

Ensaio

The Role of Foreign Direct Investment in the Structural Transformation of Portuguese Exports between 1995 and 2005*

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1. Introduction

In the current debate on the Portuguese economy, there is a view that the country's specialization pattern, traditionally dominated by low-skilled labour intensive products, is a major obstacle to convergence. According to this view, with the emergence of new trading partners with a comparative advantage in labour intensive goods, the future performance of the Portuguese economy will depend critically on its ability to shift its specialization pattern towards goods with higher productivity content. In this article, we investigate the extent to which the Portuguese economy has actually become increasingly specialized in goods with higher income content (measured according to the quantitative indexes proposed by Hausmann et al., 2007) and whether such shift is more evident in sectors with a high presence of FDI.

FDI may have a role in breaking up with the natural inertia underlying the existing specialization patterns, both directly – i.e., creating new productive capacity in new, more advanced activities – and indirectly – e.g., promoting, through knowledge spillovers, the accumulation of experience in new product domains, which help further diversification of the export base (Hausmann and Klinger, 1997); and creating the demand for product-specific services and labour or managerial skills, which would not develop otherwise and which, once in place, create incentives for further investments in related activities (*Trindade*, 2005, Hausmann and Rodrik, 2003; Morris and Shin, 2000).

FDI can thus be viewed as a carrier of structural change in the export specialization of host countries. Not surprisingly, governments all over the world spend large amounts of resources to attract subsidiaries of multinational firms to their jurisdiction, on the basis that FDI can help to break up with the natural inertia underlying the existing specialization patterns. In Portugal, Governments have made significant efforts to support FDI inflows, either through financial incentives (EU funds and tax allowances) or by providing complementary infrastructures. Despite the high year-on-year volatility, FDI net flows to Portugal have a clear upward trend, from 0,43% of GDP in the 1970s to 1,03% in the 1980s, 1,085% in the 1990s and 3,65% in the 2000-2006 period (UNCTAD, 2007). Our evidence gives support to the idea that FDI has in fact played an important role in the process of transforming the Portuguese export sector. If the sophistication of a country export basket is correlated with its future growth – as Hausmann et al. (2007) sustain – then FDI seems to be having a positive impact on the growth prospects of the Portuguese economy.

The paper proceeds as follows. In Section 2, we briefly present the measures used to assess the income content of a country's exports – PRODY and EXPY. In Section 3 we investigate how the Portuguese export basket has

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evolved in terms of EXPY and classes of PRODY. In Section 4 we evaluate the extent to which the sectors that most contributed to the Portuguese export growth have a large presence of FDI. Section 5 concludes.

2. PRODY and EXPY as measures of income content of exports

We use the Hausmann et al. (2007) PRODY index to assess the sophistication level of products. Formally, the index is defined, for each product, as the weighted average of per capita incomes of countries exporting that product, where the weights are proportional to the country's index of Revealed Comparative Advantage in that good (Balassa, 1958). As a measure of the overall income content of a country's export basket, Hausmann et al. (2007) proposed the EXPY index. This is the average PRODY for each country, where the weights are the share of each product in the country's total exports. We compute these two measures with a sample consisting in 81 countries and 1235 products.¹

Figure 1 mimics Figure 4 in Hausmann et al. (2007), relating EXPY values and GDP per capita, using our sample. The figure confirms a positive and strong relation between the two variables, with GDP per capita growing exponentially with EXPY². This supports the idea that rich countries export products that tend to be exported by other rich countries, while poor countries export products that tend to be exported by other poor countries.

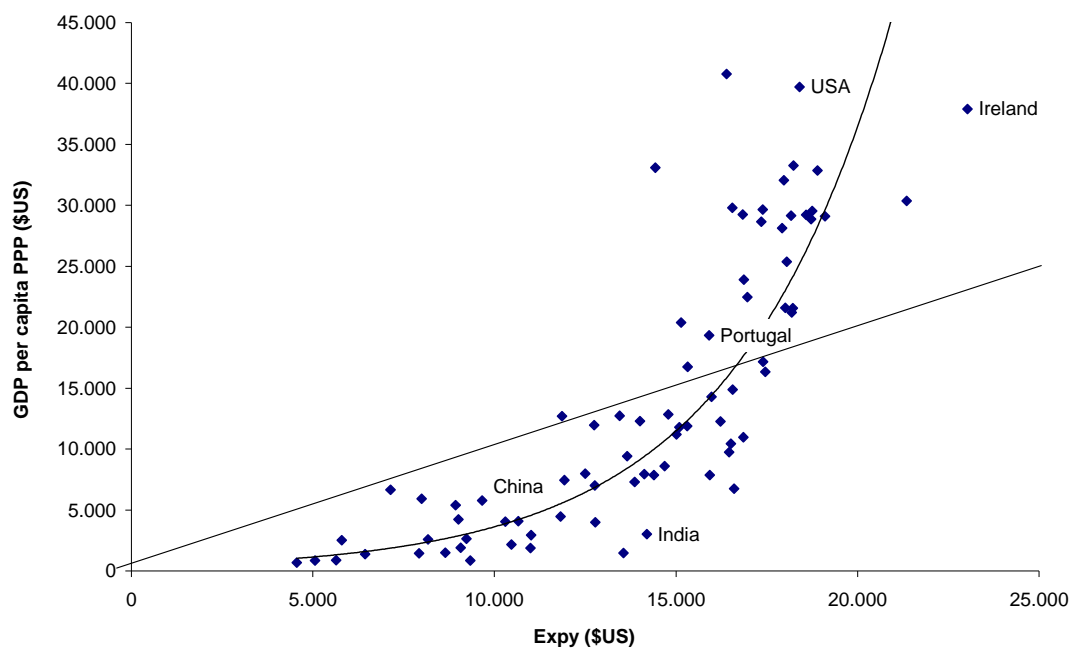
Hausmann et al. (2007) also found that EXPY is a strong and robust predictor of subsequent economic growth, controlling for standard covariates. In their central case, the estimation results imply that a 10 percent increase in EXPY boosts growth by half a percentage point (p.15 and Table 8, in the original). Because these results are not significantly affected by the presence of other variables, such as physical capital, human capital and institutional quality, the authors concluded that EXPY exerts an independent force on economic growth ("countries become what they export").

These findings imply that the type of goods in which a country specializes has important implications for subsequent economic performance. Thus, structural transformation, e.g., the change in the specialization pattern towards products with higher implied productivity, shall be part of the agenda for economic growth.

¹ Our calculations use international trade data at the product level (SITC-4 rev 2), from the UN-COMTRADE database, as extracted in September 2007 and per capita GDP levels (in PPP) by the International Monetary Fund, World Economic Outlook Database, April 2008.

² A similar pattern is found for 1995.

Figure 1: EXPY and GDP per capita at PPP (2005, \$US)



3. Income content, export shares and export growth in Portugal

Because PRODY indexes change over time – according to the changes in the world structure of trade and to changes in GDPs per capita at PPP – EXPY values can be computed at constant PRODY levels or at current PRODY levels. Changes in EXPY at current PRODYs reflect both changes in the structure of exports and changes in the implied value of exports. In this article, we focus on the structural transformation effect, so we abstract from changes in EXPY caused by changes in PRODY values. Hence, the analysis proceeds at constant PRODYs.³

The corresponding estimates of EXPY and export shares by classes of PRODY are displayed in Table 1. The table reveals that the average sophistication level of the Portuguese export basket (EXPY) has increased steadily over time, from 14.041 USD in 1990 to 16.603 USD in 2005. This is suggestive of future growth.

To get a sense on how this change came about, exports at constant PRODY values are split into 5 classes of PRODY. The 5 classes considered range from the 20% products with higher PRODY values to the 20% products with lower PRODY values. The table shows that there has been a steady increase in the share of products with “High” and “Very High” income content (from a total weight of 27.8% in 1990 to 44.3% in 2005), at the cost of the classes “Low” and “Very Low” (from 57.9% to 39.5%). This suggests that the increase in the average sophistication of the Portuguese export basket was achieved through a re-allocation of resources from products with low and very low implied productivity to products with higher implied productivity.

³ The two effects are disentangled in *Lebre de Freitas and Mamede (2008)*. Since we are no longer concerned with international comparisons, in this section and the following we use trade data from the Portuguese National Institute of Statistics (INE), which includes data on confidential positions, thus being more accurate than the COMTRADE database.

Table 1. The structure of Portuguese Exports by classes of PRODY

PRODY Class	1990		1995		2000		2005	
	Share on Exports	EXPY	Share on Exports	EXPY	Share on Exports	EXPY	Share on Exports	EXPY
Very High (top 20%)	6,2	1528	8,5	2118	9,4	2363	12,5	3097
High	21,6	4457	25,8	5392	32,8	6982	31,8	6727
Average	14,4	2390	14,2	2363	14,8	2460	16,3	2692
Low	32,1	3743	31,1	3673	27,0	3202	25,6	3049
Very low (20% lowest)	25,8	1923	20,4	1517	15,9	1195	13,9	1036
Total	100	14041	100	15063	100	16202	100	16603

Sources: own calculations, based on INE

Table 2. Structure of exports by classes of PRODY – Portugal

PRODY Class	1990		2005		Growth of exports 1990-2005	
	Exports (10 ⁶ Euros)	Share on Exports	Exports (10 ⁶ Euros)	Share on Exports	% Change	Contribution (percentage points)
Very High (top 20%)	718,1	6,2	3688,8	12,5	413,7	16,7
High	2508,6	21,6	9358,7	31,8	273,1	38,4
Average	1670,4	14,4	4792,1	16,3	186,9	17,5
Low	3737,2	32,1	7534,2	25,6	101,6	21,3
Very low (20% lowest)	3001,0	25,8	4082,1	13,9	36,0	6,1
Total	11635	100	29456	100	153,2	100

Sources: own calculations, based on INE

Table 2 examines the contributions of the different classes of PRODY to the growth rate of Portuguese exports between 1990 and 2005. According to these data, the growth rate of exports (at current prices) between 1990 and 2005 was of 153%. The classes growing above the average were those with “Very High” (413,7%), “High” (273,1%) and “Average” (186,9%) income content. Because the class “Very High” had initially a modest share in total exports its contribution to total growth is less impressive. Still more than half of the growth in Portuguese exports between 1990 and 2005 was due to products with “High” and “Very High” income content, which represented little more than ¼ of the exports in the beginning of the period. This confirms a trend of structural transformation towards a specialization pattern more based on “rich country goods”.

4. FDI, export growth and structural transformation in Portugal

In this section we assess the extent to which Foreign Direct Investment (FDI) had a role in the process of structural transformation of the Portuguese Economy between 1995 and 2005. For this purpose, we estimate the share of foreign firms in the Portuguese exports by product category, using data collected by the Portuguese Ministry of Labour and Social Solidarity on the composition of firms’ capital by nationality of owners (see details in *Lebre de Freitas and Mamede, 2008*).

Table 3: The role of FDI in Portuguese exports by classes of PRODY⁴

Prody Class in 2005	number of product classes	share of exports (%)		contribution to export growth (%)	share of FDI in total exports (%)		share of exports by foreign firms (%)	
		1995	2005		1995	2005	1995	2005
very high (20% high)	217	8	10	13	34	43	9	13
high	235	25	31	40	50	56	40	50
median	216	14	16	19	33	33	14	16
low	215	30	25	17	25	17	23	12
very low (lowest 20)	211	20	13	4	23	24	14	9
All products	1094	97	96	93	33	36	100	100

Sources: own calculations based on INE and GEP/MTSS, Quadros de Pessoal

Notes: the table does not include data on 140 product classes, for which there is no data available on the presence of FDI; the share of FDI in each group is calculated as the weighted average of the FDI shares in the exports in each product, with the weights given by the share of each product in the exports of the group; firms are considered 'foreign' if the percentage of capital held by non-nationals is greater or equal to 50%.

Table 3 displays data on the role of FDI in the evolution of Portuguese exports by PRODY classes. According to our estimates, the share of FDI in total exports increased from 33% in 1995 to 36% in 2005, the increase being mostly concentrated in the products with "High" and "Very High" income content. Furthermore, exports of "High" and "Very High" PRODY value had the biggest proportions of FDI in 2005 (56% and 43%, respectively). Those two classes of products were responsible for more than half of the increase in exports in the period. These figures suggest that FDI played a relevant role not only in the growth of Portuguese exports during the period, but also in improving the income content of those exports.⁵

The role of FDI in the structural transformation of Portuguese exports can also be analysed by organizing the export products according to their revealed comparative advantage (RCA) in 1995 and in 2005. In Table 4 we consider four types of products: the 'classics' (i.e., products in which Portugal had a revealed comparative advantage both in 1995 and 2005); the 'marginal' (products in which Portugal did not have a RCA in none of the years); the 'emerging' (products in which Portugal gained a RCA between 1995 and 2005); and finally the 'decaying' (products in which Portugal had a RCA in 1995 but not in 2005).⁶

⁴ In this and in the following tables, the share of FDI in each group is calculated as the weighted average of the FDI shares in the exports in each product, with the weights given by the share of each product in the exports of the group (for further details see appendix 3 in *Lebre de Freitas and Mamede, 2008*).

⁵ This result questions the IMF (2008) conclusion that FDI did not contribute to boosting export performance or to upgrade Portuguese exports. That conclusion is formulated observing that: (i) the sectors which experienced an increase in the shares of FDI since the mid-1990s were typically those with a lower growth of international demand, and (ii) rising FDI flows to high-tech sectors were offset by increasing low-tech FDI. The data used by the IMF have however a higher level of aggregation than ours and are also very different in nature: FDI flows by sector, in contrast to the share of exports by foreign controlled firms, broken down by income content.

⁶ We partially borrow these expressions from Boccoardo et al. (2007).

Table 4: The role of FDI in Portuguese exports by evolution of RCA

Types of products	number of product classes	share of exports (%)		contribution to export growth (%)	share of FDI in total exports (%)		share of exports by foreign firms (%)	
		1995	2005		1995	2005	1995	2005
<i>classics</i>	175	67	54	35	26	26	54	41
<i>marginal</i>	682	12	15	19	33	46	12	20
<i>emerging</i>	110	10	24	45	64	52	21	36
<i>decaying</i>	51	8	2	-5	52	46	13	3
All products	1094	97	96	93	33	36	100	100

Sources: own calculations based on INE and GEP/MTSS, Quadros de Pessoal

Notes: the table does not include data on 140 product classes, for which there is no data available on the presence of FDI; the share of FDI in each group is calculated as the weighted average of the FDI shares in the exports in each product, with the weights given by the share of each product in the exports of the group; firms are considered 'foreign' if the percentage of capital held by non-nationals is greater or equal to 50%.

According to Table 4, the 'emerging' products was the group that contributed the most to the increase in exports (45%), reflecting the role of non-traditional products to the expansion of the Portuguese export sector. This is also the group of products in which the share of FDI in total exports was highest both in 1995 (64%) and in 2005 (52%).

The last column on the right in Table 4 shows that the 'emerging' group of products concentrated 36% of the exports by foreign firms, while the 'classics' were responsible for 41% of those exports. While this suggests that FDI is still mostly directed to exports in which Portugal had a traditional comparative advantage, new products are gaining relevance: in fact, both the 'emerging' and the 'marginal' have increased their contribution to foreign-commanded exports (56%, jointly, in 2005, against 33% in 1995). This contrasts to what happened with the 'classics' and the 'decaying'.

Table 5 illustrates the results discussed in this section by providing information on the 20 product categories that have contributed the most for the growth in Portuguese exports between 1995 and 2005 (these were responsible for 60% of the total increase in exports during this period). In the table we see that FDI accounted for at least 2/3 of the exports in 2005 in 8 out of those 20 product categories. With two exceptions the share of FDI in these FDI-dominated products was already significant in 1995. Only 3 of these 8 cases consist in 'classic' exports (the others being non-traditional products). And in all but two of these products (namely, cigarettes and rubber tyres), the income content is either "High" or "Very High".

This table also illustrates the relevance of the automotive and related industries in the processes discussed above: Motor cars and Parts and accessories of motor vehicles, both classified as products with high Prody values and with a significant presence of foreign firms, are responsible for 19% of the growth observed in exports.

5. Conclusions

In this paper we show that the average income content of Portuguese exports (as reflected in the value of EXPY) has grown in recent years, suggesting that Portugal has been able to shift its specialization pattern toward products of higher productivity content. These accords with the recent findings of *Caldeira Cabral* (2008), who made a similar assessment using a classification of products based on technological intensity.

Analysing in greater detail the evolution in the Portuguese export structure, we find that such improvement was characterised by a fast increase in the classes of products with "High" and "Very High" income content. Between 1990 and 2005, the class of exports of "Very High" income content grew 413% between 1990 and 2005, followed

by the class of “High” income content, which grew at 273%. In terms of contributions, these two classes explain 55% of total export growth.

Taking into account the presence of FDI in the different export products, we find that the share of foreign firms in 2005 was higher than average for products with “High” and “Very High” income content (56% and 43%, respectively). Those two classes of products concentrated almost 2/3 of exports by foreign firms in Portugal in 2005.

All these pieces of evidence suggest that FDI played a relevant role both in the growth of Portuguese exports during the period and in increasing their income content.

We mentioned in Section 2 the results by Hausmann et al. (2007) showing that structural transformation (shifting the specialization pattern towards products with higher productivity content) is a leading indicator of economic performance. The results in this paper suggest that Portugal has indeed move its specialization pattern towards “rich country goods” and that FDI has played a positive role in this process.

Table 5: Top 20 products in terms of contribution to export growth

Code	Commodity	share of exports in 2005 (%)	contribution to export growth (%)	share of FDI in exports in 1995 (%)	share of FDI in exports in 2005 (%)	Prody value in 2005	RCA class
8.703	Motor cars and other motor vehicles principally designed for the transport ...	7	11	99	84	High	emerging
8.708	Parts and accessories of the motor vehicles of headings 87.01 to 87.05.	4	8	56	66	High	emerging
8.473	Parts and accessories for use with machines of heading 84.69 to 84.72	2	5	28	n.a.	Very High	emerging
2.710	Petroleum oils, other than crude	4	5	0	0	Low	classics
9.401	Seats (other than those of heading 94.02), whether or not convertible into ...	2	3	5	0	Median	classics
4.802	Uncoated paper and paperboard, of a kind used for writing	2	3	1	0	Very High	classics
8.527	Reception apparatus for radio-telephony, radio-telegraphy or radio-broadcas ...	3	3	93	98	High	classics
8.542	Electronic integrated circuits and microassemblies.	2	3	80	95	Very High	marginal
6.109	T-shirts, singlets and other vests, knitted or crocheted.	2	3	31	33	Very low	classics
4.011	New pneumatic tyres, of rubber.	1	3	75	93	Median	classics
7.601	Unwrought aluminium.	1	2	0	12	Median	emerging
2.402	Cigars, cheroots, cigarillos and cigarettes	1	2	4	85	Very low	emerging
3.004	Medicaments (excluding goods of heading 30.02, 30.05 or 30.06)	1	2	38	36	Very High	marginal
8.481	Taps, cocks, valves and similar appliances for pipes, boiler shells	1	1	14	78	High	emerging
7.214	Other bars and rods of iron or non-alloy steel, not further worked than for ...	1	1	0	0	Low	emerging
2.204	Wine of fresh grapes, including fortified wines	2	1	31	18	Low	classics
2.901	Acyclic hydrocarbons.	1	1	5	73	High	classics
4.504	Agglomerated cork (with or without a binding substance)	1	1	8	8	High	classics
8.480	Moulding boxes for metal foundry; mould bases; moulding patterns	1	1	4	6	High	classics
4.503	Articles of natural cork.	1	1	8	8	High	classics
Total of 20 products contributing most to export growth		39	60	46	50	-	-

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