THE PRICE ELASTICITY OF EXTERNAL DEMAND OF PORTUGUESE EXPORTS: A COMPARISON WITH OTHER EURO AREA COUNTRIES*

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ABSTRACT

We compute the price elasticity of external demand of Portuguese exports in the period 1995-2009, comparing it with other euro area countries. This proxy of the export price elasticity is calculated as a weighted average of the import demand elasticities in each individual country-product destination market, using the elasticities of substitution across imported varieties of Broda *et al*. (2006). Overall, Portugal tends to export to individual markets that have, on average, a lower price elasticity than the markets where other euro area countries export to. Therefore, the product and geographical composition of Portuguese exports reduces their exposure to relative price fluctuations.

1. Introduction

Trade elasticities are important parameters in international economics that have been extensively studied for several decades. At present, the empirical literature provides a wide range of estimates for trade elasticities with different methodologies and at different data breakdown levels. The price elasticity of demand for exports measures the change in a country's exports with respect to changes in the price of exported goods relative to the prices of competing goods in destination markets. This article computes a proxy of the price elasticity of exports as a weighted average of import demand elasticities using detailed trade data from 1995 to 2009 for Portugal and other euro area countries.

The starting point is to measure the price elasticity of external demand of Portuguese exports in a sample of individual destination markets, which are defined as product-country pairs. The basic assumption is that, for each importing country and each product, imports supplied by different countries are different varieties of the product, as in Armington (1969)'s formulation of product differentiation by country. Under certain conditions, the price elasticity of demand facing all the exporters of a given product in each importing country is given by the willingness of consumers in the importing country to substitute among foreign products, that is, the elasticity of substitution among imported varieties. A measure of the elasticity of a country's external demand can be obtained by taking the weighted average of these import demand elasticities across individual export destination markets.

The estimates of the import demand elasticities are obtained from Broda *et al*. (2006), who report elasticities of substitution for a sample of 73 countries estimated using the methodology originally proposed by Feenstra (1994) and extended by Broda and Weinstein (2006). In each importing country, these elasticities of substitution are the same for all countries exporting a given good and are also assumed constant over time. Therefore, the differences among countries in terms of the price elasticities of

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external demand are totally determined by the product and geographical structure of their exports. This feature allows us to analyse to what extent the product and geographical composition of Portuguese exports exposes them to a relatively more/less elastic demand than other euro area countries. Our results indicate that the sectoral and geographical specialisation of Portuguese exports does not expose them to markets with a more elastic demand compared with other euro area countries.

This article is also related to other studies on the specialisation of Portuguese exports. Over the last decades, the relative product composition and the geographical distribution of Portuguese exports had a negative impact in the evolution of total market shares in world exports, as Portugal was relatively more specialised in individual markets than tended to grow below average.[1] In addition, there is also evidence that the product specialisation of Portuguese exports is relatively more similar to that of the new players in international trade than other developed economies.[2] These factors can create extra challenges for Portuguese exports, increasing the competition in third markets from low-cost trading partners with similar patterns of comparative advantage.

The article is organised as follows. Section 2 briefly presents the methodology and describes the database used. Section 3 starts by comparing the price elasticities of external demand of Portugal with those estimated for other euro area countries. The remaining of the section details the results along the product and geographical dimensions, comparing Portugal with Spain, Greece and Ireland in the 1995-2009 period. Section 4 presents some concluding remarks.

2. Methodology and data

In this framework, the response of the external demand of a country's exports to changes in relative prices depends on the willingness of consumers in importing countries to substitute among foreign goods. We start by defining that a specific good produced and exported by a particular country is a "variety". This is the standard definition of variety applied in several international trade papers, using Armington (1969)'s formulation of product differentiation by country. To give a concrete example, a good constitutes a particular product, *e.g.*, clothing, while a variety constitutes a given good produced by a specific country, *e.g.*, Portuguese clothing or Italian clothing.

The next step is to describe the preferences of consumers in importing countries. As in Broda and Weinstein (2006), consumers have a "taste for variety" in the sense that they prefer to consume a diversified bundle of varieties of the imported good. The elasticity of substitution among imported varieties of good i by country j, σ_{ij}, is interpreted as the price elasticity of demand for a good i exported by any origin country to destination country j. Using our example, if σ is the elasticity of substitution between Portuguese and Italian clothing for French consumers, then σ is also the price elasticity met by Portuguese and Italian clothing producers exporting to France. The domestic production of good i in country j is not considered as a competing variety, so σ_{ij} only captures the substitutability between imported varieties of good i.

The elasticity of substitution between imported varieties reflects the degree of differentiation among them. When σ_{ij} is low, consumers in country j see the imported varieties of good i as imperfect substitutes, that is, as differentiated varieties that are to some extent substitutable, based on actual physical product differences or other characteristics such as purchasing convenience, after-sales service or even consumers' perceptions of inherent unobservable quality. In contrast, when σ_{ij} is high, varieties of a particular good are assessed as more alike and consumers will easily substitute one for another when relative prices change.

1 See, for instance, Amador and Cabral (2008).

2 See, for instance, Cabral and Esteves (2006).

The price elasticity of external demand directed to a country's exports can be obtained as a weighted average of σ_{ij}, aggregated both across goods and destination markets. More precisely, the elasticity of the external demand faced by Portuguese producers in period t can be obtained as a weighted average of the elasticities of import demand in each individual product-country destination market, that is,

$$\eta^t = \sum_i \sum_j \theta_{ij}^t \sigma_{ij}, \tag{1}$$

where σ_{ij} is the elasticity of substitution between imported varieties of good i in importing country j, assumed to be constant over time, and $\theta_{ij}^t = \frac{X_{ij}^t}{\sum_i \sum_j X_{ij}^t}$ is the share of exports of product i to destination country j in total Portuguese exports in period t.

The product and geographical dimensions of the external demand elasticity can be examined separately. The contribution of each sector k to this price elasticity in period t can be computed as:

$$\eta_k^t = \sum_{i \in K} \sum_j \frac{X_{ij}^t}{\sum_i \sum_j X_{ij}^t} \sigma_{ij} = \sum_{i \in K} \sum_j \left(\frac{X_k^t}{\sum_i \sum_j X_{ij}^t} \right) \left(\frac{X_{ij}^t}{X_k^t} \sigma_{ij} \right) = \theta_k^t \sigma_k^t,$$

where K is the set of all i goods of sector k, $X_k^t = \sum_{i \in K} \sum_j X_{ij}^t$ are total exports of sector k in period t, θ_k^t is the share of exports of sector k in total exports in period t, σ_k^t is the elasticity of import demand of sector k in period t and $\eta^t = \sum_k \eta_k^t$.

The contribution of each country of destination c to the external demand price elasticity in period t can be computed as:

$$\eta_c^t = \sum_i \frac{X_{ic}^t}{\sum_i \sum_j X_{ij}^t} \sigma_{ic} = \sum_i \left(\frac{X_c^t}{\sum_i \sum_j X_{ij}^t} \right) \left(\frac{X_{ic}^t}{X_c^t} \sigma_{ic} \right) = \theta_c^t \sigma_c^t, \tag{3}$$

where X_{ic}^t are exports of product i to destination country c in period t, $X_c^t = \sum_i X_{ic}^t$ are total exports to country c in period t, θ_c^t is the share of exports to country c in total exports in period t, σ_c^t is the elasticity of import demand of country c in period t and $\eta^t = \sum_c \eta_c^t$.

The price elasticity of import demand σ_{ij} is assumed constant across all exporting countries. Thus, all exporters competing in a given individual product-country market face the same elasticity of demand by assumption. Carrying on with our example, the elasticity of substitution between Portuguese and Italian clothing in the French market is the same as the elasticity of substitution between Chinese and Portuguese clothing or Chinese and Italian clothing in the French market. This assumption is a drawback given the large differences found in unit values across origin countries, even with highly detailed product data (see Schott (2004)). These differences in import unit values point to differences in pricing power across exporters that can derive from differences in quality of the goods or any other non-price competitiveness factors, which are not captured by our framework. As a result, differences in the estimated elasticities of external demand across countries result only from differences in their sectoral and geographical specialisation of exports, a composition effect. Therefore, our analysis cannot be used to state that Portuguese exports face a more or less elastic demand due to their own intrinsic characteristics.

The international trade data used in this article comes from the BACI - CEPII database, which provides reconciled bilateral values (in US dollars) and quantities at the 6-digit of the 1992 Harmonised System (HS) classification, including over 5000 products and 200 trading partners in each year.[3] The sample period starts in 1995 and ends in 2009. We make all computations at the HS 3-digit level in bilateral terms. For the sectoral analysis described above, we use a breakdown based on the sections of the HS, defined at the 2-digit level, which includes 18 sectors.

The methodology originally proposed by Feenstra (1994) and extended by Broda and Weinstein (2006) allows the quantification of the impact that new imported varieties have on import prices and, hence, on aggregate welfare. The main idea is that imports of new varieties of a good lead to a decline in import prices and this effect is not captured by conventional import price indices based on a fixed set of varieties, leading to a measurement bias. The methodology assumes that there are two determinants of how new import varieties affect the price index: the magnitude of the increase in varieties and the degree of substitutability among varieties. Hence, one of the key parameters of this methodology are the estimates of the elasticities of substitution between varieties of each imported good, which we use in this article with a different goal.[4]

We obtain estimates for these elasticities of substitution from Broda *et al*. (2006) who report the import demand elasticities at the 3-digit HS level (171 products) for a sample of 73 countries estimated according to the methodology of Broda and Weinstein (2006). The set of 73 countries includes most of the main trading countries in the world. However, countries like Belgium, Russia, Singapore and Taiwan are excluded, which, especially in the first two cases, can limit the coverage of the sample for some euro area countries.

Some import demand elasticities estimated by Broda *et al*. (2006) have extremely high values, signalling that varieties of a given good are undifferentiated. Even taking into account that the theoretical price elasticity with perfect substitutability is infinite, these few extremely high values are clear outliers and have no significant economic interpretation, since differences in the values of the elasticities above a certain level are not meaningful in economic terms (see Felettigh and Federico (2010) and Mohler (2009) for a discussion). However, these abnormally high import elasticities have a large impact on the elasticity of external demand of some countries. We choose to drop all import demand elasticities above 500 from the analysis, eliminating 7 individual markets of the 11293 available in Broda *et al*. (2006).[5]

In the end, the individual markets selected represent between 70 and 90 per cent of total exports of each euro area country in every year considered. For Portugal, exports in the sample represent more than 80 per cent of total Portuguese exports in each year examined.

3. The price elasticity of external demand of Portuguese exports

The methodology presented in the previous section was applied to data of the initial euro area countries and chart 1 displays the results of the estimated price elasticity of external demand of exports in the period 1995-2009.[6] On average, the estimated price elasticity of external demand for Portugal is lower than for most euro area countries, with only the Netherlands and, especially, Ireland displaying smaller elasticities in this period. Ireland clearly stands out by its much lower elasticity of external demand than the other euro area countries considered. Finland also has below-average values, but slightly higher

3 See Gaulier and Zignago (2010) for a detailed description of this database.

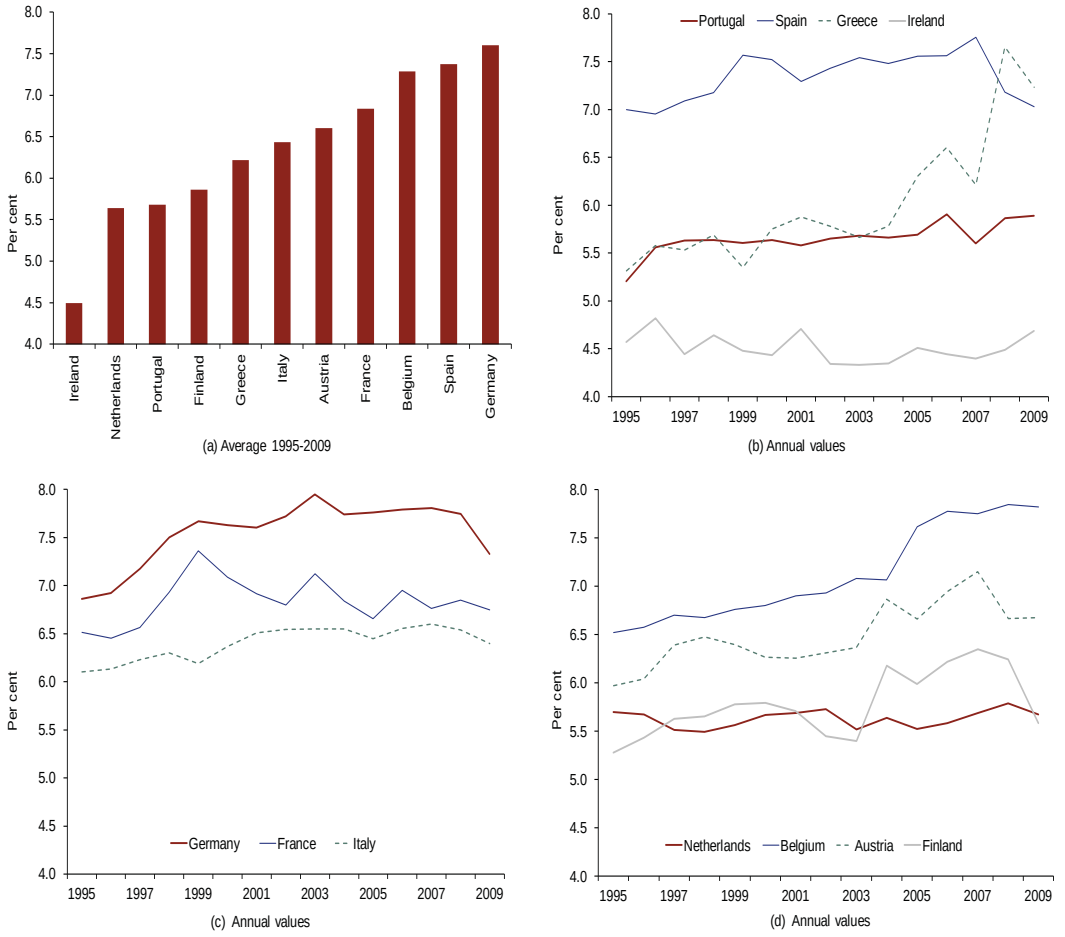
4 For a quantification of the welfare gains from the growth in import variety for the Portuguese economy, see Cabral and Manteu (2010).

5 Several additional thresholds were tested and the results remained qualitatively similar.

6 Belgium and Luxembourg are examined together as the BACI database reports only information for the aggregate of the two countries.

Chart 1

ELASTICITY OF EXTERNAL DEMAND, 1995-2009



Sources: CEPII (BACI) and authors´ calculations.

than those estimated for Portugal in this period. The highest external demand elasticity is estimated for Germany, with Spain and Belgium showing also high elasticities in the period. In France, external demand is also estimated to be more elastic than the average of the other countries examined.

Our external demand elasticities, computed as a weighted average of import demand elasticities estimated from detailed data, are much higher than the export elasticities obtained from aggregated data, which tend to be closer to one. This result is in line with the robust finding from the empirical literature that trade elasticities estimated from aggregated data are lower than those based on disaggregated data (see, for instance, McDaniel and Balistreri (2002) for a discussion). One reason for the comparative higher responsiveness of sectoral exports to relative prices is that estimating the response of aggregate quantities to changes in aggregate prices implies constraining all sectoral elasticities to be the same. As discussed by Imbs and Méjean (2009), this procedure ignores that different goods are not substitutable to the same extent and thereby creates a pure econometric bias. Another reason for the higher estimates obtained with detailed data is related to the fact that studies with disaggregated and aggregated data are in fact measuring different elasticities. As discussed by Feenstra *et al*. (2010), with aggregate import data, the price elasticity typically refers to the substitution between domestic goods and imports, which they call the "macro" elasticity. In contrast, with detailed trade data, the elasticity refers to the substitution between similar goods imported from different origin countries, that is, the "micro" elasticity.

The next subsections analyse in more detail the elasticity of external demand of Portuguese exports in the 1995-2009 period, identifying the sectors and countries that contributed more to the results. A comparative analysis of the results for Portugal and three other euro area countries (Spain, Greece and Ireland) is included.

3.1 Product breakdown

This section identifies the individual sectors that contributed more to the estimated price elasticity of external demand directed to Portugal using a breakdown based on the sections of the HS, defined at the 2-digit level, which includes 18 sectors. Table 1 reports the sectoral breakdown of the average elasticities of external demand for Portugal, Spain, Greece and Ireland in the period 1995-2009 as described in equation 2. The first block of columns in table 1 includes the elasticity of import demand of each sector, the second shows the share of exports of each sector in total exports of each country, and finally the last block of columns displays the contribution of each sector to the total external demand elasticity. To facilitate the analysis, the top 3 values of each column are highlighted in table 1. In general, the different sectoral contributions to the external demand elasticities of these countries reflect mainly cross-country differences in terms of export specialisation since the import elasticities are relatively similar.[7] The fact that differences in specialisation patterns explain most of the cross-country variation in external demand elasticities is also reported by Imbs and Méjean (2010) and Felettigh and Federico (2010).

What sectors contribute to the lower elasticity of external demand of Portugal compared to other euro area countries in this period? The result is mainly driven by two sectors: "Apparel and clothing accessories" and "Machinery and electrical equipment". Both sectors account for a significant share of total Portuguese exports (13.5 and 18.8 per cent, on average in the period 1955-2009, respectively) and face relatively low elasticities of substitution in their main destination markets. These results suggest that the Portuguese specialisation in some of the so-called "traditional sector" was positive insofar as it contributed to reduce the exposure of total exports to increases in relative prices. However, this specialisation probably also implied more adverse movements in relative prices, as these sectors are among those most affected by the entrance of low price producers from developing countries in international trade.[8]

The very high elasticities of substitution of import demand of the sector "Transport equipment" in the four countries, with values clearly above all other sectors, stand out in table 1. This sector has an important impact in the elasticity of external demand estimated for Portugal since it represents also a large proportion of Portuguese exports. However, even in this sector, the demand elasticity in Portuguese export destination markets is, on average, lower than that faced by most euro area exporters. The high external demand elasticity estimated for Spain results mostly from the sector "Transport equipment", which accounts for a much larger share of Spanish exports than for other euro area countries. In contrast, Ireland not only benefits from a low share of this sector in total exports but also from the very large export shares of the sectors "Chemicals and allied industries" and "Machinery and electrical equipment", both of which are exposed to a relatively inelastic demand in their destination markets.

A large part of the difference in total external demand elasticities among euro area countries is driven by the sector "Transport equipment" (Chart 2). Accounting for this sector, the elasticities of external demand among euro area countries range from 4.5 per cent in Ireland to 7.6 per cent in Germany in this period. Excluding "Transport equipment", the range of total elasticities in the euro area becomes narrower, between 3.8 per cent in Portugal and 5.4 per cent in Belgium. The ranking of the countries according to the estimated external demand elasticities also changes substantially excluding "Transport

7 For a comparative analysis of the international trade specialisation of Portugal, see Amador *et al*. (2007).

8 For a detailed analysis of the textiles and clothing sectors in Portugal, see Amador and Opromolla (2009).

Table 1

SECTORAL BREAKDOWN OF THE ELASTICITY OF EXTERNAL DEMAND, AVERAGE 1995-2009

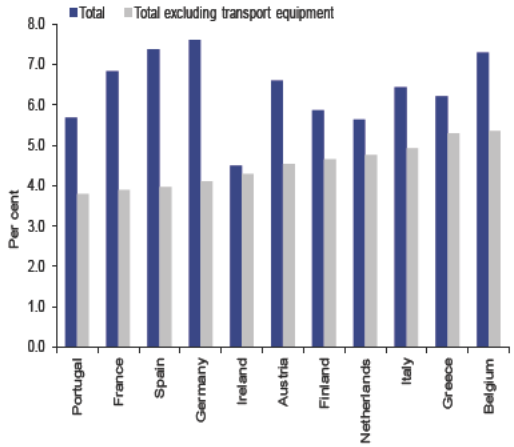
HS codes	Description	Import elasticity				Export share				Contribute			
		PRT	ESP	GRC	IRL	PRT	ESP	GRC	IRL	PRT	ESP	GRC	IRL
1-5	Live animals and animal products	4.9	8.4	6.3	6.3	2.1	3.2	4.6	4.6	0.1	0.3	0.3	0.3
6-15	Vegetable products; Fats, oils and waxes	3.6	4.3	4.8	3.5	1.9	8.3	10.4	0.5	0.1	0.4	0.5	0.0
16-24	Foodstuffs, beverages and tobacco	5.4	5.4	7.8	4.4	4.6	4.7	10.7	6.1	0.3	0.3	0.8	0.3
25-27	Mineral products	5.4	7.1	4.6	3.8	4.2	3.3	10.0	0.9	0.2	0.2	0.5	0.0
28-38	Chemicals and allied industries	3.9	5.0	5.7	4.5	4.6	10.1	9.3	44.6	0.2	0.5	0.5	2.0
39-40	Plastics and rubber	3.8	4.7	5.0	3.4	4.5	5.5	4.3	1.2	0.2	0.3	0.2	0.0
41-43	Raw hides, skins, leather and furs	7.8	6.9	5.6	5.4	0.4	0.9	1.3	0.2	0.0	0.1	0.1	0.0
44-46	Wood, cork and straw	4.0	4.3	3.8	2.8	4.6	0.8	0.4	0.4	0.2	0.0	0.0	0.0
47-49	Pulp, paper and paperboard	5.3	4.6	4.4	3.6	5.2	2.9	1.4	0.6	0.3	0.1	0.1	0.0
50-59	Textiles and textile fibres	5.5	5.7	5.5	4.5	3.4	2.1	5.8	0.6	0.2	0.1	0.3	0.0
60-63	Apparel and clothing accessories	3.3	3.7	4.3	3.3	13.5	2.2	10.2	0.5	0.4	0.1	0.4	0.0
64-67	Footwear and headgear	5.1	4.1	5.4	3.9	5.9	1.4	0.3	0.1	0.3	0.1	0.0	0.0
68-71	Stones, plaster, ceramic, glass and glassware	3.6	4.7	10.5	6.5	4.0	3.2	1.7	0.8	0.1	0.1	0.2	0.1
72-83	Base metals	4.4	5.0	5.1	3.9	6.2	8.9	15.8	1.3	0.3	0.4	0.8	0.0
84-85	Machinery and electrical equipment	4.3	5.1	5.2	3.9	18.8	16.4	9.1	29.0	0.8	0.8	0.5	1.1
86-89	Transport equipment	14.7	14.9	32.5	18.1	12.8	22.9	2.8	1.1	1.9	3.4	0.9	0.2
90-92	Optical, precision, medical and musical instr.	6.0	3.9	3.7	4.0	0.9	1.1	1.0	6.7	0.1	0.0	0.0	0.3
93-97	Miscellaneous manufactured articles	3.7	5.3	5.2	4.1	2.4	2.0	1.0	0.7	0.1	0.1	0.1	0.0
	Total excluding transport equipment					87.2	77.1	97.2	98.9	3.8	4.0	5.3	4.3
	Total					100	100	100	100	5.7	7.4	6.2	4.5

Sources: CEPII (BACI) and authors´ calculations.

Note: HS refers to the 1992 Harmonized System classification.

Chart 2

ELASTICITY OF EXTERNAL DEMAND, AVERAGE 1995-2009



Sources: CEPII (BACI) and authors´ calculations.

equipment". While Portugal remains one of the euro area countries with a less elastic external demand, it is now joined by France and Spain, which were in the higher than average elasticity group when the "Transport equipment" sector was included. Excluding "Transport equipment", Germany is also in the below average elasticity group when it had the highest elasticity when this sector was considered.

One factor that may account for the extremely high import demand elasticity obtained for the sector "Transport equipment" is the fact that multinational corporations and their foreign direct investment decisions play a strong role in the organisation of production of these goods that tend to be produced and traded within global supply chains. In addition, as described in Sturgeon *et al*. (2009), the global automotive industry has an extremely concentrated firm structure at the top of the value chain with only a few lead firms of worldwide dimension. These lead firms own the final automobile brands and manage the local, national and regional value chains nested within their global organisational structure. As a result, the country that exports the final good becomes less relevant for the way consumers value additional varieties than the brand itself. For example, Portuguese exports of cars with German brands are perceived by consumers as German cars and, hence, are highly substitutable with German exports of cars produced in Germany.

3.2 Geographical breakdown

Following what was done in the previous section, we now turn to the geographical analysis of the estimated external demand elasticity of Portugal. Table 2 presents the main contributions to the elasticity of external demand of Portugal, as well as the respective import demand elasticity and the export share of each destination country. The corresponding results for Spain, Greece and Ireland are also included and the top 3 values of each column are highlighted. As in the sectoral breakdown, the cross-country differences in terms of the elasticities of external demand are mainly due to the distinct geographical specialisations of these countries. The differences in terms of geographical import demand elasticities are not substantial, even if they are higher than those obtained for the sectoral elasticities.

What geographical markets contribute to the lower elasticity of external demand of Portugal compared to other euro area countries in this period? The result is mainly driven by three destination countries: Spain, France and the USA. Spain is the most important destination of Portuguese exports, but France and, to a lesser extent, the USA also represent an important proportion of total exports. These three geographical destinations have relatively low elasticities of substitution for Portuguese exporters. Ireland,

Table 2

GEOGRAPHICAL BREAKDOWN OF THE ELASTICITY OF EXTERNAL DEMAND, AVERAGE 1995-2009

	Import elasticity				Export share				Contribute			
	PRT	ESP	GRC	IRL	PRT	ESP	GRC	IRL	PRT	ESP	GRC	IRL
Portugal	-	6.6	4.5	4.7	-	10.7	0.8	0.5	-	0.7	0.0	0.0
Spain	4.7	-	3.6	4.1	24.5	-	4.4	3.9	1.2	-	0.2	0.2
Greece	4.2	7.4	-	3.2	0.5	1.3	-	0.5	0.0	0.1	-	0.0
Ireland	8.3	7.1	8.1	-	0.7	0.7	0.5	-	0.1	0.0	0.0	-
Germany	6.6	7.1	4.2	5.4	16.9	13.5	16.2	11.7	1.1	1.0	0.7	0.6
France	5.2	7.9	8.1	6.8	14.1	21.3	5.7	8.0	0.7	1.7	0.5	0.5
UK	5.1	7.5	3.0	3.2	10.6	10.0	7.9	19.4	0.5	0.7	0.2	0.6
Netherlands	6.2	6.6	7.2	3.7	4.2	3.8	3.2	4.3	0.3	0.3	0.2	0.2
Italy	5.9	5.6	4.5	5.5	4.2	7.5	14.8	4.6	0.2	0.4	0.7	0.3
USA	3.2	3.4	3.2	2.5	6.4	5.1	6.4	23.2	0.2	0.2	0.2	0.6
Switzerland	13.6	6.8	31.0	9.5	1.3	1.7	1.5	3.5	0.2	0.1	0.5	0.3
Sweden	9.6	8.4	9.2	8.4	1.6	1.1	1.4	1.6	0.2	0.1	0.1	0.1
Hungary	25.8	44.7	7.1	5.7	0.5	0.5	0.7	0.3	0.1	0.2	0.0	0.0
Canada	10.3	11.9	10.9	11.1	0.8	0.6	0.8	1.4	0.1	0.1	0.1	0.2
Norway	8.9	31.1	19.1	4.1	0.9	0.7	0.6	0.8	0.1	0.2	0.1	0.0
Austria	5.3	5.5	4.9	5.0	1.5	1.1	1.4	0.6	0.1	0.1	0.1	0.0
Romania	19.8	18.5	13.4	18.3	0.3	0.4	4.0	0.2	0.1	0.1	0.5	0.0
Poland	6.7	7.4	7.7	5.5	0.8	1.3	1.6	0.6	0.1	0.1	0.1	0.0
Denmark	3.7	5.7	3.9	5.0	1.4	0.8	1.1	0.9	0.1	0.0	0.0	0.0
Turkey	5.9	7.6	6.3	9.9	0.7	1.8	5.2	0.7	0.0	0.1	0.3	0.1
Finland	4.7	4.3	2.5	3.6	0.8	0.5	1.0	0.6	0.0	0.0	0.0	0.0
Brazil	3.8	14.1	4.6	5.5	0.9	1.1	0.4	0.4	0.0	0.2	0.0	0.0
Total of countries included					93.5	85.5	79.4	87.8	5.3	6.4	4.7	3.9
Total					100	100	100	100	5.7	7.4	6.2	4.5

Sources: CEPII (BACI) and authors' calculations.

which shows the lowest elasticity of external demand in the euro area, also strongly benefits from its specialisation in some destination markets in which Irish exporters face relatively inelastic demands, namely the USA and the UK. In contrast, the relatively high elasticity of external demand estimated for Spain in this period reflects mostly its specialisation in the French market, where Spanish producers face a large import demand elasticity. In addition, two smaller destination markets, Hungary and Norway, also have very large demand elasticities for Spanish exporters.

4. Conclusions

This article computes the price elasticity of the external demand of Portuguese exports in the period 1995-2009 and confronts it with developments in other euro area countries. This elasticity is obtained as a weighted average of the import demand elasticities in each individual country-product destination market obtained from Broda *et al*. (2006).

For all euro area countries considered, our estimates based on detailed trade data point to relatively high elasticities of external demand, which suggest important effects on real export growth of changes in relative export prices. However, on average, the elasticity calculated for Portugal is lower than in most euro area countries in this period, implying that Portuguese exports are relatively less vulnerable to increases in relative prices. Conversely, a less elastic external demand will also hinder the positive response of exports to improvements in relative export prices. Ireland stands out by its much lower elasticity of external demand, while Spain is among the countries with higher external demand elasticities.

Given the methodology used, the product and geographical specialisation of exports explain all the difference among countries in terms of external demand elasticities, since all countries face the same elasticity of substitution in each individual product-country destination market. Therefore, the relatively

low elasticity obtained for Portugal only indicates that Portuguese exports are relatively more specialised in individual markets (product-country) that have, on average, a lower price elasticity of demand for imports.

In sectoral terms, this result is mainly driven by two sectors: "Apparel and clothing accessories" and "Machinery and electrical equipment". These sectors account for a large share of total Portuguese exports and Portuguese exporters face relatively low elasticities of substitution compared to other euro area countries. Even in the sector "Transport equipment", which is characterised by extremely high import demand elasticities for all euro area countries, the demand elasticity in Portuguese export destination markets is lower than that faced by most euro area countries.

Regarding geographical markets, the lower elasticity of external demand of Portugal compared to other euro area countries in this period results mostly from three destination countries: Spain, France and the USA. Portugal benefits from its specialisation in these markets that have relatively inelastic demands for Portuguese exports.

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