenreyro (2006, 2011),

PPML proved to be a consistent estimator in presence of heteroscedasticity and measurement errors.

7 Results and discussion

7.1 Main Results

Table 2 presents our main results of estimating the effect of being listed in FTAs provisions on EU GI cheeses export performance using the PPML estimator. The results in column 1 refer to the estimation of equation (3), where thus our three-way fixed effects consider product at the 8-digit level. GI cheeses included in FTA provisions show a positive bilateral trade effect, which however is not statistically significant at the conventional level. Quantitatively, the estimated coefficient of the Listed GI variable suggests that the inclusion of an additional cheese in a bilateral FTA provision, increases trade by about 5 percentage point, an effect that however proved to be not statistically significant. FTA provisions aimed at allowing higher protection for a selection of EU GI cheeses in the signatory destination countries thus seem not to have a relevant effect in improving the export performance of the listed products.

The results in column 2 refer to the estimation of equation (4), where thus our three-way fixed effects consider product at the 6-digit level, but including only our bilateral Listed GIs variable. The estimation of such specification yields a positive and highly significant effect on our main variable of interest, which is also higher in magnitude than the one estimated in column 1. However, when controlling for EU Countries regular GI cheese endowment as in column 3, our Listed GIs variable turns out to be non- significant, and reduces its magnitude to a value similar to the one in column 1. In contrast, the GI endowment variable results to be positively and significantly associated with exports to extra-EU countries, a result in line with Raimondi et al. (2019).

The results in column 3 thus suggest that countries' regular GI endowments, more than the higher protection of GIs within bilateral FTAs matters in determining the performance of EU cheeses exports. The results in column 4 and 5 are robustness checks for the estimation of equation (4). Specifically, these additional estimations have the objective to address potential concerns of collinearity between the Listed GIs and GI endowment variables. These concerns may arise because these two variables could have the same value when all the GI cheeses in a country-product line are listed in bilateral FTA provisions. To address this concern, we first replaced our GI endowment variable with a dummy variable assuming the value of 1 if an EU country has one or more GI cheese in a product line, and zero otherwise. Second, we dropped

all the observations where this event occurs. The results in columns 4 and 5 suggest that our main findings are not significantly affected by this robustness check.

Table 2. EU GI cheeses included in FTA provisions and export performance

Dependent variable:	(1)	(2)	(3)	(4)	(5)
Export Value	PPML	PPML	PPML	PPML	PPML
Listed GIs *(ijht)*	0.054	0.193***	0.048	0.067	0.034
	(0.062)	(0.041)	(0.047)	(0.054)	(0.067)
GI endowment *(iht)*			0.173***		0.185***
			(0.038)		(0.039)
Dummy GI endowment *(iht)*				2.049***	
				(0.188)	
Exporter-Importer FE	Yes	Yes	Yes	Yes	Yes
Exporter-Product-Time FE	Yes	Yes	Yes	Yes	Yes
Importer-Product-Time FE	Yes	Yes	Yes	Yes	Yes
FE product level	CN8	HS6	HS6	HS6	HS6
N	141,688	349,770	349,770	349,770	345,414

Note: Table reports the results of estimating the GI trade effect on EU cheeses extra-EU exports. Results in column 1 refer to the estimation of equation (3) using PPML estimator with product fixed effects at the 8-digit level. Results in columns from 2 to 5 refer to the estimation of equation (4) using PPML estimator with product fixed effects at the 6-digit level. Results in column 5 refer to the estimation of the same model than in 3, but excluding all cases where the number of Listed GIs is equals to GI endowment. Standards errors, clustered at the exporting-importing-product level are reported in parenthesis. *, **, *** indicate significance at 90%, 95% and 99% confidence levels, respectively.

In Table 3 we show the results concerning trade margins and export unit values. We measured extensive and intensive trade margins following the theoretically founded method developed by Feenstra and Kee (2008). As these indeces have been built at the HS 4-digit level, data have been collapsed at the same product category level. For this purpose, our *Listed GIs* variable includes the sum of listed GIs in FTA within each bilateral-product (HS 4-digit) pair in a given year. In the same vein, the *GI endowment* variable presents the total number of GI cheeses registered by the different EU countries in each product (HS 4-digit) category. The results presented in Table 3 are consistent with those presented in Table 2, thus suggesting that EU countries' regular GI Endowment more than the higher protection guaranteed by the FTA provisions is an important determinant for EU GI cheeses exports. These findings thus confirm one more time that the protection of GI cheeses in bilateral trade agreement seems to be

ineffective from a trade enhancing perspective. The results on the extensive margin (columns 1 and 2) thus suggest that the presence of GI cheeses in a country-product (4-digit) line increases the number of exported varieties (8-digit) within that product category. Similarly, the positive and significant effect of the GI endowment variable on the intensive margin (columns 3 and 4), suggests that the presence of GIs leads to an increase of the volume of cheeses already exported by the EU toward extra-EU Countries. Overall, these results are in line with previous findings reported by Raimondi et al. (2019) and Duvaleix-Treguer et al. (2018).

Table 3. EU GI cheeses included in FTA provisions, trade margins and export unit value.

	(1)	(2)	(3)	(4)	(5)	(6)
	PPML	PPML	PPML	PPML	OLS	OLS
	Ext. Margin	Ext. Margin	Int. Margin	Int. Margin	(log) Unit Value	(log) Unit Value
Listed GIs *(ijht)*	0.008*	0.001	0.006	-0.001	0.006	0.007
	(0.005)	(0.005)	(0.010)	(0.009)	(0.007)	(0.006)
GI endowment *(iht)*		0.092***		0.027***		-0.004
		(0.015)		(0.006)		(0.002)
Exporter-Importer FE	Yes	Yes	Yes	Yes	Yes	Yes
Exporter-Product-Time FE	Yes	Yes	Yes	Yes	Yes	Yes
Importer-Product-Time FE	Yes	Yes	Yes	Yes	Yes	Yes
N	8,794	8,794	8,794	8,794	26,281	30,789

Note: Table reports the results of estimating the GI trade effect on EU cheeses extra-EU extensive, intensive margins and export unit values. Results in column 1 and 2 consider extensive margin as dependent variable and refer to the estimation of equation (3) and (4), respectively, using PPML estimator. Results in column 3 and 4 consider intensive margin as dependent variable and refer to the estimation of equation (3) and (4), respectively, using PPML estimator. Results in column 5 and 6 consider export unit value as dependent variable and refer to the estimation of equation (3) and (4), respectively, using OLS estimator. Standards errors, clustered at the exporting-importing-product level are reported in parenthesis. *, **, *** indicate significance at 90%, 95% and 99% confidence levels, respectively.

Finally, columns 5 and 6 present the results on EU cheeses export unit values. The results in column 5 are obtained running equation (3), and show a positive but not significant effect of the inclusion in FTA provisions on GI cheeses export unit values. We obtain similar results in column 6, when running equation (4) and thus controlling for regular GI endowment. Overall, these final results suggest that protecting GIs through FTAs does not have a significant price effect.

Taken together, these results provide evidence that is not in line with the importance attributed by EU countries to the protection of EU GIs. A potential explanation for the observed lack of export effects may stem from the fact that the ad valorem tariff reductions obtained through the FTAs make more expensive EU food products relatively cheaper in the destination countries than before, in line with the findings of Hummels & Skiba (2004). As a consequence, consumers of FTA signatory EU partners increase their consumption of original EU GI products. So, tariff reduction represents per se a meaningful protection against the misuse of EU names of GI products such as Parmesan.

We see three main explanations for why the Mediterranean EU member states insist on GI protection in FTAs in spite of robust export effects. First, member states may seek protection because of gastronationalism (DeSoucey, 2010; Huysmans, 2019). Second, member states may simply be unaware that, once properly controlling with fixed effects for factors such as tariff decreases, there are no significant export increases. Third, member states may hope for more sales of authentic GI products in the long-term future than if there had been no protection.

8 Conclusion

This paper analyses whether higher protection of GIs in EU bilateral FTAs affects the export performance of GI products. The focus is on EU cheeses, which encompass a large number and value share of EU GIs. We manually classified GIs into the corresponding CN 8-digit category, and we set our analysis looking at export flows with the top 36 extra-EU partners, over the period 2004-2018. Our analysis relied on a structural gravity-like model, accounting for the usual zero-trade flows issues employing a PPML estimator. Our main results suggest that GI products listed in bilateral FTA provisions, which thus receive higher legal protection in the signatory destination countries, do not show any significant improvement in their exports. Our main findings suggest that countries' regular GIs endowment is instead associated to higher export performance with respect to other products. Our results are quite surprising, given the effort that EU countries devote in asking higher protection for their GI products. One potential explanation of this (null) result may be related to the fact that FTA agreements are associated with significant tariff reductions. Therefore, all the exported products, either GIs or non-GIs benefit from the lowering in tariffs.

Our results suggest that the EU should focus more on the promotion of its GIs, rather than asking for stronger legal protection. However, our results should be interpreted with some caveats. First, our analysis provides insights on the short-run effect of GIs protection in bilateral

FTAs. We cannot exclude therefore that this protection will guarantee higher export performance on listed products in the long-run. The existence of some clauses (e.g. grandfathering) in some cases do not prevent past producers of listed GIs to carry on the production of simialr products, which is instead not allowed to new producers. Second, we only focus on the cheese sector. Although this is perhaps the most relevant sector in terms of GIs, our results may be not confirmed considering other sectors.

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