

Broadening or Jumping?

An analysis of the first export market of EU firms

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Abstract

This paper explores the export activities of international firms from seven European countries with a special focus on the neighbourhoods of Europe, where sixteen countries have been included in the Neighbouring Policy. Using a detailed dataset of the internationalisation activities of nearly 15,000 companies, we focus on the best export destinations of EU firms. In 2008, only 6% of exporters had at least one neighbouring country in their top three export destinations. We subsequently model the export/no-export activity of each firm and the location of the first export destination by means of a nested logit model and find that this process is driven primarily by geography. No reduction (or even an increase) of the strength of the distance effect can be detected for a firm when exporting outside Europe to nearby countries, meaning that EU firms do not have any particular advantage in exporting their goods in countries near their borders with respect to all the other possible destinations in the world. The ‘repulsive force’ of distance is alleviated only when moving outside of neighbourhoods where the size of the destination market becomes stronger.

Keywords

Exports; EU; Firms; European Neighbouring Policy

JEL Classification

F13-F14-F15

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1. INTRODUCTION

The most successful empirical trade model shows that geographic frictions reduce trade. Other things equal, countries whose distance is shorter tend to trade more. Distance matters for one fundamental reason: It actually works as a proxy that condenses the existence of non-negligible international trade costs, whether variable, such as transport, or fixed, related to the operations for a firm's engagement in another market (such as costs of information). Together, fixed and variable costs explain why countries that are far apart find it more costly to trade.

One recent discussion on the role of distance relates to its non-linearity in the way it affects trade. The most classical reference is Eaton and Kortum (2002), who tested a Ricardian model by means of structural equations with bilateral flows and divided the distance variable into six intervals, as an alternative to the quadratic form. The non-linear effect can be attributed to different factors, such as the network structure of trade relations (Abbate, De Benedictis, Fagiolo and Tajoli, 2012) and the different types of borders (regional, national, supra-national) when moving in space (Hillberry and Hummels, 2008; Gallego and Llano, 2014), but also to the fact that distance simply has a different effect country by country, an approach that is more in line with the geographers' focus on the context, as reported by Arribas, Perez and Tortosa Ausina (2011).

When studying inter-regional trade across several parts of the world, it is evident that countries tend to trade more with countries that are near their border. In 2014, the first export destination of the U.S. economy was Canada, whereas the third was Mexico (US Census, 2014). Germany has a similar structure, France being the first export destination and the Netherlands the fourth. If we examine most countries in the world, a clear finding is that having a common border matters for trade. The country data evidence is clearly based on firms' choices: U.S. exporters largely ship goods to markets in North America because the first destination of most EU firms is within Europe (Bruegel EFIGE report, 2012). The existence of a regional trade agreement (the NAFTA for the U.S. and the common EU market for European firms), where official borders to the movement of goods are cut down, clearly plays a role in facilitating firms' operation abroad.

The aim of this paper is to study where European firms export outside Europe and particularly to assess whether European firms are more likely to export nearby, in countries where the EU had undergone Free Trade Agreements (FTA) and Deep and Comprehensive Free Trade Agreements talks, or they tend to export far away. The Mediterranean (MED) neighbouring countries of Europe in the last ten years have made progress towards trade liberalisation. Tariffs applied to goods have decreased following the implementation of Free Trade Agreements with the European Union, which led in 2000-2006 to growing volumes of trade flows between the Mediterranean region and EU partners and to growing exports to the EU. Exports from the EU to Mediterranean countries have

also grown, but have grown much less than MED exports. Similarly, the EU's Eastern neighbourhoods have further opened up their economies to international trade and implemented liberal trade regimes with low average levels of tariff protection. In the same period, the EU was the single largest trading partner for almost all countries in the region.

In this paper, we look at where EU firms make exports, focusing on how their choice is linked to standard gravity determinants: the size of the exporting market and its distance. This exercise allows us to take into account 3 issues. The first is the presence of a EU external border. The EU region, as a group of countries, is a differently regulated place (thanks to the *acquis communautaire* rule) with respect to non-EU economies. The second is the drastic shift of EU external borders after the fifth EU enlargement (2004-2007): a jump of 1200 km from Gryfino (Germany-Poland border) to Narva (Estonia-Russia border), of 1300 from Gorliz (German-Polish border) to Costanta in the Romanian Black Sea coast, and of 1020 km from Jennesford (Austria) to Burgas, in the Black Sea, Bulgaria. In other words, the space within the EU enlarged considerably after its external border moved. The third is the presence of a large group of countries in the outskirts of Europe that, in the last 10 years, have been affected by measures for a neighbouring policy, the primary aim and underlying rationale of which were not economic integration but a framework for Europe for engaging with its immediate neighbours, managing their aspirations (e.g., for enlargement, for market access) and promoting democratisation and political stability.

Our analysis indirectly considers the ENP from the viewpoint of the EU countries, providing an empirical exercise on whether European Neighbouring Countries represent the nearest trade destination for EU firms, as their geography would suggest. Our finding is that this is not the case. Outside the new external border, European firms tend to export far from Europe. This result questions the proper 'existence' of the new EU external border in defining nearby countries. This calls for an analysis on the possible non-linear effect of distance on trade costs and therefore trade flows. Does it have a different weight compared to economic size or income level (the other main determinant of the gravity model) when EU firms operate outside the new external EU border with respect to their operations inside the EU? Is the weight different when exporting nearby or faraway? For the scope of our work, we use firm-level data (EFIGE dataset), which allow to study the activity of EU firms in countries near Europe and compare them with firms concentrated in faraway markets. EFIGE consists of approximately 15,000 firms from seven EU countries, Austria, France, Hungary, Germany, Italy, Spain, and the UK, and allow us to control for several dimensions that are likely to contribute to competitiveness and success in the international markets. The detailed information on each firm's main export destinations allows us to investigate the role that nearby countries play in making it more likely for an EU firm to export, with respect to all the possible

world destinations. In this way, we can ascertain how important are, for EU exports, their “neighbours”, which can be considered in a wider area. Our focus will be on the first export destination of each firm present in the EFIGE dataset, which actually counts for 1/3 to half of the total exports in value (references). We first evaluate whether a country’s status of being in the ‘neighbourhood’ of Europe makes it more likely to be a primary destination of EU products with respect to countries that are near the EU but are not covered by the ENP. Two of them, Russia and Turkey, are also big players. Subsequently, we will econometrically analyse the process that (seldom) makes the “neighbours” of Europe (distinguishing between countries covered by the ENP and those that are not) the first export destination of a firm vis à vis within all world country groups present in the EFIGE dataset using a nested logit model (NLM), an econometric model usually adopted in the analysis of multinational location choice. This empirical model allows us to evaluate the effects of both firm and destination characteristics in a multiple (and nested) decision process for the firm of whether it exports, at the first stage, and where, in the following stages.

Our study improves on the existing empirical literature along several dimensions. First, until now, the empirical literature that applies discrete choice modelling to trade has focused primarily on the location decision of production-based capital movements across borders (multinationals; see, among others, Disdier and Mayer, 2004; Basile, Castellani and Zanfei, 2008) and, to much lower extent, on the choice of where to export; this decision is persistent in time because of the high fixed costs for entering another national market, and it has been found to be fundamental in determining firm behaviour (Brambilla, Lederman and Porto, 2012). Moreover, our analysis improves on the standard results from the gravity equation by putting together firm-level and country-level characteristics. In particular, we provide new evidence on the relative importance of the two main dimensions from the gravity equation, i.e., size and distance, in determining the export location of EU firms. Overall, our results suggest that for EU firms, moving from national borders outside the EU is impeded more for shorter distances than for longer ones. In this respect, no trace of indirect beneficial effects by the ENP on the export of European firms has been found.

The structure of the paper is the following. Section 2 contains a review of the relevant literature on trade and distance, whereas Section 3 briefly surveys the main characteristics of the ENP. Section 4 presents our analysis of the export activities of European firms carried out by means of the EFIGE dataset. Section 5 describes the econometric analysis, i.e., the issue of modelling export decisions and destinations. Section 6 discusses the results from the NLM, which puts together firm-level and country characteristics. Section 7 provides concluding remarks.

2. DISTANCE, BORDERS, PROXIMITY AND TRADE

One of the longest-standing and most robust empirical results in international economics is the existence of a negative relationship between aggregate exports and distance. Moreover, since the work by McCallum (1995), border effects in trade have seemed to be a stylised fact at both the regional and national levels. Additionally, recent research on exporting activity at the firm level has established an apparently equally robust result – few firms export, and exporting firms usually sell in a limited number of markets. This has led to the development of new models of trade that focus on firm-level exporting decisions. These two lines of literature, when considered together, provide important information on the role of distance when firms operate in international markets.

The differential result ascribed to the presence of a border has been recently (Gallego and Llano, 2014) connected to the non-linear relationship between trade and distance. As suggested by Hillberry and Hummels (2008), spatial frictions matter and have the greatest effect on very short distances rather than longer ones.¹ Additionally, the modelling at the firm level on whether the firm is present in the international markets (the extensive margin in trade) focuses on the concurrent role of firms' heterogeneity in productivity and the fixed costs for operating abroad. Firms that cannot export enough to cover their fixed costs will not export at all. A puzzling role for distance emerges. By definition, it is a proxy for variable costs, but different effects can be ascribed to it at both the extensive margin (e.g., number of firms, number of shipments) and the intensive one (quantity of trade). Indeed, Hillberry and Hummels (2008) showed that spatial frictions reduce trade primarily by reducing the number of shipments; that is, the aggregate trade–distance relationship in intra-US trade is driven by the fact that most establishments ship only to geographically proximate customers, rather than shipping to many customers in quantities that decrease in distance. Conditional on a shipment taking place, its value is largely unaffected by spatial frictions. More recently, Lawless (2010) found that distance has a negative effect on both margins, although for US shipments, it is found to be 4 times stronger on the extensive one.² The point about the influence of distance on firms' shipment has also been clearly addressed by Crozet and Koenig (2010). In their work, the role of distance in firms' export volume and value and in the share of exporting firms is clearly evident even with respect to France's economy, pointing out the role of France borders to the north, east and south. They find that 57% of the distance effect on trade works through the extensive margin (fewer firms operate in long-distance markets); the remaining 43% reflects larger average shipments per firm.

¹ The final implication from these works is that attempts to measure border effects on larger geographical groupings are nearly certain to ascribe the non-linear effects of distance to 'home bias' dummy variables.

² In the same work, all of the variables capturing language, internal geography, and import cost barriers have been found to have significant negative effects on the number of firms exporting and not on the quantity of their exports. In this light, they can be interpreted more as fixed costs.

The next section is devoted to a description of the policy that the EU has implemented in its neighbourhood in the last decade.

3. EU EXPORTS AND THE ENP: TWO INDEPENDENT SETS?

After the fifth enlargement round of the European Union started in 2004, its external borders shifted dramatically. Suddenly, a range of poorer, economically and politically less stable and less democratic countries bordered the EU. In response to these context changes, the need was felt to create a unified policy to address bordering countries. This unified policy, the European Neighbourhood Policy (ENP), subsumed the patchwork of existing policy instruments. Its goal was to create a ring of countries around the EU with which the EU has close, peaceful and co-operative relations (COM 373 final, 2004).

The EU asked the ENP countries to reform their political system to align with EU democratic and humanitarian standards. Countries were also asked to adapt an extensive range of EU regulations to comply with EU internal market standards and to develop a range of institutions that could ensure the implementation of the reforms on a political and economic level. Finally, the EU demanded the resolution of a number of ongoing conflicts in the ENP countries (COM 104 final, 2003). The EU has incentivised these reforms through different mechanisms: i. direct funds for the implementation of legislation and the development of institutions and technical support to programmes that initiate reforms; ii. an extension of the promises for enhanced relations to ENP countries that carry out extensive reforms; and iii. investments in the ENP countries through different facilities of the European Investment Bank (EIB).

In summary, the policy would promote close political cooperation, close economic integration and ultimately access to the unified market as a reward for convergence towards the EU 'Acquis' on economic regulations and progress in the areas of border security, the prevention of illegal migration, an improved human rights record and expanded efforts towards democracy (Wesselink and Boschma, 2012).

The Search project aimed to study the effect of the ENP on the 'integration' of neighbouring countries and the EU in several areas: trade flows, mobility and human capital, technological activities and innovation diffusion, and the institutional environment. The scientific debate on the ENP (which is primarily an area of international relations and politics rather than political economics) clearly suggests that issues of economic development appear rather peripherally in the ENP agenda (Monastiriotis and Borrell, 2012). Nevertheless, the economic-developmental issue remains central in at least two other respects. First, the rewards associated with the ENP conditionality remain largely economic (and, it can be argued, become increasingly so), being

related to market access and financial assistance. Second, irrespective of conditions, the opening up of relations with the ENC periphery allows and encourages the development of closer economic ties between the ENP countries and the EU member states, as is manifested by the fast growth of trade and FDI flows registered over the last two decades between the two country blocks (Monastiriotis and Borrell, 2012).

This work represents an attempt to study the first area from a particular point of view: the self-interested goal of Europe to enlarge its market access rather than the political one of increasing its stability by providing a tool for economic development outside its border (access to its market).

4. THE EU FIRMS' EXPORTING ACTIVITY AND THE EFIGE DATASET

Is the 'new' neighbouring region of Europe a 'nearby region' for its firms? The US trades primarily with countries with which they share a border. In this paper, we transfer this question to the European area and study the first export destination for EU firms in a context where the space of nearby economies involves several borders regulated by bilateral agreements.

We consider EU bordering countries (and countries near them) as a different group with respect to far-away economies. In particular, in our empirical exercise, we categorise the possible export destinations in three macro-groups: other EU economies, countries in the nearby-bordering EU region, and far-away countries. In this setup, we can assess whether the heterogeneous set of measures under the name of ENP defines a region in the outskirts of EU borders that is more integrated than faraway countries.

Our empirical analysis is based on the EFIGE dataset, a database recently collected within the EFIGE project (*European Firms in a Global Economy: internal policies for external competitiveness*) supported by the Directorate General Research of the European Commission through its 7th Framework Programme and coordinated by Bruegel.

The dataset is focused on international operations, combining information about firms' international activities (i.e., exports, outsourcing, FDI, imports) with different sets of firms' activities. It includes quantitative and qualitative information on approximately 150 items divided into six sections: 1. structure of the firm; 2. workforce; 3. investment, technological innovation and R&D; 4. exports and internationalisation processes (exports, imports, foreign direct investments and international outsourcing); 5. market structure and pricing; and 6. financial structure and bank-firm relationship.³

The data consist of a representative sample (at the country level for the manufacturing industry) of almost 15,000 surveyed firms (above 10 employees) in seven European countries (Austria, France, Germany, Hungary, Italy, Spain and the UK). The data were collected in 2010 and cover the 2008;

³ See Altomonte and Acquilante (2012) pages 4-6.

for some variables more related to investment, technological innovation and R&D years from 2007 to 2009 are covered.

Firms included in EFIGE dataset are in harmony with countries' size such that larger countries have more firms than smaller ones. In addition, a sample stratification has been carried out to ensure the representativeness of the collected data. Hence, larger firms have a higher weight than smaller ones.⁴ The EFIGE data have been complemented by balance-sheet data drawn from the Amadeus database managed by Bureau van Dyck.

Table 1: The EFIGE dataset: Exporters and non-exporters

Country	Exporters	Non-Exporters	All firms
Austria	342	101	443
France	1861	1112	2973
Germany	1901	1034	2935
Hungary	342	146	488
Italy	2231	790	3021
Spain	1796	1036	2832
UK	1376	691	2067
TOTAL	9849	4910	14759

Source: Own calculations from EFIGE dataset

Table 1 shows briefly the composition of the sample in terms of export status. There are 14,759 firms observed: approximately 3,000 each from Italy, France, Germany and Spain, more than 2,000 from the UK, and just fewer than 500 from Austria and Hungary. Exporters comprise 67% of the sample (9,849 firms): Firms are classified as exporters if they export directly from the home country or if they sold abroad some or all of their own product/services in 2008.

Our analysis makes use of Section 4 of the EFIGE survey: exports and internationalisation processes. Exporting activity is covered exhaustively. Each firm's first, second and third main export destinations are specified. Other topics regarding international activities are treated with less detail, taking into account not a single destination country but eight geographical regions: 1. EU 15 countries; 2. other EU countries (EU 12); 3. other European countries not EU; 4. China and India; 5. other Asian countries; 6. the U.S. and Canada; 7. Central and South America; and 8. other areas.⁵

⁴ The sample stratification has been made using three elements: industries (11-NACE classification), regions (NUTS-1 level of aggregation) and size class (10-49; 50-249; more than 249 employees). Due their relevance in the aggregate competitiveness dynamic but their small weight in a standard stratification of the sample of firms, large firms have been oversampled (doubling their weight). Given the objective of the dataset (to study international operations of firms), firms included in the dataset have been selected using a sampling design that follows a stratification by sector and firm size. In fact, the reference population is composed of firms with more than 10 employees. This explains why internationally active firms are significantly more numerous in the EFIGE sample, with respect to the total firm population. Because the aim of our paper is to study the determinants of the first export destination of EU firms, the unbalanced cut of the sample towards exporting firms is less of an issue.

⁵ EFIGE data include 193 possible export destinations. See Appendix A to see how countries are organized into the 8 areas in the EFIGE dataset.

Starting from this geographical stratification, we divide all possible 193 destination countries into eight destination areas: 1. EU 15; 2. EU 12; 3. ENCs; 4. countries bordering either the EU or the ENCs; 5. China and India; 6. other Asian countries; 7. the U.S. and Canada; and 8. the rest of the world.⁶ This geographical aggregation into eight areas allows us to evaluate how European firms choose their first export destination, which accounts for a good portion of their total exports (41%), describing the relative importance of standard countries' characteristics in driving the choice of the first export destination. Moreover, separating ENCs from countries that border them (and the EU) allows us to take into account features and perspectives that can be connected with the existence of the ENP.

When taking into account, as the main objective, features connected with distance and borders, some of these 8 alternatives are more similar than others. In fact, considering the EU as a reference area, groups 3 and 4 bring together countries in the neighbourhood of Europe, whereas the remaining groups collect countries located far away from the EU. If it is true that distance matters in impeding trade (geographical, cultural, institutional), we could think of different levels of fixed costs for a firm that wants to export: in Europe, in a country that borders Europe or is even affected by the Neighbouring Policy or is far from Europe, where by "far" is meant being a country that, as a minimum condition, does not share any border with the EU or any country bordering the neighbouring area. Hence, we also aggregated the eight regions above into three main macro-regions: 1. EU; 2. NBNCs (Neighbouring and Bordering the EU or the Neighbouring countries); and 3. all other countries.

Table 2 describes firms' top three export destinations using the three macro-regions aggregation but splitting the second region into two groups: countries covered by the ENP (i.e., the European Neighbouring Countries, ENCs) and countries that border both the EU and the ENCs but are not covered by the ENP. There are 554 exporters to the ENCs —this means that they have at least one neighbouring country in their top three export destinations— but just 452 exporters that have at least one neighbouring country in their top three export destinations and no bordering countries. On the contrary, 753 firms have at least one country bordering the ENCs as a main export destination, but just 651 have no ENCs as one of their top three export targets. The majority of exporting firms choose to export to the EU or to nations different from any country near Europe: 6927 firms (70% of all exporting firms) have at least one EU country as a top three export partner. For 2000 exporting firms, we have no information about where they decide to export.⁷

⁶ Appendix A provides a detailed list of our geographical decomposition with respect to that one provided by EFIGE.

⁷ Data in Table 2 refer to 'at least one' country of the considering group included in firms' top three export destinations; then, the sum of the last row of columns 2 to 7 (subtracting column 6) gives not the total number of exporting firms because a firm could have, for example, an ENC as the first export destination, a faraway country as the second export destination and an EU country as the third export destination.

Table 2 Exporters in the EFIGE dataset

Country	Exporters to the EU		Exporters to the ENCs and to the countries bordering the EU and the ENCs		Exporters to faraway countries	Exporters to ENCs but not to countries bordering the EU and the ENCs	Exporters to unknown countries
	Macro-region 1		Macro-region 2		Macro-region 3	Group 3 but not 4	
	Group 1	Group 2	Group 3	Group 4	Groups 5-6-7-8		
Austria	228	88	6	19	128	3	87
France	1206	142	153	103	669	136	420
Germany	1100	276	37	132	702	24	611
Hungary	194	117	9	15	43	9	91
Italy	1662	337	181	285	904	132	255
Spain	1238	94	143	105	506	129	375
UK	961	109	25	94	711	19	161
TOTAL	6589	1163	554	753	3663	452	2000

Source: Own calculations from EFIGE dataset

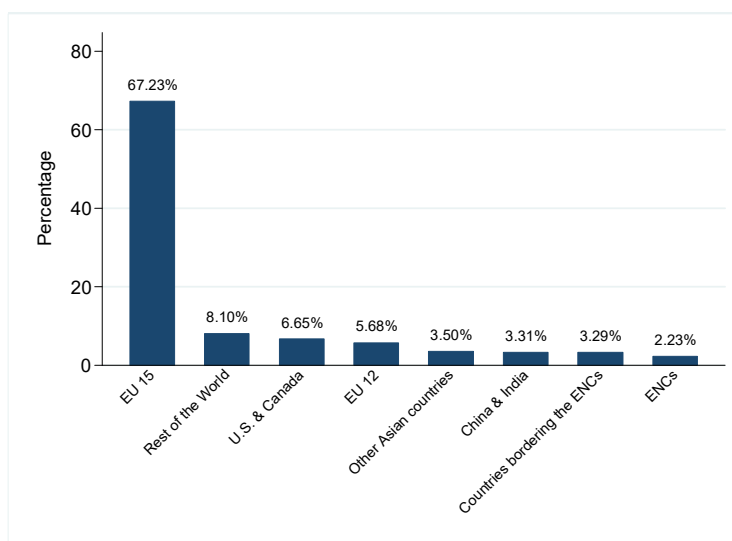
4.1 Export diversification: Neighbourhood or not?

This subsection analyses how diversified European firms' exports are. Export diversification is defined either as the change in the composition of a country's existing export product mix or export destination (Ali, Alwang and Siegel, 1991) or as the spread of production over many sectors (Berthelemy and Chauvin, 2000). Henceforth, we use the first "geographical" perspective. The bottom line is that to concentrate the entire export activity in a few destinations imposes risks for the continuity of the exporting activity.

We study European export diversification from two points of view. First, we look at geographical diversification to know and understand where European firms' exports go and which are their main exporting partners. Second, we investigate on the differences in firms' characteristics, between non-exporting firms, exporters to countries near Europe (including the ENCs) and exporters to other countries, to explore whether the preference to export to specific countries is due to particular firm features.

As seen above, the EFIGE database includes non-exporting and exporting firms. The exporters represent approximately 67% of the entire database. For 80% of them, we know which are their top three export destinations. Table 2 highlights that only a small number of EU firms primarily export near Europe and export even less to the neighbouring countries: Merely 6% of exporters have at least one neighbouring country in their top three export destinations. Figure 1 confirms that for the majority of EU firms, Europe is the first market. The main export destinations are countries that belongs to the EU. This fact opens an important question: If going outside Europe, where are exporting firms going? When examining their first export destination, it is clear that a role is played by the U.S. and Canada. All other destinations have a small share.

Figure 1 First export destination: all destinations



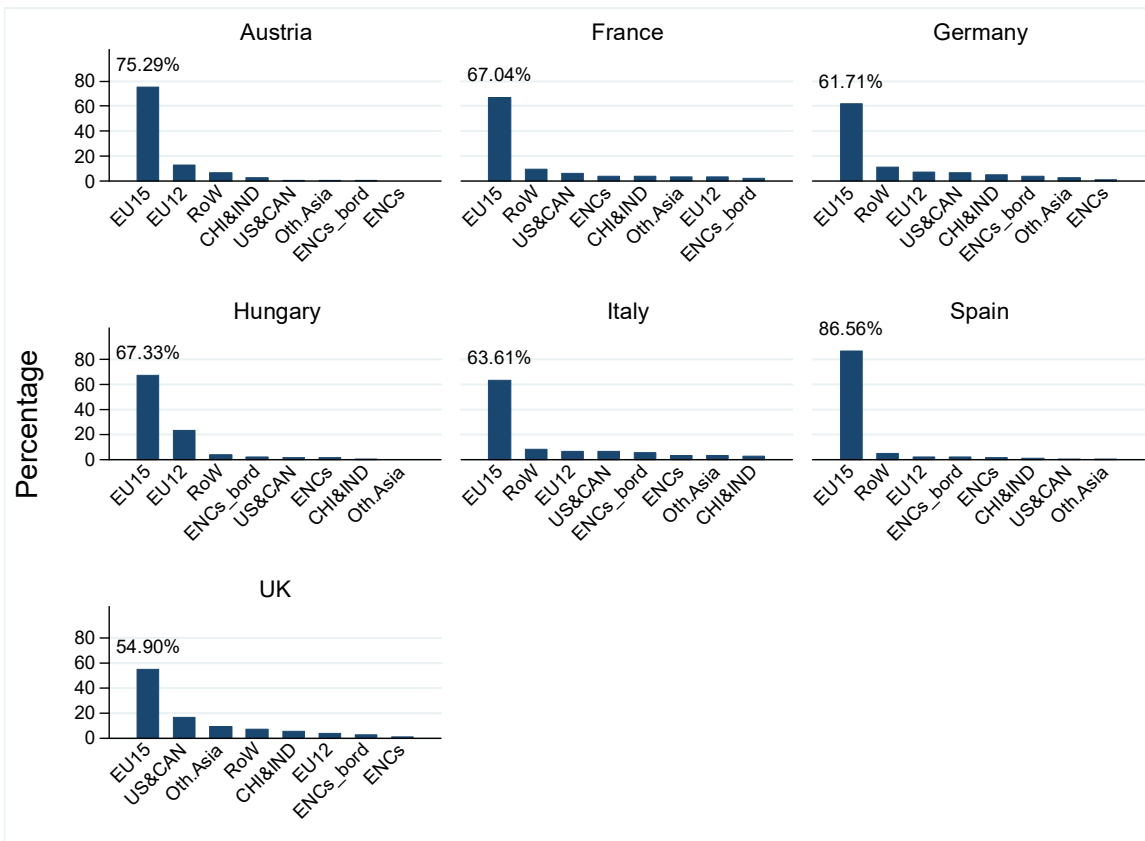
Source: Own calculations from EFIGE dataset

Figure 2 displays what happens based on firms' origin. Larger countries show a higher level of diversification, but the first export destination is represented by EU 27 countries. In the UK, the U.S and Canada are more influential. They represent the primary export destination of 17% of firms. The data confirm that exports to neighbouring countries are a smaller share with respect to goods going to other destinations.

Let us see now which countries are more popular as destinations when considering exporters to the ENCs: Mediterranean countries (Algeria, Egypt, Morocco, Tunisia), Middle-East countries (Jordan, Israel, Lebanon, Libya, Syria) or Eastern countries (Armenia, Azerbaijan, Belarus, Georgia, Moldova, Ukraine)? Figure 3 displays first export destinations for firms that have as main export partner a neighbouring country. As seen, Algeria and Morocco together represent the primary trade target of 50% of firms. When considering Egypt and Tunisia, we notice that Southern countries account for 76%.

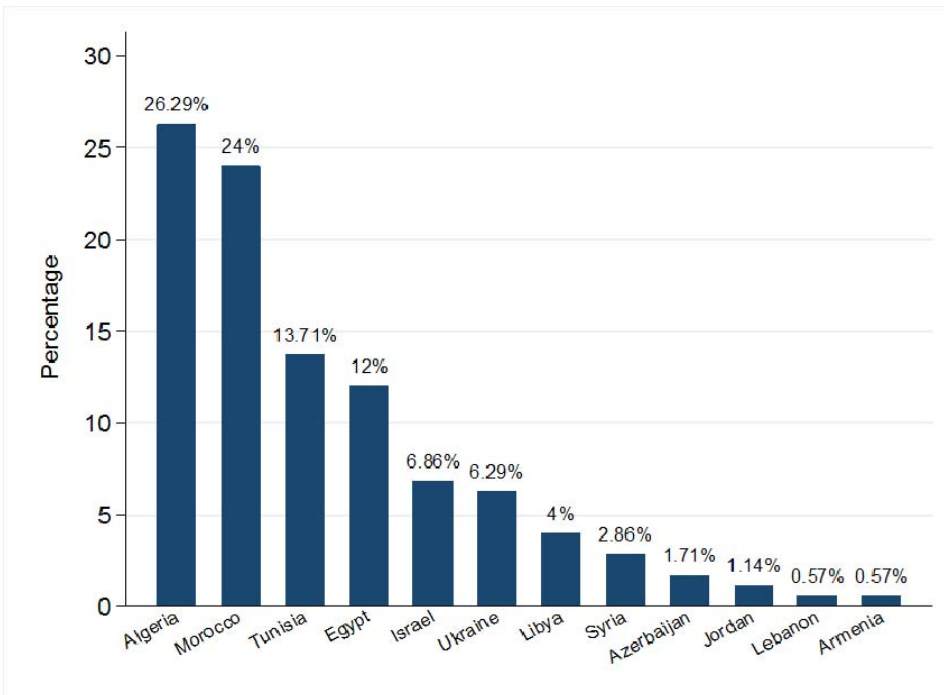
From this first descriptive analysis, it is clear that proximity and colonial legacy affect firms' export decisions and choices. Because the majority of firms are concentrated primarily in the large old European countries that are nearer to the Mediterranean group of the ENCs, the results reflects what the gravity model says. Bilateral trade flows depend directly on the economic sizes of countries and indirectly on the distance between nations.

Figure 2 First export destination, by country of origin: All destinations



Source: Own calculations from the EFIGE dataset

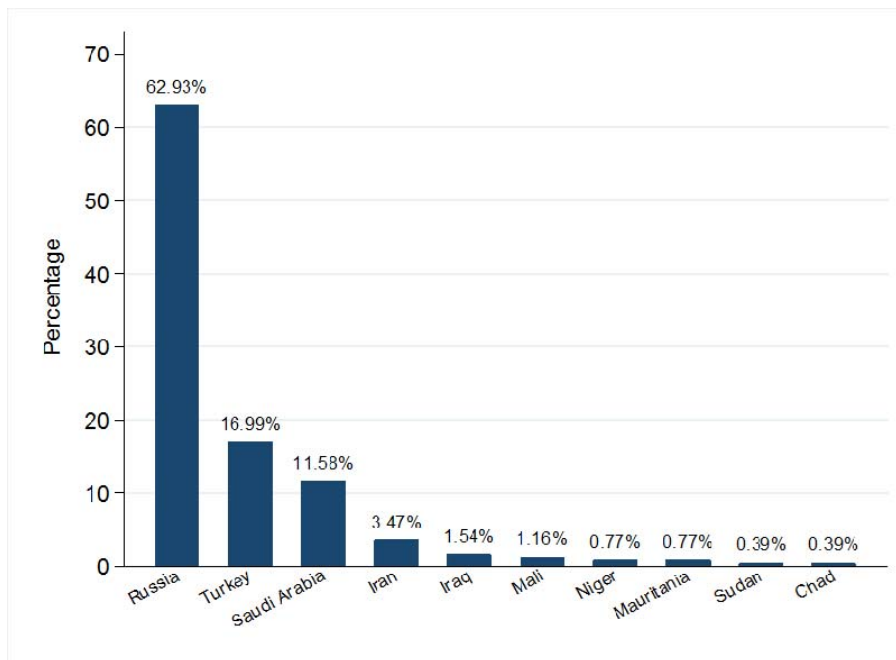
Figure 3 First export destination: ENCs



Source: Own calculations from EFIGE dataset

When taking into account countries that are not included in the neighbouring policy but border the ENC or Europe (in other words, are also nearby countries), we can see in Figure 4 that Russia accounts for 63%, followed by Turkey and Saudi Arabia. The other bordering countries have no role as main export destinations.

Figure 4 First export destination: Countries bordering the ENC



Source: Own calculations from EFIGE dataset

4.2 Differences across firms exporting near or far from Europe

In this subsection, we investigate whether firms that export primarily to the ENC are characterised by features that allow them to export in a profitable way. To better identify the characteristics of those firms, we first distinguish firms into two main groups, non-exporters and exporters. Within the group of exporters, we distinguish firms according to the area where they are included in their first export destination. To investigate whether the inclination to export to specific countries is due to particular firm features, we collected in a single table fifteen different firms' traits related to structure, employment, productivity, abroad activity, foreign ownership and innovation. The sampling design used for the EFIGE dataset consists of a stratification by sector and firm size that oversamples large firms. This weighting scheme, based on sectors and size classes, has been carried out to ensure sample representativeness and to guarantee balance. It divides the sample into 33 cells

by sector/size defining 3 firm-size classes (10-49 employees, 50-249 employees, more than 249 employees) and 11 NACE sector groups.⁸

A general look at Table 3 give us the sense that there are no great and significant differences between exporters to the ENC's and exporters to other countries.

Table 3 Descriptive statistics by export status (weighted statistics)

	All firms	Non-Exp.	Exp.	First export destination							
				EU 15	EU 12	ENCs	Countries bordering the ENC's	China & India	Other Asian countries	U.S. & Canada	ROW
Number of firms	14759	4910	9849	5277	446	175	258	260	275	522	636
Firm's age	35	33	37	37	33	35	37	40	36	41	34
Group (%)	18	12	21	22	20	19	19	30	30	26	19
Foreign ownership (%)	6	2	9	10	7	8	8	9	13	9	7
Importer of materials (%)	45	22	58	61	52	61	60	65	64	64	56
Importer of services (%)	21	7	29	30	27	27	27	34	27	30	25
Active outsourcer (%)	4	1	5	5	4	5	9	6	10	9	4
Passive outsourcer (%)	37	4	55	61	57	71	63	69	68	67	60
FDI (%)	4	1	6	5	6	6	7	12	6	9	4
R&D (%)	58	42	67	67	64	67	73	84	74	77	69
Product innovation (%)	48	33	57	58	51	62	68	66	70	69	54
Process innovation (%)	43	35	47	49	47	42	44	48	41	49	46
Market innovation (%)	31	17	38	39	35	41	49	52	49	49	40
Employment (log)	3	3	4	4	3	3	4	4	4	4	3
Labour Productivity	4	4	4	4	4	4	4	4	4	4	4

Source: Own calculations from the EFIGE dataset

Looking at firms' age, there is no evidence based on export status, but exporters to China and India and to the U.S. and Canada seem to be older than other firms. As expected, firms that carry out exporting activities belong much more to groups (national or foreign) and are characterised by foreign ownership; exporters to the Asian countries group show higher shares. No dissimilarities between exporting firms emerge when considering imports of materials and services or when we take into account whether the firm is an active or a passive outsourcer. Firms seem to perform their production activity similarly when making FDI or when investing in R&D. Again, exporters to the China and India group show higher percentages. Looking at other features relative to innovation, we note that exporters, not surprisingly, produce many more product and process innovations than non-exporters, but there is no evidence within exporting firms. The same applies for market innovation. Finally, if we consider employment and labour productivity, all types of firms have similar values. From this descriptive analysis, we find no clear facts that allow us to explain why just a few European firms choose to export to the ENC's. Moreover, firms that have their neighbouring

⁸ See Barba Navaretti, Bugamelli, Schivardi, Altomonte, Horgos, Maggioni (2011) to know in detail how the weighting scheme has been built.

countries as their main export destinations seem not to be so different from firms that prefer to have other countries as their main export partner.

5. THE EMPIRICAL MODEL

The main destination country of a firm's exports is a mutually exclusive outcome that yields a framework similar to that referring to the multinational location decision of a given investment.

Indeed, one of the possible outcomes is the "no export one", which can be seen as part of a preliminary decision/capability to access foreign markets, which the literature largely shows to be determined by firm-level attributes. Exporters are on average larger, more productive, and more innovative and employ more skilled workers (Bernard and Jensen, 1999, 2004a, 2004b). Conditional on finding exports profitable/feasible, a firm maximises its profits primarily by serving a specific foreign market subject to the constraints given primarily by mass and distance factors that characterise gravity models.

5.1 Modelling export decisions

Importing convention from the modelling location decision of multinationals (see, for example, Disdier and Mayer, 2004; Basile, Castellani and Zanfei, 2008), we assume that a firm first chooses whether to serve a foreign market of its products (exporting or not) and only if exporting it defines the first market for its product. Herein, we focus on both the first step of the decision-making process, which the literature largely shows to be determined by firm-level attributes, and the following level(s), where we consider several alternative markets for the firm whose final choice is dependent on country-level characteristics. Therefore, our analysis is conditional on the firm's decision to export its products.

5.2 The econometric model

Export activity and the main export localisation can be modelled by means of the following discrete choice econometric model.

Let $k = 1, 2, \dots, K$ be the mutually exclusive observed outcomes (in this case, $K=8$, including the "no export" possibility), taken from a sample of $h = 1, 2, \dots, H$ firms. By assuming that firms' choices are essentially driven by profitability, the profit associated with each element of firms' export destination choice set takes a random utility specification such as the following:

$$\pi(\text{choice } k \text{ by firm } h) \equiv \pi_k^h = V_k^h + \varepsilon_k^h = \boldsymbol{\beta}' \mathbf{x}_k + \varepsilon_k^h, \quad (1)$$

where the elements of the vector \mathbf{x}_k may either refer to the characteristics of the main export destination alternatives or be firm-specific. Hence, firm actual profits are given by the sum between an observable component V_k^h and a stochastic unobservable component ε_k^h .

Depending on the assumptions made on the distribution of ε_k^h , different discrete choice models are obtained. We obtain the standard multinomial logit (according to the original terminology of McFadden, 1984 and conditional logit in many other reference texts, e.g., Greene, 2012)— if we assume that the firm-level random components, ε_k^h , are independently and identically distributed (IID) with an extreme value type 1 (Gumbel) distribution.

However, for modelling export and main destination choices, the IID assumption may be highly questionable because it leads to the so-called independence of irrelevant alternatives (IIA) hypothesis,⁹ ultimately imposing that export and destination choices have an unobservable component whose correlation among alternatives is the same independently of the destination considered. When there are subsets of similar alternatives, common unobserved factors within these subsets are likely to affect the standard deviation of the stochastic component in a common way that is different from the effect on less similar alternatives.

This is likely to be our case, where a “no export” outcome compares to a set of different export destinations and explains why the modelling of firms’ foreign locations and investment strategies usually rely on a “nested” specification. Moreover, a few alternative export destinations are likely to have a nested structure. Following the argument by Disdier and Mayer (2004), different unobservable factors cause firms to decide whether to export primarily within the EU, sell its products outside EU but nearby, or move to other alternatives (the rest of the world).

Hence, a plausible model should first account for the firm’s export decision process and then for the choice of its main export destination. An intermediate potential decision level should also be considered to make firms’ exports conditional on moving to macro-regions, which can be seen as “nests” of alternative foreign markets characterised by a supposed higher within-group degree of similarity. This modelling framework is usually known as the nested logit (henceforth, NL) model.

In the two-level case, the unobservables in (eq.1) are assumed to adopt the following additive error structure:

$$\varepsilon^h(j, k) = u_j^h + u_{k|j}^h, \quad (2)$$

where the index k relates to the ‘elementary’ alternative main export destinations, and j relates to the choice of whether to extend coverage against LTC risk. In other words, the random term that

⁹According to IIA, the odds of an alternative k being chosen over alternative l are independent of the availability of attributes or alternatives other than k and l (McFadden, 1984).

affects final choices is the sum of two independent components: a specific one (conditional on the two decisions) and a common one. As a consequence, the variance of the unobserved utility is allowed to differ across ‘nests of choices’. By partitioning the overall decision process according to two levels of choices (the extension to three levels is immediate), the NL keeps the IID condition of the stochastic terms within each partition.

In our subsequent econometric analysis, we start from a two-level structure: with an upper-level “export/no export” outcome and eight bottom-level mutually exclusive first export destinations (EU15, EU12, ENCs, countries bordering the ENCs, China and India, other Asian countries, the U.S. and Canada, and the rest of the world) and subsequently consider a three-level NL structure with an intermediate level with three potential foreign market “nests”: EU 27, countries near the EU (ENCs and other countries bordering the ENCs or Europe) and all other countries.

In both cases, we end-up in an ‘NL with partial degeneracy’ structure, given that there is only one single ‘no export’ option. The advantage of having a ‘degenerate branch’ is that it has a very recognisable economic characterisation—i.e., a ‘non-participation’ alternative—which is likely to be based on firm-specific effects instead of destination-based characteristics.

Let us now define a random utility model consistent with this structure. For the sake of completeness, a three-level NL model is described.¹⁰ For a generic bottom-level alternative k , belonging to intermediate nest j and conditional on the fact that the upper-level choice $i = no\ export$, $export$ has been made, the firm’s profit function takes the form:

$$\pi(i, j, k) = V(i, j, k) + \varepsilon(i, j, k),$$

where the $V(i, j, k) = V_i + V_{j|i} + V_{k|j,i}$ indicate the non-stochastic components, and $\varepsilon(i, j, k) = u_i + u_{j|i} + u_{k|j,i}$ is the stochastic component. Location k is chosen by a firm if the profits by concentrating exports in this country are higher than those at any alternative location.

Let us now formally distinguish between the characteristics (\mathbf{x}), which explain the setting up of a given destination as a main export market, and the firm-level variables that are assumed to affect the existence of an export activity (\mathbf{z}). A third vector (\mathbf{y}) is assumed to affect the probability that the main export destination belongs to one of the three groups considered in our analysis. Given the hypothesis that the deterministic part of the profit function is additively separable, we can write:

$$\pi(i, j, k) = \boldsymbol{\gamma}' \mathbf{z}_i + \boldsymbol{\delta}' \mathbf{y}_j + \boldsymbol{\beta}' \mathbf{x}_k + u_i + u_{j|i} + u_{k|j,i} \quad (3)$$

The joint probability that a respondent chooses alternative k is given by the product between a marginal and two conditional probabilities:

¹⁰ Henceforth, we omit the individual index h .

$$P_{i,j,k} = P_i \times P_{j|i} \times P_{k|ij} = \frac{\exp[\gamma' z_i + \lambda_i IV_i]}{\sum_{n=1}^I \exp[\gamma' z_m + \lambda_m IV_m]} \cdot \frac{\exp[\delta' y_{j|i} + \lambda_{j|i} IV_{j|i}]}{\sum_{m=1}^{J_i} \exp[\delta' y_m + \lambda_{m|i} IV_{m|i}]} \cdot \frac{\exp(\beta' x_{k|j,i})}{\sum_{l=1}^{K_{j|i}} \exp(\beta' x_{l|j,i})}, \text{ for all } i \quad (4)$$

with the so “inclusive values” (or expected maximum utilities) equal to

$$IV_{j|i} = \sum_{l=1}^{K_{j|i}} \exp(\beta' x_{l|j,i}) \quad \text{and to}$$

$$IV_i = \ln \sum_{m=1}^{J_i} \exp[\delta' y_m + \lambda_{m|i} IV_{m|i}] \quad \text{for all } i.$$

The previous formulation is the so-called ‘non-normalised model’. In the estimation, following the survey by Louvière *et al.* (2000) and most empirical studies, we adopt a normalisation that sets to one the scale parameter of the upper level utility index.¹¹

6. EMPIRICAL RESULTS

This section presents the results of the estimation of the NLM outlined in Section 5.2. Table 4 below illustrates the distribution of first export destinations in the case of two- (on the left-hand side) and three-level nested structures (on the central part), whose results are reported in Table 5.

We estimated both a model with a simple two-level structure, where firms that export set up their main destination out of eight alternatives under the restrictive assumption of equal similarity across them, and a three-level model, where the first export destinations are grouped in the groups of EU27, near Europe and other countries.

Table 3 Distribution of first export destinations (three-level nested logit specification)

No export/export level		Macro-region level		Single destination level			
Alternatives	Proportions	Alternatives	Proportions	Alternatives	Proportions		
No export	0.35	No export	0.35	No export	0.35		
Export	0.65	Macroregion 1	0.48	EU 15	0.45		
				EU 12	0.03		
		Macroregion 2	0.04	ENCs	0.02		
				Countries bordering the ENCs	0.02		
		Macroregion 3	0.13			China and India	0.02
						Other Asian Countries	0.02
						U.S. and Canada	0.05
				Rest of the World	0.04		

Source: Own calculations from EFIGE dataset

In the first nest (see sub-section 6.2 below), we assess the role of firm-level factors that are associated with a higher probability of exporting. Therefore, the dependent variable in the first stage is a dummy that indicates whether manufacturing firms export a fraction of their sales.

¹¹ This normalisation is adopted by default with the current version of the STATA package and is labelled as “random utility model 2” normalization in the NLOGIT package. This type of normalisation has the advantage of enabling the researcher to relate the normalisation to the total variance of the error distribution (e.g. Carrasco and Ortúzar, 2002).

Once the probability of being active in the international market has been modelled, the nested structure of the model allows us to evaluate the extent to which traditional mass and distance factors used in gravity models influence the definition of the first export destination for a firm. Section 6.1 focuses on the final choice across all the eight alternatives, allowing some alternatives within the aggregated groups of countries to be more similar than others. In this final stage, we ascertain the importance of national-level factors derived from the classic formulation of the gravity model and check whether and how they vary across all possible destinations. This implies that our measures for size, similarity and distance are considered in their common effect for all possible alternatives. Distance is then interacted along the dimension near/far EU 15 (distinguishing between those ones which are included in the Neighbouring Policy or not) to assess the possible presence of non-linearities in its repulsive effect on trade.

Because the large majority of exporting firms choose a European country as a first market for their products, we also model the first export destination choice by considering 3 intermediate macro-alternatives (the second level of the nested structure): the EU, its wider neighbourhood and all the rest of world. For this intermediate level, our specification strategy is that of using firm-level covariates that cannot determine the “no export” alternative, given that they only refer to firms for which we record some exports. The dummy variable ‘being a passive outsourcer that has sold some produced-to-order goods to foreign clients’ displays this property. By allowing for different coefficients for the three macro-regions, we are able to identify the different levels of ‘engagement’ in selling products in the international markets.

6.1 Defining Export Destination

The main findings from the empirical gravity literature are that trade between pairs increases with their size and decrease with their distance. Size is a measure of demand for international products, whereas distance, in most cases a simple geography measure, captures all the elements that increase the costs of moving goods in space (culture elements, as language; rules, as regulation; institutional functioning).¹² Another element that is considered in the empirical specifications and captures size and/or similarities across countries is per capita national income. In our formulation, we have considered population as a measure of size and income per capita as a measure of similarity/dissimilarity across countries. The main advantage of the NLM is to consider how these national attributes can be ordered in terms of importance when looking at a sample of firms that have a heterogeneous outcome in terms of first export destination (baseline specification).

¹² Di Guardo, Marrocu and Paci (2015) find that spatial distance has an adverse effect on the rate of recurrence of M&As. The effect is directly related to the transaction costs associated with the collection and interpretation of information regarding the potential target, including the costs of negotiation and other forms of personal interaction.

Our regression analysis is reported in Table 5, which is comprised of 4 specifications estimated with both the two- and three-level models.¹³ Results in the upper part of the Table 5 show, consistently with standard gravity results, that geography matters (the sign of the coefficient is negative). In the baseline specification (1), we can see that the effect of distance in shaping firms' first export destinations is approximately three (in the two-level model) to four times (in the three-level model) larger than the attraction effect related to population. The relative magnitude is even larger when compared to the effect of income per capita.

In the subsequent specifications, we add detail on whether and how change occurs in the probability to have a first export destination near the EU 15 area (i.e. the EU 12 countries, the ENC's and countries bordering ENC's) rather than a faraway destination. In specification (2), we introduce the possibility for the distance effect to vary across macro-regions of export destination. Our results detect the presence of differential distance effects, whether in the form of a stronger repulsive effect for destinations near the EU15 area (in the two-level model) or of a weakening of the relative predominance of geography when considering export destinations that are far away, detected by a significant positive coefficient for the interactions (three-level model).

With specification (3), we are able to gain more in-depth insight into the ENC's. As seen, distance is interacted with each destination near the EU15 countries. The negative effects detected for the ENC's' interaction in the two-level model and the lack of significance in the three-level model note that export activities towards these countries have not benefited from the European Neighbouring Policy that started in 2004. Finally, with specification (4), we can confirm that the stronger repulsive effect of distance detected for nearby destination areas is confirmed when considering differentiated effects for population size for both for the two- and the three-level NLM.¹⁴

Whereas on the one hand, these results are consistent with the current literature on the effects of distance, on the other hand, they note that the presence of a neighbouring policy (at least up to 2008, when the EFIGE survey was conducted) does not seem to have introduced any "pro-trade" effect in the weight that destination-area attributes have for firms that export, given that results on the coefficients of attributes do not change when interacting with the identifying dummy for the nearby countries.

¹³ Qualitatively, the results of the two- and three-level models are similar. The two-level model performs better in terms of the goodness of fit (detected by the log-likelihood and pseudo-r-squared tests). By contrast, the three-level nested structure presents an estimate of the inclusive value (IV) parameter for the export alternative laying in the interval [0,1], denoting a correct specification of the NL structure in terms of a higher degree of similarity between alternatives that share the same upper level (e.g. Ben-Akiva and Lerman, 1985; Hunt, 2000), thus confirming that the no-export outcome has a different nature from the main export destination alternatives.

¹⁴ A more complicated model with interactions between single destinations and the two variables distance and population could not be calculated, having reached the maximum number of regressor admitted by the NLOGIT software.

On the whole, our analysis confirms the important fact that for the definition of the best export destination of EU firms, geography matters. It matters considerably in Europe, where the effect of geographical distance is much stronger than size; and, notably, it shows the same relative strength when going outside Europe to nearby countries. This strength is slightly alleviated when moving out from the neighbourhoods. These outcomes are directly connected to the recent puzzle on the role of distance that has fascinated the most recent empirical trade literature. Disdier and Head (2008) note that the estimated distance effect has increased significantly over time. This has stimulated further investigations on the possible non-linear effects of distance, whether arguing that technical change in transport technology is biased in favour of long distances (Hummels, 2007), focusing on the relationship between distance and firms' characteristics,¹⁵ or investigating the role of networks in international trade, whose presence could explain how the geographical distance of faraway locations can be mitigated by the information on entering a market from firms already active in the same location (Chaney, 2011).

¹⁵ For example, Holmes and Stevens (2012) note that not only are large plants more likely to export; they also are more likely than small plants to ship long distances within the United States.

Table 5: Estimation results with the nested logit specification

Variable	(1)	(2)	(3)	(4)	(1)	(2)	(3)	(4)
<i>Choice of sub-region destination nest</i>								
	<i>Two level</i>				<i>Three level</i>			
Population (log)	4.146***	3.739***	3.482***	2.675***	0.889***	0.973***	0.951***	0.635***
GDP per-capita (log)	0.275***	-0.195**	-0.845***	-0.718***	0.213***	-0.034	0.275***	0.279***
Distance (log)	-11.381***	-9.583***	-9.445***	-9.479***	-3.528***	-3.490***	-3.977***	-2.574***
Interaction distance (log) * NEAR countries macro-region		-8.845***		-13.065***		0.115		-0.862**
Interaction distance (log) * EU12 region			-4.572***				-0.103	
Interaction distance (log) * ENCs region			-11.426***				0.111	
Interaction distance (log) * NENCs region			-23.095***				0.185	
Interaction distance (log) * FARAWAY countries macro-region		-0.098	-0.320	-4.329***		0.394**	0.275	0.441
Interaction population (log) * NEAR countries macro-region				7.749***				0.409***
Interaction population (log) * FARAWAY countries macro-region				3.304***				-0.170
<i>Choice of macro-region destination nest</i>								
Interaction EU area * Passive outsourcer					1.464***	1.521***	0.850***	1.009***
Interaction ENCs area * Passive outsourcer					0.032	0.230	0.236	0.632**
Interaction ALL other countries area * Passive outsourcer					0.797***	0.674***	0.600***	1.075***
<i>Export - No export nest</i>								
Age (log)	0.361***	0.366***	0.372***	0.365***	0.496***	0.224***	0.468***	0.228***
Group	0.270**	0.270**	0.267**	0.227*	0.048	0.431***	-0.037	-0.079
Foreign Ownership	0.561***	0.567***	0.561***	0.609***	0.025	0.316***	0.086	0.141
Importer of materials	0.886***	0.893***	0.887***	0.880***	0.148***	1.391***	0.803***	0.991***
Importer of services	0.850***	0.872***	0.869***	0.833***	0.083*	0.979***	0.555***	0.704***
Active outsourcer	0.856***	0.853***	0.847***	0.881***	0.015	0.172	0.115	0.154
Passive Outsourcer	3.687***	3.713***	3.694***	3.681***				
FDI	0.825***	0.781***	0.786***	0.788***	0.017	0.231	0.083	0.119
R&D	0.700***	0.683***	0.687***	0.712***	0.147***	1.035***	0.626***	0.619***
Product innovation	0.636***	0.617***	0.616***	0.620***	0.130**	0.956***	0.596***	0.514***
Process innovation	-0.053	-0.041	-0.036	-0.035	0.095**	0.394***	0.279***	0.155***
Market innovation	0.067	0.078	0.077	0.073	0.089	0.774***	0.442***	0.377***
Employment (log)	0.046	0.047	0.050	0.069	0.583***	1.120***	0.593***	-0.176***
Labour Productivity (log)	0.267***	0.265***	0.272***	0.296***	0.576***	-0.147***	0.964***	0.609***
IV parameter: <i>export</i>	2.573***	2.554***	2.581***	3.068***	0.432***	0.664***	0.936***	0.698***
IV parameter: <i>EU27 macro-region</i>					1.059***	0.921***	1.108***	1.227***
IV parameter: <i>NEAR countries macro-region</i>					0.993***	1.016***	1.189***	0.873***
IV parameter: <i>FARAWAY countries macro-region</i>					0.721***	1.080***	0.577***	0.709**
Log-likelihood	-5363.211	-5300.047	-5268.421	-5111.890	-7610.742	-9049.939	-6941.617	-6979.799
Pseudo-R-squared	0.638	0.642	0.644	0.655	0.461	0.359	0.508	0.505
Number of observations	7236	7236	7236	7236	7236	7236	7236	7236

Note: Asterisks denote significance levels; * p<0.10, ** p<0.05 and *** p<0.01. All the estimates contain a full set of alternative specific constants.

6.2 Firm Export decision

The bottom part of Table 5 defines the process that makes it more likely for a firm to export. Three sets of explicatives are included in the model:

- (a) the ‘traditional’ size and productivity characteristics of the firm. Starting with Melitz (2003), the literature has put a great emphasis on the sunk costs firms have to incur to start exporting, and existing estimates indicate that those costs are indeed likely to be high. These costs discourage less productive firms from globalising their activities. Selection mechanics according to the level of productivity are called the ‘selection effect’ in global activities;
- (b) the involvement of the firm in the global production chain. Muuls and Pisu (2009), Castellani *et al.* (2010) and Vogel and Wagner (2010) found that exporting is associated with the activity of importing and being connected to the construction of the value chain at the international level;
- (c) other firm-level characteristics, such as age, innovation activity and the level of R&D expenditure, which are expected to help the firm to be competitive with respect to a wider number of rivals.

The results in the baseline specification (1) show that ~~large~~, more productive and older firms are prone to export. These findings are consistent with all the empirics on firms active in the global markets, which started with the work by Bernard and Jensen (1995). Another factor related to the export capability is being a firm that imports materials. Being connected to the international markets is another channel that facilitates competitiveness in a wider market. The subsequent specifications that control for differences across macro regions in our main destination’s attributes reveal that the set of variables linked to the connectivity of the firm in the international markets (being part of a group, importing services and being a passive outsourcer) contribute to making a firm more prone to export. A similar reasoning can be made for R&D expenditure and (at least for the three-level model) all measures linked to the capability of the firm to be innovative in several environments.

7. CONCLUSIONS

In 2004, the EU launched its Neighbourhood Policy to reinforce and intensify its relationships, including trade, with the ENCs. Ten years afterwards, it is time to evaluate whether the EU strategy has produced the expected results.

This paper has analysed whether European firms find it profitable to export to countries interested by the ENP or to other nearby countries with respect to all of the other possible destinations in the world. To achieve our goal, we used the EFIGE dataset, a firm-level dataset that includes

information on international activities for approximately 15,000 firms. The focus of the paper has been the first export destination of each firm.

First, we evaluated whether being an ENC increased the likelihood that a country was an export destination of EU firms with respect to countries not covered by the ENP. The descriptive analysis *per se* has shown how only a small number of EU firms in 2008 had exported near Europe and had exported even less to the neighbouring countries. Merely 6% of exporters had at least one neighbouring country in their top three export destinations. When going outside of Europe, a role is played only by the US and Canada. All other destinations had a small share. When focusing on the subsample of firms whose main market is in the neighbourhoods of Europe, a larger role has been played by the group of the Mediterranean ENCs. The results reflect what the gravity model predicts on the role of distance. The EFIGE sample is focused primarily on large countries of the old Europe that are closest to the Mediterranean basin.

In the second part of the paper, we assessed the role of the ENCs and the other countries near Europe. We ran a nested logit model (NLM), which allowed us to evaluate both firm and destination characteristics in a multiple (and nested) decision process for the firm: whether they exported or not, in the first stage, and where they exported, in the following ones. Our results confirm facts already established in the literature on the important role played by size, productivity and further involvements of the firm in the global markets (importing) in making it more likely for a company to export. Additionally, being innovative and spending on R&D play a role due to their push on competitiveness. Regarding the analysis on the destination-level factors derived from the classic formulation of the gravity model, we find that the effect of distance in shaping firms' top export destinations is up to 4 times larger than that related to population. The relative magnitude is even larger compared to income per capita. When introducing the possibility for this effect to vary across macro-regions of export destinations, our results show that for countries near the EU (ENCs and other countries bordering either the EU or the ENCs), the relative strength of the repulsive effect of distance persists or even increases. The relative predominance of geography weakens when considering export destinations that are far away.

From a trade policy perspective, this result indicates the need to foster factors (technical changes in transport technology, activity of trade networks, the same market size) that could outbalance the centrifugal force of geography when European firms export in the surrounding areas of Europe). This was not the subject of the original ENP, and not surprisingly, ENCs are not a main export destination of European firms.

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APPENDIX A: EFIGE and our geographical groups

EFIGE aggregates the 193 possible exporting destinations into the following eight areas:

- **EU 15** (*15 countries*): Austria, Belgium, Denmark, Finland, France, Germany, Greece, Ireland, Italy, Luxembourg, Netherlands, Portugal, Spain, Sweden, United Kingdom.
- **EU 12** (*12 countries*): Bulgaria, Cyprus, Czech Republic, Estonia, Hungary, Latvia, Lithuania, Malta, Poland, Romania, Slovakia, Slovenia.
- **Other European countries** (*22 countries*): Albania, Andorra, Armenia, Azerbaijan, Belarus, Bosnia Herzegovina, Croatia, Georgia, Iceland, Liechtenstein, Macedonia, Moldova, Monaco, Montenegro, Norway, Russia, San Marino, Serbia, Switzerland, Turkey, Ukraine, Vatican.
- **China and India** (*2 countries*): China, India.
- **Other Asian Countries** (*42 countries*): Afghanistan, Bahrain, Bangladesh, Bhutan, Brunei, Cambodia, Japan, Jordan, Indonesia, Iran, Iraq, Israel, Kazakhstan, Korea DPR, Korea Rep. (South), Kuwait, Kyrgyzstan, Laos, Lebanon, Malaysia, Maldives, Mongolia, Myanmar, Nepal, Oman, Pakistan, Palau, Philippines, Qatar, Saudi Arabia, Singapore, Sri Lanka, Syria, Taiwan, Tajikistan, Thailand, Timor-Leste, Turkmenistan, United Arab Emirates, Uzbekistan, Vietnam, Yemen Rep.
- **The U.S. and Canada** (*2 countries*): The U.S., Canada.
- **Central and South America** (*33 countries*): Antigua, Argentina, Bahamas, Barbados, Belize, Bolivia, Brazil, Chile, Colombia, Costa Rica, Cuba, Dominica, Dominican Rep., Ecuador, El Salvador, Grenada, Guatemala, Guyana, Haiti, Honduras, Jamaica, Mexico, Nicaragua, Panama, Paraguay, Peru, St. Kitts-Nevis, St. Lucia, St. Vincent, Suriname, Trinidad & Tobago, Uruguay, Venezuela.
- **Rest of the World** (*65 countries*): Algeria, Angola, Australia, Benin, Botswana, Burkina Faso, Burundi, Cameroon, Cape Verde, Central African Republic, Chad, Comoros, Congo, Democratic Republic of the Congo, Cote d' Ivoire, Djibouti, Egypt, Eritrea, Ethiopia, Fiji, Gabon, Gambia, Ghana, Guinea, Guinea Bissau, Equatorial Guinea, Kenya, Kiribati, Lesotho, Liberia, Libya, Madagascar, Malawi, Mali, Marshall, Mauritania, Mauritius, Micronesia, Morocco, Mozambique, Namibia, Niger, Nigeria, New Zealand, Papua New Guinea, Rwanda, Samoa (West), Sao Tome & Principe, Senegal, Seychelles, Sierra Leone, Solomon, Somalia, South Africa, Sudan, Swaziland, Tanzania, Togo, Tonga, Tunisia, Tuvalu, Uganda, Vanuatu, Zambia, Zimbabwe.

Starting from EFIGE aggregation, we adopted a grouping more consistent with our purposes. We divided the 193 countries into eight areas:

- **EU 15** (*15 countries*): Austria, Belgium, Denmark, Finland, France, Germany, Greece, Ireland, Italy, Luxembourg, Netherlands, Portugal, Spain, Sweden, United Kingdom.
- **EU 12** (*12 countries*): Bulgaria, Cyprus, Czech Republic, Estonia, Hungary, Latvia, Lithuania, Malta, Poland, Romania, Slovakia, Slovenia.
- **ENCs** (*15 countries*): Algeria, Armenia, Azerbaijan, Belarus, Egypt, Georgia, Jordan, Israel, Lebanon, Libya, Moldova, Morocco, Syria, Tunisia, Ukraine.
- **Countries bordering the ENCs** (*10 countries*): Chad, Iran, Iraq, Mali, Mauritania, Niger, Russia, Saudi Arabia, Sudan, Turkey.
- **China and India** (*2 countries*): China, India.
- **Other Asian Countries** (*35 countries*): Afghanistan, Bahrain, Bangladesh, Bhutan, Brunei, Cambodia, Japan, Indonesia, Kazakhstan, Korea DPR, Korea Rep. (South), Kuwait, Kyrgyzstan, Laos, Malaysia, Maldives, Mongolia, Myanmar, Nepal, Oman, Pakistan, Palau, Philippines, Qatar, Singapore, Sri Lanka, Taiwan, Tajikistan, Thailand, Timor-Leste, Turkmenistan, United Arab Emirates, Uzbekistan, Vietnam, Yemen Rep.
- **The U.S. and Canada** (*2 countries*): The U.S., Canada.
- **Rest of the World** (*102 countries*): Albania, Andorra, Angola, Antigua, Argentina, Australia, Bahamas, Barbados, Belize, Benin, Bolivia, Bosnia Herzegovina, Brazil, Botswana, Burkina Faso, Burundi, Cameroon, Cape Verde, Central African Republic, Chile, Colombia, Comoros, Congo, Democratic Republic of the Congo, Costa Rica, Cote d' Ivoire, Croatia, Cuba, Djibouti, Dominica, Dominican Rep., Ecuador, El Salvador, Eritrea, Ethiopia, Fiji, Gabon, Gambia, Ghana, Grenada, Guatemala, Guyana, Guinea, Guinea Bissau, Equatorial Guinea, Haiti, Honduras, Iceland, Jamaica, Kenya, Kiribati, Lesotho, Liberia, Liechtenstein, Madagascar, Macedonia, Malawi, Marshall, Mexico, Mauritius, Micronesia, Monaco, Montenegro, Mozambique, Namibia, Nicaragua, Nigeria, New Zealand, Norway, Panama, Papua New Guinea, Paraguay, Peru, Rwanda, Samoa (West), San Marino, Sao Tome & Principe, Senegal, Serbia, Seychelles, Sierra Leone, Solomon, Somalia, South Africa, St. Kitts-Nevis, St. Lucia, St. Vincent, Suriname, Swaziland, Switzerland, Tanzania, Togo, Tonga, Trinidad & Tobago, Tuvalu, Uganda, Uruguay, Vanuatu, Vatican, Venezuela, Zambia, Zimbabwe.

Appendix B: Variables description

Name	Description	Source
Exporter	Dummy variable, 1 if the firm is an exporter	Own calculations from EFIGE dataset
Exporter to EU	Dummy variable, 1 if the firm has at least one country belonging to the EU in its top three export destinations	Own calculations from EFIGE dataset
Exporter to ENCs	Dummy variable, 1 if the firm has at least one ENC in its top three export destinations	Own calculations from EFIGE dataset
Exporter to bordering countries	Dummy variable, 1 if the firm has at least one country bordering the EU or the ENCs in its top three export destinations	Own calculations from EFIGE dataset
Exporter to faraway countries	Dummy variable, 1 if the firm has none of EU countries, ENCs and countries bordering the ENCs in its top three export destinations	Own calculations from EFIGE dataset
Exporter to unknown countries	Dummy variable, 1 if firm's top three export destinations are unknown	Own calculations from EFIGE dataset
Age	Length in year of firm's activity since its establishment	Own calculations from EFIGE dataset
Group	Dummy variable, 1 if the firm belongs to a group	Own calculations from EFIGE dataset
Foreign ownership	Dummy variable, 1 if the firm is foreign-owned (at least 50% of its capital owned by foreign shareholders)	Own calculations from EFIGE dataset
Importer of materials	Dummy variable, 1 if the firm is an importer of intermediate goods in 2008 or before	Own calculations from EFIGE dataset
Importer of services	Dummy variable, 1 if the firm is an importer of services in 2008 or before	Own calculations from EFIGE dataset
Active outsourcer	Dummy variable, 1 if the firm has production activity contracts and agreements abroad	Own calculations from EFIGE dataset
Passive outsourcer	Dummy variable, 1 if the firm has sold some produced-to-order goods to foreign clients	Own calculations from EFIGE dataset
FDI	Dummy variable, 1 for firm running at least part of its production activity in another country via direct investments	Own calculations from EFIGE dataset
R&D	Dummy variable, 1 if the firm employs more than 0 employees to R&D activities	Own calculations from EFIGE dataset
Product innovation	Dummy variable, 1 if the firm has carried out any product innovation in years 2007-2009	Own calculations from EFIGE dataset
Process innovation	Dummy variable, 1 if the firm has carried out any process innovation in years 2007-2009	Own calculations from EFIGE dataset
Market innovation	Dummy variable, 1 if the firm has carried out new to the market innovation	Own calculations from EFIGE dataset
Employment	Numbers of employees in 2008	Own calculations from EFIGE dataset
Labour Productivity	Labour productivity in 2008 (thousands €), calculated as value added per employee (Amadeus data)	Own calculations from EFIGE dataset
Population	Total population of the export destination	Own calculations from CEPII & WDI
GDP per-capita	GDP per-capita of the export destination	Own calculations from CEPII & WDI
Distance	Simple distance (most populated cities, km)	Own calculations from CEPII
Employment	Numbers of employees in 2008	Own calculations from EFIGE dataset
EU (27) macro-region	Dummy variable, 1 if firm's main export destination is a country belonging to the EU	Own calculations from EFIGE dataset
EU 15 (sub)region	Dummy variable, 1 if firm's main export destination is a country belonging to the EU 15	Own calculations from EFIGE dataset
EU 12 (sub)region	Dummy variable, 1 if firm's main export destination is a country belonging to the EU 12	Own calculations from EFIGE dataset
ENCs (sub)region	Dummy variable, 1 if firm's main export destination is a country included in the ENCs group	Own calculations from EFIGE dataset
NENCs (sub)region	Dummy variable, 1 if firm's main export destination is a country bordering the ENCs	Own calculations from EFIGE dataset
NEAR macro-region	Dummy variable, 1 if firm's main export destination is a EU12 country, a ENC, or a country bordering the EU and the ENCs	Own calculations from EFIGE dataset
FARAWAY countries macro-region	Dummy variable, 1 if firm's main export destination is country which is not included in the EU and in the NEAR macro-region	Own calculations from EFIGE dataset
China and India (sub)region	Dummy variable, 1 if firm's main export destination is China or India	Own calculations from EFIGE dataset
Other Asian countries (sub)region	Dummy variable, 1 if firm's main export destination is an Asian country (not China or India)	Own calculations from EFIGE dataset
U.S. and Canada (sub)region	Dummy variable, 1 if firm's main export destination are the U.S. or Canada	Own calculations from EFIGE dataset
Rest of the World (sub)region	Dummy variable, 1 if firm's main export destination is a country not included in one of the groups above	Own calculations from EFIGE dataset