THE PORTUGUESE EXPORT PERFORMANCE IN PERSPECTIVE: A CONSTANT MARKET SHARE ANALYSIS*

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1. INTRODUCTION

Changes of a country's market share in world exports result from many interrelated factors. Firstly, domestic and external macroeconomic developments influence the relative price/cost competitiveness of exports. Secondly, long term structural factors like the endowment of productive factors, technology and institutional background affect overall competitiveness and the sectoral specialization of exports. Thirdly, geography and cultural linkages condition the performance of exports and its distribution among different trade partners. Fourthly, the dynamics of international trade flows determined, in part, by the entrance of new players, mechanically affects individual countries' market shares. Therefore, the analysis of the export performance of a country should be put in perspective by analysing long periods in order to identify trends and comparing with a set of benchmark countries.

This discussion is relevant for the Portuguese economy because export market shares have been showing a disappointing path over the last decade. In a small open economy like the Portuguese, deteriorations in export performance tend to hinder economic growth and thus contribute to the real *per capita* income divergence against the euro area observed in the last years.

This article analyses the evolution of Portuguese market shares in world exports over the 1968-2006 period, in comparison with other Southern European countries and Ireland and taking into account the impact of product and geographical composition on the aggregate results. For this purpose, we use a constant market share methodology as proposed by Nyssens and Poullet (1990). The total change in the market share of Portuguese nominal exports is decomposed into three main additive and analytically interpretable terms: a market share effect, taking into account the effective changes of share in each product/geographical market, and two additional terms that analyse how the geographical and product composition of Portuguese exports affected developments in the overall market share. Other applications of the constant market share methodology to Portuguese exports can be found in Abreu and Manteu (1993), Cabral (2004) and Cabral and Esteves (2006). In ECB (2005) an analysis of this type for euro area exports is included.

The main contribution of this article comes from the very long time span selected, which provides a good picture of Portuguese export market shares during periods of structural reform, over the diverse stages of European economic integration and under different macroeconomic regimes. In addition, a comparative perspective of the main results of the constant market share analysis is provided, as the methodology is applied to a set of benchmark countries, namely Spain, Greece, Ireland and Italy. Moreover, the analysis focuses on the path of the share of Portuguese exports in world markets as a whole, and not just in a selected reference group comprising a sample of products or geographical destinations. We use also a detailed product (118 items) and geographical breakdown (79 countries or

* The authors thank Jorge Correia da Cunha and Cristina Manteu for their comments. The analyses, opinions and findings represent the views of the authors; they are not necessarily those of the Banco de Portugal or the Eurosystem. The usual disclaimer applies.

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country groups). Nevertheless, such detailed data is only available in nominal terms, imposing some caution in the interpretation of the results.

The article is organized as follows. Section 2 reviews the methodology for decomposing the changes of export market shares and describes the database used. Section 3 presents the results of the constant market share analysis and starts by comparing the main results for Portugal with those obtained for Spain, Greece, Ireland and Italy over the last forty years. The remaining of this section details the results obtained for Portugal. Subsection 3.3 examines the product and geographical dimensions of the market share effect and Subsection 3.4 focuses on the combined structure effect. Section 4 presents some concluding remarks.

2. CONSTANT MARKET SHARE ANALYSIS: METHODOLOGY AND DATA

The constant market share analysis is an accounting method that enables the *ex-post* breakdown of the changes in total market shares of a certain country over time. This method is particularly useful to separate and quantify the contribution of the trade pattern of the country (in terms of products and geographical destinations) from the contribution of other factors. The interest of this method, which is used for descriptive rather than explanatory purposes, results mainly from its simplicity and easiness to use, as well as from its ability to identify key features of the differentiated behaviour of a given variable. This technique was initially used in studies of variables such as employment or labour productivity within the scope of regional economics, where it is best-known as shift-share analysis. Subsequently, it was applied to studies of international trade flows, where it was used for the first time by Tyszynski (1951).[1] The main idea underlying the constant market share analysis is that the export structure of a given country affects its global export performance, despite changes in other factors, such as those associated with competitiveness. As stated by Magee (1975), even if a country maintains its share of every product in every geographical destination, it can still have a decrease in its aggregate market share if it exports to individual markets that grow more slowly than the world average.

According to the formulation suggested by Nyssens and Poullet (1990), the total change in the share of Portuguese exports in the world market, the Total Effect (TE), is proxied by the difference between the growth of total Portuguese exports of manufactured goods (g) and the growth of total exports of manufactured goods of the rest of the world (g^*), that is:

$$TE = g - g^* = \sum_i \sum_j \theta_{ij} g_{ij} - \sum_i \sum_j \theta^*_{ij} g^*_{ij} \quad (1)$$

where $g_{ij} = \frac{X_{ij,t} - X_{ij,t-1}}{X_{ij,t-1}}$ is the percentage change of Portuguese exports of product i to country j in period t, $\theta_{ij} = \frac{X_{ij,t-1}}{\sum_i \sum_j X_{ij,t-1}}$ is the share of product i to destination country j in total Portuguese exports in period $t-1$, and g^*_{ij} and θ^*_{ij} are the equivalent notions for world exports (excluding the reporting country).

If the growth of Portuguese exports is higher (lower) than that of world exports, the TE will be positive (negative), corresponding to a total market share gain (loss) of Portugal. This TE can be broken down into two terms: one resulting from effective changes in market shares in individual markets, the Market Share Effect (MSE); and another resulting from the influence of the relative specialization of the coun-

(1) For a detailed description of the constant market share methodology, its different formulations and applications in studies of regional economics, see Loveridge and Selting (1998). For an influential study of the application of this methodology to exports, see Leamer and Stern (1970).

try, the Combined Structure Effect (CSE). The notion of individual market used here refers to each *ij* market measured as exports of product *i* to destination country *j*.

$$TE = MSE + CSE \tag{2}$$

Market Share Effect (MSE) – The difference between the growth rate of Portuguese and world exports in each period, excluding the influence of differences in relative specialization. Taking as given the product/geographical structure of Portuguese exports, a comparison is made between the growth rates of Portuguese and world exports for each product *i* to each destination country *j*. The MSE for a specific product *i* (destination country *j*) can be taken as the sum over *j* (*i*) of this effect.

$$MSE = \sum_i \sum_j \theta_{ij} \, (g_{ij} - g^*_{ij}) \tag{3}$$

Combined Structure Effect (CSE) – The relative evolution of each individual destination market (defined as the difference between its growth and the growth of total world exports) weighted by the relative importance of that market for Portugal (defined as the difference between its share in total Portuguese and in total world exports). The relative specialization term ($\theta_{ij} - \theta^*_{ij}$) compares export structures and, hence, gives information equivalent to the traditional Balassa (1965) index of revealed comparative advantage. The CSE determines which part of the total change of market share results from the influence of the relative product/geographical specialization of the country. In each period, the CSE will be positive if Portugal is relatively more (less) specialized in individual markets that grow above (below) the average; the CSE will be negative if Portugal is relatively less (more) specialized in individual markets that grow above (below) the average.

$$CSE = \sum_i \sum_j (\theta_{ij} - \theta^*_{ij})(g^*_{ij} - g^*) \tag{4}$$

The CSE takes into account both the product and geographical specialization of exports as a whole, but it can be further decomposed into three terms to separately account for the effects of the product and geographical compositions.

$$CSE = PSE + GSE + MIX \tag{5}$$

Product Structure Effect (PSE) – it determines which part of the total change in the market share resulted from the relative product specialization of Portuguese exports.

$$PSE = \sum_i (\theta_i - \theta^*_i)(g^*_i - g^*) \tag{6}$$

where $g^*_i = \dfrac{\sum_j \theta^*_{ij} g^*_{ij}}{\theta^*_i}$ is the percentage change of world exports of product *i* in period *t*, $\theta_i = \sum_j \theta_{ij}$ is the share of product *i* in total Portuguese exports in period $t-1$, and θ^*_i is the equivalent notion for world exports.

Geographical Structure Effect (GSE) – it represents the impact of the relative geographical specialization of Portuguese exports.

$$GSE = \sum_j (\theta_j - \theta^*_j)(g^*_j - g^*) \tag{7}$$

where $g_j^* = \frac{\sum_i \theta_{ij}^* g_{ij}^*}{\theta_j^*}$ is the percentage change of world exports to country *j* in period *t*, $\theta_j = \sum_i \theta_{ij}$ is the share of country *j* in total Portuguese exports in period $t-1$, and θ_j^* is the equivalent notion for world exports.

Mixed Structure Effect (MIX) – it is a residual term that results from the fact that the product and geographical structures are not independent and thus the sum of the product and geographical effects does not match the combined structure effect. The option here was to calculate and display this interaction effect separately, hence controlling for its magnitude.

$$MIX = \sum_i \sum_j \left[(\theta_{ij} - \theta_{ij}^*) - (\theta_i - \theta_i^*) \frac{\theta_{ij}^*}{\theta_i^*} - (\theta_j - \theta_j^*) \frac{\theta_{ij}^*}{\theta_j^*} \right] g_{ij}^* \quad (8)$$

The constant market share analysis became popular in the literature of applied international economics despite continued criticism both for the lack of theoretical basis and for several shortcomings associated with its empirical application. Richardson (1971a, b) discusses the main shortcomings of this technique and gives an important contribution to the understanding of its accounting nature. The method has been progressively refined and Milana (1988) proposed satisfactory solutions to some of the major problems of the traditional constant market share decomposition. Some recent studies of constant market share that consider most of the empirical improvements suggested in the literature include the works of Simonis (2000), Foresti (2004) and ECB (2005).[2] However, several shortcomings regarding the empirical implementation of the constant market share analysis still remain. The most relevant and long standing criticism is that the various effects of the constant market share decomposition vary with the level of breakdown considered (by products and by countries). In fact, the analysis can be applied at several product/destination market breakdown levels and the results are not independent from this choice. The discretionary decision on the level of disaggregation to be used is generally determined by the availability of information.

The formulation used in this work includes some of the refinements suggested in the literature. Firstly, we use the structure of the initial year in the computation of the structural effects as in the traditional formulations, but the calculations are performed annually and the effects are added up over time to have multi-year effects.[3] Secondly, in the traditional formulation the product and geographical structure effects are calculated in an asymmetric way and, depending on the sequence of calculation, one of them will include the mixed structure effect. The solution adopted here was to consider this interaction effect explicitly and, hence, the structural effect is decomposed into three blocks (product, geographical and mixed) that are insensitive to the order of decomposition. Thirdly, in order to prevent distortions, the value of Portuguese exports was excluded from the aggregate of world exports at the most detailed level. Given the relatively small dimension of the Portuguese economy, this correction has a small influence on the results, but it can be very influential when the country considered has large market shares.

The international trade data used in this article comes from the CEPII - CHELEM database, which reports bilateral trade flows for goods in value terms (the unit being the US dollar).[4] The sample period starts in 1967 and ends in 2006. All bilateral computations are done in nominal terms given the lack of

(2) Cheptea *et al.* (2005) use an alternative formulation in a recent shift-share analysis of trade competitiveness.

(3) The constant market share analysis is applied over discrete time periods even though the export structure of any country changes continuously. Different aggregation weights can be chosen to translate the continuous-time into a discrete-time formulation, *i.e.*, the index number problem stated by Milana (1988) that suggests the use of average weights.

(4) See De Saint-Vaulry (2008) for a detailed description of this database.

information on external trade flows in volume with the suitable product and geographical detail over such a long time span. As a result, it is not possible to distinguish between the volume and the price components in the evolution of the market shares. Additionally, as all exports are denominated in US dollars, the developments in market shares are mechanically influenced by changes in the US dollar exchange rate.[5] Therefore, the interpretation of the results should be made with caution, as changing exchange rates and prices have an impact on the evolution of market shares that is not accounted for in this analysis. Our bilateral database comprises 79 countries or country groups (counting with Portugal, which is then excluded from the world aggregate), and 121 manufacturing products, with a product breakdown at the 4-digit level of the International Standard Industrial Classification (ISIC), rev.3. Data on energy-related items as coke, refined oil products and nuclear fuel were excluded from the analysis to avoid distortions coming from highly volatile oil prices, resulting in 118 active products.[6] All constant market share computations were performed at the detailed product breakdown level and the results for the 118 manufactured goods were afterwards grouped in accordance with their technological intensity, following the OECD classification of R&D intensities. This widely used technological classification includes four main sectors: high-technology, medium-high-technology, medium-low-technology and low-technology; and at a second breakdown level contains nineteen sub-sectors, excluding energy.[7] Appendix A displays the list of countries and country groups included in our sample and Appendix B reports the product technological breakdown with the respective ISIC code.

3. MAIN RESULTS

3.1. Portugal versus the benchmark countries

This subsection presents a comparative analysis of the constant market share decomposition for Portugal and four benchmark countries - Spain, Greece, Ireland and Italy. Throughout the nineties, the first three benchmark countries, together with Portugal, were commonly designated the “cohesion countries", as *per capita* income stood clearly below the European Union (EU) average.[8] As for the Italian economy, its sectoral export structure holds some similarities with the Portuguese one and, in the last decades, serious competitiveness problems with negative consequences on economic growth and export performance have been reported.

The methodology presented in the previous section was applied to data for the five countries and Chart 1 displays the annual results in cumulative terms. Starting with the total effect, sharp differences exist between these countries. Portuguese exports show a cumulative increase of total market shares over the 1968-2006 period of 14.5 per cent. This increase is higher than the one observed in Italy, where total export shares declined by 16.4 per cent in cumulative terms over the same period, but worse than in Greece (cumulative market share growth of 55.7 per cent). In contrast, the export shares of Ireland and Spain in world markets increased sharply over this period, by around 150 per cent in cumulative terms. In the recent years, there is a decrease in the market share of these countries (Greece being

(5) Using the example included in ECB (2005), if the share of trade denominated in US dollars is smaller in the Portuguese than in world exports, an appreciation of the US dollar will result, *ceteris paribus*, in a decline in the Portuguese market share.

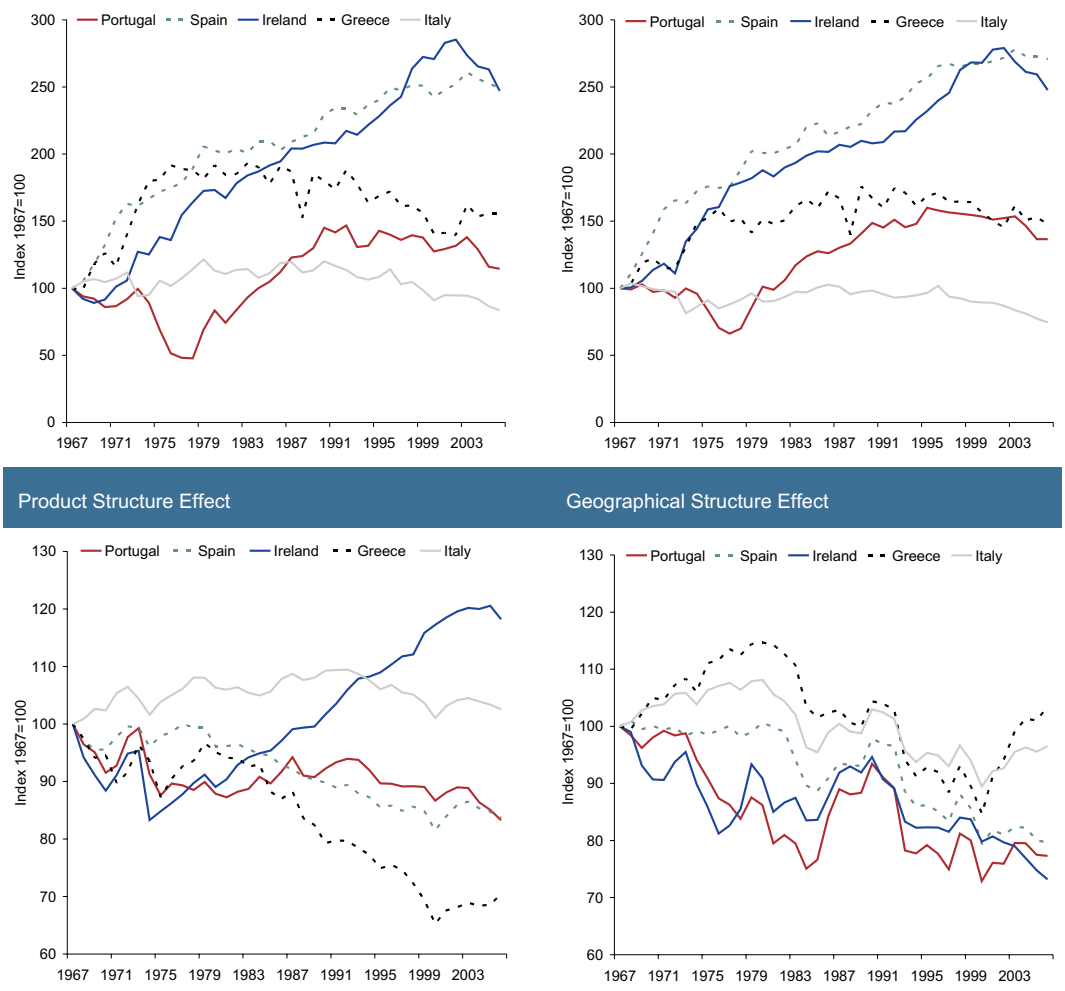
(6) Given the detailed breakdown used, several observations have a zero value, making it impossible to compute the growth rate for the following year. In order not to exclude these observations, the zero values were replaced by a very small number as 0.0000001, not affecting the overall rate of change of exports.

(7) As stated previously, the results can change significantly with the product classifications used. Nevertheless, we replicated all computations using this second breakdown level of the OECD classification of R&D intensities and, in the countries considered, the main results remain broadly unchanged. However, this outcome should not be seen as a general result for all countries.

(8) The Cohesion Fund, which started in 1994, is a structural instrument that helps European Union (EU) Member States to reduce economic and social disparities and to stabilize their economies. Eligible Member States of the Union are those whose gross national product (GNP) *per capita* is below 90 % of the EU-average. Four Member States, Spain, Greece, Portugal and Ireland, were eligible under the Cohesion Fund until the end of 2003. The European Commission's mid-term review of 2003 deemed Ireland (GNP equal to 101 % of EU average) as ineligible under the Cohesion Fund as of 1 January 2004.

Chart 1

MAIN RESULTS OF THE CONSTANT MARKET SHARE ANALYSIS OF MANUFACTURING EXPORTS
(excluding energy, cumulative results in nominal terms)



Sources: CHELEM database and own calculations.

the exception), partly related with the progressive entrance of new players in world trade. These additional competitive pressures are posed by emerging market economies located in Central and Eastern Europe and, mainly, in East Asia, in particular China. Nevertheless, it should be noted that in the cases of Ireland and Spain the strong losses of share observed since 2003 and 2004, respectively, follow substantial cumulative gains recorded earlier. This is not the case in Portugal or Italy, which have been lagging behind. Greece has been able to broadly maintain its overall market share in recent years, though declining relatively to the mid-eighties.

In the five countries selected, the breakdown of the total effect over the whole period indicates that the market share effect is the major driving force behind the overall evolution of market shares, thus mimicking the results described above. One interesting point is the markedly different behaviour of the Portuguese market share effect in the period 1974-77, when compared with the benchmark economies. The cumulative 33.6 per cent effective loss of market share in this period coincides with three shocks that hit the Portuguese economy and substantially reduced its external competitiveness. Firstly, the oil shock of 1973 directly affected price/cost indicators in the following years, though it was not idiosyn-

cratic. Secondly, the 1974 revolution disrupted part of the economic activity and subsequent real wage increases severely deteriorated relative unit labour costs. Thirdly, the decolonization process reduced trade flows with a set of African preferential markets. Competitiveness rebounded after 1977 following packages of expenditure-switching and expenditure-reducing policies, partly associated with a stabilization agreement with the IMF. Portuguese effective market shares recovered until mid-nineties, but lost momentum after that. The recent decline of Portuguese export shares should partly reflect the deterioration of relative cost competitiveness indicators, in a context of increased competition in world markets associated with the entrance of new players.[9]

There are also differences between the countries considered in terms of the combined influence of product and geographical structure of exports, even if this is not the dominant effect underlying the evolution of total market shares. In the cases of Portugal and Spain, the impact of the export structure is negative, both in terms of geographical distribution and product composition. In contrast, the combined structure effect is slightly positive in the cases of Greece and Italy. In Greece, it benefits from a small positive impact of the geographical distribution of exports and in Italy there is a very small positive contribution of the product specialization. In the case of Ireland, the combined impact of the product and geographical composition of exports over this period is null. On the one hand, there is a very positive influence of the product composition of Irish exports, which reinforces the effective gains of market share obtained. On the other hand, the geographical orientation of Irish exports has been mainly towards markets with a lower than average growth rate, leading to a negative geographical structure effect over this period.

The comparison of Portugal with the benchmark countries in terms of the product and geographical structure effects offers some insights. The contrast between the path of the cumulative effect of the product structure in Portugal and Ireland is striking. Both countries recorded a strong negative evolution in the mid-seventies, meaning that their sectoral export structure did not correspond to the products where world export growth was more dynamic. Nevertheless, in the subsequent decades developments were very different. Ireland successfully changed the sectoral export structure towards more dynamic products, contributing to the increase of its total market share, while Portugal did not. This is consistent with the information available on the dynamics of the Irish specialization pattern during the last decades (see Amador *et al.* (2007)). As for Spain and, mostly, Greece, the product structure effect was also unfavourable, while Italy seems to have recorded a positive, though small, effect.

In what concerns the evolution of the geographical structure effect, the interesting result is the similarity observed between these countries over the eighties and nineties. Such evolution reflects the increased importance of European markets for these countries, translated by a higher share of intra-European trade and a share of trade with the US below that of the world average. In fact, as long as the progress of the European integration makes the geographical export structure of Member States more uniform, it drives similar paths for the geographical structure effect. However, some distinct developments are visible in the most recent period. The geographical structure effect is more favourable in the case of Greece and, to a lesser extent, Italy than in the other three countries selected. In the Greek case, this evolution reflects a positive contribution from the non-specialization in the US market, which grew below world average in this period, and from the higher specialization of Greek exports on the recently opened and dynamic Bulgarian and Romanian markets. The positive contribution of the US for the geographical structure effect in the last period is evident in all of these countries with the exception of Ireland, where the share of exports to the US surpassed the world average since 2002. However, the main contribution to the negative geographical structure effect observed in Ireland

(9) See Esteves and Reis (2005) for a discussion on the deterioration of Portuguese effective exchange rates considering a large number of competitor countries and accounting for differences in product specialisation.

in the 2002-06 period resulted from the strong specialization of Irish exports in the UK market. Finally, the non-specialization of these five countries in the dynamic Chinese market contributed negatively to the evolution of their export shares since the nineties.[10]

3.2. Overall results for Portugal

In this subsection we turn to a more detailed analysis of the results obtained for Portugal. Table 1 and Chart 2 decompose the total change in Portuguese export market shares using the constant market share methodology described in Section 2. In order to facilitate the analysis, the data was organized in five-year periods by averaging the respective annual results (the results for each year are presented in Appendix C).

The total share of Portugal in world exports had an average annual increase of 0.4 per cent over the 1968-2006 period. Nevertheless, the results differ substantially over time. The first two periods considered, from the late sixties to the mid-seventies, are characterized by a substantial overall reduction of market share. In the next three periods, from the late seventies to the beginning of the nineties, the growth of Portuguese exports was higher than the growth of total world exports, leading to a positive total effect. This situation was reversed in the last three periods considered, which show an increasingly negative evolution of total Portuguese export shares.

The market share effect, with an average effective gain of 0.9 per cent per year in the 1968-2006 period, was the dominant factor behind the total change in market shares in most periods. The main exception is the 1992-96 period, where there is a positive market share effect, but a total loss of share, reflecting a very negative geographical structure effect. Additionally, the market share effect was only marginally negative in the first period, with the relative product composition of Portuguese exports influencing negatively the developments in total market share.

Table 1

MAIN RESULTS OF THE CONSTANT MARKET SHARE ANALYSIS OF PORTUGUESE MANUFACTURING EXPORTS

(excluding energy, average results in nominal terms)

	Growth of Portuguese exports	Growth of world exports	Total Effect	Market Share Effect	Combined Structure Effect	of which:		
						Product Structure Effect	Geographical Structure Effect	Mixed Structure Effect
1968-71	10.7	14.0	-3.3	-0.4	-2.9	-1.8	-0.2	-0.9
1972-76	14.2	21.3	-7.0	-5.6	-1.5	-0.6	-2.4	1.5
1977-81	18.7	14.1	4.6	5.7	-1.1	-0.5	-1.6	0.9
1982-86	12.9	5.4	7.6	5.5	2.1	0.9	0.9	0.3
1987-91	18.2	12.3	5.9	3.8	2.1	0.3	1.4	0.4
1992-96	8.9	9.2	-0.4	2.5	-2.9	-0.7	-2.7	0.5
1997-01	0.9	3.0	-2.1	-1.4	-0.7	-0.3	-0.3	-0.1
2002-06	9.9	12.9	-3.0	-2.9	0.0	-1.0	0.2	0.7
1997-06	5.4	8.0	-2.5	-2.1	-0.4	-0.6	0.0	0.3
1968-06	11.8	11.5	0.4	0.9	-0.6	-0.4	-0.6	0.4

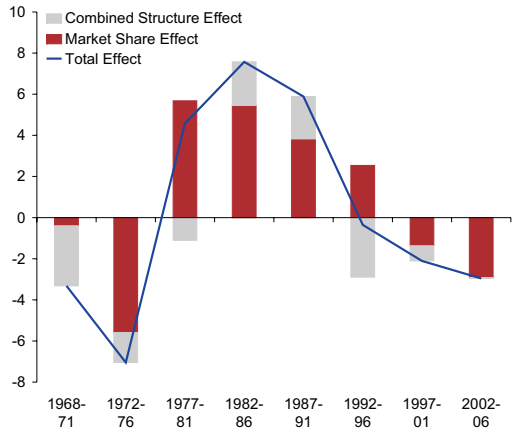
Sources: CHELEM database and own calculations.
Note: The results of each period are computed as the average of the individual results obtained for each year.

(10) ECB (2005) also found a significant negative contribution to the geographical structure effect coming from the under-specialisation of euro area exports in the Chinese market.

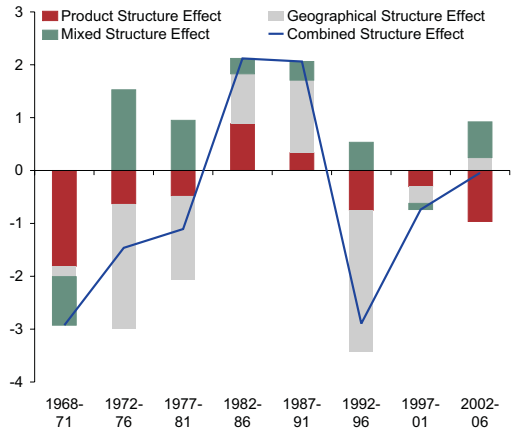
Chart 2

MAIN RESULTS OF THE CONSTANT MARKET SHARE ANALYSIS OF PORTUGUESE MANUFACTURING EXPORTS
(excluding energy, average results in nominal terms)

Breakdown of the Total Effect



Breakdown of the Combined Structure Effect



Sources: CHELEM database and own calculations.

The contribution of the combined structure was negative on average over the 1968-2006 period, reflecting both the product and the geographical specialization of Portuguese exports. In fact, the impact of the product and geographical composition of Portuguese exports was negative in most subperiods. The exceptions are 1982-86 and 1987-91 where a significant positive effect of the combined structure is evident, both by products and, mainly, by geographical markets. In the last two periods examined, the influence of the combined structure of Portuguese exports is less relevant than in previous periods, though a significant negative impact of the product composition is detected in 2002-2006.

The next two subsections break down the market share and the combined structure effects for Portugal. As for the latter effect, the contributions of sectoral and geographic structures of exports are detailed separately, *i.e.*, identifying the individual products/destinations that contributed more to the results. However, the division between the product and geographical effects is not exact, since the structures are not independent and there is a residual term of interaction. This mixed structure effect, which is not analysed individually here, includes impacts of both the product structure and the geographical structure of exports. As for the market share effect, recall that it can be detailed either for a specific product *i* (by summing the individual *ij* effects over the *j* countries) or for a specific country *j* (by summing the individual *ij* effects over the *i* sectors), *i.e.*, for this effect the contributions of geographical markets and products can not be added.

3.3. Market share effect in Portugal

3.3.1. Product breakdown

In the first two periods considered in the analysis, the results point to a considerable loss of effective export market share, especially concentrated in the years 1975-76. This fact mostly results from the disruption of production in several sectors, the increase in unit labour costs and the loss of preferential African markets, following the 1974 revolution and the decolonization. Table 2 shows the contribution

Table 2

PRODUCT BREAKDOWN OF THE MARKET SHARE EFFECT OF PORTUGUESE MANUFACTURING EXPORTS
(excluding energy, average results in nominal terms, contributions in percentage points)

	1968-71	1972-76	1977-81	1982-86	1987-91	1992-96	1997-01	2002-06
High-technology products	**0,6**	**-0.5**	**0.3**	**-0.3**	**0.0**	**0.5**	**0.5**	**0.1**
Aircraft and spacecraft	0,0	0.0	0.1	0.0	0.0	0.0	0.1	-0.1
Pharmaceuticals	0,0	-0.1	0.1	0.0	0.0	0.0	0.0	-0.1
Office, accounting and computing machinery	0,1	0.0	0.0	-0.2	-0.1	-0.1	0.2	0.1
Radio, TV and communications equipment	0,4	-0.4	0.0	0.0	0.0	0.5	0.2	0.2
Medical, precision and optical instruments	0,1	0.0	0.1	0.0	0.0	0.1	-0.1	0.0
Medium-high-technology products	**0,4**	**-0.8**	**1.2**	**0.9**	**1.9**	**2.2**	**-0.4**	**-0.7**
Other electrical machinery and apparatus	0,2	0.0	-0.1	0.2	0.5	0.5	-0.4	-0.5
Motor vehicles, trailers and semi-trailers	0,1	-0.1	0.4	0.6	0.8	1.6	0.0	-0.6
Chemicals excl. pharmaceuticals	0,0	-0.9	0.2	0.6	0.1	-0.1	-0.1	0.3
Railroad equipment and other transport equip.	0,0	0.0	0.0	0.0	0.0	0.1	0.0	0.0
Other machinery and equipment	0,0	0.2	0.6	-0.5	0.4	0.1	0.2	0.1
Medium-low-technology products	**-0,5**	**-0.3**	**0.6**	**0.9**	**0.1**	**0.3**	**0.1**	**0.5**
Rubber and plastics products	-0,1	-0.2	0.0	0.1	0.2	0.1	0.1	0.2
Other non-metallic mineral products	-0,1	-0.2	0.4	0.2	0.4	0.1	-0.1	0.1
Building and repairing of ships and boats	-0,1	0.1	-0.2	0.2	-0.3	0.0	-0.1	0.0
Basic metals	-0,3	0.2	0.1	0.4	-0.1	0.0	0.2	0.2
Fabricated metal products, excl. machinery	0,0	-0.2	0.4	0.0	0.1	0.1	0.0	0.1
Low-technology products	**-0,8**	**-4.0**	**3.6**	**4.0**	**1.9**	**-0.5**	**-1.6**	**-2.9**
Other manufacturing and recycling	-0,8	-1.2	0.6	-0.2	-0.1	0.0	0.0	-0.1
Wood, pulp, paper and printed products	0,8	0.0	0.6	0.5	0.0	-0.1	-0.1	-0.5
Food products, beverages and tobacco	-1,6	-2.1	-0.5	0.0	0.1	0.1	-0.1	0.2
Textiles, textile products, leather and footwear	0,7	-0.8	3.0	3.6	1.9	-0.4	-1.3	-2.4
Total	**-0,4**	**-5.6**	**5.7**	**5.5**	**3.8**	**2.5**	**-1.4**	**-2.9**

Sources: CHELEM database and own calculations.
Note: The results of each period are computed as the average of the individual results obtained for each year.

of each product to the market share effect, using a breakdown by technological intensity. The referred effective decreases in market share are mostly observable in low-technology products. This fact reflects mainly the negative contributions from the "jewellery and related articles" item, included in the "other manufacturing and recycling" sector, and from the sector of "food products, beverages and tobacco". Considering the detailed ISIC 4-digit product breakdown level, the losses of market share in this latter sector were mostly concentrated in the items of "preserved fish and fish products", "vegetable and animal oils and fats", "manufactured grain mill products" and "wines".

In the following four periods, comprising the years from 1977 to 1996, there were effective gains of export share in specific markets, pointing to an improvement of Portuguese external competitiveness. It should be recalled that the Portuguese economy in this period was marked by the current account crisis and the stabilization agreements with the IMF in 1978 and 1983. In fact, most of the stabilization in macroeconomic conditions and the significant improvement in competitiveness observed in the late seventies was based on a mix of higher interest rates, domestic credit ceilings, cuts in government spending, real wage declines and currency depreciations under a crawling-peg regime.[11] In 1981, the international crisis that followed the 1979 oil shock, together with the revaluation of the escudo and the decrease in its monthly depreciation rate in 1980, reduced export market shares in many important sectors, thus contributing to ignite the second current account crisis.[12] Nevertheless, the reintroduc-

(11) It should be recalled that our analysis is nominal and conducted in dollar terms. Therefore, depreciations of the domestic currency have an immediate negative effect in the nominal export market shares but a net positive effect tends to follow as quantities exported increase due to improved price competitiveness.

(12) Abreu and Manteu (1993) also found a substantial effective loss of market share of Portuguese exports in 1981, in both volume and value terms.

tion and intensification of stabilization policies contributed to the recovery of effective market shares in the following years (see Appendix C for the annual results).

The main contribution to the effective increase of market share in the three periods from 1977 to 1991 came from the low-technology sector of "textiles, textile products, leather and footwear". At the product level, the most relevant gains of market share occurred in "wearing apparel, except fur", "footwear" and "knitted fabrics and articles". This positive performance benefited from the 1986 accession to the European Economic Community, as larger markets opened to sectors where Portugal held a comparative advantage. This path was reversed in the period 1992-96, with Portuguese exports losing share in the sector of "textiles, textile products, leather and footwear". Such evolution mainly reflected the reductions of share in "wearing apparel, except fur", while significant gains were still observable in "footwear". In the 1992-96 period, the most significant contribution to the effective gain of market share resulted from the medium-high-technology sector, more specifically from "motor vehicles, trailers and semi-trailers". These increases of market share were especially strong between 1995 and 1997 and coincide with the location in Portugal of large foreign direct investment projects in the automobile sector, but they also existed in the previous three periods. In the 1992-96 period, there were also some important gains of market share in the high-technology item of "TV and radio receivers and recorders".

As illustrated in Table 2, the declines of market share of the low-technology sector of "textiles, textile products, leather and footwear" made a significant contribution to the negative market share effect observed in the periods between 1997 and 2006. The liberalization of the EU textiles market with the phase-out of the Agreement on Textiles and Clothing certainly contributed to this evolution.[13] In fact, the growing participation in the international market of new countries with low production costs and heavily specialized in this sector increases the competition faced by Portuguese exporters.[14] At the more detailed breakdown level, the major losses of share occurred in "wearing apparel, except fur", but the items of "footwear", "made-up textile articles, excluding apparel" and "knitted fabrics and articles" contributed also negatively. In the 2002-06 period, there was also a reduction of market share of Portuguese exports of the low-technology sector of "wood, pulp, paper and printed products", reflecting mainly the losses in the items of "pulp, paper and paperboard" and "other products of wood, cork, straw". In addition, Portuguese exports of "motor vehicles, trailers and semi-trailers" also lost share in world markets in the 2002-06 period.

3.3.2. Geographical breakdown

Following what was done in the previous subsection, we now turn to the analysis of the geographical destinations contributing more to the market share effect. To facilitate the analysis, we aggregated the previous five-year periods in blocks of effective gains (1977-96) and losses (1968-76 and 1997-06) of market share. Table 3 displays the main five positive and negative geographical contributions to the effective changes in share of Portuguese exports in each of the three blocks selected.

The losses of share of Portuguese exports in the United Kingdom and in the group of African Less Developed Countries (LDCs), which includes the five Portuguese-speaking African countries, were the main geographical contributions to the market share effect in the 1968-79 period. Significant reductions of share of Portuguese exports were also observed in the United States and Canada.[15]

(13) In 1993, the Uruguay Round agreement defined a 10-year phase-out of trade barriers existing in the Multifibre Arrangement and in the Agreement on Textiles and Clothing (ATC). As for the ATC, the liberalization would occur in 1995 (16 per cent), 1998 (17 per cent), 2002 (18 per cent) and 2005 (49 per cent). For more details, see Francois *et al.* (2007).

(14) See Cardoso and Esteves (2008) for an analysis of the impact of low-cost producers on international prices.

(15) The result of Bangladesh in this period reflects mainly a statistical problem in 1972: Portuguese exports to Bangladesh are almost nil and world exports to Bangladesh have an abnormally high rate of change in 1972. The combination of these two facts resulted in a very high negative contribution of Bangladesh.

Table 3

GEOGRAPHICAL BREAKDOWN OF THE MARKET SHARE EFFECT OF PORTUGUESE MANUFACTURING EXPORTS

(excluding energy, average results in nominal terms, contributions in percentage points)

Five main positive contributions	1968-76		1977-96		1997-06	
	Former USSR	0.28	Germany	1,20	Spain	0,17
	Sweden	0.21	France	1,00	Singapore	0,08
	Norway	0.18	Spain	0,58	Poland	0,03
	Germany	0.16	Netherlands	0,35	African LDCs	0,03
	Italy	0.10	African LDCs	0,26	Malaysia	0,02
Five main negative contributions	**1968-76**		**1977-96**		**1997-06**	
	Canada	-0,13	Thailand	-0,01	Netherlands	-0,13
	United States	-0,30	Japan	-0,02	BLEU	-0,18
	Bangladesh	-0,86	Brazil	-0,04	United Kingdom	-0,22
	United Kingdom	-0,92	Former USSR	-0,05	France	-0,29
	African LDCs	-1,72	Gulf nes	-0,13	Germany	-0,90
Total Market Share Effect	**1968-76**		**1977-96**		**1997-06**	
		-3.3		4.4		-2.1

Sources: CHELEM database and own calculations.
Note: The results of each period are computed as the average of the individual results obtained for each year. BLEU includes Belgium and Luxembourg. For more detail on the countries included in each geographical area, see Appendix A.

In the period of 1977-1996, the increases of export share in the German and French markets were the major explanation for the observed positive market share effect. Other EU destination markets gave positive contributions to the market share evolution in this period, especially Spain and the Netherlands. In addition, there were export share gains in the group of African LDCs.

In the period from 1997 to 2006, the major losses of share of Portuguese exports were concentrated in the EU market. The reductions of share in the markets of Germany, France, United Kingdom, Netherlands and Belgium/Luxembourg gave a significant contribution to the market share effect. This evolution reflects the increased competition that Portuguese firms face in the EU market, as new players enter the rapidly expanding world market. The major exception is the Spanish market, where Portuguese exports continued to gain shares, though at a slower pace than in previous periods. Portuguese exports also continued to increase slightly its share in the group of African LDCs. Singapore, Poland and Malaysia appear as new geographical destinations where some small market share gains were obtained in this period.

3.4. Combined structure effect in Portugal

3.4.1. The product structure effect

This subsection identifies the individual products that contributed the most to the evolution of the product structure effect, using the previously referred breakdown by technological intensity (Table 4). In the average of the 1968-2006 period, the relative product specialization of Portuguese exports did not

Table 4

BREAKDOWN OF THE PRODUCT STRUCTURE EFFECT OF PORTUGUESE MANUFACTURING EXPORTS
(excluding energy, average results in nominal terms, contributions in percentage points)

	1968-71	1972-76	1977-81	1982-86	1987-91	1992-96	1997-01	2002-06
High-technology products	**-0.2**	**0.2**	**-0.1**	**-0.2**	**-0.4**	**-0.4**	**-0.8**	**0.2**
Aircraft and spacecraft	0.0	0.1	-0.1	0.1	-0.2	0.2	-0.1	0.2
Pharmaceuticals	0.0	0.0	0.0	0.0	0.0	-0.1	-0.1	-0.1
Office, accounting and computing machinery	-0.1	0.0	-0.1	-0.2	-0.1	-0.2	-0.2	0.2
Radio, TV and communications equipment	-0.1	0.1	0.2	0.0	-0.1	-0.4	-0.3	0.0
Medical, precision and optical instruments	0.0	0.0	-0.1	-0.1	0.0	0.0	-0.1	0.0
Medium-high-technology products	**-0.7**	**-0.2**	**0.1**	**0.0**	**0.3**	**0.2**	**0.2**	**-0.1**
Other electrical machinery and apparatus	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0
Motor vehicles, trailers and semi-trailers	-0.6	0.0	0.1	-0.3	0.2	0.1	0.1	0.0
Chemicals excl. pharmaceuticals	-0.1	-0.1	0.0	0.0	0.1	0.0	0.0	-0.1
Railroad equipment and other transport equip.	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Other machinery and equipment	0.0	-0.1	0.0	0.4	0.1	0.0	0.2	-0.1
Medium-low-technology products	**0.4**	**-0.1**	**0.0**	**0.5**	**0.1**	**0.0**	**0.1**	**-0.4**
Rubber and plastics products	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Other non-metallic mineral products	0.0	0.0	0.0	0.1	0.0	-0.1	0.0	-0.1
Building and repairing of ships and boats	0.0	-0.1	0.1	0.0	0.0	0.0	0.0	0.0
Basic metals	0.3	0.0	-0.1	0.4	0.1	0.1	0.1	-0.3
Fabricated metal products, excl. machinery	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0
Low-technology products	**-1.3**	**-0.6**	**-0.5**	**0.6**	**0.4**	**-0.6**	**0.1**	**-0.7**
Other manufacturing and recycling	-0.1	0.0	-0.1	0.0	0.0	0.0	0.0	0.0
Wood, pulp, paper and printed products	-0.6	-0.1	-0.2	-0.2	0.0	-0.1	0.0	-0.2
Food products, beverages and tobacco	0.1	-0.2	0.0	0.2	0.0	0.0	0.1	0.0
Textiles, textile products, leather and footwear	-0.6	-0.2	-0.3	0.6	0.4	-0.5	0.0	-0.5
Total	**-1.8**	**-0.6**	**-0.5**	**0.9**	**0.3**	**-0.7**	**-0.3**	**-1.0**

Sources: CHELEM database and own calculations.
Note: The results of each period are computed as the average of the individual results obtained for each year.

benefit the overall market share evolution.[16] The contribution of the product structure was negative in most periods, albeit not very significant. The most relevant negative effect came from the high relative specialization of Portuguese exports in low-technology products in periods where world exports of these products grew below average. The negative effects observed in the first and last periods of the sample are examples of this situation, with the sector of "textiles, textile products, leather and footwear" giving an important contribution. In addition, Portuguese exports have a bad positioning in most fast-growing products, as is the case of high-technology products that grew above average in almost all periods. In the most recent period, the non-specialization of Portuguese exports in these products had a small positive influence in overall market shares as world exports of these products grew below average. The periods of positive product structure effect, 1982-86 and 1987-91, were mostly related to the fact that some products where Portugal is relatively more specialized had a higher than average growth rate, namely the low-technology sector of "textiles, textile products, leather and footwear". Another significant positive impact in most periods came from the medium-low technology sector of "basic metals": Portuguese exports are not specialized in these goods, so the fact that world exports of these products increased below average had a positive impact on the product effect. However, in the most recent period, "basic metals" were the highest-growth sector in world export markets, so the contribution became negative. The same happened, but to a lesser extent, with the medium-high-technology group of "other machinery and equipment".

(16) See Amador *et al.* (2007) for a detailed analysis of the product specialization of Portuguese exports over the last forty years.

Table 5

BREAKDOWN OF THE GEOGRAPHICAL STRUCTURE EFFECT OF PORTUGUESE MANUFACTURING EXPORTS
(excluding energy, average results in nominal terms, contributions in percentage points)

Five main positive contributions	**1968-71**		**1972-76**		**1977-81**		**1982-86**	
	African LDCs	0.2	United States	0.2	United Kingdom	0.4	Saudi Arabia	0.3
	India	0.1	Germany	0.1	Poland	0.1	Mexico	0.2
	Netherlands	0.1	Canada	0.1	Gulf nes	0.1	Spain	0.2
	Canada	0.1	India	0.1	Canada	0.1	Germany	0.2
	Australia	0.1	South african Union	0.0	Italy	0.1	Nigeria	0.2
Five main negative contributions	**1968-71**		**1972-76**		**1977-81**		**1982-86**	
	Former Yugoslavia	-0.1	Former USSR	-0.2	Saudi Arabia	-0.1	Japan	0.0
	BLEU	-0.1	Saudi Arabia	-0.3	Mexico	-0.2	South Korea	-0.1
	United States	-0.1	United Kingdom	-0.5	United States	-0.2	China	-0.1
	Germany	-0.2	Gulf nes	-0.5	Sweden	-0.3	African LDCs	-0.3
	United Kingdom	-0.6	African LDCs	-0.5	African LDCs	-0.4	United States	-0.7
Geographical Structure Effect	**1968-71**		**1972-76**		**1977-81**		**1982-86**	
		-0.2		-2.4		-1.6		0.9
Five main positive contributions	**1987-91**		**1992-96**		**1997-01**		**2002-06**	
	Spain	0.9	Italy	0.1	Spain	0.2	Spain	0.5
	United States	0.7	Canada	0.1	Japan	0.1	United States	0.5
	Germany	0.3	Gulf nes	0.1	Singapore	0.1	Japan	0.2
	France	0.2	Saudi Arabia	0.0	South Korea	0.1	African LDCs	0.2
	Canada	0.1	BLEU	0.0	Thailand	0.1	Canada	0.1
Five main negative contributions	**1987-91**		**1992-96**		**1997-01**		**2002-06**	
	Mexico	-0.1	Spain	-0.2	France	-0.1	France	-0.1
	Singapore	-0.1	China	-0.2	China	-0.1	Gulf nes	-0.1
	Taiwan	-0.1	African LDCs	-0.2	Mexico	-0.2	United Kingdom	-0.2
	South Korea	-0.1	France	-0.3	Germany	-0.2	Former USSR	-0.2
	Japan	-0.3	Germany	-0.5	United States	-0.5	China	-0.4
Geographical Structure Effect	**1987-91**		**1992-96**		**1997-01**		**2002-06**	
		1.4		-2.7		-0.3		0.2

Sources: CHELEM database and own calculations.
Note: The results of each period are computed as the average of the individual results obtained for each year. BLEU includes Belgium and Luxembourg. For more detail on the countries included in each geographical area, see Appendix A.

3.4.2. The geographical structure effect

This subsection analyses the contribution of each destination to the geographical structure effect. Table 5 presents the five main positive and negative contributions in each period. Considering the average of the last forty years, the geographical specialization of Portuguese exports had an unfavourable impact on the overall evolution of market shares. The negative contributions were mainly concentrated in three periods: 1972-76, 1977-81 and 1992-96. From 1972 to 1981, the main contribution was given by the group of African LDCs, reflecting the high relative specialization of Portuguese exports in these markets and the below average growth rate of world exports to these countries. The significant negative impact of the geographical structure in the 1992-96 period was mainly due to the fact that world exports to EU countries grew below average, in a context where Portuguese exports are relatively more specialized in those markets.[17] In contrast, the highest positive contribution of the geographical structure effect of Portuguese exports occurred in the 1987-91 period. This effect was mostly related with the evolution of some EU markets that grew above average and that represented a high share of Portuguese exports, in particular Spain, Germany and France. In addition, the non-specialization of Portuguese exports in the North-American market also contributed positively, given that the growth of world exports to the United States and Canada was below average in the 1987-91 period. In broad terms, the most significant geographical effect since the eighties, with the exception of the 1992-96 period, was related to the Spanish market. In fact, this market recorded a growth rate above average and represents a high and sustained share of Portuguese exports, naturally increasing the sensitivity of the Portuguese economy to the Spanish business cycle. In contrast, the non-specialization of Portuguese exports in the Chinese market gave an important negative contribution in recent years, given the high growth of world exports to China in this period.

4. CONCLUSIONS

This article analyses the evolution of the share of Portuguese nominal exports in the world market over the 1968-2006 period, using a detailed product and geographical breakdown. We isolate the effective changes of export share in each individual market from the effects related with the product and geographical specialization of exports, using a constant market share formulation as proposed by Nyssens and Poullet (1990). However, as it is a descriptive method, the constant market share analysis does not provide information on the factors explaining the changes of market shares.

Over the average of the last forty years, the rate of change of Portuguese exports was slightly higher than that of total world exports, leading to an average annual increase of total market share of 0.4 per cent. This evolution contrasts with the ones observed in Ireland and Spain, whose shares in world exports had an average annual growth of 3.8 per cent from 1968 to 2006. It is possible to identify periods with distinct evolutions of Portuguese export market shares, corresponding to diverse shocks to the economy, different macroeconomic regimes and progressive economic integration with the European Union. A decline of total Portuguese market share is visible in the first two five-year periods from 1968 to 1976. Conversely, the following three periods until 1991 are characterized by an overall increase of market share. Finally, in the last three periods from 1992 to 2006 there is a gradual reduction of total Portuguese share in world exports.

(17) This negative geographical structure effect was very significant in 1993, not only for Portugal but also for the other four benchmark countries selected. In 1993 two facts are worth mentioning. Firstly, the cyclical position in most EU countries corresponded to a recession. Secondly, it was the starting year of the European Single Market, which initially brought some reporting problems in international trade data, as EU customs controls were reduced.

The results of this constant market share analysis indicate that the dominant contributions to the evolution of total Portuguese market shares in most periods were the effective changes of export share in each individual market, *i.e.*, the market share effect. A similar result is observed for the benchmark countries considered.

In the 1968-76 period, there was a significant effective loss of market share of Portuguese exports, mainly centered on low-technology products like food, beverages and tobacco. In geographical terms, the main contributions to the effective reductions of share in this period were the United Kingdom and the group of Portuguese speaking African countries. The 1977-96 period is characterized by effective gains of market share of Portuguese exports. In sectoral terms, there were substantial increases of market share in the low-technology sector of textiles, clothing and footwear in the three periods from 1977 to 1991. In 1992-1996, the most important contribution to the positive market share effect resulted from the medium-high-technology sector of motor vehicles. In terms of the geographical destinations, the major positive contributions in the 1977-96 period came from the European Union market, in particular Germany and France, but also Spain and the Netherlands. There were also increases of share of Portuguese exports in the group of Portuguese speaking African countries. Finally, in the period from 1997 to 2006, Portuguese exports experienced considerable reductions of share in textiles, clothing and footwear. In the 2002-06 period, Portuguese exports of motor vehicles and of wood and paper also lost share in world markets. In terms of destinations, the main declines of share in 1997-06 period occurred in the European Union market. The main exception was the Spanish market, where Portuguese exports continued to gain share, although less than in previous periods.

Over the 1968-2006 period, the relative product composition of Portuguese exports had a negative impact in the evolution of total shares in world exports. In general terms, the negative product structure effect resulted mainly from the high relative share in Portuguese exports of products whose markets grew below average, in particular some low-technology products like textiles, clothing and footwear. In addition, the non-specialization of Portuguese exports in most fast-growing sectors, like some high-technology products, also gives a negative contribution in most periods. The geographical distribution of Portuguese exports made also a negative average contribution to the evolution of total market shares over the last forty years. The negative geographical effects were mainly concentrated in three distinct periods: 1972-76, 1977-81 and 1992-96. This evolution resulted mainly from a higher share in Portuguese exports of countries whose markets grew below average, namely the Portuguese-speaking African countries in the first two periods and some European Union markets in 1992-96. Conversely, the relatively strong specialization of Portuguese exports in the European Union markets accounts for a significant contribution to the positive geographical effect observed in the 1987-1991 period. In the most recent periods, the overall evolution of export shares benefited from the relatively high importance of Spain as a destination market, given its above average growth rate. In contrast, the main negative contribution to the geographical effect in the 2002-06 period arises from the under-specialization of Portuguese exports in the Chinese market, one of the most dynamic in the world in recent years.

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Appendix A – Geographical breakdown

The 79 countries or country groups included in the sample are the following:

United States; Canada; France; BLEU; Germany; Italy; Netherlands; United Kingdom; Ireland; Denmark; Finland; Norway; Sweden; Iceland; Austria; Switzerland; Spain; Greece; Portugal; Turkey; Israel; Former Yugoslavia; Others in South Europe; Japan; Australia; New Zealand; South African Union; Venezuela; Ecuador; Mexico; Brazil; Argentina; Chile; Colombia; Peru; Bolivia; Paraguay; Uruguay; Others in America; Algeria; Morocco; Tunisia; Egypt; Libya; Saudi Arabia; Gulf; Middle East (no OPEC); Nigeria; Gabon; Cameroon; Cote d'Ivoire; Kenya; Others in Africa; African LDCs; Indonesia; India; South Korea; Hong Kong; Singapore; Taiwan; Malaysia; Philippines; Thailand; Pakistan; Brunei; Bangladesh; Sri Lanka; Others in East Asia; East Asian LDCs; Former USSR; Bulgaria; Former Czechoslovakia; Hungary; Poland; Romania; Albania; China, People's Rep.; Vietnam; Cambodia, Laos.

The composition of the different areas/country groups is the following:

a. BLEU includes Belgium, Luxembourg.

b. Germany includes the former German Democratic Republic until 1990.

c. Former Yugoslavia includes Serbia and Montenegro, Bosnia and Herzegovina, Croatia, Macedonia, Republic of Slovenia.

d. Others in South Europe includes Andorra, Cyprus, Gibraltar, Malta.

e. South African Union includes Botswana, Lesotho, Namibia, South Africa, Swaziland.

f. Others in America includes Anguilla, Antigua and Barbuda, Aruba, Bahamas, Barbados, Belize, Bermuda, Costa Rica, Cuba, Dominica, Dominican Republic, El Salvador, Grenada, Guatemala, Guyana, Haiti, Honduras, Jamaica, Montserrat, Netherland Antilles, Nicaragua, Panama, Saint Kitts and Nevis, Saint Lucia, Saint Vincent and the Grenadines, Suriname, Trinidad and Tobago, and all others in America not elsewhere specified (nes).

g. Gulf includes Bahrain, Iran, Iraq, Kuwait, Oman, Qatar, United Arab Emirates.

h. Middle East (no OPEC) includes Jordan, Lebanon, Syria, Yemen.

i. African LDCs includes Angola, Benin, Burkina Faso, Burundi, Cape Verde, Central African Republic, Chad, Comoros, Democratic Republic of Congo (formerly Zaire), Djibouti, Equatorial Guinea, Eritrea, Ethiopia, Gambia, Guinea, Guinea-Bissau, Liberia, Madagascar, Malawi, Mali, Mauritania, Mozambique, Niger, Rwanda, Sao Tome and Principe, Senegal, Sierra Leone, Somalia, Sudan, Tanzania, Togo, Uganda, Zambia.

j. Others in Africa includes Congo, Ghana, Mauritius, Seychelles, Western Sahara, Zimbabwe, and all others in Africa nes.

k. East Asian LDCs includes Afghanistan, Bhutan, Kiribati, Maldives, Myanmar, Nepal, Solomon Islands, Vanuatu, Western Samoa.

l. Others in East Asia includes Fiji, French Polynesia, Guam, Macao, Mongolia, New Caledonia, North Korea, Pacific Islands, Papua New Guinea, Tonga, US Samoa, and all others in Asia and Oceania nes.

m. Former USSR includes the Commonwealth of Independent States (Armenia, Azerbaijan, Belarus, Georgia, Kazakhstan, Kyrgyzstan, Moldova, Russian Federation, Tajikistan, Turkmenistan, Ukraine, Uzbekistan), Baltic States (Estonia, Latvia, Lithuania).

n. Former Czechoslovakia includes Czech Republic, Slovakia.

Source: CHELEM database.

Appendix B – Product classification by technological intensity

		ISIC rev.3
High-technology products	**HT**	
Aircraft and spacecraft	HT1	353
Pharmaceuticals	HT2	2423
Office, accounting and computing machinery	HT3	30
Radio, TV and communications equipment	HT4	32
Medical, precision and optical instruments	HT5	33
Medium-high-technology products	**MHT**	
Other electrical machinery and apparatus	MHT1	31
Motor vehicles, trailers and semi-trailers	MHT2	34
Chemicals excluding pharmaceuticals	MHT3	24 excl. 2423
Railroad equipment and other transport equipment	MHT4	352 + 359
Other machinery and equipment	MHT5	29
Medium-low-technology products	**MLT**	
Rubber and plastics products	MLT2	25
Other non-metallic mineral products	MLT3	26
Building and repairing of ships and boats	MLT4	351
Basic metals	MLT5	27
Fabricated metal products, excluding machinery	MLT6	28
Low-technology products	**LT**	
Other manufacturing and recycling	LT1	36-37
Wood, pulp, paper and printed products	LT2	20-22
Food products, beverages and tobacco	LT3	15-16
Textiles, textile products, leather and footwear	LT4	17-19
Total manufacturing		15-37

Source: CHELEM database.

Note: The product breakdown used here and available in the CEPII – CHELEM database follows the OECD classification of manufacturing industries according to technological intensity using the ISIC rev. 3 breakdown, but excludes the MLT1 sector of "Coke, refined petroleum products and nuclear fuel". This OECD classification was based on the analysis of R&D expenditure and output of 12 OECD countries in the period 1991-99. For more information, see OECD (2005).

Appendix C – Main annual results

CONSTANT MARKET SHARE ANALYSIS OF PORTUGUESE EXPORTS
(nominal, manufacturing excluding energy)

	Growth of Portuguese exports	Growth of world exports	Total Effect	Market Share Effect	Combined Structure Effect	*of which:* Product Structure Effect	Geographical Structure Effect	Mixed Structure Effect
1968	7.8	13.8	-6.0	-0.9	-5.1	-3.5	-1.6	0.0
1969	13.2	14.9	-1.7	3.8	-5.6	-1.4	-2.2	-2.0
1970	9.6	15.9	-6.3	-5.6	-0.6	-3.6	1.8	1.1
1971	12.1	11.4	0.7	1.1	-0.4	1.2	1.2	-2.9
1972	24.8	19.7	5.1	-5.4	10.5	5.0	-0.8	6.4
1973	44.7	37.0	7.7	6.9	0.8	1.6	0.4	-1.1
1974	22.3	32.5	-10.2	-3.9	-6.4	-8.0	-4.7	6.4
1975	-14.4	5.8	-20.2	-12.4	-7.8	-3.6	-3.2	-1.0
1976	-6.4	11.2	-17.6	-13.1	-4.5	2.0	-3.5	-3.0
1977	11.4	14.7	-3.3	-4.2	0.9	-0.3	-1.1	2.3
1978	19.1	19.4	-0.3	3.7	-4.1	-0.8	-2.5	-0.8
1979	42.8	21.4	21.4	15.7	5.7	1.4	3.7	0.6
1980	31.1	16.8	14.3	15.4	-1.1	-2.0	-1.3	2.2
1981	-11.0	-1.9	-9.2	-2.2	-6.9	-0.6	-6.7	0.4
1982	4.1	-5.4	9.5	7.1	2.4	1.0	1.5	0.0
1983	9.1	-0.2	9.3	11.2	-1.9	0.5	-1.5	-1.0
1984	15.5	8.5	7.0	6.5	0.4	2.1	-4.4	2.8
1985	8.9	4.2	4.7	3.8	0.9	-1.1	1.6	0.5
1986	27.1	19.7	7.4	-1.4	8.8	2.0	7.6	-0.8
1987	29.9	19.2	10.7	4.1	6.6	2.6	4.8	-0.7
1988	18.5	17.4	1.0	3.0	-2.0	-3.2	-0.9	2.1
1989	14.0	8.0	5.9	7.5	-1.5	-0.3	0.3	-1.5
1990	28.1	12.9	15.1	7.8	7.3	1.5	5.1	0.7
1991	0.4	3.8	-3.4	-3.3	-0.1	1.1	-2.4	1.2
1992	13.6	8.5	5.1	5.7	-0.6	0.6	-1.9	0.7
1993	-17.1	-1.1	-16.0	-5.6	-10.4	-0.2	-10.9	0.7
1994	16.2	15.3	0.9	2.6	-1.7	-1.7	-0.5	0.6
1995	31.2	20.1	11.1	11.9	-0.8	-2.3	1.4	0.1
1996	0.4	3.3	-2.9	-2.0	-1.0	-0.1	-1.5	0.6
1997	1.5	5.3	-3.8	-1.4	-2.4	-0.5	-2.7	0.8
1998	4.0	0.6	3.5	-0.9	4.4	0.0	6.3	-1.9
1999	1.1	2.8	-1.8	-1.0	-0.8	-0.1	-1.2	0.5
2000	-1.2	9.1	-10.3	-1.2	-9.1	-2.4	-7.2	0.5
2001	-0.7	-2.6	1.9	-2.3	4.1	1.4	3.2	-0.5
2002	7.1	4.7	2.4	1.1	1.3	0.9	-0.2	0.6
2003	22.6	16.2	6.3	1.4	4.9	-0.1	3.6	1.4
2004	11.4	20.5	-9.1	-7.3	-1.8	-2.5	0.0	0.7
2005	-4.7	8.3	-13.0	-9.7	-3.2	-1.3	-2.0	0.1
2006	13.2	14.7	-1.5	-0.1	-1.4	-1.8	-0.2	0.5

Sources: CHELEM database and own calculations.