PRICE DISCRIMINATION AND MARKET STRUCTURES IN THE PORTUGUESE EXPORT SECTOR (1977-82) (1)

Manuel Victor Martins (*)
Vítor M. Santos (**)

1 — Introduction

The protectionism which characterized the Portuguese trade policy until the end of the 70's stimulated exporters to pursue strategies of discrimination between domestic and international prices.

This behavior generally leads to a redistribution of surplus on behalf of exporters which, not only has a negative impact on social benefit but also intensifies the asymmetries in income distribution (2).

Traditionally, the analysis of the impact of price discrimination on the export sector neglects the effects of market enlargement and of promotional export policy on production efficiency.

In this paper it is emphasized that both factors can induce a market share redistribution on behalf of the most efficient firms in such a way that average production costs can be reduced. In this case, the negative effects due to price discrimination can be offset by negative variations on average production costs.

The period 1977–82 was chosen as reference because it stands between two important phases of the evolution of Portuguese economy: on one hand, during the 50's and 60's, the economy remained closed and the government pursued an interventionist industrial policy and, on the other hand, during the last decade, due to EEC's integration the industrial policy has been characterized by a regulationist tendency.

This intermediate situation, allows us first to identify the inefficiencies resulting from protection as well as from the excessive interventionism and, secondly, makes it possible to evaluate whether there are benefits on resource allocation due to trade liberalization and/or market-oriented policies.

In section 2, we discuss the shortcomings resulting from the use of the sign of the correlation between the profitability and the share of exports on output as an indicator to validate the existence of price discrimination strategies.

(*) Professor at Instituto Superior de Economia e Gestão in the Technical University of Lisbon.

(**) Assistant professor at Instituto Superior de Economia e Gestão in the Technical University of Lisbon.

(1) A first draft of this paper was presented to the 17th Conference of the European Association for Research in Industrial Economics (EARIE).

(2) Taking as reference the free trade situation.

In section 3, the effects both from the export sector growth and the promotional policies on concentration are analysed.

Finally, sector 4 presents the empirical findings for Portugal (1977–82).

2 — Profitability and price discrimination

When producers use technologies with increasing scale economies, market enlargement steered to the growth of the export sector stimulates, in the first place, a production increase in each firm and, consequently, induces a decrease in average costs. This increase in scale can be viewed, as suggested by Helpman and Krugman (1985), as a kind of technological progress that raises the eficiency of the economy.

In the second place, the integration has competitive effects on domestic markets which means that there is a decrease of both prices and profits and, consequently, an increase of the consumer surplus.

Besides decreasing prices, consumers can benefit simultaneously from two issues related to the existence of trade: the increase in quality and the diversity of products supplied in each market ([3]).

However, the increase in trade intensity on the exports side does not necessarily mean that there are positive effects on welfare.

In fact, if there is a segmentation between domestic and international markets (resulting from tariffs, transport costs and uncertainty), the greater the intensity of discrimination between domestic and international prices ([4]), the greater the possibility of anti-competitive effects on exports.

Usually, the existence of price discrimination strategies in export industries is validated when there is a negative correlation between the average profitability of each industry and the share of output that is exported.

The main objective of this section is to clarify the theoretical foundation of this methodology and to establish the conditions which must be verified for the sign of the correlation between profitability and the share of output exported to be used as an indicator of the intensity of price discrimination.

Suppose a single monopolist selling its product both in the domestic and international markets and facing the necessary conditions to follow a price discrimination strategy.

Given the international prices, the monopolist can only decide about two issues: the level of output (given the costs) and the allocation of output between domestic and international markets (given the domestic demand).

([3]) We are referring to the implications of horizontal and vertical product differentiation. About this see Krugman (1979, 1980, 1981, 1982), Lancaster (1979, 1980) e Gabszewicz et *alii* (1981).

([4]) On impacts and equilibrium solutions owing to price discrimination in export sectors see, among others, Corden (1967, 1971), Brander and Spencer (1984) and Helpman and Krugman (1989).

The problem of profit maximation is given by:

$$MAX\ \pi = pq_1 + piq_2 - C\ (q_1 + q_2)$$

where q_1 and q_2 are, respectively, the quantities sold in the domestic market and those exported; p and p_i are, respectively, the domestic and international prices and $C\ (q_1 + q_2)$ are the total costs.

The international price p_i is exogenous meaning that the demand function in internal markets is $p_i = \bar{p_i}$.

From the first order conditions, the average profitability can be calculated with the following expressions:

$$\frac{\pi_1}{R_1} = \frac{pq_1 - C(q_1)}{pq_1} = \Theta(\frac{1}{E} - 1) + 1$$

where R_1 and π_1 are, respectively, the total revenue and profits in the domestic market; $\Theta = \frac{C_M}{C'}$ is the degree of scale economies (C_M and C' are, respectively, the average and marginal costs) and E is the elasticity of domestic demand.

Admiting the the monopolist is a price-taker in international markets, the average profitability of exports is:

$$\frac{\pi_2}{R_2} = 1 - \Theta$$

which means that the average profitability in both markets, $\pi_m = \frac{\pi}{R}$, is:

$$\frac{\pi}{R} = \frac{pq_1}{R}\frac{\pi_1}{R_1} + \frac{p_iq_2}{R}\frac{\pi_2}{R_2} = \frac{\Theta}{E}\ (1 - TX) + 1 - \Theta$$

where, R_2 and π_2 are, respectively, the total revenue and profits from exports and TX is the share of exports on total output.

We intend now to analyse the impact of a change in exported output upon the average profitability of the exporter. It will be assumed for simplicity that there are only two determinants of the share of exports in total output: the decrease of marginal costs C' and/or the increase of international prices (5).

Looking at the expression for the average profitability π_m, it can be noticed that, besides the variable TX, it has two other determinants: the degree of scale economies Θ and the elasticity of demand E. It is obvious that, while a change in marginal costs only determines Θ, a change in prices can influence both Θ and E.

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(5) We should still consider the change in domestic demand but this would extend the length of this paper beyond reasonable limits.

Let's assume that the variation in exported output results from a change in marginal costs. In this case we have,

$$\frac{\partial \pi_m}{\partial TX} = -\frac{\Theta}{E} + \frac{Z\Theta}{q}\frac{\partial q}{\partial TX}\frac{1 - TX - E}{E}$$

where, $Z = \frac{\partial \Theta}{\partial q}\frac{q}{\Theta}$, stands for the elasticity of scale economies in relation to output variations.

If the variation of exported output is induced by a change in international prices, the variation in profitability results not only from Z, but also from changes in the elasticity of demand E. The differentiation of the profitability function leads to the following expression:

$$\frac{\partial \pi_m}{\partial TX} = \frac{(1 - TX)\ Z\Theta}{q\ E}\frac{\partial q}{\partial TX} - \frac{\Theta}{E} + \Theta(1 - TX)\frac{\partial(1/E)}{\partial_q}\frac{\partial q}{\partial TX} - \frac{Z\Theta}{q}\frac{\partial q}{\partial TX}$$

TABLE 1

Effect of the variations in TX ($\frac{\partial R_m}{\partial TX}$) on average profitability

	Variation in marginal costs	Variation in international prices
$Z = 0$	(—)	(—)
$Z > 0$	(—)	(—)
$Z < 0$	(?)	(?)

It should be noticed that the parcial differentiation of average profitability in order to TX gives an expression which is determined by Z. Two cases can be distinguished (6):

$Z = 0$, meaning that Θ is constant and independent from quantities; this includes any situation with homogeneous production functions (of degree Θ); even when the average cost function is L-shaped, the average and marginal costs are identical and constant (in the subset located on the right of the minimum efficient scale) and, consequently, is constant and equal to 1;

$Z < 0$, when the average cost curve is U-shaped and the marginal cost curve crosses its minimum point.

When $Z = 0$, there is a positive correlation between π_m and TX while, for $Z < 0$, this correlation is undetermined. That is, the impact on average profitability of a variation in TX is ambiguos and depends on the shape of the cost function.

(6) $Z > 0$ is a situation without any special meaning.

So far, we have been analysing the monopolist's behaviour. Henceforth, we will try to generalize this result to the case where there are N firms established in the market. The average domestic profitability is (7):

$$\frac{\pi_1}{R_1} = \frac{\alpha + (1 - \alpha)H}{E}$$

where $0 < \alpha < 1$ is the degree of colusion and H is the index of concentration in the domestic market.

Let's assume that all firms use the same technology and, consequently, have identical costs (8); in this case, the average profitability of exports is:

$$\frac{\pi_2}{R_2} = 1 - \Theta$$

We can obtain the average profitability in both markets using the same procedures followed for the monopoly case:

$$\frac{\pi}{R} = \frac{(1 - TX)[\alpha + (1 - \alpha)H]}{E} + TX(1 - \Theta)$$

The analysis of the impacts on profitability resulting from changes in exported output are given by (9):

$$\frac{\partial \pi_m}{\partial TX} = - \frac{(1 - \alpha)\ H + \alpha}{E} + (1 - \Theta) - \Theta\, Z \frac{\partial_q}{\partial TX} \frac{TX}{q},\ q = q_1 + q_2$$

It follows that the sign of:

$$\frac{\partial \pi_m}{\partial TX}$$

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(7) This result is deduced in Santos (1989). See also Cowling and Waterson (1976), Clarke and Davies (1982) and Clarke, Davies and Waterson (1984).

(8) It is not necessary the N firms to have identical costs; it is sufficient that $\Theta_i = \Theta$, for all i.

(9) This result has the following restrictive assumptions:

Firms have identical costs and, consequently, produce the same quantities $\{q_1 = q_2 = \ldots = qN\}$; in this situation, the concentration index H is constant and equal to $\frac{1}{N}$ (assuming that the number of firms is fixed); this circumstance explains why we admit:

$$\frac{\partial H}{\partial_q} \frac{\partial_q}{\partial TX} = 0$$

Firms face a constant elasticity of demand:

$$\frac{\partial E}{\partial_q} \frac{\partial_q}{\partial TX} = 0$$

is undeterminate. At most we can say that the probability of this sign being negative is greater:

The smaller the elasticity of demand, E;
The greater Θ and Z;
The greater the degrees of concentration and colusion.

We have just shown the following main premises:

- In protected markets, the existence of a negative correlation between average profitability and the share of exports on output does not always allow to infer that there is price discrimination;
- The more concentrated is the structure of the domestic market, the more plausible is this inference.

We have just analysed the effects of an increase in exports on average profitability. Next, we will analyse the impact of the variations of TX on concentration.

3 — Exports and concentration

It will be assumed that the structure of the market is exogenous (i.e., firms neither enter, nor leave the industry) and has the same characteristics that have been assumed so far: there are two producers with comparative advantages and conditions to pursue a price discrimination strategy; besides, the firms are price-takers in the international market, have acess to perfect information, produce a homogeneous good and follow a strategy of the Cournot type.

Assume also that both firms face the following demand function in the domestic market:

$$p = \varphi - \beta q_1, \quad q_1 = q_{11} + q_{12}$$

where q_{1j} is the quantity sold in the domestic market by duopolist j.
Both producers have a cost function of the same type.

$$Cj = CF + cq_j^2, \quad (j = 1,2)$$

The duopolists have the following profit functions:

$$\pi_j = p\ q_{1j} + pi\ q_{2j} - [CF + c(q_{1j} + q_{2j})^2],\ j = 1,2$$

where q_{2j} is the quantity exported by duopolist j, $q_{11} + q_{12}$ are the quantities sold in the domestic market and $q_{21} + q_{22}$ are total exports.

If we assume that the duopolists follow a Cournot's strategy, the first order conditions are given by:

$$q_{11} = \frac{\varphi - p_i}{3\beta},$$

$$q_{21} = -\frac{\varphi}{3\beta} + \frac{2c + 3\beta}{6\beta c} p_i$$

$$q_{12} = \frac{\varphi - p_i}{3\beta},$$

$$q_{22} = -\frac{\varphi}{3\beta} + \frac{2c + 3\beta}{6\beta c} p_i$$

Notice that, from the previous solutions, it yields:

$$q_1 = q_{11} + q_{21} = \frac{p_i}{2c_1}, \quad q_2 = \frac{p_i}{2c_2}$$

where q_1 and q_2 are, respectively, the quantities produced by duopolists 1 and 2.

The degree of concentration is given by the following index:

$$H = \sum_{i=1}^{2} \left(\frac{q_i}{q}\right)^2 = \frac{\left(\frac{p_i}{2c_1}\right)^2 + \left(\frac{p_i}{2c_2}\right)^2}{\left(\frac{p_i}{2c_1} + \frac{p_i}{2c_2}\right)^2}$$

We have previously assumed that a negative variation in costs and/or a positive variation in the price of exports induced an increase in exports.

Let's now analyse the effect of these variations upon concentration. In the case of prices we have, after the appropriate calculations, the following expression:

$$\frac{\partial H}{\partial p_1} = \frac{(2p_i c_2^2 + 2p_i c_1^2)(p_i c_2 + p_i c_1) - 2(c_1 + c_2)(p_i^2 c_2^2 + p_i^2 c_1^2)}{(p_i c_2 + p_i c_1)^3} = 0$$

which means that the variation of export prices has a neutral effect on concentration.

As for the variation in costs, we admit that $dc_1 = dc_2 = d\bar{c} < 0$, that is, there is a variation in costs such that the standard deviation of intra-industry costs does not change. The effect upon concentration resulting from such variation in costs can be evaluated as follows.

From:

$$dH = \frac{\partial H}{\partial c_1} dc_1 + \frac{\partial H}{\partial c_2} dc_2$$

we obtain

$$dH = \frac{2p_i^4(c_1 + c_2)(c_1 - c_2)(c_2\ dc_1 - c_1\ dc_2)}{(p_ic_2 + p_ic_1)^4}$$

and, considering that $dc_1 = dc_2 = dc$, the following result yields:

$$\frac{dH}{dc} = -\frac{2p_i^4(c_1 + c_2)(c_1 - c_2)^2}{(p_ic_2 + p_ic_1)^4} < 0$$

We have just shown that, if the variation in exports results from an exogenous shock on international prices, the market share of exports is kept unchanged and, consequently, the degree of concentration does not change.

The results are different for the variation in costs: a decrease in costs of intermediary goods and/or wages induces a readjustment of market shares which will benefit the most efficient firms (and also those with the largest scale of production) and, therefore, leads to an increase in the degree of concentration.

This result is coherent with the expectation: the reallocation of sales from the domestic market to exports means that a greater share of output is sold in a market where demand is elastic and, consequently, firms have a smaller market power; in a more competitive environment, the most efficient firms have greater possibilities of increasing their market share in detriment of those which have greater costs.

The existence of a positive correlation between concentration and exported output is a result that requires some additional qualifications.

In the first place, we must put forward that our main concern was to establish a correlation between two variables and not to set up a causal relationship between them. As a matter of fact, the deduction of the results was based, explicitly, on the assumption of concentration and exported output being determined simultaneously by the same variables.

In the second place, additional assumptions had to be implicitly accepted in order to obtain those results. It follows that they do not have the desirable generality, basically for two reasons:

The number N of established firms is constant;

The government only defines barriers to the entry of imports (restrictive trade policy) and may, eventually, restrain the acess of new entrants (domestic firms).

Let's now assume that potencial entrants can enter the market and that there is a minimum efficient size. In this situation, the growth in the market size of export industries stimulates the entry of new firms and, consequently, the degree of concentration has a tendency to decrease.

In the third place, government can have a strong influence on the market structure of each industry. In the particular case of the export sector, the gov-

ernment traditionally uses an export promotion policy which is not neutral in relation to concentration, that is, it leads to the redistribution of market shares among the established firms.

We can distinguish three different types of transfers from the government to the exporting firms:

a) Transfers based on the total output of each exporter inducing a decrease of average and/or marginal costs as with subsidies, fiscal benefits, etc;
b) Transfers based on exported output, as export credits;
c) Lump-sum subsidies, i.e., the value of the transfer, *S,* is not proportional to the quantities produced.

Assume that a subsidy proportional to output is granted to exporters [that is, it corresponds to cases *a*) and *b*)]; this policy is equivalent to an uniform reduction in production costs and, consequently, induces a positive variation in concentration.

Therefore, when the allocation of subsidies is based on output, the policy has a positive impact on concentration. However, the same is not necessarily true with lump-sum subsidies; in this case, the effects on concentration are unknown. In general, we can state that the likelihood of the impact of subsidies on concentration being negative is greater:

The more the costs are asymmetrical;
The more the most efficient firms are discriminated, that is, the most biased towards the small firms, is the allocation of subsidies.

4 — Profitability and concentration in the Portuguese export sector

4.1 — The model

The analysis made until now suggests, as usual with industrial economics, that the average profitability of each industry is explained by three subsets of variables:

The imperfections due to the domestic market structure, like excessive concentration, existence of entry barriers and product differentiation;
The distortions resulting from the industrial policy;
The degree of international integration which depends on the country size, on the factors endowment and, above all, on trade policy.

Comanor and Wilson (1967) were the first authors to suggest quantitative indicators to barriers to entry. In this study we distinguish, for this purpose, the following variables: market size (*MS*), intensity of scale economies (*MES*,

MESMS) ([10]), cost-disadvantage ratio (*CDR*), degree of product differentiation (*PD*), capital requirements (*MESKO*) and legal barriers to entry (*PE*).

In autarchy, these varibles provide information allowing to characterize and to compare different market structures. However, as the Portuguese economy is under an increasing integration process, it is important to establish the indicators allowing to mesure the degree of international integration for each industry according to the following items: imports (*TM*), exports (*TX*) and foreign direct investiment ([11]).

Here a brief reference should be made to two indicators not yet analysed: the capital-product coefficient $\left(\frac{K}{R_v}\right)$ allowing to prevent distortions arising from the existence of sectors with different capital intensities; the annual growth rate of the industry output ($\dot{VBP}$) allowing us to explain the intersectorial asymmetries in profitability resulting from different conditions in the sectoral demand.

Empirical and analitical studies on industrial concentration are more scarce. However, the previous analysis and, above all, the analitical framework proposed by Clarke and Davies (1982) ([12]) suggest that the main determinants of concentration are the barriers to entry and the three vectors of international integration (imports, exports and *FDI*).

Both equations have a high degree of multicolinearity. One possibility to minimize the shortcomings arising from this situation is to utilize the following estimator ([13]):

$$\hat{B} = A(C'C)^{-1}C'Y$$

where, A is the orthogonal matrix of eigenvalues related to the standardized matrix of exogenous variables and C is the principal component matrix.

Since we are using biased estimators, we only exhibit in table 2 the sign and the statistical likelihood of the coefficient estimates (when regression estimates are not signalized with *a*) or *b*), they are significants at 5 % level).

The equations to be estimated have the following generical expressions:

Profitability function

$$\pi_m = f(H,\ MESMS,\ K/R_v,\ PE,\ TM,\ TX,\ PD,\ KEST,\ IDEV,\ IDEVD,\ \dot{VBP},\ CDR,\ K/CV)$$

Concentration function

$$H = H\ (MESMS,\ CDR,\ MES,\ MS,\ K/R_v,\ MESKO,\ PD,\ TX,\ PE,\ KEST,\ IDEV,\ IDEVD,\ TM,\ \dot{VBP})$$

([10]) Variable *MES* correponds to the minimum efficient size while $MESMS = \frac{MES}{MS}$.

([11]) Variable *TM* corresponds to the market share of imports. We use three different indicators to measure the intensity of foreign direct investment: the stock of foreign capital (*KEST*), the percentage of output supplied by affiliates (*IDEV*) and the share of domestic sales taken by affiliates (*IDEV D*).

([12]) See also Santos (1989).

([13]) For alternative techniques for the calculation and analysis of this estimator properties see Dhrymes (1978, pp. 232–5) and McCallum (1970).

4.2 — Analysis of empirical results

The results lead to the conclusion that concentration and barriers to entry determine positively the average profitability (see table 2).

The coefficient associated with the share of exported output, *TX*, in the profitability function is significantly different from zero and has a negative sign.

We have previously shown that, when production functions were homogeneous (and, particularlly, where average costs were constant), a negative correlation between *TX* and π_m would suggest the existence of discrimination between domestic and export prices. However, this result does not have a clear interpretation when those functions do not have the above-mentioned property.

On the other hand, the data used in this study (basically, industrial statistics, can induce to an over-evaluation of the negative effects of variations in *TX* on π_m because these statistics only allow the evaluation of the accounting profits (which are calculated from accounting reports). As a matter of fact, it is not possible to purge this information from biases due to transfer price practices (14).

Althought, protectionism faced by exporters favours, as previously shown, the existence of price discrimination strategies, it must be emphasized that the test used does not have the desirable consistency (15).

Let's now analyse the estimates of the concentration function shown in table 2.

Indicators of barriers to entry (scale economies, cost-disadvantage ratio, capital requirements and product differentiation) determine the degree of concentration with its expected sign; the variables with a smaller likehood (*MESKO*) or the wrong sign $\left(\frac{K}{R_v}\right)$ are those calculated using the capital stock (16).

The variable which stands for the domestic market size (*DS*) holds the expected sign, but in fact does not have any statistical significance. On the other hand, the share of exported output *TX* (which represents the external market size) has both the expected sign and statistical likehood.

The latter result meets our expectations.

In the first place, Portugal has comparative advantages in traditional products whose production does not imply techonologies with increasing returns to scale (17).

In the second place, according to the results shown in table 3, the export sector grew at higher rates than the other sectors of the economy during the period 1977–81. Considering simultaneously this fact and the nature of scale economies, it is easy to conclude that, due to the pressure of demand, the entry of new firms had then a negative impact on concentration.

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(14) According to Redondo (1986), this was normal during this period.

(15) In Santos (1990a) the process of price formation in export industries is analysed and the results suggest the existence of price discrimination strategies.

(16) The absence of statistical likelihood might be due (at least, partially) to the accounting shortcomings concerning the evaluation of capital stock.

(17) On this subject see Jesus (1986, 1988).

TABLE 2

Signs of the regression estimates and significance of the parameters in the profitability and concentration functions (*c*)

	πm	πm	πm	H	H	H
H	(+)	(+)	(+)			
MES	(+)	(+)	(+)	(+)	(+)	(+)
MS	(–)	(–)	(–)	(–)(*b*)		
TM	(–)	(–)	(–)	(–)	(–)	(–)
TX	(–)	(–)(*b*)	(–)	(–)	(–)(*b*)	(–)(*b*)
PD	(+)	(+)	(+)	(+)	(+)	(+)
CDR	(–)	(–)	(–)	(–)	(–)	(–)
*H * TM*		(–)(*b*)	(–)			
MESMS	(+)(*b*)			(+)	(+)	(+)
MESKO	(+)(*b*)			(+)(*b*)	(+)(*b*)	(+)(*b*)
EP	(+)(*b*)			(+)	(+)(*b*)	(+)(*b*)
KEST	(–)			(+)(*b*)		
K / R_v	(–)(*b*)			(–)	(–)	(–)
VBP	(+)			(–)		
IDEV		(–)			(–)(*a*)	
IDEVD			(–)			(–)(*a*)
R^2	.816	.700	.744	.898	.865	.862
DW	1.818	1.830	1.863	2.062	2.381	2.276

(*a*) Significant at 10 %.
(*b*) Not significantly different from zero.
(*c*) The coefficient estimates and the *t*-values are presented in Santos (1989).

Therefore, the structural characteristics of the export industries as well as the high growth of demand from their outputs contributed to cancel the potential positive effects on concentration.

We are referring basically to two main effects.

Firstly, the high degree of uncertainty faced by the export sector induced a redistribution of market shares in benefit of the larger firms (which have specific advantages in this situation) and, consequently, to an increase in concentration.

Secondly, the promotion policy of exports would have had a positive effect on concentration. As a matter of fact, according to Jesus [1986, 1988, cap. 4], the promotional policies would have benefited above all the larger firms implying, as previously shown, positive effects on concentration.

The small significance of the coefficient estimates associated to exports is probably due to the co-existence of these two symmetrical effects.

These results suggest that the market enlargement and the increase of international competition do not lead, as we would expect, to a market share redistribution in benefit of the most efficient firms.

TABLE 3

Index of industrial production (annual growth rate 1977–1981)

Import-competing industries	3.4
Export industries	7.3
Intra-industry specialization	6.1
Prohibitive protection	1.1

TABLE 4

STANDARD DEVIDATION OF AVERAGE PROFITS

Import-competing industries	.050
Export industries	.176
Intra-industry specialization	.133
Prohibitive protection	.079
National average	.121

The absence of international competition — due to protectionism or to the existence of multinational affiliates selling abroad a great share of their output — created the necessary conditions to the co-existence of firms with extremely different levels of efficiency in the export sector: some of them were purely inefficient while others used technologies allowing lower average costs and higher profits.

In table 4 we show the standard deviations of average profits. To compute these results we used data from 564 firms selected from a report published by Caixa Geral de Depósitos.

When the output is homogeneous and perfect information is available, the standard deviation of average profits is an indicator of intra.-sectorial average cost asymmetries (18).

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(18) See Santos (1989, pp. 240–1).

For import-competing industries, the average profitability has a smaller variance meaning that, when faced with the competitive pressure arising from imports and from multinational affiliates, domestic firms adjusted their productive and/or organizational processes in order to produce at smaller costs.

On the other hand, for the export sector a greater variance among firms is found. This result is not unexpected since this sector did not face a significant competition, neither from imports, nor from multinational affiliates.

In spite of the profit variance in the export sector being clearly greater than in any other sector (as can be seen in table 4, it is three and a half times greater than in import-competing industries), the shortcomings of this indicator have to be clearly stated, namely, when it is used to evaluate the efficiency of the export sector.

It is important to mention that the standard deviation of average profit is a function of both prices (and, so, it depends on the market structure) and costs. So far, we have been assuming that the high variance among firms in the export sector is due to cost asymmetries this meaning that the variance of prices in this sector is identical to that to be found in other market structures facing the same level of uncertainty.

This assumption is restrictive since prices have a greater variance in the domestic market than in the export sector, for identical degrees of homogeneity. This circumstance results from the following:

In the first place, the output composition per country of destination is extremely unequal for different firms in the same sector; the differentiations of the demand elasticity among countries being likely significant, the price discrimination strategies emphasize the variance of prices of each product;

The existence of price differentiations in each sector due to uncertainty is also foreseeable; as a matter of fact, large firms have less risk aversion and deal with more favorable contractual conditions which allow them to set smaller prices and/or to benefit from higher profits.

Although these results suggest that the industrial and trade policies led to the establishment of some inefficient firms in the export sectors, it must be mentioned that the consistency of the estimates is limited since we do not have enough information to determine whether the variance of profits is due to price variance (induced by uncertainty and product differentiation) or to cost asymmetries.

5 — Conclusions

Some indications suggest that exporters followed a price discrimination strategy, that is, they set different prices in the domestic and external markets. This was due to the export sector being strongly protected, both in the domestic market, and from competing imports and thus it faced different demand elasticities in both markets.

On the other hand, the growth in exports led to an increase in concentration and a decrease in average costs in the export sector.

Therefore, the impact on welfare resulting from export growth is not well determined. However, there is strong evidence supporting that the growth in exports had a negative social net benefit:

Discriminative strategies had negative effects on consumer surplus since there was a redistribution on behalf of domestic firms;

And the characteristics of the industrial and trade policies as well as the specialization pattern of the export sector restrained the potencial competitive effects arising from exports (market enlargment and increase of competition effects) on average costs.

Moreover, whichever the global impact on total surplus, it is important to explicit that exports growth lays stress on the trade-off between efficiency and equity. In fact, export sector growth occurred at the expense of a surplus transfer from all agents on behalf of export firms.

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