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# Comparative analysis of export demand for manufactures in the euro area countries

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## 1. INTRODUCTION

In recent decades, the goods and services exports of the euro area have shown considerable buoyancy. This strength has been particularly notable in exports of manufactured goods, which, counting both trade among the euro area countries and that with the rest of the world, rose from slightly more than 10% of GDP in the mid-1970s to around 30% of GDP in 2001. However, there are marked differences among the euro area countries both in the weight of exports in output and in their level of growth in this period. Economic theory would explain this disparate performance as due to the behaviour of the determining variables (market size and competitiveness) and to the response of exports to changes in these variables. This article provides empirical evidence of the sensitivity of each euro area country's export demand to changes in its basic determinants and seeks to understand the reasons for these divergences and, in particular, for the differing elasticities to competitiveness.

With this purpose in mind, Section 2 describes how the determinants of export demand varied in the period 1975-2002, Section 3 analyses the long- and short-term elasticities of each country's exports and Section 4 draws the main conclusions.

## 2. BEHAVIOUR OF EXPORTS, EXTERNAL DEMAND AND COMPETITIVENESS IN THE EURO AREA COUNTRIES

The customary theoretical approach to determining a country's volume of exports usually assumes that the elasticity of supply of exported goods is infinite. Consequently, the delimitation of the variables influencing export flows is based on classical demand theory, whereby the demanding agent behaves as a consumer who maximises his utility function subject to a budget constraint. Thus the quantity demanded depends on an external income variable, which is approximated by an export market index, and on the relative price of exportable goods, i.e. the differential between the export prices of the country in question and those of its competitors. This price competitiveness index is equivalent to a real effective exchange rate calculated using export prices.

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(1) This article is a summary of a forthcoming Working Paper.

TABLE 1

## Changes in manufacturing exports and in their main determinants (a)

	Manufacturing exports				Export markets				Competitiveness (b)			
	75-01	75-83	84-92	93-01	75-01	75-83	84-92	93-01	75-01	75-83	84-92	93-01
Belgium	4.8	3.5	4.6	6.3	6.1	4.9	6.3	7.0	0.2	-1.2	0.7	1.0
Germany	4.9	4.1	4.1	6.4	6.3	4.7	6.1	8.0	0.4	0.0	1.6	-0.5
Greece	6.4	5.7	8.4	2.4	4.6	4.4	4.5	5.3	-2.0	-0.5	-3.4	-1.7
Spain	9.5	10.3	7.9	10.5	6.2	4.9	6.5	7.0	-0.2	-1.6	1.5	-0.7
France	5.8	4.6	5.3	7.3	6.1	4.7	6.2	7.1	-1.0	-1.7	-0.1	-1.4
Ireland	12.8	13.1	10.3	18.0	6.1	5.4	6.8	6.2	-0.3	-0.3	-0.2	-0.5
Italy	5.2	5.5	4.0	6.2	6.1	4.7	6.0	7.6	0.6	0.5	1.2	-0.1
Austria	8.3	7.1	7.6	10.6	6.0	4.4	6.3	7.6	-1.9	-1.7	-0.8	-3.4
Netherlands	5.6	3.9	6.8	6.3	5.9	4.8	6.5	6.4	-0.6	-1.2	-0.4	-0.1
Portugal	10.6	9.8	12.0	9.5	6.3	4.9	7.3	6.7	-1.0	-1.6	0.0	-1.8
Finland	5.9	6.7	2.4	8.8	5.9	4.1	5.6	7.9	0.5	0.0	0.5	1.0

Source: OECD.  
(a) Average annual growth.  
(b) A decrease (increase) in the competitiveness indicator denotes a depreciation (appreciation) in the effective exchange rate and, therefore, a gain (loss) in competitiveness.

Table 1 shows the average annual rates of change of exports (both to non-euro area countries and to euro area countries), of export markets and of competitiveness indices for the total period considered, and for three sub-periods, of all the euro area countries (except Luxembourg). Two differentiated groups of countries are observable as far as export behaviour is concerned: a first group, composed of Germany, France, Italy, the Netherlands and Belgium, in which exports are increasing at a slower pace, and a second, formed by Spain, Portugal, Austria and Ireland, in which the average growth of exports is higher. Finally, Greece and Finland are in an intermediate position. Chart 1 shows the behaviour of export share, defined as the volume of manufacturing exports divided by the export market volume of each euro area country since 1975, and portrays the path followed by competitiveness.

If regard is had to the trend in the determining variables, the differential behaviour is, however, less well defined. Thus, the average rate of export market expansion is similar in all countries (except Greece, where it is somewhat lower) irrespective of the group to which they belong. Further, in all the countries forming the less buoyant group, the average growth of exports is lower than that of the export markets (in some countries, such as the Netherlands and France, by a scant margin). This is reflected in the declining trend shown by the export share in Chart 1. By contrast, in the second group, exports systematically increased faster than the rate of expansion of the markets. However, in recent years Spain and Portugal have ceased to gain market share.

With regard to price competitiveness, Chart 1 shows that all the countries with higher export growth in the period under analysis recorded a gain in competitiveness. These gains were small in Spain and Ireland and more appreciable in Austria and Greece, although the strength of the latter countries' exports has not been so high. In the group of countries characterised by lower buoyancy of foreign sales, there have been losses of competitiveness in Germany, Italy and Belgium, and gains in France and the Netherlands which, however, have been insufficient for these two countries to increase their market shares in the period considered.

If price competitiveness is broken down into the nominal effective exchange rate and relative export prices (see Table 2), it is seen that generally speaking, on average over the period considered, the countries that gained competitiveness and belong to the group characterised by relative buoyancy of exports (Spain, Portugal and Ireland), did so thanks to the depreciation of their nominal effective exchange rate, since their export prices grew more than those of their competitors. In Austria and the Netherlands and, to a lesser extent, in France, competitiveness gains were due to the favourable trend in their relative prices, since their currencies either appreciated or remained steady. Among the countries that lost competitiveness, Belgium and Germany's export prices grew less than those of their competitors, but this favourable effect on competitiveness was offset by the appreciation of their exchange rate. Finally, Italy, on average over the period considered, saw a depreciation of its currency which did not offset the deterioration in its relative prices.

TABLE 2

## Changes in competitiveness and its determinants (a)

	Competitiveness				Nominal effective exchange rate				Relative price			
	75-01	75-83	84-92	93-01	75-01	75-83	84-92	93-01	75-01	75-83	84-92	93-01
Belgium	0.2	-1.2	0.7	1.0	0.8	-0.7	2.4	0.6	-0.6	-0.4	-1.7	0.4
Germany	0.4	0.0	1.6	-0.5	3.3	4.5	4.1	1.4	-2.8	-4.3	-2.4	-1.9
Greece	-2.0	-0.5	-3.4	-1.7	-9.0	-8.9	-10.7	-4.2	7.7	9.2	8.1	2.6
Spain	-0.2	-1.6	1.5	-0.7	-2.6	-7.2	1.4	-2.3	2.4	6.0	0.0	1.6
France	-1.0	-1.7	-0.1	-1.4	-0.3	-3.6	1.6	0.8	-0.8	2.0	-1.6	-2.3
Ireland	-0.3	-0.3	-0.2	-0.5	-0.5	-3.1	1.6	0.2	0.2	2.9	-1.7	-0.8
Italy	0.6	0.5	1.2	-0.1	-2.3	-6.6	1.0	-1.4	2.9	7.7	0.3	1.4
Austria	-1.9	-1.7	-0.8	-3.4	1.9	2.3	1.9	1.5	-3.7	-3.8	-2.7	-4.8
Netherlands	-0.6	-1.2	-0.4	-0.1	2.4	1.9	3.2	2.0	-3.0	-3.1	-3.5	-2.0
Portugal	-1.0	-1.6	0.0	-1.8	-6.4	-13.0	-4.1	-0.5	5.7	13.2	4.2	-1.3
Finland	0.5	0.0	0.5	1.0	0.2	-1.0	-0.2	1.6	0.3	1.0	0.7	-0.7

Source: OECD.

(a) Average annual growth.

From what has been said so far, it follows that the disparate trends in manufacturing exports by euro area countries during the most recent past cannot be satisfactorily explained by the different behaviour of their determining variables. In the case of export markets, this is so because their rate of expansion is very similar in the various countries. In this case of competitiveness, although there are disparate movements broadly consistent with the differences in export behaviour, they do not seem to be sufficient to explain the strong growth of foreign sales in certain countries. Therefore, it is to be expected that the divergences in export growth between euro area countries are more closely related to differing responses to changes in the explanatory variables.

### 3. EXPORT DEMAND FUNCTIONS

To analyse the sensitivity of exports to their main determinants, demand functions of manufacturing exports were estimated for each euro area country using OECD quarterly data for the sample period 1975-2002. For each country the exogenous variable is the volume of manufacturing exports, including both intra- and extra-area trade. The variable used to measure external income is an export market index, obtained as the sum of the volumes of manufacturing imports in each market expressed in constant dollars, weighted by the relative importance of the market in question within the country's total exports. Relative prices or competitiveness indices are calculated as the differential between the export price of the exporting country and that of its competitors, both converted into dollars. To obtain this latter figure, the OECD uses an over-

all weighting system which, like the double weighting system, classifies the other exporting countries as competitors, but which also considers the domestic market of the exporting country to be an export market (2).

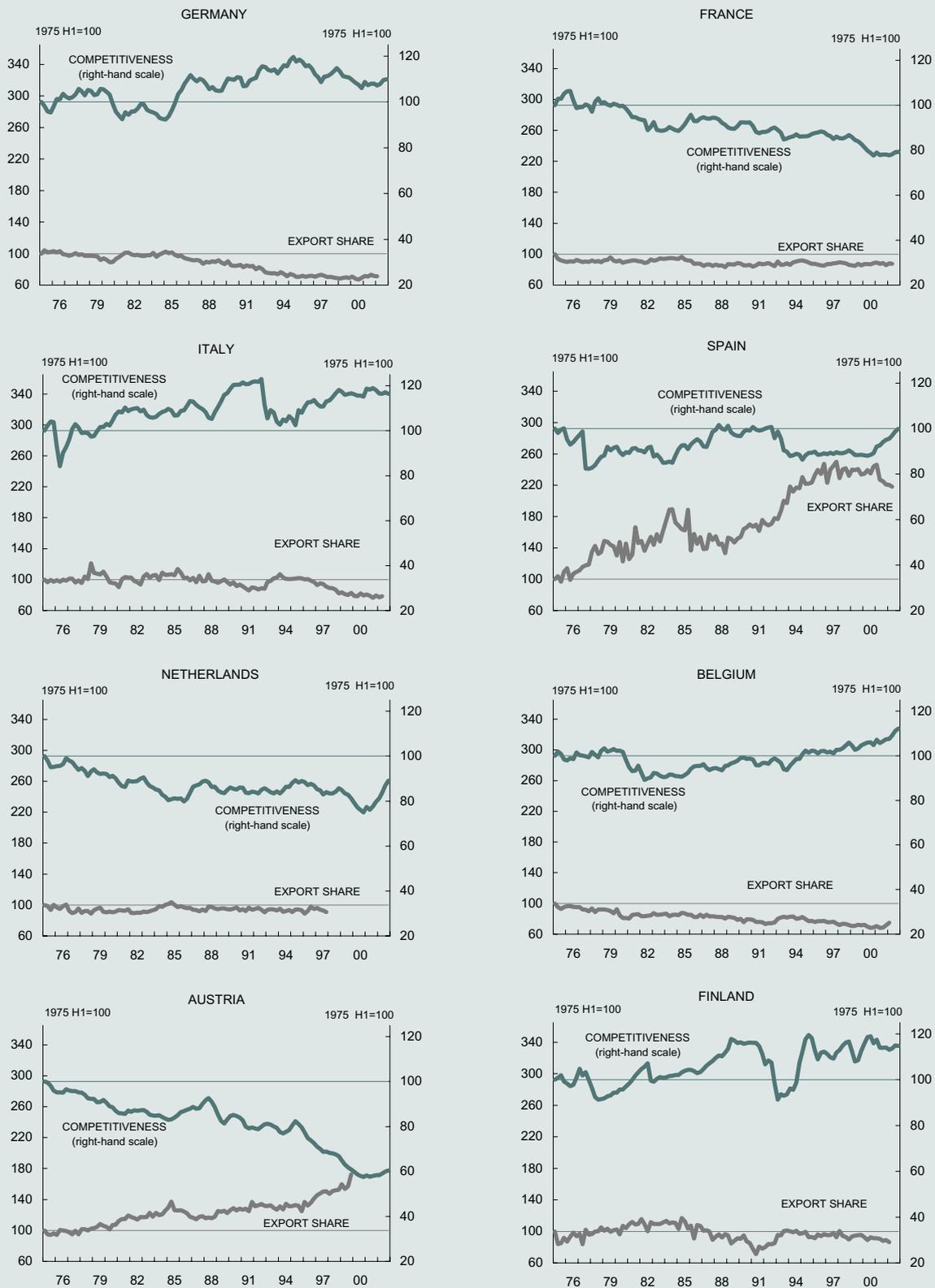
#### 3.1. Econometric results

The export functions were estimated by cointegration analysis, which was used to establish an error correction mechanism (ECM). Chart 2 shows the long-term income and competitiveness elasticities (3). As can be seen, the estimated long-term elasticities of export markets are broadly consistent with the differing response of manufacturing exports across countries to the similar changes registered in the export markets. Thus, in countries that gained market share, such as Spain, Austria, Ireland and Portugal, the ratio is greater than 1. This also occurs in Finland, although to a lesser extent. The countries in this group started, in the mid-1970s, from a lower level of openness to trade and have notably increased their share of international goods markets in a process boosted by membership of free trade areas, such as the European Union (see Chart 3). A second group of countries has elasticities below one, which is compatible with their loss of weight in world trade.

(2) A more detailed explanation of the variables is given in Durand, Simon and Webb (1992).

(3) In the cases of Ireland and Portugal, the two countries with highest export growth, it was not possible to estimate satisfactorily a demand equation incorporating short-term dynamics. The rest of the article refers to long-term elasticities obtained from a multi-equation model (VECM) for these two countries.

Changes in export share (a) and in competitiveness

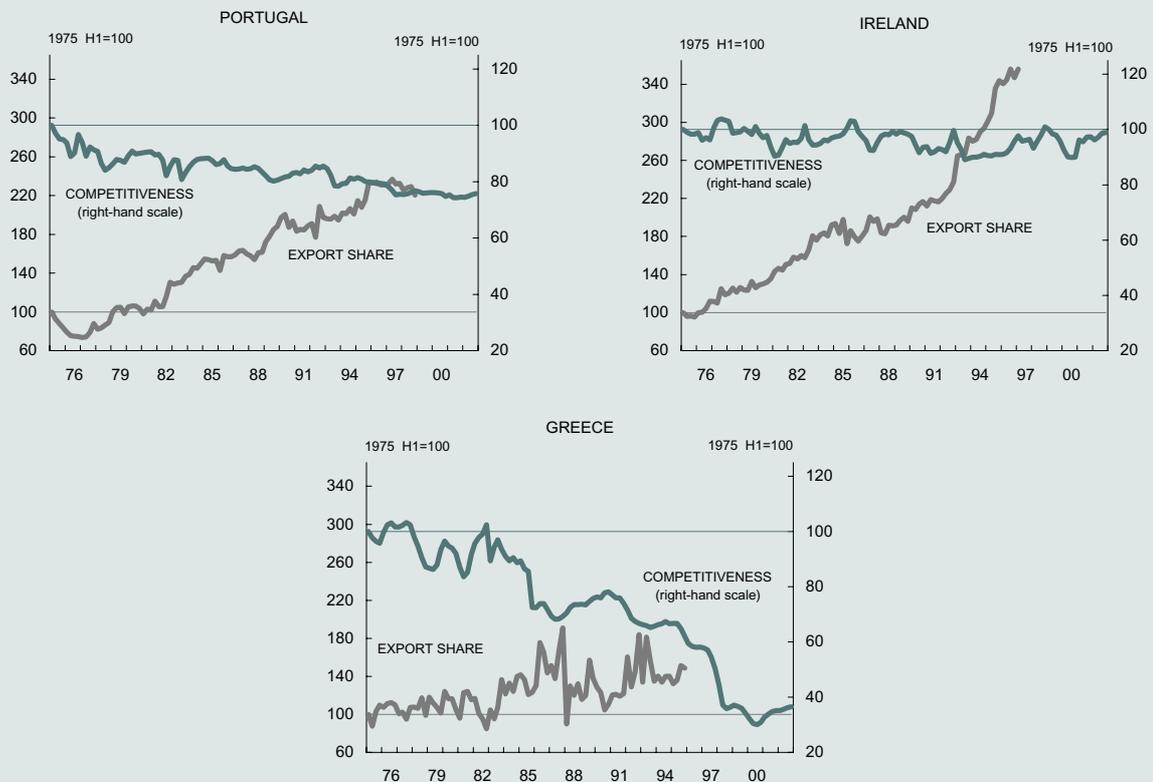


Source: OECD.

(a) Defined as the exports/export markets ratio.

CHART 1

## Changes in export share (a) and in competitiveness (continued)



Source: OECD.

(a) Defined as the exports/export markets ratio.

Long-term price elasticities vary over a wider range, from 0 in the case of Belgium to  $-1.5$  for Finland. The possible causes of this differing behaviour include most notably the specialisation of manufacturing exports in each country. It can be expected that price elasticity will be lower in the countries whose trade includes, on average over the sample period considered, a higher proportion of exported goods offering more opportunity for differentiation, which can be based on factors such as technological sophistication, quality or brand image; and that, by contrast, elasticity will be higher in countries whose trade focuses more on low-technology products in which price competition is more important. In addition, the high relative weight of intra-industry exchanges and the delocalisation of production, with the resulting increased importance of intra-company trade, would contribute to reducing the influence of price on export flows. It is also possible that the greater weight of sales to countries that are geographically and culturally close – for example, in the case of euro area countries, to other members of the European Monetary Union or European Union – will, insofar as it reflects a sustained trade relationship and capitalises on lower

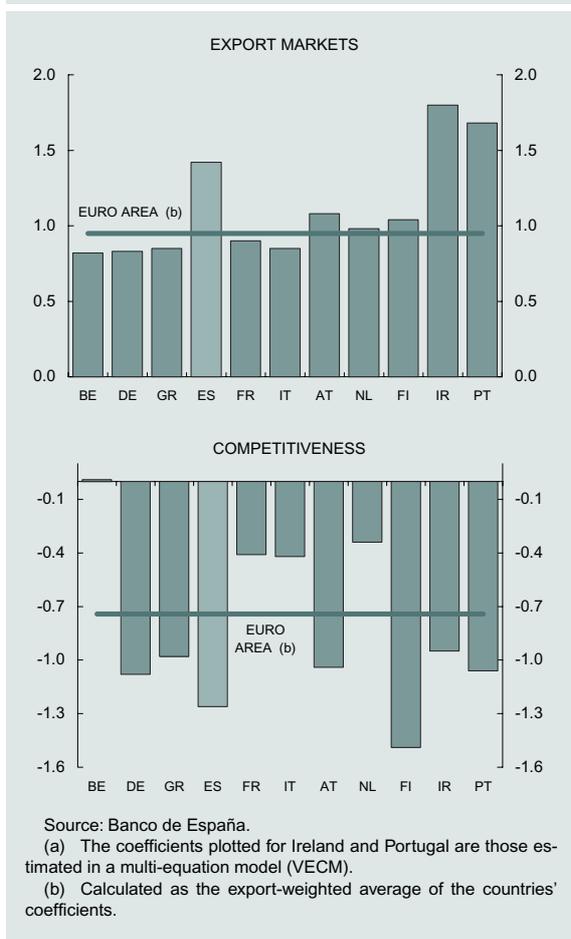
transport and transaction costs, have a moderating effect on price elasticity. Also, since the sample period used in the estimate has seen a succession of different exchange rate regimes (flexible, adjustable and, in intra-euro area trade following the introduction of the euro, fixed), foreseeably the elasticity of exports to competitiveness will in many cases be highly sensitive to changes or reductions in the sample period. Finally, it is to be supposed that, along with these general factors, other country-specific factors will play a role. These will be analysed in greater detail in the following section.

The adjustment of changes in exports to deviations from their long-term path, as expressed by the value of the error correction mechanism coefficient, is similar in most countries, and full return to equilibrium takes about one year. Only in France, the Netherlands and, particularly, Greece, is the speed of adjustment higher, so exports are, on average, nearer to their long-term path.

Chart 4 compares the long- and short-term elasticities to export markets and to competi-

CHART 2

## Long-term elasticities of export demand (a)

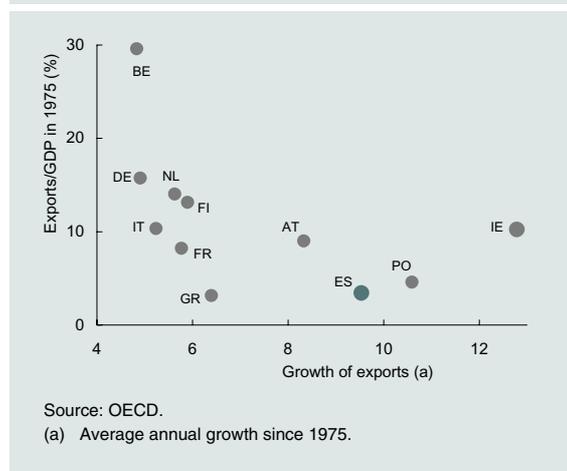


tiveness. It can be seen that only in the cases of the Netherlands, Finland and, above all, Spain, is the response of exports to export markets higher in the long term than in the short term. With regard to price, in all countries except Belgium the effect of competitiveness on exports is greater in the long term than in the short term. It is also notable that, in the short term, the response of exports to market changes is immediate, whereas the effect of prices, in addition to being smaller in magnitude, takes from one to three quarters to become apparent. Therefore, in the short term, exports are dominated by movements of external real income, which thus becomes a basic determinant of economic performance in euro area countries, while changes in competitiveness take longer to affect export performance.

In addition, a weighted average of each country's long-term elasticities was calculated in order to approximate the elasticity of the euro area as a whole. The weights used were the relative significance of the manufacturing exports of each country within the total. Elasticities

CHART 3

## Manufacturing exports: initial situation and growth



ties of 0.95 to export markets and  $-0.74$  to competitiveness were obtained and a value of  $-0.25$  was calculated for the error correction mechanism. These results are somewhat similar to those obtained in the Area Wide Model (AWM) of the European Central Bank (4). This model yields a long-term elasticity of goods and services exports to changes in competitiveness of  $-0.82$ , with an error correction mechanism coefficient of  $-0.12$ . Long-term income elasticity is restricted to unity.

### 3.2. Comparison of price elasticity

Chart 5 shows the percentage structure of the various countries' exports classified by technological content of the products (5) in 1988, which represents an intermediate point in the sample period considered, as well as the geographical distribution of the euro area countries' trade, distinguishing between intra- and extra-euro area trade, and, within the latter, between trade with developed countries and that with developing countries. In general, price elasticity is higher in countries that have a higher percentage of exports in low- and medium-low-technology industries.

To explain the low price elasticity of the Netherlands and Belgium (that of Belgium is

(4) See Fagan, G., Henry, J. and Mestre, R. (2001). The AWM is comparable with the weighted average of the estimates made in this work because it includes intra-area trade in euro area exports. However, it estimates total goods and services exports.

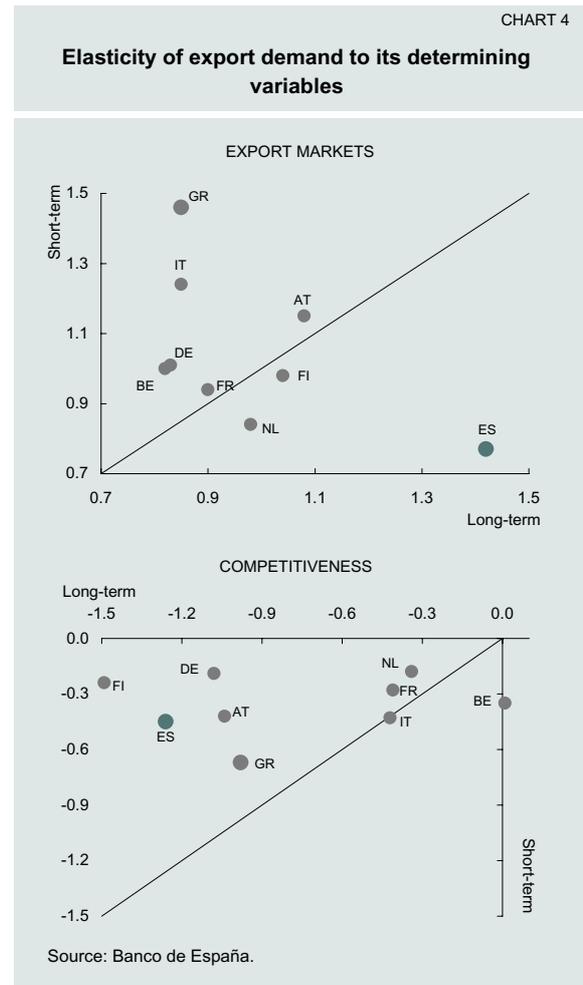
(5) The OECD prepares this classification of manufacturing industries by technology intensity based on the proportion of research and development expenditure in each sector to its value added or production.

zero), regard must be had to the growing significance of goods re-exports, which, in the case of the Netherlands have risen to more than 40% of total goods exports in 2000, compared with 20% in 1990. The term *re-exports* refers to traded goods which, during transport from the country of origin to the country of destination, pass through a third country (normally a major logistic centre) in which they are not subjected to any additional industrial processing. Since these goods become temporarily owned by entities resident in the country of transit, they form part of its imports and of its exports. In the case of the Netherlands and Belgium, the bulk of re-exports consist of products from third (particularly South-East Asian) countries destined to the main European markets, such as Germany and France. According to the Netherlands Bureau for Economic Policy Analysis (2001), the elasticity of re-exports to the price competitiveness indicator is five times lower (in absolute terms) than the elasticity of exports produced in the country.

Italy is noticeable because, despite focusing on exports with relatively low technological content proportionally more aimed at non-euro area countries, it has low price elasticity. This reflects the stability of its market share up to the beginning of the 1990s (see Chart 1), despite the progressive and substantial loss of competitiveness during that period. Such stability was probably a consequence of specialisation in specific product segments which, despite belonging to low-technology sectors, allow greater product differentiation, particularly in terms of brand image, and of the restructuring effort made by Italian industry faced with unfavourable real exchange rates up to the early 1990s [see Fazio (2000)]. In fact, during the ensuing years exports responded more strongly to changes in competitiveness, although this is not reflected in the elasticity estimated using the whole sample period.

By contrast, in France the high technological content of its exports would explain the scant sensitivity of its foreign sales to competitiveness. In Germany, however, the competitiveness ratio seems high in view of the high relative weight of foreign sales of products with substantial technological content. Among the reasons for this could be that, compared with the other euro area countries, Germany has a higher percentage of inter-industrial trade (consisting of goods that are more price-responsive), and that exports to non-European Union countries have a higher relative weight.

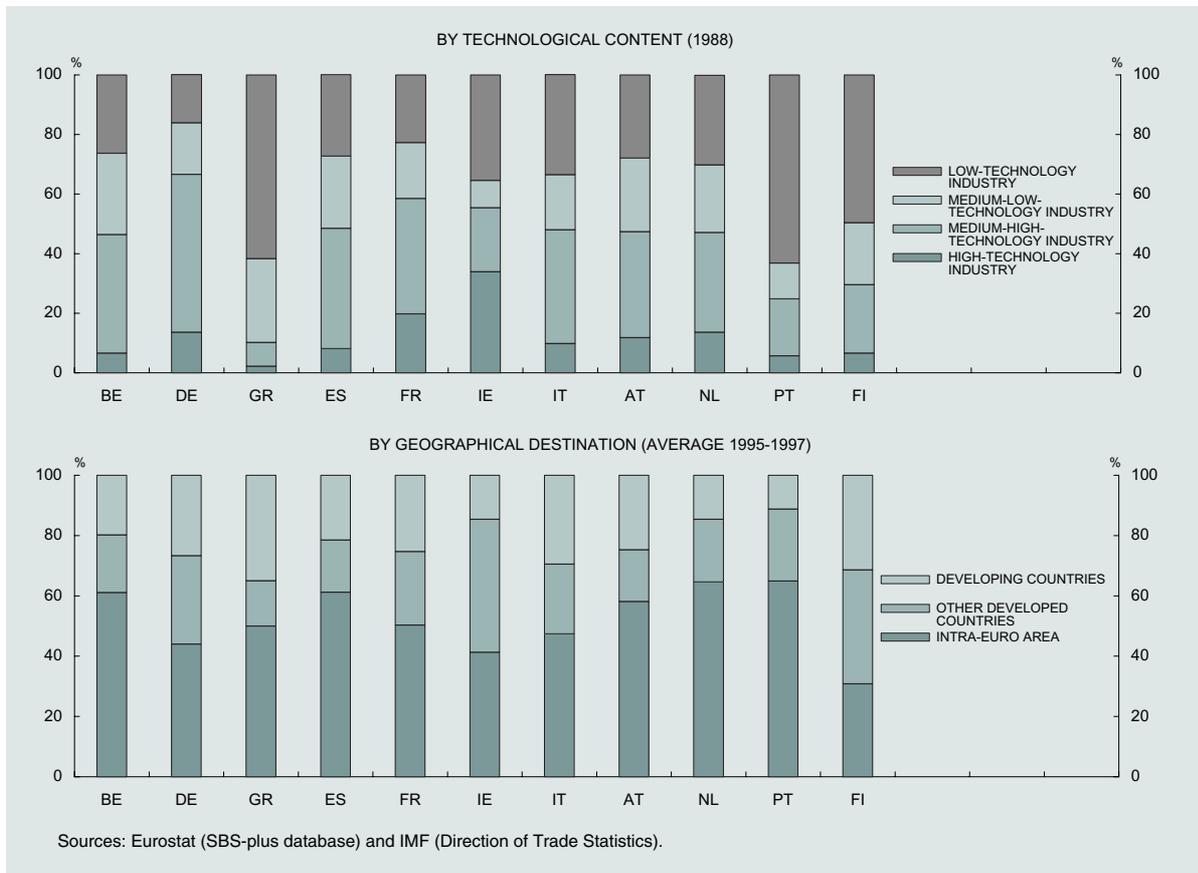
Predominating in Spain and Austria is the effect of product mix in their trade, with its relatively low technological content and, therefore,



high price elasticity:  $-1.3$  and  $-1$ , respectively. This variable is also high in Finland due to a very high percentage of price-sensitive exports, including most notably wood, cork and paper (they accounted for 42% of total manufacturing exports in 1988) intended mainly for non-euro area countries. The Finnish economy has seen a sharp change in specialisation, in both production and trade, in recent years, with a gain in the weight of the electronics and communications sector, which spurred from 3% of total exports in 1988 to 16% in 1998. It seems reasonable that this development should be reflected in a change in price elasticity. To check this, the equation was estimated with the sample period divided into two sub-periods (until 1988 and after 1988); no significant change was observed in the long-term competitiveness ratio. It should be noted that, despite the growing importance of high-technology goods in recent years, the paper industry continues to be the most important, still accounting for 30% of total exports in 1998.

Finally, it is noticeable that price elasticity is not higher in Greece, given that the technological level of its exports is very low and that it is the country that directs the highest proportion of

## Structure of exports



trade to lesser developed countries, particularly to transition economies. Possibly the geographical proximity factor is particularly important when it comes to assessing the demand for Greek exports. Indeed, for the generally less developed countries around Greece, Greek products would have a high technological content in relative terms (the opposite to what would occur if Greece were compared with the other euro area countries), which would reduce the significance of the effect of price changes on demand.

#### 4. CONCLUSIONS

The demand for manufacturing exports from the euro area countries has been characterised by considerable buoyancy since the mid-1970s, although it varies from country to country. In the case of the euro area countries, the behaviour of their determining variables does not satisfactorily explain the marked differences in export growth. This is most evident in the rate of expansion of external income (measured by taking the export markets as a proxy), which is similar in all countries. For its part, competitiveness

showed highly disparate movements that were generally consistent with the behaviour of the countries' market shares, although not with the enormous differences observed.

Thus, the response of a country's exports to changes in their determining variables largely explains the diversity of results perceived. In particular, the elasticity of exports to the export market variable is higher in the countries that started from an initial situation characterised by lower openness to trade and that, during the period, underwent rapid integration into the international goods market. Such marked differences in export responsiveness to export market growth will foreseeably tend to moderate once the processes of commercial integration and productive structure adaptation (transfer of resources from primary production to manufacturing) in the countries that started from a lesser developed level have come to an end. As these economies mature and specialise more in the provision of services, the gains in market share will tend to moderate considerably.

The differing long-term price elasticities seem to be explained, in general terms, by the

productive specialisation of each country, although there are particular cases in which idiosyncratic factors may play a major role in determining certain values. In a context in which manufacturing industry specialisation continues to change dramatically and very unequally across countries, it is reasonable that the sensitivity of exports to price competitiveness should continue to be different in each country. However, it can also be expected that there will be a general trend of elasticities to decrease as countries make progress in improving their competitiveness in ways other than through leadership in costs and in selling prices.

It is also notable that elasticity to competitiveness is lower in the short term than in the long term and that, furthermore, in the short term it always operates with some delay. Therefore, in the short term the effects of the income variable are more important and more immediate than those caused by changes in competitiveness.

Spain is a typical case of a country that started from an initial situation of low openness to trade and whose exports have enjoyed high buoyancy as a result of its progressive integration into world trade flows (with landmarks such as EEC membership in 1986), the consequent reduction in tariffs and the marked changes in its productive structure. This buoyancy of foreign sales is reflected in the high income elasticity of Spanish manufacturing exports. Also, the low proportion of high-technology goods exports would explain the high price elasticity. It thus becomes apparent that there is a certain specialisation in products that allow less differentiation and are therefore subject to greater price-based competition by third countries.

However, in recent years, as the creation of trade driven by economic integration has lost

steam, Spain's export share has moved more in line with its competitiveness. This situation, if sustained over time, would mean that the Spanish economy's degree of openness to trade, as measured by the weight of manufacturing exports in GDP, would increase more slowly from now on, as is happening in other more developed euro area countries. Therefore, gaining export share will require, to a greater extent than in the past, improvements in competitiveness. The achievement of significant gains in competitiveness through price containment seems unlikely in the short term, given the recent contraction in manufacturing margins, and it will require a major effort to correct the positive differential traditionally shown by unit labour cost growth in Spain compared with that of its main competitors; this will call for greater flexibility in product and factor markets. Simultaneously, improvements in competitiveness based on factors other than price must be fomented by stepping up the incorporation of innovation and technical progress into productive processes. This would be conducive to product differentiation and brand creation and ultimately lead to the moderation of unit labour costs as a result of increased productivity.

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