Industrialization, trade and market failures: the role of government intervention in Brazil*

Mauricio Mesquita Moreira**

Summary: 1. Introduction; 2. The "unintentional" industrialization: the pre-1956 period; 3. Heavy industry "at all costs": the 1956-64 period; 4. The pragmatic "miracle": the 1964-73 period; 5. Heavy industry revisited: the 1974-79 period; 6. The dismal decade: the 1980s; 7. Conclusion.

The results of Brazil's industrialization are mixed and controversial. Neoclassicals credit the good results to the export-oriented, hands-off periods of the government's policy, and the bad ones to those when import substitution (IS) and intervention prevailed. Structuralists, in turn, emphasize the role of IS in overcoming supply inelasticities, and attribute the bad results to macroeconomic failures. This paper seeks to show that even though trade orientation, excessive government intervention and macroeconomic mismanagement seemed to have mattered, the key to the mixed results lies on the government's inept policies towards key market failures.

A disparidade dos resultados da industrialização brasileira abre espaço para controvérsias acerca de sua eficiência e sucesso. Neoclássicos creditam os bons resultados aos períodos de política econômica liberal e de incentivo às exportações. Já os autores de tradição estruturalista procuram dar ênfase ao papel da substituição de importações na eliminação de inelasticidades de oferta, atribuindo os maus resultados a problemas de gestão macroeconômica. Este artigo procura argumentar que apesar de o grau de abertura, a excessiva intervenção governamental e as falhas na gestão macroeconômica terem sido problemas relevantes, o fator predominante parece ter-se materializado na incompetência governamental em remediar importantes falhas nos mercados de produtos e fatores.

1. Introduction

The results of nearly a century of industrialization in Brazil are an open invitation to controversy. A writer keen on painting a rosy picture could, for instance, draw attention to its exceptional growth record, which until the 1980s compared favourably with most LDCs. He could also point out that Brazil has a large and diversified manufacturing sector, whose value-added ranked seven in the world in 1988; and whose export performance over 1965-80 reached East Asian standards. Yet, it would not be difficult to paint a gloomy picture either. Industrialization was accompanied by rising inflation, by the build-up of the external debt and by the worsening of the income distribution. By 1980, the signs of serious resource misallocation were all too obvious, with 35.4 percent of the workforce underemployed (Wells, 1987, p. 96). To complete the picture, in the 1980s output and manufactured export growth fell sharply to well below the LDC's average.

This sort of disparate results has been generally associated in the literature with an inward-oriented policy regime with lapses of outward orientation. Rather unsurprisingly, neoclassicals credit the good results to the allegedly export-oriented, hands-off periods of the government's policy, and the bad ones to those when import substitution (IS) and selec-

* Paper received in Sept. 1st, 1993 and approved in Apr. 15, 1994.
** From Universidade Federal do Rio de Janeiro.

tive intervention prevailed. The arguments are well known. Outward-orientation would have led, *inter alia*, to better resource allocation, economies of scale and technological dynamism. Conversely, IS and its selective policies would have, *inter alia*, distorted resource allocation, hampered exports, and promoted oligopolistic markets, rent-seek behaviour and technological backwardness.

Structuralists, in turn, emphasize the role of IS in building a diversified industrial structure, in overcoming supply inelasticities, and in boosting growth. It is acknowledged that the IS hurts exports, but the bad results, particularly of the 1980s, would have *come from the side of macroeconomic failure, not a debilitating sectoral misallocation*, as Fishlow (1990, p. 66) put it. Sceptical of export-promotion strategies, they argue that the State has failed to back up IS with sound fiscal and monetary policies.

Although there are merits in these interpretations, they both have important drawbacks. Neoclassicals correctly draw attention to the benefits of a more open economy, but underestimate the market failures facing the Brazilian government. On the other hand, structuralists rightly point out that, given the market failures, government intervention was vital. However, they do not address the point that under an inward-oriented regime, the diagnosing and correction of market failures was far from satisfactory, leading to often misguided and wholesale government interventions. This, in turn, set the stage for much of the macroeconomic failures.

All things considered, this paper seeks to show that the mixed results of Brazil's industrialization can be better understood if we focus on the role of government in overcoming market failures. The underlying assumption is that the degree of industrialization success in LDCs varies in direct proportion to the efficiency with which the government has tackled imperfections in product — externalities and static and dynamic economies of scale — and factor markets — externalities and informational related failures.[1] The analysis is divided into five sections, broadly reflecting the evolution of the government's policies towards industrialization. That is, the minimalist government of the pre-1956 period, the 1956-63 IS strategy; the pseudo-neoclassical revolution of 1964-73; the neo-IS strategy during 1974-79; and the complete lack of direction of the 1980s.

2. The "unintentional" industrialization: the pre-1956 period

When the first significant surge of manufacturing investment took place in the 1890s, Brazil could be described as an open, export-oriented and agricultural-based economy, with its trade-GDP ratio standing roughly at 28 percent. At that time, agriculture accounted for 56 percent of GDP, whereas industry (12 percent of GDP) consisted mostly of small establishments in the textile and food sectors. Manufactured exports were virtually inexistent, with coffee accounting for as much as 60 percent of total exports (IBGE, 1990).

Half a century later, though, the picture was somewhat different. The industry's share of GDP had climbed to 30 percent and the manufacturing-import ratio had dropped from 45 percent to an amazing 10 percent. Yet, Brazil's industrial structure was still shallow and lacking diversification. The share of the so-called heavy industries was only 35 percent and

[1] For a detailed analysis of the most important market failures that affect industrialization in LDCs, see Moreira (1994) and Lall (1992).

coffee still accounted for 60 percent of total exports.[2] Overall, the economy had significantly reduced its dependence on foreign trade, halving the trade-GDP ratio to around 7 percent. To use a cliché, Brazil had completed in mid-1950s the IS easy stage.

The government's role in this first phase of the industrialization is a matter of controversy, but most authors seem to agree that, whatever it was, it has changed markedly after the Great Depression. It makes sense, then, to look at these two periods — pre and post-Great Depression — separately.

Before the Great Depression

The dominant view in the literature is that the government's role in the first steps of Brazil's industrialization was minimal, or to put it differently, that industrialization was the result of relative price changes provoked by external shocks, and/or the product of linkages between the coffee and manufacturing sectors.[3] No doubt, this perception seems to square with the liberal rhetoric of the first Republican governments and their agrarian political base.[4] The fly in the ointment, though, are evidences suggesting, first, that tariffs were anything but low, and second, that the State has granted incentives and subsidies, notably, to the heavy industry.

Table 1, for instance, shows a significant, if not monotonic, increase in the actual tariff rates since the independence, to levels that cannot be outright dismissed as negligible. Other incentives seem to have included tariff exemptions for capital good imports, a law of similar (1890) which prohibited tariff exemptions for goods produced domestically, and loans and profit-guarantees for heavy industries.

Table 1
Brazil's actual tariff rates* — 1823-1955 (%)

1823-32	1833-82	1893-1902	1903-12	1913-22	1923-32	1933-42	1943-50	1951-55
10.0	27.2	24.0	28.0	36.0	37.0	23.0	7.0	5.6

* Tariff revenue divided by total imports. Arithmetic average.
Source: Silva, G. A. A reforma aduaneira no Brasil. *Estudos Aduaneiros*. Esaf, Brasília (11), 1983, as quoted by Machado (1990).

However, these evidences are played down on the grounds that they do not prove that the government was systematically pursuing industrialization, nor that the measures taken were effective. Much ammunition is spent on tariffs whose main purpose is thought to have been fiscal, and whose impact is believed to have been limited given that they were specific, and tended to be offset by international prices and exchange rate fluctuations. As to the other incentives, the claim is that they were not used in a systematic fashion, and had more of a *de jure* than a *de facto* existence (Suzigan, 1984).

---

[2] Moreira (op. cit.). All statistics quoted in this paper, unless stated otherwise, were taken from Moreira (op. cit.).

[3] For an excellent review see Suzigan (1984).

[4] The Republic was proclaimed in 1889, overthrowing the monarchy which had ruled since the independence from Portugal in 1822.

Strong as these arguments may be, it seems difficult to deny that relative price changes received a valuable, if modest, assistance of government's incentives. Particularly if one takes into account that productivity in the light industry was apparently well below the international frontier.[5] The long arm of coincidence would have to be stretched too far to explain why the first spurts of manufacturing investment occurred only after quasi-free-trade agreements with Portugal and England had expired.[6] This does not imply, however, that State was developmental. In fact, the limited service that it rendered industry by raising tariffs and giving incentives appears to have been more than offset by its inaction regarding market failures in the financial markets, infrastructure, education and science and technology (S&T).

Over the period, the financial sector remained basically geared to cater for the coffee-export sector, and there was virtually no source of long-term credit for manufacturing. The government played an important role in expanding the infrastructure, yet, as these investments were mainly targeted to serve the coffee-export sector (concentrated in the South-East), they neither provided industry with access to a unified national market, nor with an adequate energy supply. As to education, despite being free and compulsory, the share of total population enrolled in school in 1930 (6.3 percent) was well below the already dismal Latin America's average (8 percent) (Albert, 1983, p. 38). Finally, government action in the area of S&T did not go beyond a few specialized institutions in the engineering and biomedical fields, with virtually no links with industry.

After the Great Depression

In the post-1930 period, the government's hand became more visible, but the main targets were balance of payment (BP) adjustment and full employment, and not industrialization. Most accounts give trade policies the pride of place. In fact, these policies took the classical contours of an IS strategy. Instead of pursuing an orthodox BP-adjustment with exchange rate devaluation and fiscal-cum-monetary contraction, the government opted for a different package that included the former but not the latter.[7] Given the size of the foreign exchange gap, this policy mix had to be complemented by foreign exchange and import controls. The success of this strategy in adjusting the BP, boosting growth and promoting manufacturing investment left a permanent mark in Brazilian policymakers. From then on, import and foreign exchange controls would be a key element of the government's policies whatever the incumbents' ideological colours.

During 1930-55, import and exchange rate controls took different forms and were combined with different exchange rate policies, gradually becoming more favourable to industry. Customs tariffs were left playing second fiddle. These policies are seen to have helped industry in two main ways. First, by restricting import competition, particularly to the light industry, allowing local firms not only to survive and learn, but also to grow ahead of

---

[5] According to Clark, W. Cotton goods in Latin America, Part II. 1910 (Department of Commerce Special Agents Serie, 36), quoted in Fishlow (1972. p. 18), labour productivity in the Brazilian textile-cotton industry was in 1910 between 50 to 30 percent below that of the US.

[6] The last trade agreement expired in 1844. According to this agreement, the tariff rates on English products could not exceed 15 percent. See Machado (1990) for details.

[7] See Furtado (1963) and Villela & Suzigan (1973) for details.

income through IS. Second, by subsidizing imports of capital goods and raw material with a highly overvalued exchange rate.[8] The changes in the import structure — with the consumption goods' share falling from 21 to 10 percent over 1930-55 —, the already mentioned abrupt decline in the import ratio, and the annual growth rate of 8.4 percent for manufacturing output (1930-55) all tend to support these arguments.[9]

However, the cost involved were no less visible. One could mention, for instance, the much-heralded rent-seeking and static costs of protection. These costs, however, can be said to have been attenuated, first, by the fact that the light industries remained dominant, very much in line with Brazil's factor endowment. Second, because the introduction, in 1953, of an auction system for import licenses, reduced the opportunity for rent seeking. And third, because the welfare gains associated with rapid growth have probably made up for the consumer loss. More damaging losses were inflicted on two other interrelated issues, i.e., the industry's efficiency and the external balance.

Economic theory has already shown that the replacement of tariffs for non-tariff barriers (NTBs) leads to non-competitive behaviour, aggravating the infant industry problems of X-inefficiency and endless-learning periods. The experience of countries like Korea, however, also suggests that these problems can be largely avoided, and monopolistic behaviour even turned into a positive factor, if protection is made conditional on export performance, forcing firms into the international market (Moreira, op. cit.). In Brazil, during 1930-55, competition from imports was totally removed but nothing was put in place to push firms down the learning curve. Firms had, then, incentives to fill the gaps left by imports, but little incentive to increase efficiency given the technologically poor domestic competition.

With the wrong set of incentives, the manufacturing-export ratio collapsed from 9 to 2.3 percent over 1907-49, and in 1955 this figure must have been even lower, given that during 1950-55 manufacturing output has outperformed manufactured exports by a large margin. This lack of incentives also led to a BP increasingly dependent on coffee exports, and therefore exposed to the vagaries of a very unstable market.

These trade policy distortions were aggravated by the government's belated and unsatisfactory response to the industry's growing requirements for infrastructure, financing and human capital. It was not until the early 1950s that effective steps were taken to tackle some of these market failures. An exception to this rule was the State's direct intervention in the production of intermediary goods in the late 1930s. Although this move had little to do with an industrialization strategy — it was prompted mainly by military reasons related to World War II — and was carried out only when the State had run out of private options, it would later prove to be economically sound.

But going back to the industry's needs, the State's actions in the area of infrastructure were hampered by a government torn between the virtues of public and private investments, and ending up with the worst of both worlds. Key sectors such as electric power and telecommunications were in private hands (mainly foreign companies), but were regulated by state and municipal governments that constantly imposed unrealistic rates. The result was low and uncoordinated investments. On the other hand, services that had passed to public hands (e.g. railways) tended to suffer from the lack of long-term planning and the State's

---

[8] See Furtado (1963) and Fishlow (1972).

[9] Moreira (1994). All growth rates in this study, unless stated otherwise, are average real annual rates, computed using the least-squares method.

inadequate financial and fiscal base. It was only in the early fifties that a clear option for public sector investments emerged, with key State enterprises (SEs) being created, particularly in the energy sector (oil and electric power). Major investments, however, would only begin in 1956.

On the financial side there was little progress, if at all. Government intervention, to a certain extent, was more of a hindrance than a help. For instance, the development of the financial sector was considerably delayed by the ill-conceived usury law (1933), which limited the maximum rate of interest to an annual rate of 12 percent. This, coupled with inflation averaging 13 percent annually over 1940-55, led the financial sector to shrink exactly when rapid industrialization was demanding the opposite. As a result, industry ended up without both long-term financing and short-term funds for working capital. Without proper credit, and with a negligible stock market, firms had to increasingly rely on internal finance, whose limits were pushed by constant, increasingly elusive, attempts to raise mark-ups. In this endeavour, firms were helped not only by the trade policy but also by a lax monetary policy.

This disastrous intervention contrasted sharply with a more positive, if timid, move to provide industry with long-term loans. This came in 1952, with the establishment of a development bank (National Development Bank — BNDE). Industry, however, had to wait until the mid-1950s to benefit from a significant share of its loans (most of them went for infrastructure), and even then the lion's share went to the government-owned heavy industries.

Finally, S&T and education continued not to figure among the government's priorities even though important, if uncoordinated, steps were taken in the area of higher education and training (World Bank, 1979). Overall, though, no substantial improvement appears to have occurred. As of 1950, 50 percent of the population were still illiterate.

3. Heavy industry "at all costs": the 1956-64 period

As shown, more than half a century of unintentional and inward looking industrialization had good results in terms of growth but gave rise to an industry of dubious quality, suffering from distorted incentives and burdened by serious bottlenecks in infrastructure, financing and human capital. However, it was not until the mid-1950s that industrialization became part of the government's agenda.

This event was marked by the Targets Plan (T plan) — 1956-61. Inspired by Ecla's structuralism, the plan was nothing more than a collection of five-year targets for output and investment in infrastructure and heavy industry (Lessa, 1982). It was not accompanied by any significant institutional change. Even though a National Development Council, with the initial purpose of acting as a central planning agency, was set up in 1956, it was soon fragmented into several sectoral agencies, the so-called *executive groups*.

These weaknesses were compounded by an inhospitable macroeconomic environment, marked by a two digit inflation — reflecting the high GDP growth (8 percent in 1955) and the lack of proper funding for investments — and a worrying BP situation — the result of an erratic export performance, a rising debt-service and falling terms of trade. In order to circumvent these constraints, the government went again for an eclectic policy mix, still dominated by trade and exchange rate policies, but this time other important ingredients were added, i.e., foreign capital and an a greater role for the State in infrastructure, intermediary goods and in the financial sector.

The government policies

Beginning with trade and exchange rate policies, there was little change in the dual purpose of avoiding a BP crisis and promoting IS. The aim to deepen the industrial structure, though, meant that import controls were extended to most of the heavy industry. As a result, all manufacturing sectors were given very high effective tariffs (table A.1), with the structure of protection reflecting *essentially* rather than comparative advantages. As before, the effective purchase-power-parity (PPP) exchange rate for imports continued to be substantially higher than that of exports.

This now traditional policy, though, was not enough to keep the plan afloat. Given the import intensity, and the capital and technological requirements of the heavy industry, a new element had to be brought in, i.e., foreign capital. To this end, the government reformed the already liberal legislation, dropping the remaining restrictions and offering lavish incentives.[10] Foreign capital responded quickly, with the annual inflows increasing threefold in the first years of the plan.

The third prong of the government's strategy involved, as noted earlier, an increase in the State's role in infrastructure, intermediary goods and financial sector. The public sector's share of the gross fixed capital formation rose from 26 to 33 percent over the 1947-55 and 1956-64 periods, led by SEs' investments in the steel industry and infrastructure. Likewise, the public sector's share of total loans went up from 26 (1951-55) to 36 percent (1956-63), whereas as a lender, its share rose from 48 to 57 percent over the same period (Sumoc, various years).

This expanded State presence in the financial sector did little to remedy capital market failures. Much of it reflected the inadequacy of the public sector's financing schemes. Despite its ambitious targets, the plan was short of specifics on how investments would be financed, and arrangements were virtually limited to the set up of various earmarked fiscal funds, placed under BNDE control. Even though this move, combined with the possibility of issuing foreign-loan guarantees, significantly increased BNDE resources, it proved to be thoroughly inadequate to the public and private sector's financial needs.[11]

In the case of the public sector, the lack of adequate financing was compounded by the SEs' unrealistic pricing policy, part of an ill-advised attempt by the government to control the rising inflation. As an increase in the national debt was not a viable option (the usury law made government bonds with positive returns an impossibility), the gap in the public sector's finances was almost entirely financed by monetary expansion (Sochaczewski, 1980).

As to the private sector, whereas foreign firms had access to foreign loans at preferential exchange rates, local firms continued to have problems in arranging long-term financing, due to their diminished creditworthiness. The BNDE's loans and guarantees were of little help since they were meagre and mostly directed towards the public sector. Local private firms (LPFs) continued, then, to resort to auto-finance via higher mark-ups, an option favoured by the lax monetary policy, but that became increasingly inefficient as inflation accelerated towards 30 percent in the late 1950s. Moreover, the supply of short-term funds was further restricted by the combination of high inflation with negative interest rates.[12]

---

[10] See Abreu (1990, p. 101) and Guimarães et al. (1982, appendix A.)

[11] BNDE loans over 1956-64 averaged 2.2 percent of the gross fixed capital formation (Moreira, op. cit.).

[12] In real terms, outstanding domestic loans to the private sector remained stagnant over 1956-61, despite a twofold increase of GDP (Sumoc, various years).

Assessing the results

At first sight, the plan's overall results point to a remarkable success. Most of the targets, either in infrastructure or manufacturing, were met within a reasonable margin of error (Lessa, 1982). GDP and manufacturing output grew at annual average rates of 9.4 percent and 12 percent (1955-61), respectively. IS was successfully carried further down the road, notably in the heavy industry, whose import ratio reached 9 percent in 1964, and whose share of total manufacturing output rose from 35 to 48 percent (1955-65). Yet, the plan's main goal — a speedy move into the heavy industry — can be seriously questioned if the options involved, and the results achieved, are examined more carefully.

One can begin by arguing that in the mid-1950s there was hardly a sound case for a massive move into heavy industry. Looking first from a static viewpoint, Brazil was far from any Lewisian turning point as suggested by falling unit labour costs.[13] Factor prices, therefore, were suggesting that resource allocation would be improved not by widespread targeting of heavy industries, but by giving light industry the right incentives and financial means to *grow* and sell in the international market. Instead, as we have seen, not only exports continued to be discriminated, but the light industry received only 2.6 percent of the total BNDE manufacturing loans. As a result, both manufacturing employment growth and its elasticity were halved at a time when almost half of the work force was underemployed (table 2).

Table 2
Brazil's manufacturing employment elasticities — 1939-84[1]

1939-49	1949-59	1959-70	1970-75	1975-80	1970-80	1980-84
0.6 (4.7)	0.3 (2.9)	0.6(4.0)	1.0 (11.7)	0.8 (5.2)	0.9(7.3)	1.2 (-3.5)

[1]Total employment growth divided by real output growth. Compound annual rates until 1970 and ordinary least square rates thereafter. Numbers in parenthesis are manufacturing employment growth.
Source: IBGE, 1990.

From a dynamic and, say, strategic perspective, it is true that a move towards the heavy industry was justified, first, because of dynamic economies, particularly in technologically mature sectors, and second because of the human capital slipovers, higher productivity and above-the-average-cost profits, usually associated with this industry. However, to take full advantage of these benefits, any attempt in this direction would have to allow for the limitations of the existing resource endowment, and for the market failures and imperfections that affect competition in this industry. This, not only to prevent benefits being offset by excessive resources misallocation, in the static sense, but also to give LPFs realistic chances to grow and compete.

Yet, as shown, the government overlooked all these considerations. Despite Brazil's poor capital and human capital resources, several sectors were targeted at once. Notwithstanding, the "lumpiness", long-term maturation, and economies of scale that mark investment in this industry, very little was done to centralize capital, either through the stock market or banking credit, and an excessive number of producers was allowed in. Despite the obvious limitations of the domestic market, backward integration, through domestic content

[13] Unit labour costs fell by 7 percent between 1949 and 1959. See Moreira (op. cit.)

incentives, was excessively pursued. And finally, notwithstanding the industry's high technological and skill requirements, improvements in the S&T infrastructure and education remained out of the government's agenda. It was as if all these constraints and preconditions could have been quickly overcome by a large inflow of FDI. True enough, the targets were met and manufacturing growth was high, yet the costs seemed to have been too high.

Even though the analysis of FDI costs and benefits tends to be controversial, there seems to be a rare consensus in the literature regarding the inapplicability of the infant industry argument to TNC affiliates (e.g. Graham, 1991, and Westphal, 1982). Even though these firms also face a learning curve and generate externalities, their unrestricted access to capital and technology in the international market does not make them legitimate candidates for protection. The more so if one takes into account, first, that their access to parent company technology tends to exclude the *know why* from their contribution to domestic technological capabilities (Lall, 1992); second, that foreign ownership invalidates the welfare gains related to the *profit-shifting* argument (Brander, 1986); and third, that their protection is hardly compatible with that of those who really need to "mature", i.e., the LPFs.

Therefore, even though heavy reliance on protected FDI allowed the government to ignore the local constraints and the LPFs' human capital and financial needs, it ended up compromising much of the potential dynamic benefits involved in a heavy industry push. In fact, by taking this short cut, the government created a situation where, on the one hand, the local firms were thoroughly exposed to the imperfect competition of the affiliates, and, despite the highly protected internal market, they had largely to settle for marginal or subcontractor positions, when not driven out of the market. And, on the other, the combination of high domestic prices and lax investment licensing led to the so-called "crowd in" effect. An inefficient industrial structure was then built — oversized *vis-à-vis* the domestic market but with most of the plants below the international minimal efficient scale (MES) — heavily dependent on permanent protection, even though most of the heavy industry sectors were either led or totally dominated by the most efficient producers of the world.

4. The pragmatic "miracle": the 1964-73 period

It was not long before Brazil had to pay the price for the shortcomings of the government's first conscious attempt to promote industrialization. The lack of proper financing and the trade bias led to high inflation and a BP crisis, which coupled with the polarization of the political situation resulted eventually in a military coup, in 1964. A new team of neoclassical policymakers, then, took over the command of the economy.

The new team set out to implement comprehensive institutional and policy reforms aimed at restoring "the supremacy of the price mechanism". In practice, as we shall see, theoretical principles quickly gave way to a puzzling pragmatism, which did not altered in essence either the government's role or the previous pattern of industrialization. The reforms were largely designed to deal with two major issues — the inadequacy of the public and private sector financing, and the incentive-bias against exports — thought as the main causes of the chronic inflationary and BP problems. Moreover, at a less prominent level, there were also changes in the industrial and S&T policies.

Reforming public and private sector financing

Looking first at the public sector, a fiscal reform was implemented to modernize taxes and protect revenue from inflation, SEs' prices were adjusted, and earmarked, compulsory saving funds were set up to finance investments in infrastructure and housing. In addition, a central bank was finally created, and the Treasury was allowed to issue bonds with monetary correction. As Sochaczewski (1980, p. 360) pointed out, this last measure allowed the government to circumvent the usury law, whose 12 percent ceiling was now reinterpreted as referring to the real and not the nominal rate. As a result, the State improved its control over the monetary policy, and significantly increased its resources, which became more in line with its new responsibilities in the infrastructure and intermediary goods industry, whose legitimacy was not questioned by the newcomers. On the contrary, SEs increased investment in these areas, doubling their share of gross fixed capital formation to 18.7 percent over 1965-73.

As to the private sector, new non-banking financial institutions and assets were created, and old ones reformed. The principal innovation was the introduction of assets with monetary correction, which, as with public bonds, would allow interest rates to be positive (Sochaczewski, 1980). Foreign loans were also to be another important source of funds, and new legislation was enacted to expedite these operations. The immediate impact of these measures was a substantial increase in financial savings that rose from 16 to 26 percent of GDP (1965-73), sustained by a twofold increase in the financial asset-to-GDP ratio and a stock-market boom (World Bank, 1984, p. 11).

Reforming the trade regime and foreign capital policy

Beginning with the trade regime, the government gradually moved towards a unified exchange rate via devaluation and removal of NTBs. In addition, a crawling-peg system was adopted, aiming at curbing speculation and reducing the real exchange fluctuations. These measures were accompanied by the implementation of export incentives, and by a selective import liberalization. On the export side, manufactured exports were exempted from indirect and income taxes, granted product-specific fiscal subsidies, a system of drawback was implemented, and heavily subsidized export credits were made available (Baumann & Braga, 1985). Exports responded quickly, particularly manufactured exports, which grew 29 percent annually over the period, reaching 24 percent of total exports in 1974 (5 percent in 1964).

On the import side, tariffs were reduced with the manufacturing average falling from 99 to 66 percent over 1966-73. In addition, tariff exemptions were extended to capital goods imports of priority sectors, irrespective of the market targeted, and an *import processing zone* was created in the Amazon region, which allowed the assembly of mainly electric and electronic consumer goods for the domestic market. However, legal and effective protection remained rather high and its inter-industrial structure unchanged (table A.1). The fact that the consumption goods share of imports remained negligible (4.3 percent in 1972) and the manufacturing import ratio showed a modest increase (from 6 to 8 percent over 1964-70) suggests that non-competitive, producer-goods imports were largely the sole beneficiaries of the liberalization.

With respect to foreign investment, the military aborted an attempt by the deposed civilian government to impose restrictions. The manufacturing sector continued to be totally open to FDI, and foreign loans had no restrictions on the borrower's nationality or sector of activity (Guimarães et al., 1982). In fact, the access to foreign loans was further facilitated with short-term loans being allowed to be registered and serviced. These measures, in conjunction with economic recovery, triggered off a new spurt of FDI and a rapid growth of the external debt (11 percent annually over 1965-73).

Changes in the industrial and S&T "policies"

Despite the policy-makers' neoclassical credentials, the uncoordinated group of institutions that were the tools of the industrial and S&T "policies" during the T plan and earlier were not wound up but reformed; and on S&T, there was even an attempt to come up with a strategy worthy of the term. On the industrial side, the government set up, in 1964, the Industrial Development Council (CDI), made up of representatives of the main economic agencies, which were to incorporate the executive groups (see last section), and to co-ordinate and establish criteria for the concession of fiscal and credit incentives. These initial ambitions, though, never materialized. CDI's incentives were distributed without any clear criteria, but to increase investments. Moreover, there were at least a dozen regional and sector-specific government institutions, conceding similar incentives, with the CDI having little or no control over them (Suzigan, 1978).

As to S&T, it finally became, in 1968, an explicit policy aim. A National System of Scientific and Technological Development (SNDCT) was then set up, which would co-ordinate the existing S&T institutions and formulate S&T development plans. Particular emphasis was given to the need to develop more appropriate technologies to Brazil's resource endowment. This move was soon followed by a new emphasis on higher education, and by the screening of technology imports (1971). The alleged motivation of this last measure was to reduce the cost of technology imports and to facilitate its absorption. Its impact, though, would only be felt in earnest in the next period, in so far as it did not affect the contracts in force.

Behind the "miracle"

These measures sparked off a new period of exceptional growth. GDP grew 10 percent annually over 1965-73, whereas manufacturing output reached 11 percent. Other indicators point to better resource allocation, with a substantial increase in labour absorption in manufacturing (table 2), and a remarkable decline in incremental capital output ratios (ICORs) (table A.2). There was also a considerable reduction in inflation that fell from around 90 to 16 percent over 1964-70, reflecting not only the reforms examined above, but also a rather heterodox stabilization program (1964-67), which combined a "stop-and-go" monetary policy with outright intervention in the labour market. Finally, the BP also improved — helped by the export take-off and the substantial inflow of foreign capital.

These impressive results prompted largely two sorts of reading. First, that they reflected industry reaching its maturity and, therefore, vindicated the previous IS strategy, and sec-

ond, that they were the results of the new regime's outward orientation.[14] Apparently contradictory, these interpretations can be easily reconciled if we argue, for instance, that the "miracle" would not have been possible without, on the one hand, the capacity and capability building of the IS period, and, on the other, the incentive changes and financial and fiscal reforms that put them to good use. Yet, even when cobbled together, these views can be misleading for two interrelated reasons. First, because despite being instrumental for export and economic growth, IS policies left a legacy that made a move towards an open economy costlier and economic growth unsustainable. And second, because it gives the wrong impression that the reforms tackled successfully the key shortcomings of Brazil's industrialization.

In order to clarify these points, we begin by looking at the changes in the trade regime and its results. Whereas the reforms reduced the bias against exports, they fell well short of turning Brazil into an outward-oriented economy. Growth accounting estimates show that exports played a minor role in the "miracle", accounting for not more than 6 percent of manufacturing growth (Baumann, 1985). As a number of authors have already pointed out, the "miracle" was largely an internal matter, the upshot of the explosive combination of the industry's excess capacity, a consumer credit boom, and public sector's investment in infrastructure and housing (e.g. Serra, 1982).

While there is nothing wrong in principle with a domestic-market-led boom, the fact that manufactured exports remained marginal suggests that much of the old regime, and its drawbacks, were still in place. The government continued to give incentives and highly protect virtually all manufacturing sectors. Inward, protected FDI continued to be encouraged, and to expand its presence increasingly at expense of the local firms.[15] With protection still high, the exchange rate remained overvalued. In other words, notwithstanding its liberal inclinations, the government's option was to maintain protection high enough not to upset the prevailing (inefficient) industrial structure, and to use subsidies to reduce the bias against exports.

While an apparently similar strategy was successfully pursued by other NICs such as Korea, in Brazil, even though it succeeded in expanding manufactured exports, it turned out to be rather costly (table 3), and did not make exports more than a poor alternative to internal sales. The reasons for that seems to lie not so much in Brazil's "continental" market, but in three other factors: (a) whereas Korea made protection and incentives to industrialization conditional on export performance, Brazil relied solely on export subsidies; (b) whereas in Korea IS was selective, plants were built at international scale, and exporters were given full access to inputs at international prices; in Brazil, IS lacked selectivity, plants were built below the MES, and given the limitation of its drawback scheme, exporters had to shoulder the burden of an excessively backward-integrated industrial structure (table 3).[16] And, (c) unlike Korea, Brazil relied heavily on protected FDI, a strategy that made export diversifi-

---

[14] See, e.g., Tyler (1976) on the former, and Balassa (1979) on the latter.

[15] In 1971, TNCs accounted for more than 50 percent of the heavy industry sales, and for 45 percent of those of the whole manufacturing sector (Moreira, 1994). Morley Smith (1971) estimated that in 1965 this last figure was 33.5 percent. Moreover, whereas during 1956-60, 33 percent of US-based TNCs were set up via take-overs of local firms, this percentage rose to 52 percent during 1966-70, and to 61 percent during 1971/72 (Newfarmer, 1979).

[16] Drawback users, until 1975, would lose part of the fiscal subsidy, and both drawback and export incentives were conditional on localization indices above 70 percent (Pastore et al., 1979, p. 75; and Guimarães, 1989).

cation easier, but that restricted mainly to intra-firm trade the access to the important developed country markets, in view of parent-subsidiary arrangements.[17]

In short, Brazil continued with a trade regime that reflects neither static nor possible dynamic comparative advantages, but rather an urge to save foreign exchange. As the regime did not become more selective and outward-oriented, the export drive had to bear the burden of an excessively protected, integrated and fragmented industrial structure, imposing heavy costs to the taxpayer. Moreover, as export success never really became a necessary condition for survival, it did not exert the necessary pressure on firms to increase efficiency, and on the industrial structure to find sustainable configurations. For not increasing outward-orientation, Brazil also missed the opportunity to have sustainable economic growth, combined with better resource allocation. The "miracle" was very much built on the indebt-

Table 3
Korea's and Brazil's export subsidies and export related imports as a percentage of manufactured exports (FOB) 1969-85 (%)

Year	Korea			Brazil		
	Subsidies[1]		Imports[3]	Subsidies[2]		Imports[3]
	Net	Gross	% of exp.	Net	Gross	% of exp.
1969	6.4	27.8	66.3	10.8	42.7	2.34
1970	6.7	28.3	56.2	21.0	52.7	6.51
1971	6.6	29.6	63.6	22.3	53.1	8.05
1972	3.2	26.8	54.8	25.8	58.8	8.55
1973	2.2	23.7	53.1	24.1	58.3	11.69
1974	2.1	21.2	49.3	19.9	55.2	10.50
1975	2.7	16.7	48.6	25.3	56.0	16.28
1976	2.5	16.9	43.3	29.0	65.8	14.07
1977	1.9	19.2	n.a.	33.5	72.5	9.37
1978	2.3	19.5	n.a.	31.6	68.1	10.04
1979	2.3	20.2	n.a.	30.3	67.5	n.a.
1980	3.3	21.3	n.a.	7.4	45.1	n.a.
1981	2.2	n.a.	n.a.	29.8	71.8	n.a.
1982	0.4	n.a.	25.9	34.6	76.7	n.a.
1983	0.0	n.a.	n.a.	20.6	58.5	n.a.
1984	n.a.	n.a.	n.a.	13.9	53.0	n.a.
1985	n.a.	n.a.	n.a.	10.0	49.2	n.a.

[1] Korea data for total exports. Yet manufactured exports averaged 94 percent during the period. Net subsidies include direct cash subsidies, export dollar premium, direct tax reduction and interest rate subsidy. Gross subsidies include net subsidy plus indirect tax exemptions and tariff exemptions.
[2] Net subsidies comprise direct tax reduction, tax credits and interest rate subsidy. Gross subsidies include net subsidies plus indirect tax and tariff exemptions.
[3] Export-related imports consist of parts and raw material used in export production which were exempted from import and indirect taxes.
Source: Original data from Kim, S. K. (1991, p. 33), Hong (1979, p. 68) and KFTA (1989) for Korea; and from Baumann (1990) and Musalem (1983, p. 746) for Brazil.

[17] Fajnzylber (1971) showed that in 1967, only 34 percent of the MNC's exports were to DC. BNDE (1988b) put the share of intra-firm exports from American TNCs based in Brazil at 70 percent in 1977.

edness of a tiny middle-class, which could not keep on accumulating durable goods at 22 percent annual rate forever; and for all the improvements in labour absorption, Brazil's manufacturing sector continued to employ, *vis-à-vis* its share of GDP, far less labour than its capital-intensive DCs counterparts.[18]

Apart from the trade regime, there are two other points worth making concerning financial reforms, and S&T and education. As to the former, while they were successful in improving the State's finances, and in providing funds for current activities, they failed to eradicate inflationary financing and to provide industry with a proper source of long-term funds. Inflation has never gone below 16 percent, and indexation was a mixed blessing. True, it allowed interest rates to be positive, and reduced the worst inflationary effects upon the government's income and the creditors' and savers' assets. Yet, those on fixed incomes continued to suffer, and as indexation swiftly spread throughout the economy (exchange rate, wages), relative price changes became increasingly difficult, since they were quickly fed into monetary correction and passed on to other prices. More to the point, in so far as indexation made the past inflation the floor to future price rises, inflation got increasingly resistant to any sort of therapy.

With respect to long-term financing, the stock-market boom soon proved to be ephemeral and the debenture market has never really taken off. Whereas risk-aversion and informational imperfections seem to have played a part, government policy was less than helpful. The combination of high inflation and short-term indexed assets made long-term investment in non-indexed assets even riskier.[19]

Hence, BNDE and foreign loans continued to be the only sources of long-term funds. Even though access to these sources was increased, first by expanding and redirecting BNDE loans to the private sector, and second, by the already mentioned new legislation to foreign loans, they remained well short of the industry's needs, particularly of those of LPFs. BNDE's manufacturing loans over the period were equivalent to only 19 percent of manufacturing investment, and the bulk of foreign loans went to State and foreign firms. In the face of it, LPFs, whose association with banks was forbidden by law, continued to rely heavily on internal and inflationary financing for their capacity expansion. No doubt, a conduct that curtailed their chances of growth and diversification. For instance, the local firm's share of the top 25 and 500 firms' sales in 1974 was zero and a mere 39 percent, respectively (*Exame*, various issues).

As for education, investments in basic skills continued to be inadequate. As of 1970, the illiteracy rate was still high (40 percent in 1970), and less than half of the literate population over 20 had elementary education. Apart from efficiency implications, the scarcity conditions in the market for skilled workers seem to have contributed — together with the economy's product mix and the high-inflation-cum-indexation policies — for the worsening of income distribution experienced during the 1960s.[20]

Finally, in spite of SNDCT investments, R&D expenditures remained inadequate (0.2 percent of GDP), and the fact that investments came only after the heavy industry was set

---

[18] In 1974, the difference between the manufacturing's share of GDP and its share of total employment was 14.4 percent. The same figure for the US and Canada was -0.8 percent, and -3.3 percent respectively. (ANESTBR & OECD, 1989.)

[19] The total stock market value fell from 22 to 7 percent of GDP over 1972-77 (Goldsmith, 1986, p. 422). The ratio of indexed to non-indexed assets increased from 5 to 43 percent over 1965-73 (World Bank, 1984, p. 9).

[20] The share of the 20 percent highest income group increased from 55 to 62 percent over 1960-70 (IBGE, 1990).

up, and since the latter was done mainly through protected FDI, posed the problem of who would demand the top quality human capital, technologies and infrastructure that the SNDCT was proposing to deliver. This would hardly come from either the TNCs or LPFs. The former, because of their advantageous access to the parent's company technology. And the latter because they were either located in the light industry, where technology is easily acquired off-the-shelf, or were sustaining marginal positions in the heavy industry, with TNC competition leaving no option but to import technology.

5. Heavy industry revisited: the 1974-79 period

For all its shortcomings, primarily for its narrow base of growth, the pragmatic "miracle" could not last for long, but it took the oil shock in 1973 to convince the government that adjustments were necessary. Clearly something had to be done. In 1974, the current account deficit hit an unprecedented 6.5 percent of GDP and inflation was above 30 percent. The response came with the Second National Development Plan — II NDP — (1974-79). By then the liberal rhetoric had been forgotten, and the old structuralist analysis was back in business. The difficulties were put down to Brazil's unbalanced growth model, whose insufficient investments in the basic inputs and capital goods industry would have created inflationary bottlenecks and an undue dependency on imports. The therapy prescribed, then, was massive IS investments in these areas, which would concurrently promote structural adjustment and growth.[21]

Even though it all looks very much like the previous IS strategy, the plan signaled with a more favourable treatment for exports, and a more consistent approach to market failures. For instance, it emphasized the need to carry out IS in conjunction with the promotion of exports and local private conglomerates, capable of competing against TNCs in the scale, technology-intensive heavy industry. There were also references to sustainable market structures, technological capabilities, and to a new role for TNCs. They were now supposed to increase exports, carry out R&D, and form joint-ventures instead of taking over local firms. SEs, in turn, were seen continuing their investments in infrastructure and in key basic input industries such as steel, fertilizers, basic petrochemicals and mining.[22] Before discussing the results of this neo-IS strategy, though, let us look at its policy mix.

Trade and exchange rate policies

The adjustments in the trade regime sought, in the short term, to avoid a BP crisis, and in the long term, to carry out IS and to promote exports, in this order of importance. Right from the start, a real exchange rate devaluation was ruled out on the grounds, first, that it would be ineffective given the widespread indexation and would increase inflation, and second, that it would impose heavy losses on externally indebted firms, and discourage further borrowing abroad (Simonsen, 1988, p. 299). Hence, the bulk of the changes was in the trade policy. On the import side, the government reintroduced a whole range of NTBs and raised

[21] In 1974, raw material, intermediate and capital goods accounted for 87 percent of total imports.

[22] II Plano Nacional de Desenvolvimento. Brasília. For a thorough analysis, see Batista (1992).

tariffs, virtually banning consumer good imports, and imposing tough restrictions on those of intermediate and capital goods.

As to exports, the government increased subsidies (table A.5), the drawback was made more attractive by giving its users access to export fiscal subsidies, and the CDI began to suggest long-term export agreements (so-called Befiex), particularly to foreign firms, as a precondition to exempt capital goods imports from tariffs and NTBs (Guimarães, 1989). This increase in incentives more than offset the appreciation of the exchange rate, keeping the PPP-export rate well above the 1973 level.

Financial policies

The financial side of the II NDP did not involve any significant institutional change, and the traditional combination of policy loans, foreign capital incentives and a permissive attitude towards inflation continued to hold sway. There were, though, some adjustments. BNDE resources were beefed up by compulsory saving funds, allowing a significant increase in manufacturing loans, with the heavy industry and LPFs being the major beneficiaries.[23] In addition, new BNDE programs were set up, seeking to offer competitive finance for the purchase of locally made capital goods; and to capitalize LPFs, particularly in the capital goods and basic input sectors (Villela & Baer, 1980).

As for foreign capital, there was a certain swing towards portfolio investments, with restrictions being imposed on FDI (see below). Yet, both forms of investment kept on growing rapidly. The average annual inflow of FDI during the period (US$1.1 billion) was well above that of the "miracle" (US$0.2 billion), whereas the external debt trebled to US$50 billion in 1979. This exceptional increase in foreign borrowing resulted largely from the government's strategy of using the cheap Eurocurrency funds available to finance the plan's investments and the BP. This strategy involved the concession of foreign borrowing incentives, the liberalization of domestic interest rates in 1976, and, as noted earlier, a passive exchange rate policy.

Finally, the government continued to look at inflation as a necessary evil, a price worth paying for growth and structural adjustment. To be sure, there were attempts to pursue a tight monetary policy but, as the finance minister of the day put it, "[they were] soon abandoned because wage-indexation was considered to be encouraging the wage-price spiral. Eventually the government chose monetary accommodation, which kept the annual inflation rates in the range of 30-40 a year until 1978" (Simonsen, 1988, p. 293).

Industrial and S&T policies

Part of what can be understood as the II NDP industrial policy was already discussed above, and involved greater protection and subsidized credit to the capital goods and basic input industries, in general, and for LPFs, in particular. These measures were supposed to be part of a broader strategy, which, as suggested earlier, aimed not only at carrying out IS but

---

[23] The bank's disbursed manufacturing loans were equivalent to 28 percent of the manufacturing investment during the period. See Moreira (1994).

also at fostering large LPFs, sustainable market structures, and technological capabilities. The pursuance of these first two objectives was left to the discretion of the government's loosely co-ordinated army of federal, sectoral and regional incentive agencies — which still had the CDI formally on top — and to BNDE and SEs (through procurement).

These institutions, though, tended to have different interpretations of what would be a LPF or a sustainable market structure. As a result, quite a few policy regimes emerged even in technologically related segments of the capital goods and basic input industries. In some sectors, strict investment licensing was enforced together with different sorts of FDI restrictions, ranging from the imposition of joint-ventures (e.g. petrochemicals and telecommunications equipment) to a complete ban on foreign firms (e.g. micro and minicomputers). In others — the great majority — restrictions continued to be limited to localization requirements, and the objectives of promoting LPFs and efficient market structures were left to BNDE credit and CDI incentives, despite the obvious limitations of these institutions.

As to technological capabilities, investments in S&T were significantly increased, particularly regarding graduate education and research.[24] This was combined with initiatives aiming at financing R&D activities at the private firm level, and at imposing stricter controls on technology imports. The former was done through the concession of subsidized credit by BNDE and SNDCT institutions, and the latter by making new contracts conditional upon absorption of technology by the recipient firms. In addition, the SEs were used to foster the LPFs' technological capabilities by favouring the purchase of locally developed capital goods, and by offering technological support (Villela, 1984).

The results

The results of this neo-IS strategy are controversial. Enthusiasts argue, first, that economic growth was kept at a relatively high rate (6.4 percent), and exports, notably manufactured exports, continued to grow fast (6 and 16 percent, respectively), substantially increasing their share of world exports (table A.3). Second, that export growth was accom-

Table 4
Selected results of II NDP investments

	(a) Capital goods		(b) Rolled Steel		(c) Aluminium		(d) Paper pulp		(e) Oil
	imp. ratio[1]	exp. ratio[2]	imp. ratio	exp. ratio	imp. ratio	exp. ratio	imp. ratio	exp. ratio	imp. ratio
1974	29.0	7.0	39.1	2.2	50.4	1.6	16.6	11.8	79.7
1978	20.0	8.0	5.7	5.4	26.3	2.0	4.4	14.8	84.7
1983	23.0	19.0	1.0	39.1	2.3	40.0	0.8*	27.7*	68.7
1987	25.0	20.0	0.5	50.7	n.a.	n.a.	n.a.	n.a.	52.0

[1]Imports divided by domestic supply.
[2]Exports divided by total production.
* 1982.
Source: BNDE (1988b) for (a), Batista (1992) for (c) and (d), and IBGE (1990) and ANESTBR, various issues.

[24] Elementary education, though, continued to be neglected. The SNDCT's share of federal expenditures, which average 0.4 percent over 1970-73, increased to 0.9 percent over 1974-79 (World Bank, 1983; IBGE, 1990). Graduate enrollments grew at annual average rate 18 percent over 1974-79 (Castro, 1989).

panied by diversification towards the heavy industry, whose share of total exports rose from 18 to 43 percent over 1973-80. Third, that IS contributed not only to export diversification, but also to reduce dependency on producer goods (table 4), assisting therefore in the structural adjustment whose first signs came out in the early 1980s.[25]

Yet, critics draw attention to the costly macroeconomic side-effects, whose most obvious manifestations were a huge external debt, whose service was taking up 62 percent of export revenue even before the 1980s shocks, and a record inflation (38 percent in 1978) fueled by indexation and by the deterioration of public sector finances. The latter, provoked by the combined effect of the mounting indexed domestic debt, credit subsidies, fiscal incentives and the SEs' external debt. In addition, IS contribution to BP adjustment is viewed with scepticism, particularly when measured by import coefficients, since these indicators would also reflect the slowdown in growth and investment during the 1980s.[26]

Even though the task of disentangling macroeconomic from industrial strategy failures is fraught with difficulties, it seems that the problem with the neo-IS strategy went well beyond unsound macroeconomic policies. In fact, a case can be made out that these imbalances were just part of a series of adverse results, which were rooted in the government's failure to go beyond a mere patch up of the old IS strategy.

To begin with, despite attempts to increase the selectivity of the incentive regime, the clamp down on imports and the lack of control over the allocation of foreign loans ensured that resources remained dispersed across virtually all manufacturing activities, regardless of the existence of static or dynamic comparative advantages. This was made particularly worse by the increased obsession with localization indices. As a result, exports became an even more subsidized and costlier business (table 3). Despite responding, they remained at 9 percent of the manufacturing output, and under 7 percent of GDP. Apart from efficiency implications, this result — given the low level of imports — left the bulk of the BP adjustment to foreign loans, which in turn led to the debt build-up.

On the issue of targeting, whereas the potential static and strategic benefits of investments in the basic input and capital goods industries were unquestionable (as the export success of some of these industries was to prove), a number of considerations regarding the choice and implementation of the targets seemed to have been overlooked. Looking first at the target chosen, there were still clear gains to be made from better resource allocation by promoting the light industry. Brazil's underemployment in mid-1970s was unabated and unit labour costs were still falling (Moreira, 1994). This opportunity, though, was largely missed since, amid an incentive bias against exports, BNDE credits and fiscal incentives were concentrated in the heavy industry. As expected, the light industry's export performance was disappointing,[27] and labour absorption in the manufacturing sector slumped (table 2).

Moreover, the technological and strategic externalities involved in the production of capital goods should have been set against: (a) the benefits of intra-industry trade and access to state-of-the-art embodied technology, and (b) the disadvantages of spreading scarce resources too thinly. Yet, although the ratio of capital goods to GDP in 1975 was lower than

---

[25] See, e.g., Castro de Souza (1985) and Batista (1992).

[26] See, e.g., Balassa (1979) and Fishlow (1986).

[27] In fact, Brazil's share of world exports of textiles and basic industry increased significantly during the period (table A.3). Yet, it remained unimpressive *vis-à-vis* other NICs. For instance, Korea's share of textile exports in 1980 was 5.5 times larger than Brazil's. See Lucke (1990, p. 23).

that of the US (Frischtak & Dahlman, 1990), the government went on to substitute as much as capital goods imports as possible.

As for implementation, despite the measures taken to promote LPFs and sustainable market structures, the results were mixed, and on the whole unsatisfactory. In the basic input sector, strict investment licensing, FDI restrictions, and greater outward-orientation seemed to have guaranteed plants close to the MES and an efficient number of producers, but SE remained the dominant player. In the capital goods sector, the fact that the TNCs were already firmly installed, combined, as noted earlier, with an inconsistent industrial policy, led to the entry of LPFs in already crowded and inward-oriented industrial structures. Apart from aggravating inefficiency, this process precluded LPFs from benefiting from economies of scale and specialization, doing no wonders for their learning process or for the prospects of a limited period of protection.[28]

In view of this inhospitable environment, the objectives of fostering LPFs' technology capabilities and large private conglomerates turned out to be elusive. In the former's case, whereas the S&T infrastructure was significantly improved, its links with manufacturing remained weak. The available evidence suggests that the majority of firms did not go beyond the routine and adaptive/duplicative technological tasks. During 1974-79 only 0.7 percent of the industrial firms conducted formal R&D, the great majority (63 percent) SEs, whereas the private sector's outlays on technology (R&D and royalties in 1978 and 1982) were under 0.2 percent of net sales.[29]

As for large private conglomerates, the limited available evidence suggests modest advances. For instance, as of 1980 the LPFs' share of the top 100 non-financial groups' sales was only 30.7 percent, with TNCs and SEs taking 31 and 38 percent respectively (Willmore, 1987, p. 169). At the firm level, as of 1980, LPFs had still only 6 percent of the top 25 firms', sales, 20 percent of the top 100, and their share of the top 500 fell from 39 to 35 percent over 1974-80 (*Exame*, various issues). A comparison with Korea is revealing. As of 1989, the sales of Brazil's largest private group (US$3.8 billion) were lower than that of Korea's twelfth *jaebol* (US$4.2 billion) (Moreira, 1994).

Apart from these factors, the small scale achieved by Brazil's private groups seems to have also a bearing on the precariousness of the intervention in the financial sector. Despite the increase in BNDE credits, the LPFs' financing pattern did not change significantly during the period (table 5). Retained earnings continued to be the main source of long-term financing, putting them side by side with American firms, even though they do not have anything like their size, or their access to intra-firm capital markets. Government intervention led to a financial system that was neither credit nor capital market-based (Zysman, 1983). Since BNDE, at its peak, did not controlled more than 8 percent of the private sector loans and private banks remained largely out of the manufacturing sector, LPFs have never had the amount of credit available to their, for instance, Koreans counterparts. On the other hand, high inflation-cum-indexation continued to preclude the development of a capital market.

In sum, for all its success in deepening the industrial structure, diversifying exports, strengthening the LPFs position and improving the S&T infrastructure, the II NDP did not

---

[28] The custom-built segment, where LPFs were more successful, is a case in point. BNDE (1988a) speaks of inward-oriented and excessively diversified LPFs, struggling with the large number of producers and the limited and cyclical internal market. It also points out that vertical integration was unduly pursued.

[29] Data on R&D reviewed by Frischtak & Dahlman (1990).

go far enough to change substantially the pattern of Brazil's industrialization. The incentive regime continued to be largely non-selective, inward oriented, and exports a heavily subsidized and lesser business. Under total protection, lax investment and FDI licensing, fragmented and inefficient industrial structures continue to survive and proliferated as IS moved upstream. On the financial side, the key issue of long-term financing for LPFs was only precariously solved. In this sort of environment, the LPFs' growth was bound to be hampered and macroeconomic imbalances, inevitable, regardless of any macroeconomic failure.

Table 5
Brazil, Korea and US source of funds by the corporate sector — 1978-84

	Autofinance	External	Total	External		
				Loans	Shares	Others
Brazil						
1978	58.8	41.2	100	51.1	35.9	13.0
1980	62.5	37.5	100	69.6	24.1	6.3
1982	65.7	34.3	100	58.8	29.0	12.1
1984	76.8	23.2	100	54.7	24.8	20.6
Korea						
1977-81	23.3	76.7	100	53.7	24.8	21.5
1982	27.0	73.0	100	55.4	31.8	12.8
1984	33.3	66.7	100	60.5	32.1	7.4
US						
1979	78.7	21.3	100	84.5	15.4	—
1982	78.7	21.3	100	71.8	28.1	—
1984	83.5	16.5	100	124.8	-24.8	—

Note: Data for Brazil was based in a sample of the 90 largest locally owned firms.
Source: For Brazil, Rodrigues (1986), for Korea (Amsden & Euh, 1990, p. 66) and for the US (Ross et al. 1988, p. 378).

6. The dismal decade: the 1980s

When the interest and second oil shocks struck at the turn of the decade, Brazil could not be in a more vulnerable position. As noted earlier, a huge external debt had been accumulated, inflation was high and reinforced by widespread indexation, and oil made up more than one third of imports. In such a scenario, external shocks could only play havoc. In fact, the current account deficit reached 5.8 percent of GDP in 1982, and debt-service ratio 98 percent. Inflation, in turn, broke the three digit barrier in 1980. Unlike previous BP crises, this time there was no substantial imports to substitute, and the option of "borrowing its way out the crisis" received its *coup de grâce* with Mexico's default in 1982. With little room to manoeuvre and resorting to misguided stabilization policies, the government would pass the rest of the decade struggling with these macroeconomic imbalances, creating an environment of low, unstable growth and near hyperinflation, hardly appropriate to industrial development.

Facing chaos in the short-term management of the economy, and apparently influenced by a simplistic structuralist notion that the II NDP had completed industrialization, the government would also forsake any attempt to formulate a long-term industrial strategy. In practice, this meant that the previous pattern of intervention lingered on, and given the depth of the BP crisis and the sharp deterioration of the public sector finances, its shortcomings were further aggravated by extra cuts in imports, S&T expenditures, and curbs on long term financing.

This troubled decade can be roughly divided in two periods, marked by different responses to the growing macroeconomic difficulties. That is, the 1980-84 period, when an orthodox BP-adjustment policy was adopted, and the 1985-89 period, when the threat of hyperinflation led to a series of heterodox stabilization plans. Let us look at their implications for industry.

Under orthodox adjustment

Living up to the country's tradition, the government's first response to the crisis was to try to adjust and stabilize the economy without hurting growth. Yet, the combination of devaluation with an expansionary fiscal and monetary policies led to a two-fold increase in inflation, while the BP situation continued to deteriorate.[30] The government, then, finally caved in, adopting an orthodox program in 1981. At first, given the previous experience, a real exchange devaluation was avoided (crawling-peg was reintroduced) and efforts were concentrated on restricting demand and escalating export subsidies and import controls.[31] The interruption of voluntary capital inflows provoked by Mexico's default led eventually to a new maxidevaluation in early 1983.

These measures eventually adjusted the BP, with the current account showing a small surplus in 1984. Even though II NDP investments seem to carry considerable weight in explaining these results, the 34 percent growth in exports and the 39 percent fall in imports accumulated over 1980-84 cannot be dissociated from the all-time high reached by export subsidies and import controls, and from the brutal recession that hit the country. The GDP fell by 0.7 percent per year over the period. The aggregate investment ratio fell continuously from 21 to 16 percent.

Industry was severely hurt in this process. The slump in domestic demand, combined with restrictions on BNDE loans and high interest rates, led output to fall on average by 3 percent yearly over the period, whereas manufacturing investment fell 36 percent in 1981, and was around the 1976 level in 1984. Among the manufacturing sectors, capital goods, a key II NDP target, were worst hit. Output in 1984 was 22 percent below the 1975 level, and its share of manufacturing structure fell below the 1970 mark .

---

[30] See Belluzzo & Coutinho (1983) for details.

[31] During the Tokyo Round, Brazil had agreed to phase out the fiscal subsidy to exports until 1983. Yet, it was abruptly eliminated in December 1979. When reinstated in 1981, it lost its product-specific character and a flat 15 percent rate of the export value was introduced. This rate was to be phased out until 1983. In 1982, however, Brazil negotiated with the US, which was threatening to impose countervailing duties, the extension of the subsidy until 1985 (Cepal, 1985). Moreira & Araújo (1984) estimated that, as of 1983, 75 percent of total imports were affected by NTBs.

The depth and length of the recession helped to put into perspective the much-heralded good manufactured export performance over period. True enough, Brazil managed to increase its share of world exports in most sectors (table A.3). Yet, despite the highest ever subsidies (table 3) and the collapse of domestic demand, the shift to exports was less than impressive, with its contribution to recovery coming only in 1984. Even then, exports made up less than 10 percent of the manufacturing output. The external constraint argument does not seem to hold against the fact that countries like Korea increased manufactured exports at an annual rate of 12 percent against Brazil's 4 percent (1980-84). More to the point, in the crucial machine and transport equipment sector, its share of world exports fell to 0.6 percent, whereas Korea's nearly trebled to 1.9 percent (United Nations, *International Trade Statistical Yearbook* and *Handbook of International Trade*).

All those years of protected FDI, non-selective and inward-oriented incentive regime seem to have produced an industry that was not prepared to take on the international market. An increase in the already comprehensive NTBs could only aggravate this situation. Estimates of effective tariffs put the average protection for manufacturing at the end of the period as high as 43 percent, with an inter-industry structure that bore no logic (table A.1). Apart from inefficiency, the prospect of having another period of unchallenged inward-oriented growth after the recession might have certainly precluded a stronger commitment to exports.

This scenario of falling output and investments, coupled with a limited shift towards exports, did no wonders for the industry's competitiveness. The static and dynamic diseconomies of scale associated with a prolonged recession added to the old problems of fragmented industrial structures and sub-optimal plants, causing labour productivity growth to plunge (3.1 to 1.4 percent over 1974-79/1980-88). Moreover, investments in the modest S&T infrastructure fell *74 percent* in real terms over 1975-84 (Becker & Egler, 1992, p. 93). Technology imports also fell by 35 percent over 1979-84 (Bacen).

To complete the picture, the orthodox adjustment failed to stabilize the economy and ended up aggravating the problem. Inflation more than doubled to 213 percent in 1984, reflecting again the widespread indexation and the increasing deterioration of the public sector finances. Apart from turning cost accounting into a nightmare, this rampant inflation, coupled with short-term indexed assets offering stratospheric interest rates, made the prospect of developing a proper source of long-term financing even gloomier. Not surprisingly, LPFs moved even further into internal financing (table 4).

Paradoxically, it was amid this inhospitable environment that the most important industry related initiative of the 1980s was taken. That is, the decision to consolidate the so-called market-reserve for mini and microcomputers, set up in 1977, and to expand it to much of the professional electronics industry.[32] Among the several policy regimes originated in the late 1970s, this initiative stands out for its almost unique attempt to apply correctly the infant industry principle. That is, to protect LPFs (instead of affiliates) in an industry where the importance of strategic benefits and positive externalities are widely recognized.

Unfortunately, the old IS mentality remained dominant. The government did not act as if it was keen on promoting an internationally competitive industry. For instance, despite market imperfections such as R&D and production related economies of scale, there were about 37 different firms producing PC-clones in 1985. Despite the limited human capital

[32] See, e.g., Piragibe (1985) for details.

base, and the benefits of intra-industry specialization, vertical and horizontal diversification was encouraged. Finally, despite the capital market failures, BNDE loans came only late in the day.

The results achieved reflected these shortcomings. On the one hand, despite the macroeconomic chaos, the local computer industry grew at about 23 percent annually during the 1980s (Evans & Tigre, 1989), and "the skilled technical and engineering component of the labour force has grown substantially" (Hewitt, 1992, p. 196). But on the other, after more than a decade of protection exports remained negligible and prices are said to be twice that of US, despite the obvious differences in quality (Schmitz & Hewitt, 1992).

Under heterodox stabilization

If the implications of the orthodox adjustment for industry were disastrous, things were not much better under the heterodoxy. The BP adjustment gave the newly installed civilian government (March 1985) more room to manoeuvre, and after a short-lived austerity, economic policy became clearly expansionary. As a result, the recovery initiated in 1984 continued in 1985 with GDP growing 7.9 percent. Yet, the combination of fast growth, a higher fiscal deficit and a food supply shock in a very closed and indexed economy put the monthly inflation by year-end at 15 percent.

Believing that indexation was to blame, the government launched the Cruzado Plan in February 1986 — a heterodox attempt to stabilize the economy that had at its core a price-wage freeze and the abolition of monetary correction.[33] Despite its initial success, expansionary fiscal, monetary and wage policies led to a consumer boom that, in turn, raised inflation to above pre-plan levels in early 1987. To add to the gloom, the frozen exchange rate coupled with the domestic boom produced a 2 percent of GDP current account deficit, which led the government to an interest moratorium in February 1987.

After this failure, another two stabilization plans were implemented (mid-1987 and early 1989) pursuing variants of the price-freeze-cum-desindexation formula, but combined with more restrictive policies. Even though they managed to slow down the economy — growth fell from 7.6 percent in 1986 to an annual average of 2 percent over 1987-89 — and adjust the BP, they both went down the Cruzado path. Initial successes were followed by unprecedented rates of inflation and re-indexation. By December 1989, inflation had reached a mind-boggling monthly rate of 49 percent. Underlying these failures was an increasingly intractable fiscal deficit approaching 48 percent of GDP in 1989.[34]

Reflecting this highly unstable macroeconomic environment, the performance of the manufacturing sector was erratic and on the whole poor. After growing on average 11.3 percent in 1985 and 1986, output fell annually by 0.3 percent until 1989. Manufacturing investment in 1986 was still well below 1980 levels, and fell even further in 1987, following the decline of the aggregate investment ratio.[35] Labour productivity, in turn, stagnated around

---

[33] For details see, e.g., Modiano (1990) and Dinsmoor (1990).

[34] Bacen. PSBR concept. On these two plans see Dinsmoor, op. cit.

[35] The latter, after recovering to 18.7 percent in 1986, fell continuously to 16.7 percent in 1989. FDI also plunged to record levels reflecting uncertainty surrounding the government policies.

the dismal 1980-84 levels, and the whole decade produced the worst Icor of the post-war period (table A.2).

As one would expect, manufactured exports were also affected. Apart from the macroeconomic chaos, the steep appreciation of the PPP-exchange rate prompted by the price freezes,[36] compounded by a substantial reduction of export subsidies, increased the incentive bias against exports. These events reinforced the export market status as a poor and occasional alternative to domestic crises. This is clearly indicated by an export performance that mirrored the "boom and bust" performance of the internal market, with exports growing on average 18.7 percent in the years of negative or no growth (1987/88), and/or declining when growth resumed (-0.2 over 1985/86 and -16 percent in 1989).

Not surprisingly, Brazil's share of world manufactured exports over 1984-87 fell or stagnated in most segments (table A.3). This decline could have been worse had it not been for the long-term export agreements under the Befiex scheme, which forced firms to export whatever the costs, and that continued to receive, until 1989, the fiscal subsidy eliminated for the regular exports in 1985. The Befiex's share of manufactured exports rose from 17 to 40 percent over 1979-86 and reached 50 percent in 1989 (Baumann, 1990).

In sum, the impact of external shocks, magnified by previous misguided intervention in the product (trade bias) and financial markets (indexation), largely reduced the government's action over the 1980s to a series of unsuccessful stabilization attempts. Facing a highly unstable environment, industry fell into a vicious circle of falling output, investments and productivity, which coupled with a higher trade bias, produced declining market shares abroad. This decline in competitiveness, however, cannot be dissociated from the industry's structural weaknesses fostered by decades of an ill-conceived approach to market failures.

7. Conclusion

The mixed results presented by Brazil's industrialization seem to closely reflect the dubious quality of government intervention. Instead of being moulded and disciplined by international prices and market failures, government action was largely guided by the pressures to keep the economy growing at all costs, and by the need to remove a perceived foreign exchange gap. This, coupled with a solid export pessimism — deeply rooted on the backwardness caused by centuries of export-oriented colonial history —, set the stage for an industrialization strategy that blindly followed the country's import composition.

Whereas there is no doubt that this strategy was successful in turning an agrarian country into a highly sophisticated industrialized economy, the combination of wrong incentives and an inconsistent and often misguided approach to market failures led not only to a damaging waste of resources, but also produced serious structural weaknesses that compromised the industry's efficiency and competitiveness, while exposing the economy to violent macroeconomic imbalances.

Since the beginning of the 1990s the government has been striving to reform the incentive regime. A program of import liberalization was adopted, which included the removal of NTBs and a four year advanced schedule for tariff reductions.[37] However macroeconomic

---

[36] The PPP-exchange appreciated by 55 percent over 1985-89. See Moreira (1994).

[37] For an analysis of the 1990s reforms see Erber (1992).

stability continues to be elusive, with yet another failed heterodox stabilization plan. Moreover, the reforms have been taking place amid a liberal, anti-government rhetoric that threaten to throw away the baby with the bathwater.

The source of most of Brazil's problems, as suggested, is not government intervention *per se* but the quality of this intervention. Deficiencies such as a weak local private sector, lack of long-term financing, low domestic technological effort, poor human capital base and limited S&T infrastructure are not going to be solved by market forces alone. They all arise from market failures and they all call for government action. Not of the type that Brazil had in the past, but one focused on remedying these failures, and disciplined by an open and outward-oriented economy.

References

Abreu, M. P. Inflação, estagnação e ruptura: 1961-64. In: Abreu, M. P. (ed.). *A ordem do progresso: cem anos de política econômica republicana, 1889-1989.* Rio de Janeiro, Campus, 1990.

Albert, B. *South America and the world economy from independence to 1930.* London, Macmillan, 1983.

Almeida, J. S. *Instabilidade da economia e estrutura financeira das empresas no Brasil do ajustamento recessivo.* Rio de Janeiro, Instituto de Economia Industrial — UFRJ, dez. 1988. (Discussion Paper, 178.)

Amsden, A. & Euh, Y-D. *Republic of Korea's financial reform: what are the lessons?* Geneva, Unctad, 1990. (Discussion Paper, 30.)

Anuário Estatístico do Brasil. Rio de Janeiro, IBGE. Various issues.

Balassa, B. Incentive policies in Brazil. *World Development*, Nov./Dec. 1979.

Banco Central do Brasil (Bacen). *Boletim Mensal*, various issues.

Bank of Japan. *Comparative economic and financial statistics: Japan and other major countries.* Tokyo, 1990.

Batista, J. C. *Debt and adjustment policies in Brazil.* San Francisco, Westview Press, 1992.

Baumann, R. *Exportações e crescimento industrial no Brasil.* Rio de Janeiro, Ipea/Inpes, 1985. (Série monográfica.)

———. Befiex: efeitos internos de um incentivo à exportação. *Revista Brasileira de Economia, 44* (2), abr./jun. 1990.

——— & Braga, H. C. *O sistema brasileiro de financiamento às exportações.* Rio de Janeiro, Ipea/Inpes, mar. 1985. (Série de Estudos de Política Industrial e Comércio Exterior, 2.)

Becker, B. K. & Egler, C. A. *Brazil: a new regional power in the world economy. A regional geography.* Cambridge, Cambridge University Press, 1992.

Belluzzo, L. G. M. & Coutinho, L. Política econômica, inflexões e crise: 1974-81. In: Belluzzo, L. G. M. & Coutinho, L. (orgs.). *Desenvolvimento capitalista no Brasil: ensaios sobre a crise.* São Paulo, Brasiliense, 1983.

BNDES. *Questões relativas à competitividade da indústria brasileira de bens de capital: bens de capital de encomenda e máquinas-ferramenta.* Rio de Janeiro, Deest, jun. 1988a.

———. *O capital estrangeiro na indústria brasileira: atualidade e perspectivas.* Rio de Janeiro, Deest, maio 1988b.

Brander, J. Rationales for strategic trade and industrial policies. In: Krugman, P. (ed.). *Strategic trade policy and the new international economics.* Cambridge, Mass., MIT Press, 1986.

Carvalho, J. S. & Haddad, C. L. S. Foreign trade strategies and employment in Brazil. In: Krueger, A. O. et al. *Trade and employment in developing countries. Vol. 1: Individual studies.* Chicago, Chicago University Press, 1981.

Castro, A. B. & de Souza, F. E. P. *A economia brasileira em marcha forçada.* Rio de Janeiro, Paz e Terra, 1985.

Castro, C. de M. What is happening in Brazilian education. In: Bacha, E. & Klein, H. (eds.). *Social change in Brazil, 1945-85: the incomplete transition.* New Mexico, University of New Mexico Press, 1989. First published in Portuguese in 1986.

Cepal. *Trade relations between Brazil and the United States.* United Nations, 1985. (Estudios e informes de la Cepal, 52.)

Conjuntura Econômica. Rio de Janeiro, FGV. Various issues.

Dinsmoor, J. *Brazil: responses to the debt crisis. Impact on savings, investment, and growth.* Washington, D.C., Johns Hopkins University Press for the Inter-American Development Bank, 1990.

Erber, F. The development of the electronic complex and government policies in Brazil. *World Development, 13* (3), 1985.

———. A política industrial e de comércio exterior: uma avaliação. In: *Perspectivas da economia brasileira.* Rio de Janeiro, Ipea, 1992.

Evans, P. & Tigre, P. Going beyond clones in Brazil and Korea: a comparative analysis of NICs strategies in the computer industry. *World Development, 17* (11), 1989.

Exame. Maiores e melhores. Abril. Various issues.

Fajnzylber, F. *Sistema industrial e exportações de manufaturados. Análise da experiência brasileira.* Rio de Janeiro, Ipea/Inpes. 1971. (Relatório de Pesquisa, 7.)

Fishlow, A. Origins and consequences of import substitution in Brazil. In: Di Marco, E. (ed.). *Essays in honor of Raul Prebisch.* New York, Academic Press, 1972.

———. A economia política do ajustamento brasileiro aos choques do petróleo: uma nota sobre o período 1974/84. *Pesquisa e Planejamento Econômico, 19*(1): 507-50, Apr. 1986.

———. The Latin American State. *Journal of Economic Perspectives, 4*(3): 61-74, 1990.

Frischtak, C. R. & Dahlman, C. *National systems supporting technical advance in industry: the Brazilian experience.* World Bank, 1990. (Industry and Energy Department Working Paper, Industry Series Paper, 32.)

Furtado, C. *The economic growth of Brazil,* Berkeley, University of California Press, 1963.

Goldsmith, R. *Desenvolvimento financeiro sob um século de inflação.* São Paulo, Harper and Row, 1986.

Graham, E. M. Strategic trade policy and the multinational enterprise in developing countries. In: Buckley, P. & Clegg, J. (eds.). *Multinational enterprise in less developed countries.* Basingstoke, Macmillan, 1991.

Guimarães, E. A.; Malan, P. S. & Araújo, Jr. *Changing international investment strategies: the "new forms" of foreign investment in Brazil.* Rio de Janeiro, Ipea/Inpes, 1992. (Discussion Paper, 45.)

Guimarães, E. P. *Recent trade policy in Brazil.* The Kiel Institute of World Economics, 1989. (Kiel Working Paper, 389.)

Hewitt, T. Employment and skills in the Brazilian electronics industry. In: Schmitz, H. & Cassiolato, J. (eds.). *Hi-tech for industrial development. Lessons from the Brazilian experience in electronics and automation.* New York, Routledge, 1992.

Hong, W. *Trade distortions and employment growth in Korea.* Seoul, Korea Development Institute, 1979.

IBGE. *Estatísticas históricas do Brasil. Séries econômicas, demográficas e sociais de 1550 a 1988.* Rio de Janeiro, 1990.

Kim, S. K. Korea. In: Demetris, P.; Michely, M. & Choksi, A. *Liberalizing free trade: Korea, Philippines and Singapore.* Washington, D.C., World Bank Publications, 1991. v. 4.

Korea Foreign Trade Association — KFTA. *Major statistics of Korean economy.* Seoul, 1989.

Krueger, A. O. Trade policies in developing countries. In: Jones, R. W. & Kenen, P. B. (eds.). *Handbook of international economics. V. 1: Amsterdam.* Elsevier Science, 1984.

Kume, H. *A proteção efetiva proposta na reforma tarifária.* Rio de Janeiro, Fundação Estudos de Comércio Exterior (Funcex), 1988. mimeog.

Lall, S. Explaining industrial success in the developing world. In: Lall, S. & Balasubramaranyan, V. N. (eds.). *Current issues in development economics.* London, Macmillan, 1991.

———. Technological capabilities and industrialization. *World Development, 20* (2): 165-86, 1992.

Lessa, C. *15 anos de política econômica.* São Paulo, Brasiliense, 1982.

Lucke, M. *Traditional labour-intensive industries in newly industrializing countries. The case of Brazil.* Tübingen, University of Kiel, 1990. (Kieler Studien.)

Machado, J. B. M. *Tarifa aduaneira e protecionismo no Brasil.* Rio de Janeiro, Universidade Federal do Rio de Janeiro — IEI, 1990. (Tese de mestrado.)

Matesco, V. *As novas diretrizes da política industrial.* Rio de Janeiro, Ipea/Inpes, jul. 1988. (Relatório do Seminário de Política Industrial.)

Moreira, H. C. & Araújo, A. B. *A política brasileira de importações: uma descrição.* Rio de Janeiro, Ipea/Inpes, 1984. (Série Épico, 1.)

Moreira, M. M. *Industrialization trade and market failures. The role of government intervention in Brazil and South Korea.* London, Macmillan, 1994.

Morley, S. & Smith, G. W. Import substitution and foreign investment in Brazil. *Oxford Economic Papers, 23*: 120-35, 1971.

Modiano, E. M. A ópera dos três cruzados 1985-1989. In: Abreu, M. P. (org.). *A ordem do progresso: cem anos de política econômica republicana. 1889-1989.* Rio de Janeiro, Campus, 1990.

Musalem, A. R. O regime de *drawback* nas exportações de manufaturados e a balança comercial no Brasil. *Pesquisa e Planejamento Econômico, 13* (3):745-62, 1983.

Newfarmer, R. TNC takeovers in Brazil: the uneven distribution of benefits in the market for firms. *World Development, 7*: 25-43, 1979.

——— & Miller, W. *Multinationals in Brazil and Mexico: structural sources of economic and non economic power.* Washington, D.C., U.S. Senate, 1975.

Organization for Economic Cooperation and Development (OECD). *Main economic indicators. Historical statistics 1969-1988.* 1989.

Pastore, A. C.; Savasini, J. A.; Rosa, J. & Kume, H. *Promoção efetiva às exportações no Brasil.* Rio de Janeiro, Funcex, 1979.

Piragibe, C. *Indústria de informática: desenvolvimento brasileiro e mundial.* Rio de Janeiro, Campus, 1985.

Ross, S. A.; Westerfield, R. W. & Jaffe, J. *Corporate finance.* Boston, Irwin, 1988.

Rodrigues, D. G. *Empresas não-financeiras no Brasil: evolução de desempenho no período 1975-84.* Ibmec, 1986.

Serra, J. Ciclos e mudanças estruturais na economia brasileira do pós-guerra. In: Belluzzo, L. G. M. & Coutinho, R. (orgs.). *Desenvolvimento capitalista no Brasil: ensaios sobre a crise.* São Paulo, Brasiliense, 1982.

Schmitz, H. & Hewitt, T. An assessment of the market reserve for the Brazilian computer industry. In: Schmitz, H. & Cassiolato, J. (eds.). *Hi-tech for industrial development. Lessons from the Brazilian experience in eletronics and automation.* New York, Routledge, 1992.

Simonsen, M. H. Brazil. In: Dornbusch, R. & Helmers, F. L. C. H. (eds.). *The open economy. Tools for policy makers in developing countries.* Washington, D.C., Oxford University Press for the World Bank, 1988.

Sochaczewski, A. C. *Financial and economic development of Brazil, 1952-68.* London, University of London, 1980. (Doctor of Philosophy Thesis.)

Sumoc. *Boletim da Superintendência de Moeda e Crédito.* Various years.

Suzigan, W. Política industrial no Brasil. In: Suzigan, W. (ed.). *Indústria: políticas, instituições e desenvolvimento.* Rio de Janeiro, Ipea/Inpes, 1978. (Série Monográfica, 28.)

———. *Investment in the manufacturing industry in Brazil, 1869-1939.* London, University of London, 1984. (Doctor of Philosophy Thesis.)

Tyler, W. G. *Manufactured export expansion and industrialization in Brazil.* University of Kiel, 1976. (Kieler Studien, 134)

United Nation. *International Trade Statistical Yearbook.* Geneva, various years.

———. *Handbook of International Trade.* Geneva, various years.

Versiani, F. R. *Industrial investment in a "export" economy: the Brazilian experience before 1914.* University of London, Institute of Latin American Studies, 1979. (Working Paper, 2.)

Villela, A. & Suzigan, W. *Política de governo e crescimento da economia brasileira: 1889-1945.* Rio de Janeiro, Ipea/Inpes, 1973. (Série Monográfica, 10.)

Villela, A. V. *Empresas do governo como instrumento de política econômica.* Rio de Janeiro, Ipea/Inpes, 1984. (Coleção Relatórios de Pesquisa, 47.)

——— & Baer, W. *O setor privado nacional: problemas e políticas para o seu fortalecimento.* Rio de Janeiro, Ipea/Inpes, 1980. (Coleção Relatórios de Pesquisa, 46.)

Wells, J. *Empleo en América Latina: una búsqueda de opciones.* Santiago, Prealc, International Labour Organization, 1987.

Willmore, L. Controle estrangeiro e concentração na indústria brasileira. *Pesquisa e Planejamento Econômico, 17*(1): 161-90, 1987.

Westphal, L. Fostering technological mastery by means of selective infant-industry protection. In: Syrquim, M. & Teitel, S. (eds.). *Trade, stability, technology, and equity in Latin America.* New York, Academic Press, 1982.

World Bank. *Brazil. Financial systems review.* Washington, D.C., 1984. (A World Bank Study.)

Zysman, J. *Governments, markets and growth: financial systems and the politics of industrial change.* Ithaca, Cornell University Press, 1983.

Appendix

Table A.1
Brazil's effective tariff rates* — 1958-67 (%)

Sectors	1958[a]	1963[a]	1966[a]	1967[a]	1980[b]	1985[b]	1988[b]
Total industry	30	75	44	14	n.a.	n.a.	n.a.
Agriculture	-47	-15	-13	-14	n.a.	n.a.	n.a.
Manufacturing	106	184	108	48	46.4	42.9	32.6
Capital goods	53	113	69	52	71.9	14.5	19.0
Intermediate goods	65	131	68	39	42.0	45.9	42.2
Consumer durables	242	360	230	66	n.a.	-15.5	-10.5
Consumer non-durables					n.a.	50.1	18.9

*Machinery only.
Source: a. Fishlow (1975, p. 58) Foreign trade regimes and economic development: Brazil. (mimeo.), as quoted in Carvalho & Haddad (1981, p. 42). Non-specified method based on legal tariff. Sectoral figures are averages weighted by the 1959 value-added adjusted for tariffs. b. Tyler (1983, p. 553) for 1980, Braga et al. (1988) for 1985 and Kume (1988) for 1988. Effective rates were derived from direct price comparisons, and used 1970 (1980) and 1975 (other years) technical coefficients.

Table A.2
Brazil's Icor — 1948-89[1]

1948-55	2.69
1956-64	2.34
1965-73	1.94
1974-79	4.70
1980-89	9.50

[1]1980 prices. GDP deflated by the implicit deflator and the gross fixed capital formation by the WPI.
Source: Data from IBGE (1990) and *Conjuntura Econômica*, July 1991.

Table A.3
Brazil's share of exports by economic group and sector — 1950-89

SITC	1950	1960	1970	1975	1980	1984	1987	1989
World	2.2	1.0	0.9	1.0	1.0	1.4	1.1	1.1
LDC mnf.			0.9	1.5	2.6	3.8	3.9	n.a.
World mnf.			0.2	0.4	0.7	0.9	0.8	n.a.
Chemicals (5)			0.2	0.3	0.5	1.1	0.8	n.a.
Iron & steel (67)			0.6	0.4	1.2	3.2	2.4	n.a.
Non-ferrous (68)			0.0	0.2	0.2	1.4	1.9	n.a.
Mach. + transp. (7)			0.1	0.4	0.7	0.6	0.6	n.a.
Textile (26+65+84)			0.2	1.0	0.8	1.1	0.7	n.a.
Basic (6+8-68)			0.3	0.6	0.8	1.4	0.9	n.a.

Notes: a) manufacturing defined as 5 to 8 minus 68. b) Figures for industrial sectors are world shares.
Source: United Nations, *International Trade Statistical Yearbook* and *Handbook of International Trade*.