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IMPORT REPRESSION, PRODUCTIVITY SLOWDOWN,
AND MANUFACTURED EXPORT DYNAMISM:
BRAZIL, 1975-1990

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Import repression, productivity slowdown, and manufactured export dynamism: Brazil, 1975-1990

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ABSTRACT

This paper describes the changes in Brazilian outward orientation in light of the interactions between the trade and industrial policy framework and both the unstable macroeconomic environment and developments endogenous to the process of industrial growth and maturation. A discussion of determinants of competitiveness is conducted with particular emphasis devoted to macroeconomis issues involved in styles of development affecting openess.

SUMARIO

O ensaio descreve as mudanças na orientação internacional do Brasil à luz da interação entre, de um lado, o arcabouço de políticas industrial e de comércio exterior e, de outro, o ambiente macroeocnômico instável e fatores estruturais associados ao amadurecimento industrial brasileiro. Discute-se em detalhe os determinantes da competitividade brasileira com ênfase particular em questões macroeocnômicas envolvidas em estilos de desenvolvimento afetando o grau de abertura da economia

1. Introduction

The record of Brazilian industrial growth and structural change up to the late seventies, when looked at in a long run perspective, seems quite impressive. Between the end of World War II and 1980, industrial output in Brazil grew at an average rate near 8%, while world industrial production rose only close to 5%. Given Brazil's relatively large economic size, her share in total manufacturing value added of world market economies in 1980 reached 3.2%,the 6th largest manufacturing sector of the capitalist world[1].

This process of rapid industrial growth was far from being uniform over time, showing, as can be seen in Chart 1, a short interregnum of stagnation in the mid sixties and a fall in average growth rates in the wake of the first oil shock. However, following the second oil shock and the debt crisis, growth has dramatically stalled and, as Chart 1 also shows, since the early eighties industrial output has fluctuated widely around a stagnating trend.
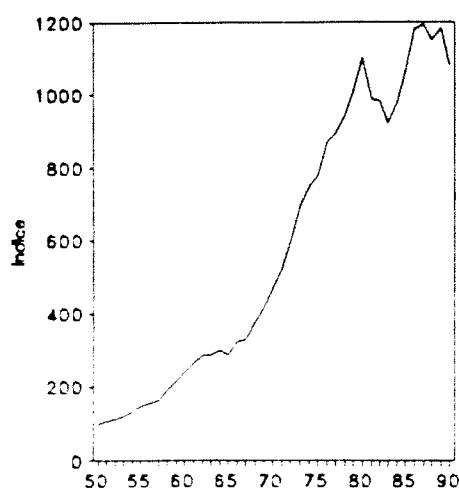
Chart 1. Industrial output
Source: Abreu (1989)

During these four decades, the contribution of the industrial sector to total value added changed significantly - industry's share in GDP rising from under

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[1] Cf. OECD (1988). According to this study, comparable figures for the G7 countries were 27.7% for the US, 14.3% for Japan, 11.7% for Germany, 7.2% for France, 3.0% for the UK, and 2.1% for Canada. Mexico's share was placed at 1.8% and Korea's, as Taiwan's, at 0.6%.

25% in the early post-war years to 35.5% in 1985 - replicating the classical patterns of transformation accompanying rapid economic development. Moreover, continuous structural change took placed within the manufacturing sector, increasing the weight of more capital and skill intensive intermediate and capital goods in total manufacturing value added, as can be seen in Table 1.

Table 1: Brazil
Distribution of value added in manufacturing, 1949-1980

	1949	1967	1975	1980	1985
Traditional sectors*	65.5	44.6	39.6	37.0	35.9
Non traditional sectors	34.5	55.4	60.4	63.0	64.1
Paper and pulp	2.1	2.9	2.5	3.0	2.9
Non-metallic minerals	7.4	5.2	6.2	5.8	4.2
Metalurgy	9.4	12.0	12.6	11.5	12.1
Chemicals†	4.7	10.9	16.7	18.7	21.1
Machinery	2.2	3.2	10.3	10.1	9.4
Electrical equipment	1.7	6.1	5.8	6.3	8.0
Transport equipment	2.3	10.5	6.3	7.6	6.4

* Includes wood and furniture, leather products, rubber products, textiles, clothing, footware, food products, beverages, tobacco, printing and publishing, miscellaneous. Perfumes, soap and candles included only in 1975 and 1980; for previous years are included in the chemicals group. † Includes chemicals, pharmaceuticals, and plastics for 1975 and 1980. For 1949 the figures reported are for pharmaceuticals only, presumably including other chemicals. Source: IBGE and Baer et al. (1987).

This process of industrial growth and structural transformation was also accompanied by marked changes in the trade regime and Brazilian manufacturing's tradeability. As Charts 2 e 3 illustrate, three periods can be clearly identified in this regard. The first, which lasts until the mid sixties, corresponds to the heiday of classical import substitution (IS) policies. It is
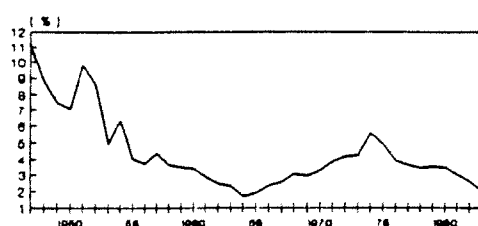

Chart 2. Ratio of imports to total supply in manufacturing, 1949-1985
(figures on constant 1949 prices. Source: Malan & Bonelli (1990)

marked by a ˙dramatic fall in import propensity and a stagnation of exports as a proportion of output in manufacturing, brought about by strongly import - and, implicity, export - repressive exchange rates. The second, which lasts until the

first oil shock, is a period of slow import liberalization but decisive export promotion and stable real exchange rates. As a result, there is a visible recovery in both import and export propensities. The third, which starts after the first oil shock and lasts to this date, is one in which there was a return to import repressive policies but this time accompanied by the reinforcement of export promotion mechanisms helped, periodically, by resort to aggressive real exchange devaluations. Thus, although manufactured imports fall again to an impressively low share of domestic supply, export propensities continue to rise.
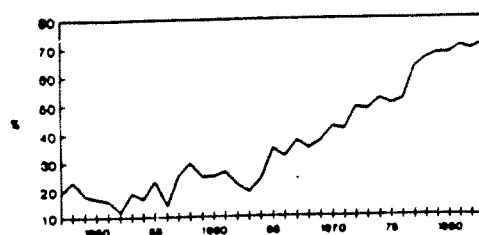

Chart 3. Ratio of exports of manufactures to total exports, 1949-1985 (figures on constant 1949 prices. Source: Malan & Bonelli (1990)

The aim of this paper is to describe this process of change and explain, with special emphasis on the post 1975 period, how the evolving trade and industrial policy framework interacted with both an unstable macroeconomic environment as well as with developments endogenous to the process of industrial growth and maturation to shape productivity growth and international competitivenesss in Brazilian manufacturing. It is divided in three sections, besides this Introduction. Section 2 briefly reviews the main "phases" in post-war Brazilian industrialisation indicated above, describes the evolution of the regulatory framework and discusses how it helped shaping some crucial features of industrial structure influencing competition and technological dynamism. Section 3 looks at the performance of the Brazilian manufacturing sector, assessing the record of international competitiveness and productivity growth and its determinants. Finally, section 4 attempts some generalizations in the light of the Brazilian experience, as to the relative importance of macro and microeconomic factors intervening in the relation between trade policy, tradeability, growth and macroeconomic instability.

2. The evolution of industrial structure and the regulatory framework

2.1) Phases in Brazilian industrial development[1]

A glance at Chart 1 reveals three long spurts of output growth, followed by a decade of instability and stagnation. These three spurts correspond, in fact to investment cycles of different character and motivation. The first, which lasts until the stagflation crisis of 1962-66, was mostly a response to incentives to domestic production created by foreign exchange shortages from the late forties, and corresponds to the classic import substitution industrialization pattern. The inducements to invest were mostly created by large cross sectoral differences in rates of return produced by the manipulation of exchange rates and commercial policy and, after the mid fifties, by explicit industrial promotion instruments notably public long term credit.

During this period the structure of industry was radically transformed: modern segments of consumer durables, the auto industry in particular, with important backward linkages with the mechanical and electrical equipment industries were installed together with a number of relevant branches of basic inputs and capital goods industries. This can indeed be seen in Table 1 by the increases in the shares of these industries - transport and electrical equipment, chemicals plus metallurgy and, to a lesser extent, machinery.

A crucial aspect of Brazilian industrialization in the classic ISI years was the increasingly important role played by foreign capital: from a handful of assembly plants in 1946, mostly installed during the interwar period, foreign controlled firms came to represent nearly 19% of total industrial capital by 1965[2] and occupying leading positions in several of the most dynamic sectors of manufacturing. The importance of foreign capital during this period had to do with an unusual combination of protection and a liberal treatment of foreign capital, two apparently contradictory policy stances explained by the continuous balance of payments problems brought about by grossly overvalued exchange rates. In this context, the maturation of investments associated to the "classic" ISI phase consolidated a reasonably integrated industry, for which the incentives

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[1] This section draws from Fritsch & Franco (1991).
[2] Cf. Malan & Bonelli (1976, p. 395).

available for import substituing production fostered industrial concentration in newer sectors, and a system of interindustrial links with great complementarities between firms with differentes patterns of ownership. The great concern with possible "enclaves" in the establishment of modern industries in Brazil led to the imposition of heavy requirements as regards national suppliers or downstream consumers, limiting vertical integration of MNCs.

The second investment spurt - the so-called Brazilian Economic Miracle of 1968-73 - was induced by the very rapid growth of industrial production - manufacturing output increased 130% in six years - with high rates of investment to a significant extent sustained by large government projects favouring capital goods and chemicals, again as seen in Table 1: these two sectors increased their joint share in Brazilian MVA from 14.1% in 1967 to 27% in 1975.

There was, however, a very significant difference in trade orientation of the manufacturing sector between the 1968-73 boom and the earlier IS oriented investment spurt in the 1950s and 1960s, stemming from more "realistic" exchage rates policies - a crawling peg regime being adopted since 1968 - and the enforcement of export promotion schemes. Brazilian exports of manufactures grew at the very impressive rates of 15.4% in constant dollars terms during 1965-70 and 26.7% during 1970-75[1], and the country was hailed by many liberalizers as a textbook example of successful trade reforms after the abandonment of the inward orientation of the 50s and 60s[2].

The period of the "Economic Miracle" was cut short by the first oil shock but, in spite of Brazil's heavy dependence on imported oil, the recessive effects of the price shock were short lived. The possibility of maintaining ample access to world capital markets made possible to finance large current account deficits and, thus, allowed the adoption of a structural adjustment strategy - the Second National Development Plan (PND II), announced in 1974 - marking the third expansionary cycle in Brazil's industrial growth in the post-war years.

As far as trade orientation is concerned, it marked a return to the strategy of import substitution, especially in basic inputs and capital goods, though now without the anti-export bias that characterized such policies in the fifties and sixties, especially because real exchange rate appreciations were avoided. There was less structural change in industry in this period, in the sense of changes in

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[1] World Bank (1983, p. 17).
[2] As, for example, in the classic study of J. Bhagwati (1978, p. 216).

shares of specific sectors in value added, but substantial modifications in trade propensities of different sectors could be observed. The overall picture in Table 2 is that of an uncommon combination of a further deepening of import substitution, but accompanied by increased tradeability, on the export side, in the same sectors in which import substitution was taking place.

Table 2: Brazil
Import and export coefficients, selected industries, 1974-1983 (%)
sectors targeted by PND-II indicated by •

	import coefficients					export coefficients				
	1974	1978	1981	1983	1985	1974	1978	1981	1983	1985
Total trade	10..6†	n a	8.7	8.4	6.7	7.0	n a	8.5	10.7	11.3
manufactures	11.2†	n a	5.3	4.8	4.9	7.4	n a	9.9	12.7	14.6
light manufts..	1.8†	n a	1.2	1.5	2.0	15.8	n a	17.7	22.1	26.7
heavy industry	11.1†	n a	4.8	3.9	3.6	2.2	n a	4.8	7.5	8.9
• paper & pulp	6.3	n a	3.2	3.4	3.1	2.1	n a	7.6	8.9	12.0
• steel	39.1	5.7	6.0	1.0	n a	2.2	5.4	13.9	37.8	n a
• ferroalloys	7.5	1.2	2.0	0.2	n a	20.1	36.5	45.6	60.4	n a
• refractories	25.3	4.8	14.9	5.1	n a	8.4	10.1	17.6	17.1	n a
Chemicals	11.7†	n a	5.6	5.1	4.8	2.4	4.8	6.5	7.9	n a
• caustic soda	53.1	6.5	1.8	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
• fertilizers[a]	60.4	44.1	30.3	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
• petrochemicals[b]	41.0	22.0	6.0	2.0	n.a.	1.9	4.9	14.6	12.2	n.a.
• petrochemicals[c]	14.0	11.0	0.4	0.6	n.a.	0.0	0.0	8.3	12.3	n.a.
• thermoplastic resins	35.2	22.0	2.0	1.0	n.a.	2.0	2.0	17.0	30.0	n.a.
• synthetic fibers	21.6	10.2	5.0	1.1	n.a.	1.3	2.2	12.3	9.6	n.a.
Non-metallic mins.	1.4†	n.a.	2.3	2.3	3.5	1.4	n.a.	2.3	2.3	3.5
• aluminum	50.4	26.3	12.0	2.3	n.a.	1.6	2.0	8.2	40.0	n.a.
• copper	72.2	80.0	79.2	40.4	n.a.	2.5	11.8	27.2	15.9	n.a.
• zinc	64.2	49.7	21.7	3.3	n.a.	0.0	0.1	10.6	1.9	n.a.
• silicon	94.2	0.5	0.0	0.0	n.a.	46.1	31.9	71.2	70.3	n.a.
Machinery	4.2†	n.a.	6.7	6.7	8.4	4.1	n.a	6.7	6.7	8.4
Transp. Material	9.3†	n.a.	6.7	8.3	7.9	5.3	n.a.	16.0	16.5	19.5
• capital goods[d]	39.8	37.9	37.1[e]	n.a.	n.a.	3.0	8.9	15.9	n.a.	n a
• capital goods[f]	27.0	20.5	24.9[e]	n.a.	na	7.0	14.3	23.1	n.a.	n a

† 1975. (a)average for nitrogen and phosphate based. (b)intermediate products. (c)basic products. (d)"on order". (e)1980. (f)"in series". Sources: United Nations, "International Trade Statistics Yearbook", vol. 1 and "National Accounts Statistics: Analysis of Main Aggregates", vol. 11. International Monetary Fund, "International Financial Statistics", Yearbook of 1988. The World Bank and Batista (1987, pp. 73-75).

The way in which Brazil's external balance was redressed after 1973 did, however, alter certain structural aspects of the country's relation with the international economy, increasing her vulnerability relative to external shocks. On the one hand, the government's reluctance in altering relative prices, or the availability of oil derivatives, the natural investment-production lags in oil prospection and extraction and the maintenance of high GDP growth rates,

combined to produce a 56% rise in the volume of oil imports and a fall of 7% in the share of domestic supplies in total consumption between 1973 and 1979, causing the share of oil in total imports to rise form 11.7% to 37.5% beween these two years. On the other hand, the quadrupling of the gross foreign debt between 1973 and 1979 - with almost 70% of debt contracted with private banks in the form of currency loans under floating interest rates - caused a serious deterioration in external indebtedness indicators, making the current account extremely sensitive to changes in dollar interest rates. This growing external vulnerability of the Brazilian economy would become clear from the second half of 1979 by a perverse combination of violent oil price and interest rate shocks which threw Brazilian economy into a decade of instability of output and near stagnation of productive capacity growth.

The initial response to the external shocks was an attempt to redress external equilibrium through the impact of a sudden and violent credit tightening on both domestic demand and foreing capital inflows, coupled with large exchange rate devaluations. This was implemented in late 1980 but the curtailment of foreign lending in mid-1982 made dcurrent account adjustment needs even more urgent and between 1982 and 1984 a current account deficit os 8% of GDP was turned into a small surplus.

Table 3
Brazil: Average Industrial Output Growth by User Sector
(in % per annum)

	1968/73	1974/80	1981/3	1984/6	1987	1988	1989	1990
Industry	13.3	6.9	-5.6	8.5	0.9	-3.2	3.2	-8.9
Interm. goods	14.0	8.3	-7.8	8.6	1.1	-2.1	2.7	-8.8
Capital goods	17.6	8.2	-17.8	16.3	-1.8	-2.1	0.5	-15.3
Consumer goods .Durable	24.7	7.9	-5.9	9.5	-5.4	0.7	2.5	-5.8
.Non-durable	9.6	4.9	0.4	6.2	1.6	-4.5	4.3	-5.4

Source: IPEA (1987), Table A.2.

The savage cut in domestic demand implemented between 1980 and 1983 had a devastating effect on industrial activity levels, especially so in the capital and durable consumer goods sectors, as shown in Table 3. In 1984, however, the impact of the rapid US recovery, further real exchange rate devaluation in 1983 and depressed domestic demand levels combined to boost Brazilian exports. Although export prices remained depressed, a 23% expansion in the volume of exports plus the impressive reduction of real imports started in 1982 - to a large

extent associated with the maturing of investment started before 1980 - eliminated the current account deficit. The stimulus given to aggregate demand by this sudden increase in net exports, coupled with the recovery of ublic investment, reversed the downward trend in activity levels, ending what was the severest Brazilian depression on record in the post-war period. By the end of the year, this unusual export-led industrial recovery had begun to trickle down to non-tradeables as employment and real wages rose.

The success in redressing external balance was not matched by success in reducing the rate of inflation which shot up during 1983 and was kept high by the inertial mechanims associated with widespread indexation. These problems would be exacerbated after 1985, the first year of a newly appointed civilian government, with the continuous deterioration of the fiscal accounts observed since. The progressive evolution of the fiscal deficit (operational concept) from an insignificant level in 1985 towards 10% of GDP at the end of 1990 favoured economic growth at first, as indeed verified in 1984-87, but led eventually to a fiscal crisis at the root of which lies the plunge into hyperinflation experienced by the Brazilian economy early in 1990. Starting in 1986 with the Cruzado Plan, several other "heterodox shocks" - that is, stabilization plans whose central aspect was a mandatory wage and prices freeze - would be implemented, all of which, including the fifth and most recent, the Collor plan 2 lauched in 1991, would fail to address the fiscal fundamentals of inflation and would produce but short lived reductions in inflation. No doubt ,the dismall growth performance verified after 1987 in Table 3, as well as the declining investment levels in manufacturing, may be directly associated with the extreme macroeconomic instabilitly verified since. In this context, enourmous political importance has been attributed to stabilization and, more specifically, to fiscal equilibrum. Yet, despite the committments of the Collor government, which took office in early 1990, along these lines, problems of political implementation have been crucial to block important initiatives towards fiscal reform. Meanwhile inflation persists in high levels where it is likely to remain until political conditions are engineered for a serious stabilization attempt.

2.2) The anti-competitive regulatory framework

As reviewed above, up to the crisis of the early eighties, Brazilian trade and industrialization policies followed classic IS policies where the main influence upon the sectoral pattern of resource allocation came from strong import protection. During this period, the classical interaction between inward looking policies and small market size relative to best-practice optimum scales led to high levels of concentration in almost all the new sectors from the outset[1]. The creation of a relatively stable oligopolistic structure was reinforced by the combination of (i) a high level of multinational penetration in response to restrictive import barriers coupled with relatively little interference in the FDI process; (ii) the creation of "national champions" by the special protection-*cum*-domestic subsidies treatment given to domestic firms in some import substitution projects and stimulated by the concern with the creation of industrial "enclaves" by vertically integrated MNCs afilliates; (iii) state ownership in sectors requiring large initial investment outlays, which created in fact monopolistic public enterprises[2].

In spite of the rapid growth and the progress of trade liberalization taking place between 1968 and 1973, the years since the first oil shock not only witnessed the return of high levels of import protection but also the consolidation of a regulatory framework which gave stability to the pre-existing non-contestable industrial structure[3]. This section describes the basic features of such regulatory framework now being reformed since 1990. Its mais features were: (i) a peculiar system of import protection relying mainly on QRs; (ii) active export promotion policies, which neutralized the strong distortions of the import regime; (iii) extensive domestic regulation with a clear pro-incumbent bias, reinforcing natural entry barriers, preventing exit by distressed firms and crystallizing market positions.

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[1] For a discussion of the dynamics of such a process, see Merhav (1971).

[2] For a more detailed discussion see Fristch & Franco (1990).

[3] As forcefully argued in The World Bank (1990) *passim* . Non-contestability is used here in the usual sense, namely, as an attribute of markets in which incumbents are not threatened by entry of potential competitors.

2.2.1) Import protection

As mentioned in section 1, the basic characteristics of the Brazilian import repression regime can be traced to the early post-war external shocks affecting the balance of payments position when, as in many other developing countries, policy makers revealed a preference for quantitative restrictions (QRs) and multiple exchange rates over tariffs and real devaluations under an unified exchange rate. During the late sixties, however, considerable progress was made towards a more balanced structure of incentives, by the introduction of export promotion schemes, exchange rate unification and the adoption of a crawling peg and, to a lesser extent, to import liberalization comprising the relaxation of QRs and further tariff cuts[1].

However, the oil shocks reinforced the traditional balance of payments rationale for the maintenance of generalized QRs. Through the late 1970s and 1980s, under the pressure of recurrent balance of payments stringencies, not only a large number of tariff itens had their importation forbiden, as the agency responsible for issuing import authorizations - CACEX - perfectioned the system of consultations with sectoral agencies and business associations, either in connection with the application of the "law of similars", or in an ad hoc basis. Sectoral agencies and regulatory bodies were delegated powers to forbid and authorize imports, though still subject to CACEX scrutiny, which gave them great leverage in project approval and in the definition of sectoral industrial policies, marking a significant diversification and decentralization of administrative obstacles to imports. By and large, local content requirements proliferated as conditionality for access to fiscal incentives, credit from official institutions and public procurement, thus forming an extraordinarily effective line of defense against imports.

As a corollary of this decentralization of import controls many "special import regimes" appeared. Importing firms that happened to bypass local content requirements invariably applied for tariff exemptions or reductions under such regimes, which were automaticaly granted by specific legislations, or on an ad-hoc basis by the Federal Tariff Commission. The nature of the "special regimes" is quite varied, comprising 42 different types in 1989, including exporters' imports, purshases of foodstuffs' buffer stocks, in addition to schemes administered by sectoral or regional agencies, state enterprises and ad hoc government bodies and

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[1] For an assessment of this liberalization episode see Coes (1991).

councils. In each special regime the exemptions of restrictive provisions on importing is varied: it may involve any combination of tariff reductions, waiver from the "law of similars", from submission of yearly "import programs" by firms, from external financing requirements and from negative lists[1]. As a result of the proliferation of such "special regimes", nearly two thirds of Brazilian imports entered the country in 1985 with tariff reductions or exemptions. An interesting consequence of this was the large difference between the legal tariffs and the ones effectively practiced, which can be gauged by calculating import tax revenues as a percentage of imports' value. In 1984, while the average tariff in manufacturing was 90.1% the "true" level was 19.1%, while effective rates of protection computed with legal tariffs reached 166% and with "true" tariffs only 34.5%. In 1989, when legal tariffs have been brought down to 49.4%, "true" tariffs, i. e. the effectively paid rate, stood at 8.3%.

2.2.2) Export promotion

The high levels of protection create a generalized anti-export bias which, in addition, displays a large dispersion[2]. Interestingly, however, this bias is offset in specific industries by export incentives that place such industries in a more or less neutral regime. In 1984, for instance, the aggregate value of all export incentives reached 48.7% of the FOB value of exports, 35.5% refering to rebates and exemptions of indirect taxes, 9.1% refering to benefits associated with draw-back operations and the rest (4.1%) produced by subsidized credit and income tax reductions[3]. Indeed, a positive and significant (rank) correlation was found between effective rates of protection and rates of export promotion (the value of sectoral incentives as proportion of sectoral exports) - 0.626 for 1973 and 0.723 for 1977[4] - suggesting therefore that export incentives were necessary to offset the prevailing structure of protection and thus a *sine qua non* to sustain export performance. This situation - high protection as a rule and high export subsidies as a glorified exception for exporters - is in itself a double distortion on the classic

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[1] "Import Programs" were required by CACEX to program the issue of licences through the year. External financing requirements applied to imports with unit values above a given ammount. For these imports external financing with maturities above a given length should be available, otherwise the importation would not be authorized. Negative lists were enforced by CACEX and by the Special Secretariat of Informatics. A detailed description of Brazilian QRs can be found in The World Bank (1989).

[2] Tyler (1983, p. 564).

[3] Neves & Moreira (1987, p. 484).

[4] Neves (1985, p. 67).

static sense calling, according to the canonical formulae, for a devaluation *cum* removal (or reduction) of export subsidies and tariffs. The traditional obstacle to this simplification of the trade regime has been the inflationary consequences of real devaluations.

Table 4
Exports and trade balance under Befiex and of foreign firms, 1972-89

| year | Befiex program | | | | | mnf. exports | % BEFIEX |
	program exports*	% of for. firms	trade balance*	contracts total	MNCs		
1972	2	100	-10	2	2	898	0.0
1973	70	100	-100	3	3	1,434	4.9
1974	212	100	-72	3	2	2,263	9.4
1975	335	100	63	4	3	2,584	12.9
1976	456	98.5	174	11	4	2,776	16.4
1977	655	90.2	348	5	3	3,840	17.0
1978	865	88.4	222	10	5	5,083	17.0
1979	1,119	82.2	646	16	3	6,645	16.8
1980	1,793	74.3	1,068	35	12	9,928	17.9
1981	2,581	77.5	1,188	35	4	11,884	21.7
1982	2,343	70.6	1,031	79	25	10,253	22.4
1983	2,935	60.6	2,110	25	7	11,276	24.8
1984	3,872	58.0	2,865	44	11	15,102	26.1
1985	4,851	54.2	3,603	44	15	14,062	35.5
1986	5,128	n.a.	4,405	n.a.	n.a.	12,386	41.4
1987	7,629	n.a.	6,912	n.a.	n.a.	14,831	51.4
1988	9,573	n.a.	8,714	n.a.	n.a.	19,902	48.1
1989	8,979	n.a.	8,119	n.a.	n.a.	19,594	48.3

Sources: Neves & Moreira (1987, tables 5,7 , and 8) and Gazeta Mercantil, May 25th, 1990. † the sample includes all exporting firms with foreign control. * Millions of dollars.

An important instrument conceived to by-pass the structure of protection was the BEFIEX program. It consisted basically in allowing tax exemptions on imports and the full clearance of "similarity" examinations for inputs and capital goods in exchange for export commitments assumed by importers never below the double of the value of allowed imports. The commitments are drawn in multi-year contracts that, initially, were mostly signed by MNCs afilliates. Over the years the program has turned into a "mechanism through which national firms seek to reduce import taxes on capital goods imports and to circumvent "similarity" examinations"[1], i. e. a scheme through which exporting firms could get accesss to imports without which competitiveness would not obtain and that would be otherwise unreacheable. The program's effectiveness can be assessed by the fact that, as seen Table 4, exports under the program increased more than tenfold from 1974 to 1981, and fourfold during 1982-89. This resulted in a fourfold

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[1] Matesco (1988a, pp. 15-16).

increase in the trade balance under the program from 1978 to 1980, and another sevenfold increase from 1982 to 1989. The share of MNCs in the program's exports fell significantly after the mid 1970s, and the program's share in manufactured exports increased from16% in 1975-79, to 23% in 1980-84 (aproximately 3% of imports), reaching slightly over 50% in 1987, where it remained since[1]. The experience clearly suggests that a binding element in export oriented projects is the very restrictive structure of protection in operation.

2.2.3) Industrial policy

The basic features of the framework of incentives and regulations created in the late fifties were refined and consolidated during the very active policies followed from the late 1960s and, especially, in the 1970s, as a response to the perceived structural balance of payments problems created by the oil price rise, as part of PND-II. Among these features it is apt to emphasize: (i) the pervasiveness of fiscal incentives granted in credits by the state development bank BNDES and directly by some government bodies; (ii) regulation enhancing non-contestability of markets, particularly the direct investment licensing limitations imposed by sectoral or regional bodies or by the mechanism of "sectoral agreements" coordinated by the price control authority (CIP)[2]; and (iii) most importantly, the imposition of local content requirements (indices de nacionalização) by BNDES - defined as the ratio between local cost components and total cost of a given product[3] - as a requirement for the accesss to its lines of subsidized credits for acquisition of capital goods, and by other government bodies and state enterprises especially in the context of public procurement contracts[4]. A 1988 decree would actually turn local content requirements enforceable in the

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[1] Neves & Moreira (1987, p. 7) and Gazeta Mercantil, 25/5/90.

[2] On price control as a device to enforce entry barriers see Fritsch & Franco (1989b).

[3] In some cases imports are considered at CIF values sometimes not, and the ratios sometimes are computed in terms of weight, depending on the demanding agency.

[4] For capital goods more generally, the acess to FINAME credits - available to buyers of such goods at BNDES - depends on having the product registered in a FINAME listing with a pre-determined local content requirement ranging between 70% and 85%. On the informatics industry local content requirements are imposed by SEI at very high levels - over 90%. Interestingly, local content requirements are enforced on the consumer electronics industry located at the Manaos Free Zone at substantially lower ratios - around 30% - which was accepted by the industry as a quid-pro-quo for the permission not to export more than 10% of their output.

production of all goods receiving any form of subsidy, purshased by any public body or receiving any sort of financing from official institutions[1].

Table 5 provides a rough picture of the incidence of these dispositions.

Table 5
Regulation and promotion schemes in Brazilian Manufacturing, 1989

sector/ subsector	nature of regulation	local content requir.	price controls	nature of incentives
Metal products	H	–	L	H (fiscal and credit)
(steel, rolled flats)	H (cap. licensing)	–	H	H
Machinery	H (access to Finame)	H (Finame, PSE)	L	H (fiscal and credit)
(made to order)	H (access to Finame and PSE)	H (Finame and particip. agreem.)	L	H (fiscal, credit and procurement)
Electric equipment	M	H-M	M-L	H (fiscal and credit)
(telecomm. equip)	H (access to PSE)	H (PSE)	L	H (fiscal, credit and procurement)
(informatics products)	M (cap. licensing)	H (SEI)	L	M
(consumer electronics)	M (cap. licensing)	L (SUFRAMA)	M	M (fiscal)
Transport equip.				
(shipbuilding)	H (cap. licensing and access to PSE)	H-M (PSE)	L	H (fiscal, credit and procurement)
(aircraft)	M (access to PSE)	L	L	H (fiscal and procurement)
(cars, trucks, buses)	M (conditionality on incentives)	H (CDI)	H	H (fiscal)
(railway material)	M (access to PSE)	–	L	H (fiscal, credit and procurement)
Chemicals	M (conditionality on incentives)	H (CDI)	H	M (fiscal and credit)
(petrochemicals)	H (cap. licensing and conditionality on incentives)	H (CDI)	H	M (fiscal, credit and import prices)
(Camaçari petrochemical complex)	H (idem)	H (CDI)	H	M (idem plus income tax exemption)
Pharmaceuticals	M (access to govt. market)	M	H	H (fiscal and procurement)
Non-metallic min.	L	–	H-M	L
(cement)	H (conditionality on incentives)	L	H	H (fiscal)
Paper products	M (conditionality on incentives)	M (CDI)	M	M (fiscal and credit)
Traditional†	L	L	M-H	L

The qualifications H high, M medium and L low, applies to the extent of government regulation (including barriers to entry, capacity limitations, conditionality on the access to incentives and others); to the magnitude of requirements of local content (indication is provided on the source of the requirement); to the extent of price controls; and to the magnitude of incentive available (with an indication of the nature of the incentive). † Comprises wood & furniture, rubber, leather and plastic products, perfumes and soaps, textiles and cloathing, food and beverages, tobacco, printing and publishing and

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[1] Art. 16, Decree 2433, May 19, 1988.

miscelaneous. There are exceptions to qualifications relative to regulation (wheat milling)
and incentives (wheat milling, textiles and paper & printing)
Source: Based on The World Bank (1990, pp. 24-25).

Note that regulation is generally light in traditional industries, except for price controls in sensitive products and on specific segments. Wheat milling, for example, is subject to capacity regulation enforced through the rationing of imported wheat. Intermediaries are largely subject to price controls, given their weight in wholesale price indexes, there resulting high entry barriers and constant complaints as regard anti-competitive practices, as in the archetypal case of the cement industry.

In many industries the key source of regulation as regards productive capacity expansion and "adequate" levels of minimum domestic content was the project evaluation activity carried out by CDI, which was created in 1969 and extinct in 1988. The Council also played an important role in coordination the action of other key bodies such as the BNDES, some large industrial public enterprises and CPA, which decided about the concession of trade-related tax exemptions on imported inputs. Although the amount of resources discretionarily granted as benefits under industrial promotion schemes was substantial - amounting to between 0.5% to 0.8% of GDP in the early 1980s[1] - the bulk of these investment incentives were concentrated in a few targeted capital intensive intermediaries: chemicals and pharmaceuticals represented 43.1% of investments made under CDI, and non-metallic goods including paper and cement, responded for 34.2%[2]. In consequence these sectors were subject, as shown in the table, to stringent local content requirements. In segments such as heavy (made-to-order) capital goods, electrical equipment and transport equipment procurement rules on the part of public enterprises are the key source of local content requirements. The importance of local content requirement as import restriction device for capital goods and parts cannot be underestimated: the share in manufactured value added of industries in the table subject to some degree of local content requirement is slightly over 50%, an astonishing figure (the more so as one notes that it corresponds to modern industries) that have crucial implications as regards the conduct of trade policy and more particularly as regards the process of liberalization to be implemented in the 1990s.

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[1] The World Bank (1990).

[2] Though together these two groups represented only 37% of the projects approved by CDI. Cf. The World Bank (1990, p. 41).

3. Brazilian competitiveness

The very large degree of trade and industrial regulation and government interference with the competitive process described in the previous section was surely an important supporting element in the formative years of Brazilian industry. Notwithstanding, it seems to have had a fundamental negative impact on entrepreneurial behaviour and industry efficiency, as it rewarded rent seeking and inhibited managerial awareness of the strategic importance of the acquisition of technological capability. This shortcoming became particulary relevant at a time when there are very rapid changes in the post-war technological paradigm upon which Brazilian industrial capability was built, and when continued manufactured export dynamism rests fundamentally on technological upgrading. For this reason the reforms now being undertaken in Brazilian trade and industrial policies tend to place industrial deregulation and competition policy - including, prominently, trade liberalization - in a privileged place.

However, the relation between the competitive regime and technological dynamism cannot be settled on the grounds of a *priori* , theoretical, arguments. To probe into such essentially empirical question this section develops two parallel, though by no means unrelated, efforts: (i) to investigate the determinants of export performance; and (ii) to study the behavior and, as far as it may be, to discuss the determinants of productivity growth.

3.1) The sources of export growth in manufacturing

A crucial feature of the evolution of Brazilian competitiveness indices confirmed by available studies[1] is that the improvement is uniformly observed throughout the last two decades, the recession and devaluations of the early 1980s having, therefore, only reinforced long term trends. This section treats macro and microeconomic determinants of Brazilian competitiveness in manufacturing, the operation of which is not mutually exclusive, in two separate sub-sections. The first subsection deals with macroeconomic influences on trade performance, namely exchange rate policy, as well as fluctuations in domestic and external demand. It also devotes some attention to the impact of export incentives

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[1] See Nonnemberg (1990)

and of mechanism to by-pass the very heavy structure of protection in force. The next sub-section considers determinants of competitiveness associated with market structure as well as with policies and environmental conditions favouring learning and technological innovation.

3.1.1) Macroeconomic and policy factors in competitiveness

A 1983 survey[1] of the extensive econometric work linking the behavior of aggregate manufactured exports to macroeconomic variables covering the 1960s and 1970s would reveal that, despite the richness of methodological details, the essential elements of these exercises were very similar: a *quantum* index for manufactured exports, or their value at constant dollars, was regressed against variables such as real exchange rates (adjusting for subsidies and tax incentives so as to interpret it as exporters' returns), world demand, and cyclical influences usually defined as deviations from a productive capacity variable (often potencial output). The more recent work uses a supply and demand specification and the results for price and world income elasticities of export demand, as well as price and domestic demand elasticity of export supply have displayed a fair amount of consistency, as shown in Table 6.

Table 6

Long run manufactured export elasticities:

price	domestic demand	foreign demand	author	period#
manufactured export supply				
1.04*	-2.5*	...	Cardoso & Dornbush (1980)	1960-77 A
1.19*	-2.1*	...	Markwald (1981)	1964-80 A
2.64	-4.5	...	Braga & Markwald (1983)	1959-81 A
1.10*	-1.3*	...	Rios (1986)	1964-84 A
1.39*	-1.6*	...	Zini (1988)	1970-86 Q
manufactured export demand				
-0.68	...	2.53*	Lemgruber (1976)	1965-74 A
-1.12	...	2.19*	Pinto (1983)	1954-75 A
-2.82	...	2.59*	Braga & Markwald (1983)	1959-81 A
-1.38*	...	2.31*	Rios (1986)	1964-84 A
-0.31	...	4.92	Zini (1988)	1970-86 Q
total export supply				
0.91	-1.0	...	Zini (1988)	1970-86 Q
total export demand				
-0.17	...	0.75	Khan (1974)	1951-69 A
-0.41*	...	1.97*	Lemgruber (1976)	1965-74 A
-0.95	...	2.89*	Zini (1988)	1970-86 Q

* significant at 5%. # A stands for annual and Q for quarterly data.. Source: Zini (1988, p. 650)

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[1] Braga & Markwald (1983).

According to the table, manufactured exports supply price elasticities are slightly above one, and domestic demand was found to be an important negative influence on Brazilian exports, asserting a clear "vent-for-surplus" logic in Brazilian exports, a result to be expected for a country with a large domestic market and in which exports represent a marginal activity for most exporting firms. Estimates of manufactured export demand price elasticities are less homogeneous than the others, ranging from -0.31 to -2.82. Income elasticities of manufactured exports demand, on the other hand, seem to be significantly greater than two, a very high value. The estimates for elasticities of total exports are much lower than the ones for manufacturing in all categories.

The interpretation of these exercises' involve some important issues. The influence of structural factors affecting export performance is not made explicit as these equations generally include only deviations from potencial output, in order to capture the "vent-for-surplus" effect, so that productive capacity increases in exporting industries, which are the result of the operation of structural factors, become hidden. A superficial reading of this literature would tend to associate export growth with domestic recessions thus conveying the impression of a contradiction between the export led and domestic market led growth.

On the price side it is important to distinguish between the effects of exchange rate policies and of export subsidies, and most arguments emphasizing "artificial" competitiveness underline the weight of the latter. In this connection it was already shown that the value of export incentives in effect in Brazil from the late 1970s on was very substantial, which constantly raises the concern with the fiscal costs of export promotion[1]. Yet, the important point to observe is that, for a country in which the rate of effective protection is very high, the anti export bias would be generally very high if not offset by export promotion schemes attempting to place exporters on a more or less neutral regime. Direct tax incentives are, thus, important to neutralize protection, as well as import-to-export" schemes, such as the BEFIEX which, as discussed above, played such an important role in manufactured exports growth.

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[1] Concerns have also been voiced on the possibility that benefits were distributed on a regressive fashion. Braga (1981)

3.1.2) Structural influences

The debate about "structural" elements liklely to explain the evolution of competitiveness over time, has centered upon the relative importance of "endogenous" mechanisms related to learning-by-doing and scale economies accompanying the process of "maturation" of predominantly national firms in manufacturing[1] and "exogenous" influences mostly affecting trade propensities of established foreign affiliates through processes of globalization and rationalization of activities within MNCs[2]. The importance usually attached to "endogenous" elements has been reinforced by the recent proeminence of the so called "new trade theories" which devote great emphasis to the role of industrial organization features in creating competitiveness. More specifically, most models along these lines suggest an association between increases in size, or in rents connected to industrial concentration, or even to protection and "market reserves", to greater efficiency either through scale economies, learning-by-doing or R & D investment[3]. Yet, this deterministic neo-Shumpeterian connection between size and competitiveness (efficiency) is very much open to question on empirical grounds[4]. Besides, the empirical association between industrial organization features, including the trade regime, and competitiveness is not a clear cut one[5].

The empirical literature addressing the relation between export performance and industrial organization features for the Brazilian case has devoted great attention to the connection between export performance, firm size (or concentration), and foreign ownership. In either case, however, the methods used in controlling for other influences, or to purge multicolinearity problems from cross-section regressions, are crucial to assert the existence of any meaningful connection. The first entries in this literature uses a 1978 income tax database including 15,122 reporting firms from which Braga (1981) sought to

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[1] As hipothesized, for example, in Teitel & Toumi (1986).

[2] As explored, for example, by Fritsch & Franco (1992a).

[3] Examples are Krugman (1984) and Rodrik (1992).

[4] For a survey see Scherer (1984).

[5] "There is no clear cut confirmation of the hypothesis that countries with an external orientation benefit from greater growth in technical efficiency in the component sectors of manufacturing; combined with the relatively small static costs of protection, this finding leaves those with a predilection towards a neutral regime in a quandary", cf. Pack (forthcoming, p. 38). Indeed, the fact that the empirical arguments for defending export promotion vis-à-vis import substitution on the grounds of technical efficiency are simply not there, was even admitted by Bhagwati (1988, pp. 39-40). For a more recent discussionreafirming these results see Tybout (1990).

investigate the distribution of export incentives according to firm size, ownership and regional location. It was found that incentives were appropriated mostly by larger firms, MNCs afilliates (whose share of incentives was found to be larger than that of exports) and richer regions, but the multicolinearity problems involved were by no means controlled.

This same data were used by CEPAL (1983) to assert the lack of difference in export propensities between national and foreign firms, both directly and through a comparison using the matched pairs methodology. The procedure was heavily criticized for it did not control for firm size[1], a problem that was not present in Braga & Guimarães (1986), who used an enlarged version of the same data set, to run regressions of export propensities on variables like industrial concentration, scale economies, capacity utilization, foreign ownership, tradeability (proxied by geographical dispersion of production within the country), capital intensity, export incentives and R & D intensity. The study reaffirmed the relation found in earlier studies of macroeconomic nature mentioned in the last sub-section between export performance and incentives and domestic demand. The study also confirmed the expected positive relation between export performance and firm size variables - concentration, scale economies and R & D intensity - but failed to identify a significant influence of foreign ownership on export performance. However, a serious shortcoming in the identification of foreign firms in the 1978 data set resulted in a very significant underestimation of their presence in Brazilian industry[2] turning, evidently, the conclusions of the studies mentioned above, especially when involving foreign ownership, quite questionable.

A more recent study - Willmore (1985) - using the same 1978 data set, but properly identifying foreign firms, conducted an extensive comparison of national and foreign firms using the methodology of matched pairs with results substantially different from the ones of early studies. Among several important differences between national and foreign firms it was found that the latter exported a much larger proportion of their output than national firms of the same size even though they do not receive a larger share of export incentives. In another study, Willmore used a sample of 17,053 firms in manufacturing for

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[1] Willmore (1985. p. 620).

[2] Firms controlled by holdings established in Brazil but controlled by foreign residents were considered national firms. See Willmore (1985, pp. 624-625).

1980^1, 652 of which foreign, resposible for approximately 3/4 of all manufactured exports. He estimated a recursive model in which the probability of a firm being an exporter is estimated through logit equations and then export perfomance of exporters is explained. The main findings are summarized in Table 7.

Table 7
Export performance and industrial organization, 1980

independent variable	regressions	
	Prob. of being an exporter	exports
constant#	-32.15	18.66
foreign ownership##	1.32**	0.51**
state ownership	-0.76	0.25
R & D intensity (RD expen. % sales)	0.06	0.26
Product differentiation†	28.17**	11.20**
Average wage	-0.09	-0.30**
Capital intensity††	-0.07**	0.29**
Vertical integration@	-0.69**	-0.88**
Size (value added)	2.53**	-1.09**
Size (value added) squared	-0.04**	0.06**
Tradeability@@	1.53**	...
Nominal protection	-0.44	...
Effective protection	0.12	...
R2 (adjusted)	...	0.412
degrees of freedom	...	3,584

** significant at 1%. # weighted averaged intercepts. ## foreign ownership defined as foreign equity share greater than 10%. †advertising intensity. †† Non wage value added per worker in the first equation and fixed assets per worker in the second equation. @ value added to gross output ratio. @@ geographical concentration of firms.
Source: Willmore (1987, pp. 315-318).

According to the table, foreign ownership and product differentiation are significant positive influences both on the probability of being an exporter and on export performance. Interestingly, foreign ownership increases the odds of exporting by 3.75 (the anti-log of 1.32) times. The average wage, a proxy for skill intensity, is a weak influence on being an exporter and a negative influence on export performance. Capital intensity has negative impact on the odds of exporting, but once the firm is an exporter, it appears with a positive sign. Vertical integration have a strong negative influence on both counts, while concentration, which is omitted in the table, is not significantly different from zero on both equations. Nominal protection appear with a negative sign, as expected, an effective protection with a positive sign[2]. Finally, the influence of

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[1] Whose combined exports represented 74% of Brazilian manufactured exports.

[2] Note that holding the price of the final product constant, an increase in the EPR means a reduction in the price of intermediate inputs, which is equivalent to a production subsidy

firm size is a complex one. Its influence is positive on the odds of exporting over the relevant size range, though regarding export performance its influence is negative when the firm is below the average size and positive when is above. Interestingly, however, the coefficient for size in the second equation is not significantly different from one, this meaning the absence of correlation between export propensity (exports/output) and size.

To sum up, the evidence seems to underline the positive influence of foreign ownership, or "exogenous" determinants operating through foreign firms, on export performance. Regarding other features of industrial organization the evidence is clear on the positive influence of product differentation and negative influence of vertical integration on export performance. As regards the precise nature of the relation between size, and other firm characteristic or market structure features, on the one hand, and technological strategies, and how the latter evolve into export performance, or more generally into productivity growth, on the otehr, the mechanisms are much less clear. Between the rather general and exceedingly deterministic nature of models of the "New Trade Theory" type and the rather specific nature of firm case studies of successful technological acquisition[1] there is vast unexplored territory for meaningful explanations.

3.2) The sources of productivity growth in manufacturing

Last section discussed the importance of macroeconomic, regulation induced and industrial organization (structural) related factors to export behavior. Presumably, these same factors should appear as determinants of yet another important aspect of firm performance, namely, productivity growth, which is the subject of this section. The empirical literature in this area, however, has been, by and large, devoted to measurement efforts, which are, by its own nature, rather complex. This section compares the available estimates of TFP growth for Brazil in the last decades and considers industrial organization influences over productivity growth, emphasizing the role of trade orientation.

The measurement of productivity growth is plagued with methodological and statistical problems[2], witness the dispersion of estimates generally seen in this literature. The work related to Brazil, summarized in Chart 4, is no exception.

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given by the capacity to by-pass the structure of protection, presumably, by a special import regime.

[1] See Katz (1984) for a review.
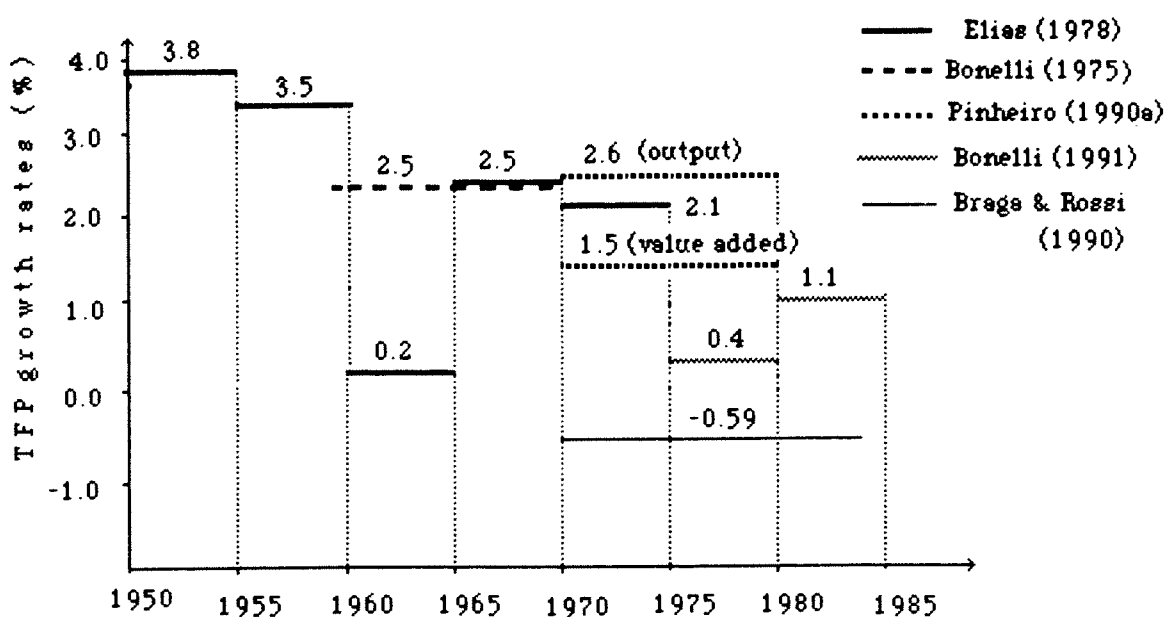
[2] For a review see Tybout (1990).

Chart 4: Estimates of TFP growth, 1950-1985

Differences between the several estimates may surely be expected given the variety of methodologies and data bases employed by each author. In these conditions the comparison between the estimates should be taken with a grain of salt. The magnitude of inconsistencies may be very significant for some periods. Note, for example, that for 1960-65, when Brazil experienced a very sharp recession, a contrast is observed between the estimates of Bonelli (1975) - 2.5% for 1959-70 - and the ones of Elias (1978) - 0.2% for 1960-65 - the latter small figure apparently consistent to Verdoorn's Law, given growth decelleration in the first half of the 1960s. For the late sixties and early seventies some estimates seem to point towards positive rates between 2.1% and 2.6%[1]. Interestingly, Pinheiro (1990a) reports a lower rate for the 1970s computing residuals from factor contributions to value added[2]. Braga & Rossi's finding - a negative rate of 0.59% for 1970-83[3] - signals a sharp slowdown which, although probably

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[1] Pinheiro (1990a, p. 21) derives alternative estimates by using different measures for the inputs of labor and capital, obtaining numbers between 1.2% and 3.1%.

[2] Alternative estimates obtained through different measures for the inputs of labor and capital, are between -1.2% and 2.7%.

[3] The adequacy of the data base used by Braga & Rossi has been seriously questioned. Interestingly, in this connection, one of the authors in another paper, Braga & Hickman (1990), using the same data base, reports sectoral TFP growth rates, defined as residuals on

exaggerated, seems to be confirmed by the low level of the more recent estimates of Bonelli, though not by the same extent. The graph appears to reveal a productivity slowdown from the late 1970s, which might be explained growth decelleration, though this influence should be controlled in order to assess the precise relation between TFP growth and increased competitiveness and outward orientation since the second half of the 1970s.

The contribution of TFP growth to Brazilian economic growth, compared to that of other NICs and Japan and USA, is pictured in Table 12 below. Note that Brazilian TFP growth performance is far superior to that of other countries, except for Korea. Interestingly, for all countries in the table, with the exception of Thailand, positive correlations were found between sectoral rates of growth and TFP growth, though only in three cases this correlation was significant at 5% and in other three cases at 10%. The Brazilian experience, to judge from the comparison between the two estimates listed in the table, appears also to be consistent with Verdoon's Law since the growth decelleration from 1970-80 to 1975-85 brings a proportional decrease in TFP growth that reduces only slightly its contribution to economic growth, from 20% to 17%.

Table 8
Sources of manufacturing output growth, several countries

country/period	output growth	TFP growth	weighted contributions				
			TFP	inputs	labor	capital	energy
Brazil (1970-80)†	13.0	2.6	20.0	45.3	5.0	27.9	1.2
Brazil (1975-85)††	4.4	0.8	17.0	45.0	4.0	34.0	...
Korea (1960-77)	17.9	3.7	20.7	57.3	2.6	19.5	...
Singapure (1970-80)	8.3	0.1	1.0	54.9	9.7	30.1	3.3
Mexico (1970-80)	7.4	0.7	10.0	51.0	10.0	29.0	...
Thailand (1963-76)	16.4	0.7	4.2	63.4	6.2	26.2	...
Turkey (1963-76)	10.7	1.3	12.4	52.3	5.1	30.2	...
Yugoslavia (1965-78)	9.8	0.5	4.9	80.2	6.9	8.0	...
Japan (1955-73)	11.6	2.0	17.6	63.3	6.0	13.0	...
USA (1949-79)	3.8	0.5	13.6	64.7	10.9	10.9	...

Sources: Pinheiro (1990a, p. 23) and Bonelli (1991, p. 17).

The sources of productivity growth, or the role of industrial organization features and, more especifically, trade orientation, have been a hotly debated issue as of late, and a concern of the recent work of Pinheiro (1990a and 1990b) and Bonelli (1991). Both authors, in this respect, reproduce a cross section version of the exercise performed in Nishimizu & Robinson (1986) whereby

value added growth, which, averaged using 1980 weights in value added, would indicate a positive rate of growth of TFP of 4.91%.

sectoral TFP growth rates are regressed against export induced (EXP) and import substitution induced (IS) sectoral growth rates. The results are shown below:

TFP GROWTH = 0.30 + 0.55. EXP + 0.80. IS $R2 = 0.59$ DW = 1.43
(1975-85)   (1.01)   (2.13)   (2.05)

TFP GROWTH = 2.85 - 0.01. EXP + 0.34. IS $R2 = 0.07$
(1970-80)   (-0.06)   (1.54)

The first equation brings the interesting finding is that both export induced and import substitution induced output growth affect TFP growth positively, a result that seems consistent with the notion of "efficient" import substitution that was suggested in section 2 and that, according to the author, "confirm the simple version of Verdoorn's Law, which implies that any expansion of the market, regardless of source, improves productivity performance"[1]. The second equation, which is referred to an earlier period brings the heterodox result that import substitution affects productivity positively and export induced expansion the opposite. More important, however, is to note that none of the coefficients were significant which may have to do with the fact that, in the 1970s, by far the main source of demand for manufacturing was the domestic market. According to Pinheiro (1990a, p. 30) domestic demand explains 83.4% of manufacturing demand growth in the seventies, with export expansion contributing with 14.0% and import substitution with 2.6%. It may reflect the fact that, particularly in the early seventies, growth was more or less balanced, without further significant import substitution efforts and export demand making a small contribution to growth, despite its dynamism, given its reduced order of magnitude. In the second half of the seventies one sees much more significant efforts of import substitution, which materialises into the eighties. These efforts meant, however, a small contribution to growth given the already small import coefficients Brazil had reached in the late seventies. Export expansion, on the other hand, raised significantly its contribution to demand growth reaching nearly a quarter of overall growth in 1975-85, considering total output growth. Within manufacturing the picture is even more impressive, as seen in Table 9.

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[1] Bonelli (1991, pp. 31-32).

Table 9
Brazil: sources of manufacturing demand growth, 1970-85

	weight in value added	consumption expansion	investment expansion	export expansion	import substitution
memo: total output	...	83.4	...	14.0	2.6
total manufacturing	100.0	47.5	4.4	33.6	15.0
"heavy"	34.6	31.6	7.8	45.3	15.5
. non metalic minerals	5.7	20.0	28.0	41.0	12.0
. metalurgy	11.8	12.0	4.0	57.0	27.0
. pulp and paper	2.7	37.0	2.0	48.0	13.0
. chemicals	14.5	51.0	4.0	37.0	8.0
"high tech"	26.1	28.8	0.9	36.8	32.9
. mecanic. equip.	10.2	14.0	0.0	25.0	62.0
. electric and comunic. equip	7.0	41.0	4.0	31.0	24.0
. transport material	7.6	21.0	-1.0	62.0	15.0
. pharmaceuticals	1.6	111.0	2.0	17.0	-30.0
"light"	39.2	72.9	3.8	21.2	2.4
. wood and furniture	4.4	27.0	17.0	48.0	8.0
. rubber	1.4	44.0	2.0	45.0	10.0
. leather	0.5	36.0	0.0	67.0	-4.0
. soaps and perfums	0.9	86.0	0.0	10.0	5.0
. plastics	2.3	47.0	9.0	36.0	7.0
. textiles	6.2	60.0	1.0	36.0	3.0
. clothing and footwear	4.7	79.0	0.0	19.0	1.0
. food	11.7	110.0	3.0	-6.0	-6.0
. beverages	1.3	80.0	1.0	12.0	7.0
. tobacco	0.8	56.0	0.0	42.0	2.0
. printing and publishing	2.5	64.0	2.0	24.0	11.0
. miscelaneous	2.7	55.0	1.0	32.0	13.0

Source: Bonelli (1991, p. 25).

According to the table both import substitution and export expansion were considerably more important in manufacturing than for total output, especially the latter. Export expansion represented 45.3% of demand expansion in heavy industries and 36.8% in high tech industries, which is consistent to the increase in export propensities observed in these industries and documented in Table 7. In "light" industries the contribution of export expansion was more modest, 21.2%, though still significant. Import substitution was mostly conducted in the high tech group and, within it, in mechanical equipment. In broad terms, the table reafirm the impression of a growing outward orientation, especially in more sophisticated segments of manufacturing, though starting from a situation in which export orientation was a marginal activity at most. With the growing importance of exporting, the question to be asked refers to the relation between TFP growth and outward orientation, in the presence of other industrial

organization influences over TFP growth. Indications along these lines are provided by the regressions in Table 10.

Table 10
Brazil: TFP growth, trade orientation and industrial organization , 1970-80
(t values in parentheses)

independent variable	regressions			
	1	2	3	4
constant	1.848	2.462	...	...
change in export propensities	0.447	0.390	0.493	0.503
	(2.31)	(1.99)	(3.12)	(3.20)
change in import propensity (inputs)	...	0.082	-0.023	...
		(3.25)	(-0.80)	
royalties as % of profits†	0.556	1.304	1.038	1.029
	(0.62)	(1.47)	(1.40)	(1.39)
imports as % of investment†	0.022	0.016	0.012	0.011
	(1.39)	(0.99)	(0.86)	(0.79)
import propensity for inputs††	0.068	...	...	0.024
	(3.68)			(1.01)
average firm size (growth rate)	...	...	0.299	0.274
			(4.97)	(4.56)
% of skilled workers on employm't†	...	...	0.189	0.051
			(1.52)	(0.35)
industrial concentration†	...	...	0.032	0.025
			(2.56)	(2.03)
relative TFP growth*	...	...	0.050	0.051
			(2.99)	(3.07)
establishment age##	...	...	-0.034	-0.039
			(-1.12)	(-1.27)
investment as % of capital stock#	...	...	5.914	4.726
			(2.20)	(1.95)
R squared	0.249	0.222	0.554	0.556
Degrees of freedom	75	75	69	69

† 1970. †† 1980. # average 1970-1980. * TFP growth as % of the highest TFP rate of growth in the sample. ## share of output of establishments founded in the five years preceding the two censuses, i. e. 1970 and 1980. Source: Pinheiro (1990a).

These regressions were run with industrial censuses data for 1970 and 1980 considering a three digit classification, thus resulting in 112 different sectors. The table considers three sorts of variables: (i) the ones related to trade performance, from which the increased commitment to exporting appears to be the most important influence on TFP growth, lending support to the "orthodox" connection between exporting and efficiency; (ii) those associated with investment and growth, from which firm growth and investment rate are positive

and highly significant, according to what one would expect from Verdoorn's Law; and (iii) those related to industrial organization features. Industrial concentration is a positive significant influence, though small, which confirms, for what it is worth, the neo-Shumpeterian connection between non-contestable markets and innovation. As for the establishment age, a proxy for learning, the regression shows a negative sign.

The main tone of the results is that the key influence on TFP is given by growth and investment, i. e. the nexus normally associated with Verdorn's Law. The influence of the trade regime, as well as the one of industrial organization variables, tend to be much weaker than growth related variables. Nevertheless it is possible to see that greater trade involvement appears to affect TFP positively, as well as industrial concentration - though not controlling for foreign ownership.

4. Conclusions: developent models for "whale" countries

This paper attempted to provide an assessment of interrelations between trade policy and performance. It was intented to consider specifically to show that policy's influence on performance works through the modifications it entails into an industrial structure of historically given characteristics and within which the competitive process has certain well defined features. In addition, macroeconomic factors provide a framework in which firm level decisions are made, thus affecting sometimes quite importantly the outcome of otherwise microeconomic processes. With these terms of reference we offered an extensive review of the highly interventionist Brazilian trade and industrial policies and argued that such actions were crucial to shape the formation of Brazilian industry. In order to assess more specifically the role of trade and industrial policies on performance we reviewed three lines of research: (i) macroeconomic and policy variables affecting export performance since the 1970s; (ii) cross sectional econometric work relating industrial organization features and export performance, and (iii) factors affecting TFP growth. The conclusions emerging from these reviews, especially when considered together, are quite revealing. Export equations show the importance of macro variables, especially the domestic and foreign levels of activity, in governing export performance in a country like Brazil, large and relatively closed. Price variables, i. e. exchange rate and incentives, are shown to be important influences, though it seems clear that sectorially differentiated

incentives had a clear role of offsetting the detrimental effects of the structure of protection on competitiveness. Cross sectional and more sector specific evidence tend to confirm the importance of incentives and other mechanisms, such as, for instance, the BEFIEX program, to by-pass the negative influence of the structure of protection. In addition, cross sectional evidence could not resolve neo-Schumpeterien claims that firm size improve competitiveness, especially when foreign ownership was controlled for. The significance of factors like product differenciation tend to offer little guidance for policy activism. In reality, no clear cut stories of maturation emerge from this work.

The empirical work on the sources of productivity growth provide a synthetic view of these issues. One may group together three sorts of considerations on TFP growth - macro factors, industrial structure features and the trade regime (or trade involvement related indicators) - and evaluate their relative importance. The key finding in this connection was the overwhelming importance of macro factors vis-à-vis the others, which brings the challenging suggestion that the trade regime and industrial policies may be but of secondary importance as determinants of productivity growth especially during high growth episodes. Indeed, Brazilian TFP growth during the 1970s (2.6%) is second only to Korea's 3.7%, despite (or on top of !) other influences produced by prevailing trade and industrial competition regimes. When growth collapses, so does TFP growth, apparently confirming the Verdorn's Law nexus and leading to the provocative conclusion that the policy agenda should be more specifically geared towards restoring growth than to reforming the trade and industrial competition regime. Though this should not be taken as an argument for the irrelevance of reforming the opaque and distortive import regime then prevailing in Brazil, it may serve to reduce often found illusions as to the effects of trade policy reforms.

However, these conclusions regarding the overwhelming importance of the macroeconomy in governing efficiency and TFP growth can hardly be generalized. Country size is a very specific feature of the Brazilian economy on which such conclusions seem to rest quite fundamentally. But, in one way or the other, it offers an explanation for good trade and productivity performance that rids one both from the association between highly interventionist policies and good performance , so dear to Brazilian policy-makers, as well as from the liberal view that the move towards neutrality after the mid 1960s produced export growth in the 1970s. There is much more, therefore, to both extremes of the ideological spectrum.

As already mentioned, once one accepts the Verdorn's nexus alluded above as a crucial element in the explanation of Brazilian competitiveness, one is led to a macroeconomic theory for the decline of productivity and competitiveness whose key element is the growing macroeconomic instability verified in the second half of the 1980s. But could the latter be associated in some degree to the trade and industrial policies adopted in the years before ? An interesting line of response is that such policies defined a model of development and, in particular, a number of structural features that enhanced external vulnerability to the kind of shock that happened in succession in the early 1980s. In this connection, it is interesting to bring the much debated contrast between models of development, especially regarding openess, of East Asia and Latin America. Given that a cool look at trade and industrial policies pursued would hardly reveal much contrast between, say, Brazil and Korea[1], the puzzle can be redefined as why (some) East Asians did well after 1982 and some Latin American countries, like Brazil, plunged into hyperinflations and protracted recessions ?

The suggested answer to the puzzle is an unexpected one: trade openess. For many years reduced openess was sought in Latin America as a means to reduce external vulnerability. Indeed, the comon sense argument that high openess as such[2] increased vulnerability can be found in historians of Latin American experience under the classical gold standard, and has been repeatedly raised as a justification for inward oriented industrialization, or for "autonomous" growth paths. History, on the other hand, repeatedly reported the same paradox: low openess and high vulnerability, the tail wagging the dog and not otherwise. Interestingly, after import substitution projects in the 1974 adjustment plan (PND-II) were taken to its ultimate consequences, the Brazilian economy reached self-sufficiency, or a degree of import penetration as low as feasible (4.5%). Accorrding to the old structuralist argument, external vulnerability should no longer be there. But, alas, the next external shock in 1982 hit as hard as ever. The challenging proposition, in this connection, would be that , in the presence of high levels of external indebtedness, low trade openess increased external vulnerability, not otherwise.

In order to illustrate this proposition consider the following exercise: take two equally indebted countries in terms of their debt to GDP ratios, so that, in

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[1] See review of Pack & Westphall (1984).

[2] In addition to factors like commodity and geographical concentration of exports.

response to the 1982 crisis, both of which are to produce a trade surplus of enormous proportions, say, 6% of GDP. Now consider that one of these countries is large and fairly closed, having, before the shock, export's (equal toimport 's) shares of GDP in 7%. Call this a "whale" country and the other, with import and export shares equal to 30%, a "tiger". Let us further assume unit export supply and import demand elasticities with respect to the real exchange rate. In these conditions it is easily seen that the "whale" country, to reduce import shares to 4% of GDP and increase export shares to 10% of GDP would need to undertake a real devaluation of 44%, while the "tiger" country, to reduce the import share to 27% of GDP and raise the export share to 33% of GDP, would have to devalue by only 10%. No doubt, the large the required real devaluation (or required reduction in domestic activity levels) the larger macroeconomic instability is likely to be. This is quite obviously a stylized simplification, though the actual figures for Brazil and Korea in Table 11 below fit quite well this picture.

Table 11
Brazil and Korea, comparative macroeconomic indicators

	BRAZIL	KOREA
Real effective exchange. rates		
(1980-81=100)	143	112
GDP in 1985 (1980=100)	117	137
Inflation in 1985	226%	2.5%
Openess: in 1980/81		
exports to GDP	7%	38%
imports to GDP	7%	36%
Debt/GDP (1983/4)	46%	53%
Debt service/exports (1983/4)	44%	19%

SOURCES: Collins & Park (1989), Cardoso & Fishlow (1989)

The similarity of debt to GDP ratios and the discrepancy in openess observed in Table 11 are very much in line with what was suggested in the above exercise. The difference in the debt service ratio stems quite directly from the difference in openess. The differences in real devaluations are strikingly similar to the ones assumed in the exercise, and the fact that Brazil grew much less and exhibted a much higher inflation seem to confirm the basics of the "whale" vs. "tiger" exercise: openess helped external adjustment and not otherwise. It should also be noted that, not suffering a liquidity crisis by virtue of her higher trade openess, Korea was also able to sustain higher growth rates which enormously helped effecting the distributive adjustments needed to increase domestic savings so as to sustain a higher long term growth path.

The fact that Brazil was indeed a closed economy and thus especially vulnerable to the 1982 crisis should not, however, be seen, as recently put, as "a reflection of a God-given fact, but of the policy option to pursue a largely inward oriented, import substituting, development strategy during most of the post-World War period"[1]. If anything, the key lesson of the 1980s for a "whale" country is that biological transformation should be sought, i. e. increasing openess should be seen as desirable and as a crucial element to secure the capacity to insulate growth from external shocks. Thus, to secure competitiveness and productivity growth, trade liberalization makes sense as a policy proposition, though for reasons somewhat diverse from the microeconomic ones normally used to justify it, i.e as a means to enhance macroeconomic stability. To believe in this, however, means to support the current drive towards liberalization throughout Latin America, though for reasons diverse from the ones normally used to justify it. That means, in addition, that we may rethink liberalization issues - timing, sequencing, biases, etc. - in a new light. This is, however, a task for further research.

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[1] Bianchi (1987, p. 196).

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