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***"THE IMPACT OF EC MEMBERSHIP ON
PORTUGUESE EXPORTS OF MANUFACTURES***

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THE IMPACT OF EC MEMBERSHIP ON PORTUGUESE EXPORTS OF MANUFACTURES

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Introduction

The EC membership in 1986 had associated changes on Portuguese trade conditions which were greater for imports than for exports of industrial goods. The main reason for such difference being that Portugal enjoyed already an almost free access to the EC10 and EFTA markets Ordaz (1993, p.111) and Alvares (1986, p.25). Therefore, membership meant:

- the gradual abolition of remaining quantitative restrictions on exports of textile products and few other goods to those markets;
- the opening-up of the Spanish market -the most significant change - which provided the potential for increasing exports;
- In relation to third countries a few changes are worth mentioning: the loss of GSP positions awarded to Portugal by some developed countries, in particular the USA and Japan; and the opening-up of Turkey and Israel markets as they granted preferences to the Community.

The general opinion in Portugal was that there was little scope for export growth to the EC because comparative advantages had been almost fully exploited before membership. In contrast, we argue that, for several reasons, we should expect the expansion of exports. First, the Spanish effect should not be neglected - the opening-up of this market meant a major change in the access for Portuguese exports. We should also expect that the geographical, economic and cultural proximity between the two countries would, additionally, favour exports. Second, exports growth is not dependent on having increased preferential access to particular markets. Several studies on developing countries have

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produced empirical evidence on the positive correlation between exports growth and trade liberalization - Papageorgiou, Michaely and Choksi (1992), Greenaway and Sapsford (1994). The theoretical explanation is that trade liberalization reduces an anti-exports bias; import competing sectors contract liberating factors which can then be used to expand exportables. In a previous study we have produced evidence on trade creation which accounts for the former and reflects the overall trade liberalization associated with Portuguese membership of the EC. In this context, the preferential access to the EC11 market provides Portuguese goods with a static gain in their competitiveness. Such an advantage is expected to produce an expansion of exports to those markets and to a certain extent at the expense of exports to the rest of the world.

In this research we try to measure the static effects of EC membership on Portuguese exports. Section one produces descriptive evidence on the changes of Portuguese pattern of exports (direction and intensity) subsequent to the EC membership. In section two a macro equation of exports is adapted to estimate changes due to EC membership. Finally in section three results are presented and discussed followed by the conclusion.

The period covered in this study is 1979 to 1991, yet whenever trade data are combined with production data the time period is reduced to 1989. Portuguese exports are classified according to the International Standard Industrial Classification and data were obtained at the OECD -Comtap data base.

1 - Changes in Portuguese Exports: a descriptive analysis

In first place we have looked for evidence on changes in the pattern of Portuguese exports subsequent to the EC membership.

By comparing pre- and post-membership trade flows we were able to identify first, changes in the geographical structure of exports of manufactured goods as a whole and disaggregated by industries; and, second changes in exports intensity given by the ratio of exports to output.



1.1 Changes in the Geographical Structure

To analyse the geographical structure of Portuguese exports, trade partners were grouped in two alternative ways. In one case we consider: the EC11 -EC10 plus Spain-, the EFTA countries and the rest of the world (RoW). The alternative case also considers three groups of countries: the EC11 plus EFTA as a single entity, and the ROW was split into the OECD and non-OECD countries, respectively.

Table1 reports the geographical structure of Portuguese manufactured exports for the entire period under analysis. From 1979 to 1985 each market has a fairly stable share of Portuguese exports. However, from 1986 onwards there is an increasing concentration of exports into the EC market as opposed to the EFTA market and particularly to the ROW market -within the latter the biggest change concerns the OECD countries.

Table 1 Geographical Structure of Portuguese Exports of Manufactures: 1979-91

	(a)			(b)			
	EFTA	EC	ROW	Total	EC/EFTA	ROWoecd	ROWnoecd
1979	13.52%	60.15%	26.33%	100%	73.67%	8.53%	17.80%
1980	14.17%	58.47%	27.36%	100%	72.64%	7.86%	19.50%
1981	13.50%	56.84%	29.66%	100%	70.34%	7.05%	22.61%
1982	12.46%	61.00%	26.55%	100%	73.45%	8.28%	18.27%
1983	11.08%	62.85%	26.07%	100%	73.93%	8.68%	17.39%
1984	10.62%	62.09%	27.29%	100%	72.71%	11.07%	16.22%
1985	10.94%	62.70%	26.36%	100%	73.64%	11.60%	14.75%
1986	11.85%	68.41%	19.74%	100%	80.26%	8.79%	10.95%
1987	11.62%	71.23%	17.16%	100%	82.84%	8.20%	8.96%
1988	10.59%	72.10%	17.31%	100%	82.69%	7.82%	9.49%
1989	10.61%	72.16%	17.23%	100%	82.77%	7.90%	9.32%
1990	10.42%	74.47%	15.10%	100%	84.90%	6.47%	8.63%
1991	9.81%	75.93%	14.26%	100%	85.74%	5.36%	8.91%

In 1985, the EC was, already, the main destination of Portuguese manufactured exports, with a share of 62.7%. After full-membership that share shows a persistent increase, reaching 75.9% by 1991 which represents a growth of 21% relative to its pre-membership level. Over that same period, the EFTA market suffers a decline of 1.13 percentage points in its share - from 10.94% to 9.81% - which means a proportional decrease of



approximately 10%. Still, it is the ROW market that reveals the greatest fall as a destination of Portuguese exports: a fall of 12.1 percentage points from 26.4% in 1985 to 14.3% in 1991; representing an overall decrease(loss) of 46% relatively to its 1985 share.

Looking at section (b) of the table 1 the conclusion is that within the ROW it is the OECD markets that reveal the biggest loss as a destination of Portuguese exports - a drop of 54% in their share relatively to 1985, in contrast with a drop of 39% for non-OECD markets. Several factors may be relevant to explain such pattern of exports reorientation or 'diversion'. One such factor is the Portuguese loss of GSP positions with OECD countries included in the group RoW. Such loss of preferences meant that alternative markets had to be found for some exports. It is only natural that such markets would, primarily, be those in which Portugal kept or improved access: i.e. EC and to a lesser degree EFTA. Another relevant factor is the increased competition within the EC associated with the single market which improved the exploitation of Portuguese comparative advantages in that market.

Several conclusions were drawn from the analysis of the geographical structure of Portuguese exports of manufactures reported in table 5.1. The most important are that following EC membership, in 1986 Portuguese exports become increasingly concentrated in the EC market. At this level of analysis one can only conclude that EFTA and the ROW markets - in particular OECD countries- became relatively less important for Portuguese exports as they represent now a smaller market share. Finally, these changes are the prima facie confirmation that the dismantling of tariffs and other trade barriers are relevant and that their discriminatory nature have an important role in shaping the geographical pattern/structure of a country's trade.

A similar analysis was carried out for Portuguese exports by products. It is possible that aggregate results mask-up distinct trends at the product level. Table 5.2 summarizes the changes, between 1984-85 and 1990-91, in the geographical structure of Portuguese exports for 81 manufactured products - class 3 of ISIC at four digit level of disaggregation. As before, all trade partners were considered under the following

denomination: EEC, EFTA, and the ROW subdivided into Roecd and Noecd. It should be stressed that Table 2 does not report the actual changes in the value or volume of trade between Portugal and the World. Therefore, increases and decreases in shares are compatible with expansion, reduction or even stagnation of Portuguese exports.

Table 2 **Change in the Geographical Structure of Portuguese Manufactured Exports, by product: 1984-85 to 1990-91**

	Changes in Export Demand Shares		
	Increase	Decrease	No. of industries
EC	73	8	81
EFTA	32	46	81
ROWoecd	15	62	81
ROWnoecd	23	58	81

Table 2 shows that the EEC has increased her share in the Portuguese export markets of 73 industrial products out of the 81. The EFTA and non-OECD countries have increased their shares in the markets of, respectively, 32 and 23 products and have decreased their shares in the markets of, respectively, 46 and 58 products. The rest of the OECD countries reveals an overall very negative trend as its market share falls in 62 products, and increases in only 15 products.

The disaggregated analysis reflects to a great degree the same trend registered for total exports. From the pre- to the post-membership years Portuguese exports, for the great majority of products, have become increasingly concentrated in the EEC partners, switching away from EFTA, and, to a greater extent, from the ROW, in particular from the OECD countries. Such evidence reinforces the argument that EC membership has had a significant impact on the Portuguese trade pattern, in this case in the geographical destination of manufactured exports.

1.2 Changes on Exports Intensity

It is relevant to evaluate changes in the intensity of exports evaluated by the percentage share of manufactured exports on manufactured industry output. Table 3 presents, for the

period under analysis, export intensity ratios of the manufacturing industry as a whole. Each row reports the exports intensity ratio, in a particular year. In other words it reports the share of industrial output that is exported: independently of their destiny - total exports; and according to their destiny: EC, EFTA, and the rest of the World subdivided into OECD and non-OECD countries. Each column reports, for total exports or for exports by destiny, the evolution of export intensity over the years. To compare the pace of that evolution simple averages of export ratios were computed for the following sub periods: 1979-81; 1982-85; and 1986-89 and reported in three rows of table 5.3.

Total is the column that reflects better -due to its aggregate value- the evolution of exports intensity of Portuguese manufacturing industry over the years. The other columns do, to a certain extent, reflect the discriminatory nature of changes in the Portuguese commercial policy.

Table 3 **Export Intensity Ratios of Portuguese Manufactured Industry (a)**

	Total	EC	EFTA	ROWoecd	ROWnoecd
1979	23,96	14,41	3,24	2,04	4,26
1980	24,20	14,15	3,43	1,90	4,72
1981	21,47	12,20	2,90	1,51	4,85
average79/81	23,21	13,59	3,19	1,82	4,61
1982	22,84	13,89	2,86	1,90	4,19
1983	26,61	16,66	2,97	2,33	4,66
1984	31,79	19,69	3,39	3,53	5,18
1985	33,72	21,14	3,70	3,90	4,99
average82/85	28,74	17,85	3,23	2,92	4,76
1986	34,47	23,55	4,10	3,03	3,78
1987	36,68	26,09	4,27	3,02	3,29
1988	38,10	27,43	4,05	2,99	3,63
1989	42,48	30,61	4,53	3,36	3,97
average86/89	37,93	26,92	4,24	3,1	3,67

(a) values in this table are percentage shares of manufactured exports on industrial output.

From the analysis of export intensity ratios reported in table 3. a few conclusions are drawn. First, over the years under analysis, manufactured exports represent increasing shares of industrial output: from 24% in 1979, to approximately 34% in 1985, and finally 42.5% in 1989. However, following EC membership there is an acceleration in that trend. Before membership, manufactured industry exported on average 23.3% of their output in

the years' 1979-81, and 28.7% of their output in the years' 1982-85, i.e. a rise by 5.5 percentage points representing a growth of 23% over a period of four years. In the four years following integration 1986-89 the average export ratio was 37.93%, i.e. a rise by nine percentage points representing a growth of 31% in relation to the previous level. EC and EFTA columns reveal a pattern of change in export intensity ratios similar to that registered for total exports; whereas in the years following membership the intensity of exports to the rest of the World - both OECD and non-OECD countries- registered either a deceleration or a decline.

A similar analysis was produced for exports at the industry level. The aim of this exercise was to find out the evolution of export intensity in each sector relative to that registered for total manufactured exports. The expectation was that sectors would present distinct patterns of change as adjustment to a free integrated market took place. With that purpose, the annual export intensity ratios were calculated for each sector total exports, and for each sector exports to the EC and ROW subdivided into EFTA and other countries. The evolution in exports intensity was given by the change in average ratios of exports to output between the four years preceding and the four years following membership.

Table 4 reports summary results of that analysis for total exports by sector. The two first columns report the average ratio of total export intensity by sector for, respectively, pre-membership years 1982 to 1985, and post-membership years 1986 to 1989. The third column shows the percentage change in the ratio of export intensity over the two periods under analysis. Therefore, each row shows the evolution in (total) export intensity for a particular sector. The last two rows reveal the evolution for the industry as whole: total(1) is the aggregate result of all industries reported; whereas, total(2) is the same as total(1) but excludes sectors 324, 385 and 390 which due to under valuation of production introduce a bias in favour of exports.

Table 4 Average Ratio of Exports Intensity

ISIC	82/85	86/89	% change	Classification
311/312	0,1145	0,0924	-19,29%	Decline
313	0,7442	0,7371	-0,95%	Decline
314	0,0105	0,0187	78,39%	Above average
321	0,4625	0,5517	19,29%	Below average
322	0,5389	0,7431	37,90%	Above average
323	0,0648	0,0990	52,73%	Above average
324	0,7020	1,0888	55,10%	Above average
331	0,6515	0,7099	8,97%	Below average
332	0,1137	0,2988	162,78%	Above average
341	0,4590	0,5018	9,31%	Below average
342	0,0434	0,0496	14,17%	Below average
351	0,2482	0,2672	7,65%	Below average
352	0,1181	0,1191	0,81%	Below average
353	0,0930	0,1326	42,62%	Above average
355	0,1105	0,2101	90,08%	Above average
356	0,0677	0,1189	75,65%	Above average
361	0,3168	0,5259	65,99%	Above average
362	0,2808	0,3190	13,61%	Below average
369	0,1018	0,1807	77,49%	Above average
371	0,2174	0,1600	-26,41%	Decline
372	0,1598	0,3428	114,51%	Above average
381	0,2117	0,2634	24,40%	Below average
382	0,7264	0,7873	8,39%	Below average
383	0,4194	0,5546	32,23%	Above average
384	0,3727	0,5471	46,77%	Above average
385	0,9633	1,0503	9,04%	Below average
390	3,1070	2,6415	-14,98%	Decline
Total(1)	0,2874	0,3793	31,97%	Average
Total(2)	0,2734	0,3531	29,12%	Average

(1) Aggregate result for all industries reported.

(2) Aggregate result excluding sectors: 324, 385, and 390.

From table 4 a few conclusions are drawn. The great majority of sectors, 23 out of 27 reported, experienced over the years an intensification of their exports activities. Only 4 industries reveal a 'relative' decline in their relative export activity. The change for the industry as a whole was 32% or 29% depending on whether all sectors are included or not. Each sector was classified according to the degree of change in their export activities. The rate of change in export intensity for the industry as a whole was used as the reference value. Thus, 13 sectors, among the 23 with expanded exports activities, revealed a rate of change greater than that of the industry as a whole whereas the remaining 10 had a rate of change smaller. Moreover, in 7 of those 13 sectors the rate of change of export intensity



was at least double that of industry as a whole, whereas 8 of those 10 sectors had a rate of change which was at the most half of that of the industry as a whole. Therefore, in spite of a pattern of change quite diverse the dominant effect was an increased involvement in export activities.

Overall, the conclusion is that over the years manufactured exports represent an increasing share of Portuguese industrial production, particularly so following EC membership. This pattern is confirmed by exports to the EC and to EFTA, whereas the export intensity to the rest of the World has declined since integration. The latter reflects the preferential access that Portuguese products have to EC and EFTA markets and consequently the concentration of exports into those markets.

At the sectoral level the general pattern confirms the result found for the industry as whole. The great majority of sectors reveal an intensification of their export activities. Yet the pace of that change varies a lot across sectors: the extreme cases are sectors 332 and 372 whose export intensity more than double its pre-membership level; and sectors 311/312 and 371 whose relative exports decline.

2. The impact of EC membership on Portuguese Exports: an econometric analysis

The relevant question is the extension of export changes that can be ascribed to changes in the Portuguese trade regime associated with EC membership. To answer that question the level of exports that would have occurred in the absence of integration have to be considered through the construction of a counterfactual or anti-monde.

2.1 The Methodology

The traditional approach has been either to replicate, from the point of view of the rest of the union, the study done for the home country imports or to use an export model, normally a demand function. In the former case, both trade created and trade diverted found for the rest of the union equals the export expansion of the home country. The



greatest disadvantage of this method is that it does not allow the identification of export diversion. To overcome that drawback a similar study has to replicate for the rest of the world. However, This seems a rather unfeasible solution because of the data requirement associated with it. Winters (1983, 1985 and 1987) has followed that approach but he selected only a few markets among union partners and non-members to study the impact of EC membership on UK exports. Therefore his results are only a partial answer to that question.

Most of the empirical studies have, instead, made an explicit use of export models: Fetherston, Moore and Rhodes (1980); Morgan (1980); Mayes (1983); and Silva (1986). All these studies, with the exception of Silva (1986), have developed models that derive from the standard trade equations present in Macroeconomic models - excluding the dynamic elements of the latter. As exemplified by equation 1 exports (X) are explained in terms of foreign income (Y_f) and relative prices ($e.P/PW$ - e is the exchange rate, P is the domestic price and PW is the foreign price). There are alternative specifications for the export equation: some models use an index of world trade as a proxy foreign income, relative unit labour costs instead of relative prices, and finally a time trend may also be included².

$$X = f(Y_f, e.P/PW) \quad (1)$$

In any case the economic theory behind those formulations is the same. An expansion of foreign income stimulates the home country exports. An appreciation of national currency or a rise in domestic prices causes a decline in exports.

The main question is which export model to use having in mind that it must have a good explanatory capacity as well as the ability to measure the integration effect on exports. In particular the decision refers to whether to follow a residual imputation or an analytical approach. Most of studies cited above follow a residual imputation method. The studies by Silva and by Winters are the exception as they used dummy variables to capture the

² For a complete survey of export equations used in the macroeconomic modelling of the UK economy see: Holden, Peel and Thompson (1982) and Whitley (1994).

integration effect getting closer to an analytical approach³. The main disadvantage of residual imputation methods is that they include too much in their estimations. By assuming that the pre-integration pattern of trade would have remained unchanged all differences between predicted and actual trade - i.e. structural and random changes - are attributed to integration, therefore, overstating its effects.

Our choice was based upon several considerations. Firstly, the study should give information on both export creation and diversion. Therefore, it should provide full coverage of trade partners - members and non-members of the Community. This requirement excluded any approach based on the analysis of other countries' imports as this could hardly be exhaustive. Secondly, because of its limitations a residual imputation method was avoided. Finally, the economic data associated with the export equation were an attractive feature as data on exports were easily available.

Yet the model adopted departs from the standard export demand equation. Traditionally, the price variable in equation 1 stands for relative prices, reflecting the fact that Portuguese exportables compete with other suppliers in foreign markets. There is an implicit assumption that all suppliers, independently of their country of origin, have equal (non-discriminated) access to any particular market. So that consumers in any market decide where to import from according to relative prices in the international market. However, such identity does not hold when the exportables of a particular country enjoy preferential access to certain markets, as it is the case of Portuguese exportables into the EC market. In such a circumstance, the relative price of Portuguese exportables in the international market is different from that in the preferred markets. The level of exports to those markets is dictated by changes in the consumer price (the price paid by the consumer) of exportables and not alone by changes in the supply price.

$$X = f (Y_f, P_c) \quad (2)$$

³ Dummies are still catch all variables which seems less than ideal in a proper analytical approach. Thus, some authors consider the approach as an hybrid one.

Equation 2 takes into account these considerations. Thus, Portuguese exports (X) are a function of foreign income (Y_f) and the consumer price of Portuguese exportables (P_c). By differentiating equation 2 changes in the level of Portuguese exports are explained in terms of changes in foreign income and foreign consumer price as presented in equation (2a):

$$dX = \frac{\partial X}{\partial Y_f} dY_f + \frac{\partial X}{\partial P_c} dP_c \quad (2a)$$

The greatest caveat of the above specification is that the foreign consumer price of Portuguese exports is not observable. However, consumer price (P_c) is, as suggested before, a function of the supply price (P_s), and the trade regime (T) in the destination market. Consequently, variations in consumer's price can result from variations in the supply price and/or in the trade regime (equation 3a).

$$P_c = f(P_s, T) \quad (3)$$

$$dP_c = \frac{\partial P_c}{\partial P_s} dP_s + \frac{\partial P_c}{\partial T} dT \quad (3a)$$

$$\text{Thus, } dX = \frac{\partial X}{\partial Y_f} dY_f + \frac{\partial X}{\partial P_s} dP_s + \frac{\partial X}{\partial T} dT \quad (4)$$

Equation 4 results from the substitution of dP_c in equation 2a by the expression obtained in 3a. Thus, minor changes in Portuguese exports are explained by changes in the foreign income, changes in the supply price and changes in the trade regime; all observable variables. An expansion of foreign income is expected to affect positively Portuguese exports. An increase on the supply price of Portuguese exportables affects negatively her exports, particularly so if competitors do not register a similar price rise. Finally, trade regime changes in foreign countries will positively affect Portuguese exports if they concede a preferential access to their markets, and negatively if a discriminatory barrier is imposed - the loss of a former preferential access will have a similar impact to the latter.

In that way integration is brought into the model. By regressing exports on foreign income, supply prices and foreign trade regime the impact of integration on exports can be

identified. Trade regime changes are not easily measurable; this problem was overcome by using a proxy dummy variable - a common solution in similar studies. Accordingly, T takes value zero from 1979 to 1985 and one from 1986 to 1991⁴. The interpretation is that in the former period there was a certain constancy in the trade regime affecting Portuguese exports - in spite of minor alterations. Additionally, what makes the second period distinct from the previous one was that from 1986 onwards considerable changes were introduced, and kept in place.

In that respect it is relevant to distinguish between EC countries and other countries. The EC countries have a common trade policy and for that reason can be treated as an homogeneous group. In contrast, the non-members' country is not an homogeneous group in terms of their trade policy towards Portuguese exports. Due to membership Portugal enjoyed preferential access to few markets - Turkey, Israel, Tunisia among others - and for the same reason it lost some GSP concessions from developed countries. Even so one of such policies must dominate and dictate the final impact on Portuguese exports to this group.

Keeping in mind these comments, the model was applied separately to Portuguese exports to the EC, and to Portuguese exports to the rest of the World. The expectations were that following Portuguese membership of the EC her exports to the latter would have expanded. On the other hand, her exports to the rest of the World could have either expanded or been diverted. This is one of the reasons why it is important to assess the full impact of integration on trade with both the EC and the ROW. In that way the total impact of integration on exports is estimated at the same time that its geographical origin is identified.

Therefore, two distinct equations were regressed using annual data for the period under analysis 1979-1991. One equation regresses Portuguese exports to the EC (X_{ec}) on the GDP of the EC, the Portuguese export price index, and the dummy variable. In the other

⁴ This specification contrast with that adopted for imports, the explanation lies on the fact that barriers affecting exports were smaller and were removed faster than those affecting imports.

equation Portuguese exports to the rest of the World (X_{row}) were regressed on the GDP of the OECD excluding EC, the export price, and the dummy. All estimation and testing was performed using the package Microfit.

Before analysing results a few aspects of the empirical exercise should be clarified. First, the export model does not specify its functional form. Therefore, two alternative forms were tried a linear and a log linear. We only report the log linear regression results as they had the best fit. Second, the values of exports in the absence of integration were predicted by applying the actual values of the explanatory variables, from 1986 onwards, to the estimated coefficients and assuming $T=0$, i.e. that trade regime had not changed. The integration impact was given by the difference between the actual value of exports and their hypothesised values in the anti-monde. Finally, because of the difficulty in obtaining world export prices index two specifications were tried for the price variable in the model: the domestic export price index and Portuguese terms of trade. The latter poses specific problems but these are discussed below with the results.

3 Results and Discussion

The report and discussion of results is organised as follows: first, using the Portuguese export price index as the price variable the hypothesis of the model is tested for both Portuguese exports to the EC and to the ROW. Second, the anti-monde is predicted using the coefficients estimated in the regression and the actual values of the variables except trade policy which is assumed unchanged. Finally, the integration impact is then calculated by the difference between actual and anti-monde values of exports.

Table 5 reports the regression results for the equation of Portuguese exports to the EC. All explanatory variables have the expected sign and are statistically significant at least at the 5% level. As hypothesised in the model described, the analyses seem to prove that a) an expansion on the EC GDP has a positive impact on the demand for Portuguese exportables; b) Portuguese export price has a negative effect on the demand for exports. Finally, the most important hypotheses under analysis - i.e. that membership of the EC has

a positive effect on Portuguese exports - is also proven correct. The coefficients of the explanatory variables are read as elasticities because the functional form is log linear. Among the three elasticities that pertaining to the dummy is the smallest in absolute terms. Yet it is positive and statistically significant which is enough to confirm that integration is relevant to explain changes in Portuguese exports to the EC.

Table 5: The Equation of Portuguese Exports to the EC

$\ln X_{ec_t} = a + b \ln GDP_{ec_t} + c \ln p_t + d T_t + u_t$				
<u>Regressor</u>	<u>Coefficient</u>	<u>Estimate</u>	<u>Standard error</u>	<u>T-statistic</u>
Constant	a	-32.37**	9.6298	-3.3623
lnGDPec	b	3.1303**	0.80822	3.8731
lnPrice	c	-0.92832*	0.39827	-2.3309
T (dummy)	d	0.35226*	0.141	2.4984
$\bar{R}^2 = 0.9594$		Sample period: 1979 - 1991		
DW-statistic = 1.6496		Method of estimation: OLS		
F-statistic: $F(3, 9) = 95.6939^{**}$				

* Statistically significant at 5% or lower. ** Statistically significant at 1% or lower.

Table 5 A: Diagnostic Tests

<u>Hypothesis</u>	<u>Statistics</u>	<u>Critical Values</u>	
		5%	1%
Serial Correlation	$F(1, 8) = 0.20138$	5.32	11.3
Functional Form	$F(1, 8) = 15.3053$	5.32	11.3
Normality	$\chi^2(2) = 0.17668$		
Heteroskedasticity	$F(1, 11) = 2.4343$	4.84	9.65

Table 6 presents the regression results for the log linear function of Portuguese exports to the rest of the World. In this case the hypotheses to be tested are the following: positive income elasticity, negative price elasticity, and as to the trade regime a positive or negative elasticity is possible. The latter is explained by the heterogeneity of trade policies towards Portuguese exports in countries of the ROW. Table 6 shows that coefficients of income and price have the expected sign, yet, whereas income elasticity is significant at 1% the price elasticity is significant at 12.6%. The coefficient of trade regime variable is positive which indicates a positive impact of integration on exports to the rest of the world, yet, it

is statistically insignificant. Therefore, while the hypotheses on income is successfully tested, that on prices and trade regime does not present a statistically strong answer.

Table 6: The Equation of Portuguese Exports to the RoW

$\ln X_{row_t} = a + b \ln GDP_{proecd_t} + c \ln p_t + d T_t + u_t$				
<u>Regressor</u>	<u>Coefficient</u>	<u>Estimate</u>	<u>Standard error</u>	<u>T-statistic</u>
Constant	a	-17.5867*	6.6862	-2.6303
$\ln GDP_{proecd}$	b	1.7591**	0.5072	3.4681
$\ln Price$	c	-0.3843	0.2282	-1.6845
T (dummy)	d	0.11058	0.1071	1.0324
$\bar{R}^2 = 0.9189$		Sample period: 1979 - 1991		
DW-statistic = 2.1060		Method of estimation: OLS		
F-statistic: $F(3, 9) = 46.325^{**}$				

* Statistically significant at 5% or lower. ** Statistically significant at 1% or lower.

Table 6 A: Diagnostic Tests

<u>Hypothesis</u>	<u>Statistics</u>	<u>Critical Values</u>	
		5%	1%
Serial Correlation	$F(1, 8) = 0.16596$	5.32	11.3
Functional Form	$F(1, 8) = 0.43661$	5.32	11.3
Normality	$\chi^2(2) = 2.0691$		
Heteroskedasticity	$F(1, 11) = 0.90707$	5.84	9.65

Comparing the two equations the conclusion is that exports to the EC the have greater sensitivity to variations in income, price and trade policy than exports to the rest of the World. One possible explanation for this result is the fact that the biggest share of Portuguese exports is directed to the EC market. In this circumstances, the biggest adjustment pressure should be experienced in this market. In turn, exports to the rest of the world have to a certain extent a residual nature. It is known that exporters try harder to sell to third markets when, for conjuncture reasons, they face difficulties in the EC markets. Also the fact that the ROW includes countries with distinct trade policy towards Portuguese exports may explain the statistical insignificance of that variable. Namely, with

EC membership Portugal has gained preferential access to few markets - Israel, Turkey, Tunisia, etc. - but has also lost few GSP positions - United States, Japan, Australia, etc.

To measure export changes due EC membership the actual value of exports to the EC and to the ROW in post-membership years were compared with their anti-monde values - i.e. their hypothesised values in the absence of integration. The anti-monde exports to the EC and to the ROW were predicted by the coefficients in tables' 5 and 6 and the respective actual values of the explanatory variables assuming that the trade regime did not change from 1986 onwards, i.e. T=0. The difference between actual and predicted values was then attributed to EC membership. The static forecast is the alternative procedure to build the anti monde. However, it was not used due to the lack of stability in the regressions of equations 5 and 6.

Table 7 Impact of EC Membership on Portuguese Exports: EEC and ROW, 1986-1991. (Millions US\$)

	Exports to the ROW			Exports to the EC		
	Actual values (1)	Integration Effect (2)	(3)=(2)/(1)	Actual values (4)	Integration Effect (5)	(6)=(5)/(4)
1986	2221.4	41.4	1.7%	4793.5	766.5	16%
1987	2619.4	274.7	10.5%	6459.4	1978.0	30.6%
1988	2981.1	376.4	12.6%	7665.3	2457.0	32.1%
1989	3406.8	506.5	14.9%	8790.4	2717.7	30.9%
1990	4007.2	747.6	18.7%	11613.2	4148.4	35.7%
1991	3768.1	116.6	3.1%	11835.8	3705.0	31.3%

Several conclusions are drawn from this table. First, EC membership has a significant positive impact on Portuguese manufactured exports, independently of their destination. These results point to an impact bigger than that expected by most ex-ante analysis. There are two type of explanations for such a result. On the one hand, the methodology followed has its own limitations - the use of a Dummy variable to capture the integration impact may bias the result upwards. On the other hand, most ex-ante studies have focused mainly



on changes in preferential market access and ignored several relevant aspects. Namely, that trade liberalization would reduce the anti-export bias in the Portuguese economy and that the Single European Market would be implemented, both stimulating the expansion of exports.

Second, the impact of integration is particularly strong on exports to the EC and weaker on exports to the ROW. Exports due to integration represent, in average, 29.4%⁵ of total exports to the EC and 10% of actual exports to the ROW. This is not surprising and has a theoretical explanation. The opening up of the EC markets to Portuguese exports was systematic and total. Following membership all tariff and quantitative barriers were lifted. Additionally, with the completion of the internal market non-tariff barriers have also been removed. The ROW has not followed neither a systematic nor an extensive opening-up to Portuguese products. In fact, it could be expected the occurrence of export diversion from the ROW to the EC. However, as explained before, the ROW includes a group of countries with distinct commercial policy towards Portuguese exports.

Thirdly, approximately 90% of Portuguese export expansion due to EC membership refers to exports to the EC. This results from the combination of two facts: on the one hand, the impact of integration was particularly stronger on exports to the EC than on exports to the ROW; on the other hand, exports to the EC are the biggest share of Portuguese exports.

Fourthly, the integration impact on exports increases over the years, except in 1991, when there is a clear slowdown on exports expansion. That evolution maybe explained by the gradual exploitation of free market access but also by the cumulative reduction of anti-exports bias as a result of the gradual liberalization of imports.

Finally, a strong limitation impairs the values reported in table 7. The regression results of the equation on exports to the rest of the World were not particularly good: the trade regime variable was not significant. Although this result may be explained by the heterogeneity of the countries included in that group, its weakness raises some doubts

⁵ This is the simple average of values included in the last column of table 5.7.

about the estimated effects on exports to the ROW. To clarify this question, and to check those results the same model was applied to total exports. The aim was to produce an alternative estimate of the integration impact on exports to the ROW. The procedure was as follows: first, the integration effect on total Portuguese exports had to be estimated with statistically significant results. Second, the difference between estimated effects on total exports and estimated effects on exports to the EC would provide an alternative residual estimate of the integration effect on exports to the ROW. Thus, total exports were regressed against the GDP of the OECD -a proxy to the world income - the export price, and the trade regime dummy. The regression results are reported in table 8. All regressors are statistically significant at 5% or lower and have the expected sign, including the dummy with a positive sign.

Table 8: The Equation of Total Portuguese Exports

$\ln X_t = a + b \ln \text{GDP}_{\text{oecd}_t} + c \ln p_t + d T_t + u_t$				
<u>Regressor</u>	<u>Coefficient</u>	<u>Estimate</u>	<u>Standard error</u>	<u>T-statistic</u>
Constant	a	-29.1**	7.8206	-3.7209
$\ln \text{GDP}_{\text{oecd}}$	b	2.6024**	0.58281	4.4652
$\ln \text{Price}$	c	-0.64402*	0.26852	-2.3984
Dummy	d	0.27435*	0.11632	2.3585
$\bar{R}^2 = 0.99603$		Sample period: 1979 - 1991		
DW-statistic = 2.0891		Method of estimation: OLS		
F-statistic: $F(3, 9) = 97.7575^*$				

* Statistically significant at 5% or lower. ** Statistically significant at 1% or lower.

Table 8 A: Diagnostic Tests

<u>Hypothesis</u>	<u>Statistics</u>	<u>Critical Values</u>	
		5%	1%
Serial Correlation	$F(1, 8) = 0.03198$	5.32	11.3
Functional Form	$F(1, 8) = 4.6024$	5.32	11.3
Normality	$\chi^2(2) = 0.58497$		
Heteroskedasticity	$F(1, 11) = 1.3234$	5.84	9.65

Following the same procedure as before the integration effect on total Portuguese exports was measured by the difference between actual exports and their anti-monde value. The

anti-monde was estimated in the same way, i.e. using the regressors and the actual values of explanatory variables, and assuming no change in the trade regime $T=0$.

Table 9 reports the estimated integration effects on total Portuguese exports. The difference between the total effect and that estimated for exports to the EC is an estimate of integration effects on exports to the ROW alternative to that presented in table 7.

Table 9 Impact of EC Membership on Portuguese Exports: Total, EC and RoW: 1986-1991 (millions US\$)

	Actual Values Total Exports(1)	Integration Effects				
		Total Exports (2)	Exports to EC (3)=(2)/(1)	Exports to EC	Exports to ROW (4)	Exports to ROW (5)
1986	7014.9	903	12.9%	766.5	136.5	6.1%
1987	9078.8	2320.7	25.6%	1978.0	342.7	13.1%
1988	10646.4	2835.3	26.6%	2457.0	378.3	12.7%
1989	12197.2	3139.2	25.7%	2717.7	421.5	12.4%
1990	15620.4	4865.7	31.2%	4148.4	717.3	17.9%
1991	15603.9	3240.5	20.8%	3705.0	-464.5	-12.3%

(5) is the % share of integration effect on actual exports to the ROW.

According to the data reported in table 9 the new estimate confirms that the overall effect of integration on Portuguese exports is always positive and quite substantial. Also, it confirms that the greatest share of that effect refers to exports to the EC. Compared to the previous estimate the impact of EC membership on exports to the ROW is slightly bigger in the first years following membership and smaller in the last years under analysis. In 1991, the impact is negative suggesting the occurrence of export diversion. However, in that year, and for the first time since membership, there was a decline in actual (total) exports. It was the downturn on the previous trend and was associated with the international recession - strongly present in the UK and US economies.

Conclusion

The main goal of this study was to estimate the static effects of EC membership on Portuguese exports. To this end a distinction was made between residual imputation and analytical approaches. A general model of exports was adopted and to depart from pure residual imputation studies a dummy variable was introduced to capture changes in trade regimes towards Portuguese exports. The model was then used to estimate the anti-monde and the differences between actual and predicted exports were attributed to integration.

From that analysis several conclusions were drawn:

- (a) Following EC membership Portuguese exports expanded significantly. Exports due to integration were responsible for approximately 25% of total exports, around 30% of exports to the EC, and 13% of exports to the ROW.
- (b) The greatest share of that expansion is due, as expected, to exports to the EC. Consequently, Portuguese exports become increasingly concentrate in this market.
- (c) Despite fears of export diversion from the ROW this did not happen until 1991 -the first year to register such an event. As suggested in the descriptive analysis this may be explained by the inclusion of EFTA in this group. However, an alternative explanation is that trade liberalization reduces the bias against exports due to greater efficiency in resource allocation and better exploitation of comparative advantages which results in the expansion of exports.

REFERENCES

- Alvares, P., (1986).** *Portugal na CEE - o Presente e o Futuro*, Lisboa. Publicações Europa-América.
- Fetherston, M., Moore, B., and Rhodes, J., (1980).** The Impact of European Integration on Member Countries- Britain. In D. Seers and C. Vaitsos (Eds), *Integration and Unequal Development: The Experience of the EEC*. London: Macmillan.
- Greenaway, D. and Sapsford, D. (1994).** What Does Liberalization for Exports and Growth, *Weltwirtschaftliches Archiv*, 130, 152-173.
- Mayes, D. G., (1983).** *Memorandum*, House of Lords, 66-86.
- Michaely, M., Papageorgiou, D., Choksi, A.M. (1991).** *Liberalizing Foreign Trade - Lessons of experience in the developing World*, vol. 7, Basil Blackwell, Oxford.
- Morgan, A.D., (1980).** The Balance of Payments and the British Membership of the European Community. In W. Wallace (Ed), *Britain in Europe*. Heinemann, London.
- Whitley, J. D. (1994).** *A Course in Macroeconomic Modelling and Forecasting*, Harvester Wheatsheaf, London.
- Winters, L. A. (1983).** The European Communities and the United Kingdom's international trade, Evidence submitted to the House of Lords Selected Committee on the European Communities, 7th report. 369-387.
- Winters, L. A. (1985).** Separability and the Modelling of International Economic Integration. *European Economic Review*, 27, 335-353.
- Winters, L. A. (1987).** Britain in Europe: a Survey of Quantitative Trade Studies. *Journal of Common Market Studies*, 25, 315-335.

