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## NBR products boom and industrial growth in Brazil 1967-1980

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TEXTO PARA DISCUSSÃO

Nº 101

NRB PRODUCTS BOOM AND INDUSTRIAL  
GROWTH IN BRAZIL  
1967-1980

José Márcio Camargo

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## 1 - Introduction

Between 1950 and 1980 the Brazilian economy experienced high rates of industrial growth. Except for the few years between 1961 and 1964, the country's industrial growth rate was more than 7% a year, in average. At the same time the agricultural sector went through a period of stagnation with relatively small average yearly growth rates (see table 1.1).

Table 1.1 - Average growth rates  
1950/1980

Years	Agriculture	Industry	Services*	Total
1950/55	5.11	7.90	7.06	5.69
1956/60	3.55	7.14	7.05	5.81
1961/65	5.84	4.04	4.70	4.24
1966/70	3.09	10.41	9.14	7.54
1971/75	6.49	11.06	12.54	10.45
1976/80	4.67	7.69	7.15	6.90

Source: FIBGE Statistical Yearbook: years: 1962, 1967, 1975 and 1982.

\*/Commerce, Transports and Communications sectors average growth rates.

The economic policies implemented in order to promote this fast industrialization changed during the period and two markedly distinct sub-periods may be characterized.

In the first sub-period, 1950/1967, economic policies induced the imports substitution of durable and non-durable consumption goods. This process actually started in 1940 but

reached its peak during the fifties. This growth strategy truly represented a reaction of Brazilian economic policy-makers to the instability of the international prices of the primary goods exported by the country (mainly coffee). As coffee represented a major share of Brazilian total exports this instability naturally generated serious Balance of Payments structural problems.

The basis of the imports-substitution policy was the imposition of very high custom duties and quantitative limits to imports. The clear objective was the elimination of foreign competition in the internal markets. The underlying argument was the protection of "infant-industries".

Although industrial output increased in the period, (see table 1.1), this policy produced two undesired side effects: the appearance of an anti-trade bias and the country's autarky. In fact, Brazilian export revenues, which were US\$1,359 millions in 1950, remained practically unchanged during the whole period reaching US\$1,430 millions in 1964, the same happening to imports (US\$934 millions in 1950 and US\$1,086 millions in 1964).

While the relative dependence on a single product was maintained in the exports side (coffee), the imports composition suffered a major change. Gradually, purchases concentrated on machinery, equipment and basic industrial inputs. This naturally signified an increase in the relative rigidity of the country's imports bill in the sense that an eventual necessity of its compression would cause a reduction of industrial output.

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On the other hand, the country's economic growth was supported by a massive investment plan which required large amounts of capital. Therefore in 1968, Brazilian foreign indebtedness totaled US\$3,780 millions which represented approximately twice the value of the country's total exports in that year (US\$1,831 millions).

In the second sub-period 1967/1980, the relative rigidity of the structure of Brazilian balance of payments, associated to the pressures imposed by the cost of the debt service led the country to open its economy after 1968. This strategy comprised not only the real side (exports and imports) but also the financial side (foreign indebtedness). The objective measures taken after 1968 were the modification of the schedule of custom duties, reducing the protection to the internal markets, the subsidizing of industrial products exports and the adoption of the crawling-peg rule with periodical mini-devaluations and maintenance of the real exchange rate. The objective of this set of policies was to increase the country's participation in the world trade.

Simultaneously with the adoption of these domestic policies, international trade went through a period of expansion. The prices of primary products increased and consequently the terms-of-trade improved, favoring the natural-resources-based products (NRB) exporters. The result was a significant increase of the exports receipts derived from the sales of NRB primary goods and manufactured goods produced with an intensive use of natural resources (processed food, for example). Due to substitution

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between crops agriculture for domestic consumption remained stagnant in the period.

The objective of this work is to analyse Brazilian economic growth in the period 1967-1980 focusing on the balance of payments performance and on the impact of external shocks on the growth path (such as variations in prices of NRB products including imported inputs).

In the next section we will make a brief description of the foreign trade policies adopted in the period, together with an analysis of the effects of the international trade growth on the prices of the NRB products exported by Brazil. In section three we will describe how these two factors influenced the country's total exports and the performance of the agricultural sector.

In the fourth section we study how the country managed to generate foreign exchange surpluses between 1968 and 1973, slackening the external constraints on growth, and the effects of the oil prices shock of 1974 on the country's balance of payments. In the fifth section the theoretical framework on which this paper is based is presented. The sixth section describes the main results obtained in terms of industrial expansion. It also contains a description of the role played by Central Government, by real wages fluctuations and by the prevailing patterns of income distribution in the determination of the level of internal absorption achieved by the economy. Finally, section 7 presents the main conclusions.

## 2. Brazilian foreign trade policy and the NRB products boom

From the second half of the sixties on, two important factors changed the pattern of Brazilian economic growth. In the first place the rapid increase in international trade and the relative abundance of funds in private international financial markets. In the second place the change in the conception of the domestic economic policy from a growth model based on imports substitution, with an important anti-trade bias, to a model based on incentives to export, mainly industrial products, as a means to face the limits imposed by the scarcity of foreign exchange.

In this section we will analyse the economic policies implemented after 1968, the growth of international trade volume and the increase of NRB products international prices.

### 2.1 - Brazilian foreign trade policy

The change of Brazilian foreign trade policy after 1967 was based in two fundamental measures:

- a) the introduction of a system of minidevaluations (crawling-peg) which maintained constant the real exchange rate and consequently reduced the exchange risk of exporters, and;
- b) the implementation of a policy based on credit and fiscal incentives to export industrial products which reduced their prices, improving their competitiveness in the world markets. (\*)

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\*/ The levels of custom duties were lowered and effective internal market protection drastically reduced. See PENALVER M. (1983).



Until 1967, Brazil used a system of fixed exchange rates which were submitted to periodical devaluations thus avoiding the high levels of domestic inflation to cause an excessive overvaluation of the dolar, vis-a-vis the cruzeiro. In this system the devaluations were generally made once a year but, from 1959 on, it could not prevent a fall of the real exchange rate of both industrial and NRB products.

Apart from generating the overvaluation of the cruzeiro vis-a-vis the american dolar, the policy of making yearly devaluations in an economy with high rates of inflation, resulted in an expressive gap in the real exchange rate between one devaluation and another. This gap, in its turn, rose the exporters exchange risk thus creating a bias against exporting. Table 2.1 shows the high levels

Table 2.1 -Real exchange rate (Cr\$ per US\$) and Coefficient of Variation  
1955-1965

Year	Real Exchange Rate Manufactured products*	Real Exchange Rate NRB products**	Real Exchange Rate Coefficient of Variation
1955	2.850	3.236	0.1074
1956	3.398	2.457	0.1245
1957	2.187	2.359	0.1299
1958	3.315	3.292	0.1124
1959	2.815	2.668	0.0761
1960	2.600	2.613	0.0761
1961	2.647	2.613	0.0670
1962	2.517	1.982	0.0867
1963	2.122	1.718	0.0867
1964	2.583	2.197	0.1666
1965	2.552	2.063	0.0588

Source: CARVALHO, J.L. and C.L.S.HADDAD - 1980, p. 72

\*/Brazilian exports exchange rate times USA wholesale price index divided by Brazilian wholesale price index.

\*\*/Calculated as the previous index substituting the USA wholesale price index for the US\$ price index of NRB products, except coffee. Both indices equal 100 in 1970.

of the exchange rate variation coefficient and the fall of the real exchange rate between 1955 and 1965.

The continuous stagnation of exports revenues and the lack of incentives to diversification reduced the country's capability to import and thus made the deepening of the imports substitution process towards capital goods and basic inputs impossible. Therefore, in the late fifties, when the dynamism of the imports substitution of durable and nondurable consumption goods was over, a period of low industrial growth rates followed (from 1961 to 1965).

From 1968 on, the operation of the crawling-peg rule stabilized the real exchange rate and significantly reduced the exporters exchange risk. The subsidizing of manufactured goods exports increased the effective real exchange rate of these products, improving their competitiveness in international markets. Table 2.2 shows the evolution of the real exchange rate and of its coefficient of variation resulting from the implementation of these policies.

The values of the effective real exchange rate of industrial products presented in the third column of Table 2.2 were calculated from the break-down of the incentives policy into its three basic components:

- a) taxes exemption to exported products
  - b) subsidized credit to exporters
  - c) other fiscal benefits and specific programs.
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Table 2.2 - Real exchange rate and its coefficient of variation

1963/1974

Year	(1)	(2)	(3)	(4)	(5)
Real exchange rate manufactured goods	Real exchange rate manufactured goods including subsidies	Real exchange rate manufactured goods including subsidies	Real exchange rate index-manufactured goods including subsidies	Real exchange rate - NRB products	Real exchange rate coefficient of variation
1963	2.122	2.122	100.0	1.718	0.0867
1964	2.583	2.589	122.0	2.197	0.1666
1965	2.552	2.675	126.1	2.063	0.0588
1966	2.190	2.426	114.3	1.821	0.0922
1967	2.080	2.527	119.1	1.850	0.0858
1968	2.216	2.152	134.4	1.948	0.0346
1969	2.319	3.102	146.2	1.918	0.0243
1970	2.272	3.166	149.2	1.864	0.0187
1971	2.224	3.458	163.0	1.890	0.0105
1972	2.215	3.678	173.0	1.971	0.0074
1973	2.241	3.720	175.3	2.473	0.0174
1974	2.287	3.797	178.9	2.732	0.0403

Source: CARVALHO, J.L. and C.L.S. HADDAD - 1980 - page 72.

\* Real exchange rate deflated by the incentives to export index calculated by W.Tyler (1976).

The incentives of the first kind were basically

exemptions from indirect taxes on the part of the production

destined to exportation (Industrialized Products Tax- IPI and

Sales Tax - ICM). Also, the profits obtained with the exporting

activities and with drawback operations (purchase of imported

inputs) were both exempt from income tax.

The credit incentives were loans with subsidized

interest rates offered by Banco do Brasil to exporting firms in order to finance their working capital. It was also possible for

these firms to account as credits the amount of the indirect taxes - IPI and ICM - industrialized products and sales taxes - from which they were exempt.

Finally some special governmental programs were implemented being BEFLEX the most important of all. Through this program the firms whose products were exported totally or in part could submit their investment plans to governmental agencies and obtain tax and custom duties exemptions in the importation of equipment and machinery. These purchases were also free from the prevailing restrictions imposed on the importation of products similar to the ones produced in the country.

Many works tried to estimate the amount of subsidies to the exportation of manufactured goods and they indicate that it represented approximately 15 to 20 per cent of the total receipts of these products exports<sup>(\*)</sup> each year.

## 2.2 - The NRB products boom

The main objective of the trade policy just described was to provoke a right shift in the Brazilian exports supply curve. It was implemented in a context of fast international trade expansion. Between 1961 and 1973 the GDP of developed countries grew at an average rate of 5 per cent a year and that of underdeveloped

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\*/ Some important works are: SAVASINI, J.A. (1975); CARVALHO, J.L. and HADDAD C. (1980); FISHLOW, A. (1975); TYLER, W. (1976); PEÑALVER et al (1983).

countries at 6.1 per cent a year. International trade also increased at very high rates. Not only the total exports of these two kinds of countries showed a favorable performance (8.4 per cent and 6.7 per cent a year, respectively) but also the total imports of developed countries grew at the average yearly rate of 8.9 per cent (see table 2.3), a rate which was much higher than the ones prevailing in the preceding years.

Table 2.3 - Real GDP and world trade growth rates

1961-1979

(percentages)

Groups of Countries	1961-1973	1974-1979
Developed Countries		
GDP	5.0	2.6
Exports	8.4	5.1
Imports	8.9	3.6
Underdeveloped Countries		
GDP	6.1	5.2
Exports	6.7	2.0
Imports	6.0	8.9

Source: World Economic Survey- 1984- United Nations- page 28

This trend was reversed in the period 1974-1979, following the first oil shock. The industrialized countries growth rate was reduced to one half, the same happening to the value of their total imports. The process of adaptation of underdeveloped countries to the new international economic conditions was not so fast. These countries faced many difficulties to slower their

economic growth pace and had to bear an increasing value of imports with decreasing exports.

As for our present objectives we must point out that the increase of total imports of industrialized countries in the period 1967-1973 caused a right shift in the demand for the exports of underdeveloped countries NRB products. The effects of this demand shift on the prices and quantities of primary products exported by Brazil were very important. Table 2.4 shows the evolution of these prices in the period 1965-1980.

Table 2.4-International price indices of some Brazilian primary products

	1965	1970	1975	1980
Sugar	100	120	587	541
Cotton	100	92	187	265
Cocoa-Nuts	100	216	415	784
Coffee	100	113	127	365
Tobacco	100	122	297	423
Oranges	100	143	343	383
Soy beans	100	96	209	259
Iron Ore	n.d.	100	155	275

Source: Calculated from the quantum and value of each of the products exported in the various years - Brazilian Statistical Yearbook- various issues.  
n.d. not determined.

With the only exception of coffee, the international prices of the Brazilian main NRB products increased sharply in the period. Undoubtedly the first five years of the seventies were the most favorable ones. After 1974, although this trend was maintained, it became less intense.

### 3. Growth and diversification of exports and the agricultural sector

The boom of the NRB products foreign demand which characterized this period, had important effects on the volume and composition of Brazilian exports and on the structure of agricultural production.

#### 3.1 - Growth and diversification of exports

Brazilian total exports receipts increased from US\$1,595 millions in 1965 to US\$20,132 millions in 1980 expressing an average yearly growth rate of 18.42 per cent in the fifteen years considered. But even more important than the increase of total exports receipts was the performance of the distinct groups of products. Coffee, that used to be the most important tradeable and contributed half the total receipts of 1965, went through a period of stagnation until 1975, improving afterwards. Coffee exports increased 8.75 per cent a year in average in the period. All other products showed a much better performance (15.78 per cent a year for other NRB products and 27.26 per cent a year for industrialized products).

In the sub-period 1970-1975 the best results were obtained. Except for coffee, whose exports value decreased 0.19 per cent a year in the period, Brazilian total exports receipts from NRB products sales increased 30.14 per cent as an yearly

average, while the industrialized products sales increase reached the outstanding rates of 39.20 per cent a year in average (see table 3.1).

Table 3.1 - Brazilian exports growth rates, value and composition  
1965/1980

	Value (US\$ millions)				Growth Rates			
	1965	1970	1975	1980	1965/80	1965/70	1970/75	1975/80
Primary Goods	1301(85.54)	2057(75.10)	5027(57.99)	8488(42.16)	13.32	9.60	19.57	11.05
Coffee	706(44.29)	939(34.29)	855( 9.80)	2486(12.35)	8.75	5.90	-0.19	23.80
Others	586(36.74)	1118(40.81)	4173(48.13)	6001(29.81)	16.78	13.38	34.14	7.54
Industrialized Products	284(17.78)	657(24.00)	3434(39.61)	11377(56.81)	27.26	18.26	39.20	27.71
Semi-manufactured	154( 9.65)	249( 9.09)	850( 9.80)	2347(11.66)	19.91	10.09	27.83	22.52
Manufactured	130( 8.13)	408(14.91)	2585(29.81)	9029(44.85)	32.67	25.70	44.66	28.42
Total	1595	2739	8670	20132	18.42	11.42	25.92	18.35

Source: Brazilian Central Bank Bulletin- various issues  
Brazilian Statistical Yearbook - various issues

Thus, the composition of Brazilian exports was significantly altered during this fast growing period and manufactured products started to be exported in a larger scale. These in 1965 contributed only 8.13 per cent of total receipts. In 1980 their contribution reached 44.85 per cent. The industrialized products in general were responsible for more than half of the country's exports receipts in 1980 (56.81 per cent). On the other hand, the relative participation of NRB primary products in total receipts was reduced from 85.54 per cent in 1965 to 42.16 per cent in 1980 mainly as a consequence of coffee poor performance.

Processed food was one of the major items responsible for the outstanding results obtained by the industrialized products group. Table 3.2 shows the exports value of the sector's four



main products and also their relative share in total exports between 1965 and 1980.

Table 3.2 - Exports value of main processed food products  
1965-1980  
(US\$ 1,000)

	Total Value				Growth Rate			
	1965	1970	1975	1980	1965/80	1965/70	1970/75	1975/80
Soluble Coffee	743	42535	79633	28516	44.47	124.67	13.36	29.06
Orange Juice	1884	14737	82213	338714	41.36	50.89	41.03	32.73
Soybeans	7225	40654	463742	1449013	42.39	41.27	62.72	25.59
Oil	-	767	153688	421250	87.92	-	188.65	22.34
Total Processed Food(1)	9852	98693	779276	2494137	44.62	58.85	51.17	26.20
Total(1)/Industrialized	3.47	15.2	22.69	21.92	-	-	-	-
Total(1)/Total Exports	0.62	3.60	8.99	12.39	-	-	-	-

Source: Basic Statistics of the Agricultural Sector in Brazil-IPE/USP, vol.I, 1983.

Central Bank Bulletin, various issues.

From this table, we may observe a remarkable increase in the receipts of these products exports. Their share in total industrialized products exports rose from 3.47 per cent in 1965 to 21.92 per cent in 1980 and their share in total exports rose from 0.62 per cent to 12.39 per cent in the same period.

### 3.2 - Agricultural sector growth and stagnation

This rapid and sustained increase in the non-traditional primary goods exports had important reflections on the structure of Brazilian agriculture in the period.

Brazilian agriculture may be divided into two sub-sectors with different insertions in international trade. On the one hand there is the tradeables sub-sector whose production is mainly destined to exportation. This sub-sector constitutes a major source of foreign exchange to the country. Its main products are cotton, sugar, coffee, cocoa nuts, tobacco, oranges and soy beans. On the other hand there is the non-tradeables sub-sector which produces food for domestic consumption. (The importation of food is a very small share of total Brazilian supply). The main cultivations are: rice, beans, manioc, potatoes, tomatoes, onions and corn.

In an economy like the Brazilian one, in which the expansion of the agricultural sector is basically made through the integration of new areas to cultivation and in which the producer's response to market signals is very strong, (\*) the relative price play an important role in the process of resources allocation amongst different crops. The rise in the international prices of NRB products increased the relative price of tradeables vis-a-vis the non-tradeables and consequently changed the sector's profitability profile favoring tradeables production. Table 3.3 registers the relative price of these two sub-sectors in the period 1967/1978.

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(\*) In a recent work GURVITZ, L.H., making use of a translogarithmic production function, estimated the elasticity of substitution between these two sub-sectors reaching - 0,310 between 1967 and 1979. The price elasticities were 0.199 and 0.327 for tradeables and non-tradeables respectively. GURVITZ, L.H. (1984).

Table 3.3-Relative price index-tradeable goods (T) x non-tradeable goods (NT)  
1967/1978

Year	T/NT	Year	T/NT
1967	100	1973	134
1968	112	1974	136
1969	132	1975	193
1970	131	1976	232
1971	141	1977	237
1972	126	1978	210

Source: HOMEM DE MELLO, F., (1983) page 20.

Obs: Tradeables (T): oranges, coffee, sugar-cane, soybeans, castor beans, peanuts and cotton.

Non-tradeables (NT): rice, potatoes, onions, beans, manioc, tomatoes, corn and bananas.

Thus, there was an expressive transference of resources from one sub-sector to another causing the fast growing of tradeables production and the stagnation of agriculture for domestic consumption. Table 3.4 shows the output indices of the main Brazilian crops. The contrast between one sub-sector expansion and the stagnation of the other is characteristic of the period. It is very important to note the quite poor performance of the three most important items of Brazilians food: rice, beans and manioc.

Table 3.4-Agricultural production index-tradeable and non-tradeable products

	1965=100			
	1965	1970	1975	1979
Tradeable				
Coffee *	100	25 (47)	55 (106)	58 (111)
Cocoa Nuts	100	127	175	209
Cotton	100	64	88	82
Soybeans	100	353	1891	1957
Oranges	100	135	276	370
Tobacco	100	88	115	170
Sugar-Cane	100	89	121	183
Non-Tradeable				
Rice	100	70	103	100
Beans	100	66	100	95
Manioc	100	58	105	100
Potatoes	100	70	133	173
Tomatoes	100	110	181	259
Onions	100	93	154	306
Corn	100	105	135	135
Bananas	100	71	104	117

Source: Statistical Yearbook-FIBGE-various issues.

Basic Statistics for Brazilian Agricultural Sector-vol.1,IPE/USP,1983.

\* As 1965 crop was exceptionally good the numbers in parenthesis represent the index with 1964=100.

The stagnation of agriculture for domestic consumption had clear effects on its prices in the seventies. Table 3.5 shows the General Price Index (GPI), the Wholesale Price of Industrial Products Index (WPI) and the indices of food share in the Cost-of Living (CLI) in Rio de Janeiro and São Paulo.

Table 3.5- Brazilian price indices  
1967/1980

Year	<u>Food in Cost-of-Living Index</u>		WPI	GPI
	Rio de Janeiro	São Paulo	Industry	
1967	100	100	100	100
1970	168	187	187	180
1975	486	625	512	478
1979	2401	2581	2049	2056

Source: Cost-of-Living Index- Food, São Paulo, HOMEM DE MELLO, F.,  
All other indices- Conjuntura Econômica, FGV, various issues.

We may observe a clear tendency of food prices to increase more than the other prices in the economy. This tendency is stronger after 1975. The undesired reflections of this fact on the real wage of workers, on the country's distribution of income and inflation rate are sufficiently known and therefore wont by analysed in this paper. (\*)

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(\*) See CAMARGO, J.M. and E. LANDAU (1983); HOMEM DE MELLO, F. (1983) and CARDOSO, E. (1980).

#### 4. External constraints and foreign indebtedness: Brazilian balance of payments performance.

The fast growth of Brazilian exports had positive consequences on the country's balance of payments results. Two sub-periods may be pointed out: Until 1973 when Brazil faced no limitations regarding the availability of foreign exchange and the years thereafter when, although exports continued to grow, the increase of oil prices brought the scarcity of foreign exchange back to the scenario, hindering the country's economic growth. Foreign funds raising was intensified after 1974 as an attempt to avoid this obstacle. In this section we will analyse the external constraints to Brazilian economic growth and pattern of foreign indebtedness.

##### 4.1 - 1967/1973 - The elimination of foreign constraints

During this period Brazilian reserves reached an unprecedented level due to the intensification of foreign capital inflows and also to the increase in the amounts exported. This meant the elimination of the foreign constraints growth, a characteristic limitation of the Brazilian economy at least since World War II. This relative availability of foreign exchange was reflected in the remarkable increase of the country's total imports and in the accumulation of reserves from 1967 on. Between 1967 and 1973 Brazilian imports increased from US\$1,667 million to US\$6,999 millions with an average yearly growth rate of 22.75 per cent and causing no considerable trade balance deficits.

During the whole period the accumulated trade deficit reached US\$2,589 millions while total exports reached US\$21,679 millions (see Table 4.1).

Table 4.1 - Brazilian balance of payments

(US\$ millions)

1964/1980

Year	Exports	Imports	Trade Balance TB	Current Account	Capital Account	Erros and Omissions	Balance of Payments BP
1964	1430	1263	167	102	92	-126	68
1965	1595	1096	499	263	67	32	362
1966	1741	1496	245	-73	128	18	73
1967	1654	1667	-13	-277	66	-34	-245
1968	1881	2132	-251	-503	498	37	32
1969	2311	2265	46	-108	244	-	137
1970	2739	2849	-110	-1	192	-	191
1971	2904	3701	-797	-1307	1846	-9	530
1972	3991	4783	-792	-1489	3492	436	2439
1973	6199	6999	-800	-1688	3512	355	2179
1974	7951	14168	-6217	-7122	6254	-36	-936
1975	8670	13592	-4922	-6700	6188	-439	-950
1976	10128	13726	-3598	-5976	6651	518	-1192
1977	12120	13257	-1137	-4037	5269	-602	630
1978	12659	15054	-2395	-6990	9439	332	3880
1979	15244	19804	-4560	-10742	7657	-130	-3215
1980	20132	24961	-4829	-12807	9679	-343	-3472

Source: Brazilian Central Bank Bulletin- various issues

This excellent trade balance performance associated to the low international interest rates then prevailing made possible an increase of the country's foreign debt without further relative

commitment of exports receipts with interest payments. In the period 1968-1973 the net expenses with interest payments/exports receipts ratio remained practically stable. (Table 4.2).

Table 4.2 - Interest payments expenses

1968/1973

Year	Net interest payments	Net interest payments (% of exports)	Foreign Debt (US\$ millions)	Reserves (US\$ millions)
1968	144	7.66	3,780	257
1969	182	7.88	4,403	656
1970	234	8.54	5,295	1187
1971	302	10.40	6,622	1723
1972	359	9.00	9,521	4183
1973	514	8.29	12,572	6415

Source: Brazilian Central Bank Report (1980) page. 121

On the other hand capital inflows more than compensated for current account deficits, providing for reserves accumulation. In 1973, Brazilian reserves reached the amount of US\$6,415 millions which was almost the same as the value of total imports and represented more than half of total foreign debt in that same year. (\*)

The fast expansion of Brazilian industrial output after 1967 (see below section 6), was only possible because of this performance of the external sector as the country's production of capital and intermediate industrial goods was relatively small

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(\*) Although it is questionable whether it was a wise policy to maintain such large reserves simultaneously with increasing debt.



and there was a remarkable increase in the rate of investment (from 17.6 per cent of GDP in 1967 to 26.8 per cent of GDP in 1973)

The imports value of machinery and equipments rose from US\$ 532 millions to US\$ 2,422 millions with an yearly growth rate of 24.18 per cent in average. The participation of these goods in total imports increased from 31.9 per cent to 41.0 per cent between 1967 and 1972. (Table 4.3).

Table 4.3 - Investment rates and capital goods imports  
1967/1973

Years	Investment rates (as percentages of GDP)	Capital goods imports US\$ millions	Capital Goods imports	Total Imports (%)
1967	17.6	531.77	31.9	
1968	19.8	625.14	33.7	
1969	19.8	38.05	37.0	
1970	21.0	1,074.07	37.7	
1971	22.0	1,528.51	41.3	
1972	24.4	1,961.03	41.0	
1973	26.5	2,421.65	34.6	

Source: Investment Rates-Brazilian National Accounts.  
Capital Goods Imports-Brazilian Central Bank Bulletin-various issues.

#### 4.2 - 1974/1980 - The reappearance of external constraints

The changes in the international scenario which took place after 1973 such as the international liquidity crisis and the rise of oil prices and international interest rates meant

a severe shock to the Brazilian economic growth pattern which depended heavily on imported inputs and international financing.

In the first place between December 1972 and December 1973, the prime-rate grew from 5.75 per cent to 9.75 per cent a year (see Table 4.4). In 1975 and 1976 the prime-rate declined but in 1977 the growing trend was retaken and, at the end of the decade, it reached the level of 15.25 per cent a year. The London interbank rate followed these variations quite closely.

Table 4.4 - International interest rates as of December of each year  
1968/1980

Year	Prime-Rate	Libor	Year	Prime-Rate	Libor
1968	6.75	7.13	1974	10.25	10.19
1969	8.50	10.06	1975	7.25	6.63
1970	6.75	6.75	1976	6.00	5.38
1971	5.25	5.81	1977	7.75	7.50
1972	5.75	5.88	1978	11.75	12.31
1973	9.75	10.13	1979	15.25	14.44

Source: Morgan Guaranty Trust, World Financial Markets, various issues

This increase of international interest rates had a considerable impact on Brazilian current account balances since it signified larger expenses with interest payments. These rose from US\$ 514 millions in 1973 to US\$1,498 millions in 1975, reaching US\$4,186 millions in 1980. Although total exports receipts continued to grow, its proportion destined to interest payments also increased much (from 8.2 per cent in 1974 to 31.3 per cent in 1980).

Table 4.5 - Net interest expenses

1974/1980

Years	Net interest expenses US\$ millions	Net interest expenses
		Exports receipts
1974	652	8.2
1975	1,498	17.3
1976	1,810	17.9
1977	2,103	17.4
1978	2,696	21.3
1979	4,186	27.5
1980	6,311	31.3

Source: Brazilian Central Bank Report - 1980 page. 121

Secondly, the quadruplication of oil prices had devastating effects on trade balance results. In the period 1967-1972, oil contributed with approximately 11 per cent of total Brazilian imports. In 1974 this contribution jumped to 22.4 percent reaching 44.4 percent at the end of the decade.(Table 4.6).

Table 4.6 - Brazilian imports composition

1973/1980

(US\$ millions)

Years	Capital Goods	Basic Inputs	Consumption Goods	Petroleum
1973	2,421.65 (34.6)	2,946.58 (42.1)	811.88 (11.6)	818.88 (11.7)
1974	3,513.66 (24.8)	6,403.94 (45.2)	1,076.77 ( 7.6)	3,173.63 (22.4)
1975	4,391.51 (32.3)	4,840.18 (35.6)	924.53 ( 6.8)	3,439.79 (25.3)
1976	3,939.36 (28.7)	4,625.66 (33.7)	878.46 ( 6.4)	4,282.51 (31.2)
1977	3,420.31 (25.8)	4,308.53 (32.5)	1,034.05 ( 7.8)	4,949.12 (33.9)
1978	3,883.93 (25.8)	4,982.87 (33.1)	1,234.43 ( 8.2)	4,952.77 (32.9)
1979	4,139.04 (20.9)	6,515.52 (32.9)	1,722.95 ( 8.7)	7,426.50 (37.5)
1980	4,767.55 (19.1)	9,909.52 (39.7)	1,422.78 ( 5.7)	11,082.68 (44.4)

Source: Brazilian Central Bank Report - various issues

Simultaneously, Brazilian government decided to change its growth strategy and implement a huge investment program to promote the imports substitution of capital and intermediate industrial goods. This, and the country's lingering in the substitution of oil for other sources of energy resulted in imports growth during the investment maturing period, and very large trade deficits.

Oil imports grew fastly until 1979 both in quantities and value. From the amount of US\$ 3,174 millions in 1974, oil imports reached US\$ 7,427 millions in 1979 and US\$ 11,083 millions in 1980 after the second oil price shock. Total expense with oil imports did not grow only because of the price increase but also because of the quantities imported. Brazil imported 252,058 thousand barrels in 1974 and 364,738 thousand barrels in 1979 which represents an yearly growth rate of approximately 7.7 per cent. At the same time, domestic production remained stable in the level of 60,000 thousand barrels a year. In other words, until 1979 almost nothing was achieved towards the goal of reducing the importation of petroleum or increasing domestic production. The oil imports contributed 80 per cent of total domestic demand in 1974 and 85.7 per cent in 1979 (see table 4.7).

Only six years after the first oil shock, around 1979/1980 the Brazilian economy started its hard adaptation to this new reality. The second oil price shock made clear for the Brazilian policy-makers that OPEP was something more permanent in the international scenario than believed at first. With this

Table 4.7 - Petroleum-domestic production and imports  
1973/1982

Year	Domestic production 1000 barels	%	Imports 1000 barels	%
1973	62,121	19.3	259,278	80.7
1974	64,754	20.4	252,058	79.6
1975	62,767	19.3	262,190	80.7
1976	61,027	16.9	300,837	83.1
1977	58,690	16.5	296,643	83.5
1978	58,527	15.2	327,641	84.8
1979	60,766	14.3	364,738	85.7
1980	66,441	17.3	316,922	82.7
1981	77,901	20.2	308,377	79.8
1982	94,852	24.6	291,166	75.4

Source: National Petroleum Council Statistical Yearbook, Petrobras - 1983

expectations reversal many programs were implemented or dynamized both on demand and supply sides which aimed at the substitution of petroleum for other sources of energy.

The imports substitution program initiated in 1974 increased capital and intermediate goods imports by rates higher than 10 per cent a year in average, the same happening to other basic inputs (except petroleum). Finally, even the importation of consumption goods which decreased in 1975 and 1976 started to increase in absolute terms reaching in 1979 an amount which was twice the one of 1973. (table 4.6). This was the direct result of the policy of maintaining the level of domestic absorption at high standards as we will see later (section 6). For the purposes of this section it is

important to analyse the effects of the new policies on the country's balance of payments results.

As we have seen, Brazilian trade balance was under control until 1973 although total imports increased very much. From this year on, it started to generate permanent and significant deficits. In 1974, the trade balance deficit was US\$6,217 millions, almost eight times the one of 1973. Between 1975 and 1977 the deficits were not so big but yet, after this last year they restarted to grow reaching US\$4,829 millions in 1980. The accumulated trade deficit of these seven years was US\$27,658 millions, which represented 37 per cent of the country's total exports of the period. The accumulated current account deficit reached US\$54,374 millions and was obtained through an average yearly deficit of approximately US\$7,767 millions (63 per cent of the period's total exports).

The financing of such disequilibrium was made through the absorption of huge amounts of foreign capital, increasing total debt. But, differently from what happened in the period 1967-1973, such new loans caused a dangerous enlargement of the country's financial exposure. Yet, in the middle of this period all economic indicators alerted to the fragility of the country's external accounts, specially if further difficulties arised. The net debt/exports ratio which was 0.99 in 1973 reached 1.98 in 1975 (a situation alike the one of the period 1960-1966) and 2.64 in 1979. In 1980, 65 per cent of total exports receipts was spent with the debt service payments. (table 4.8).

Table 4.8 - Foreign debt and financial exposure indicators  
1974-1980

(US\$ billions)					
Year	Gross debt	Reserves	Net debt	Net debt/ exports	Debt service/ exports
1974	17,166	5,269	11,895	1.50	0.33
1975	21,171	4,040	17,131	1.98	0.42
1976	25,985	6,644	19,441	1.92	0.48
1977	32,037	7,256	24,781	2.04	0.51
1978	43,511	11,895	31,616	2.50	0.64
1979	49,904	9,689	40,215	2.64	0.70
1980	53,847	6,913	46,934	2.33	0.65

Source: Brazilian Central Bank Report - 1980 - page 121

Thus, by the end of the seventies, the country's financial fragility made it impossible to cope with success with further exogenous shocks, which indeed came in the early eighties.

## 5. Theoretical framework

After this general description of the Brazilian external sector performance in the period 1967-1980, we can now make explicit the theoretical framework upon which our analysis is based. Two different models can be used to understand the period. The first one takes a macro perspective, and emphasizes the effects of the NRB products boom and capital inflows. The second one, of a micro-economic character, calls the attention to the effect of the oil shock on the tradeables and non-tradeables sectors of the economy.

### 5.1 - A macro model

We will start with an aggregate model for an open economy in which the international prices of imports ( $P_m$ ) and exports ( $P_x$ ) are exogenously determined, being the capital flows an important component of the balance of payments<sup>(\*)</sup>. So, if:

$x$  = exports value

$m$  = imports value

$\theta$  = real exchange rate =  $\frac{p}{p^*} = \frac{\text{domestic price}}{\text{international price}}$

$d$  = net debt existing in the beginning of the period

$r^*$  = international interest rate

$f$  = net result of capital flows = capital inflows -  
amortizations + reserves variation

$A$  = absorption

$r$  = domestic interest rate

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<sup>\*</sup>/ Based on RUDIGER, D: (1980) - see also MARTONE, C. (1984).



Then;

$$x = x | \theta, A(r) |$$

$$m = m | \theta, A(r) |$$

$$x - m = x | \theta, A(r) | - m | \theta, A(r) | = \text{Trade balance}$$

that is, the value of imports and exports depend on the real exchange rate and on the level of absorption given the international prices of the two kinds of products ( $P_x, P_m$ ) and therefore the terms of trade ( $P_x/P_m$ ).

A variation of the real exchange rate has an income effect and a substitution effect with different impacts over the value of imports and exports. In the case of imports, both effects act in the same direction, reducing its value. A rise of  $\theta$ , increases the prices of imported goods and reduces their demand, both through the decrease of real income and through its substitution caused by their relative appreciation. Therefore, a devaluation of the real exchange rate certainly reduces imports. Thus,

$$\frac{\partial m}{\partial \theta} < 0$$

In the case of exports, the effects act on different directions since a rise in  $\theta$  increases the domestic price of exported goods, the real income and the level of demand generating a positive income effect. The substitution effect produces an increase of exports value. We suppose the second effect is dominant thus,

$$\frac{\partial x}{\partial \theta} > 0$$

On the other hand, a rise in the level of domestic absorption increases the demand for imported goods and reduces the share of domestic production destined to exportation, therefore,

$$\frac{\partial x}{\partial A} < 0; \quad \frac{\partial m}{\partial A} > 0$$

The balance of payments equilibrium requires that:

$$x|\theta, A(r) - m|\theta, A(r) = r^* d-f \quad (1)$$

Equation (1) says that current account deficits (surpluses)  $(x - m - r^* d)$  are compensated by net capital entries (exits). This equation represents the external sector equilibrium. If we are initially in equilibrium, a real currency devaluation (a rise in  $\theta$ ), brings an incentive to export and reduces imports generating balance of payments surpluses. The return to equilibrium requires a rise in the economy's level of absorption and reduction of interest rates. Therefore, in the space  $(\theta, r)$  this is a decreasing relation. The curve BB in Figure 1 shows the combination of the values of  $\theta$  and  $r$  for which the economy's foreign sector is in equilibrium. The points above and to the right of BB produce balance of payments surpluses while the points under the curve produce deficits. An improvement (worsening) in the terms of trade  $(P_x/P_m)$  causes a left (right) shift of this curve.

Output is determined by demand which is composed of absorption  $A(r)$  and trade balance results. Domestic absorption has a public and a private component. The first is determined by the difference between governmental receipts  $(t)$  and expenses  $(g)$  and the second is negatively related to the levels of interest rates. Thus,

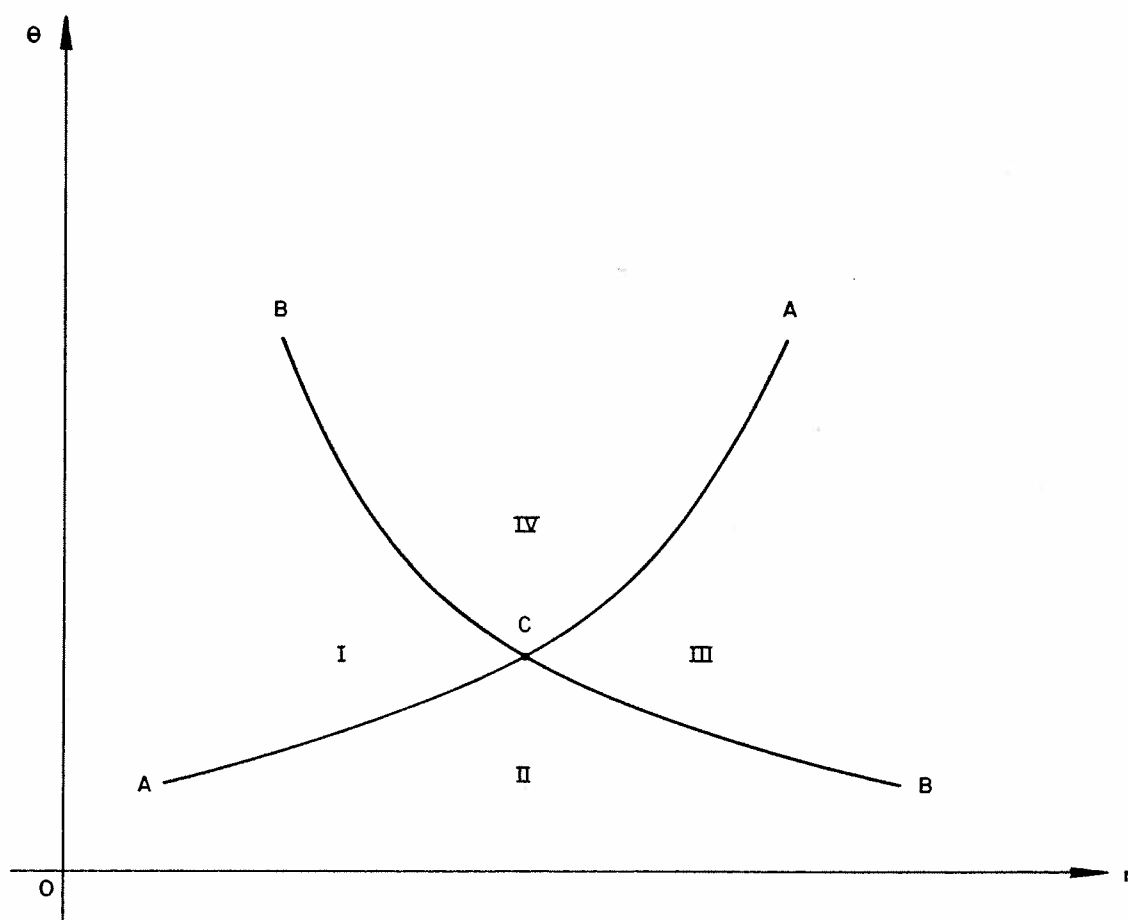


FIGURE I

$$A(r) = a(r) + (g - t)$$

where  $a(r)$  = private absorption and

$$\frac{\partial a}{\partial r} < 0$$

The internal equilibrium requires that demand equals supply so,

$$a(r) + (g-t) + x \mid \theta, A(r) \mid - m \mid \theta, A(r) \mid = y$$

where  $y$  denotes output level. If there is internal equilibrium, a rise of  $r$  reduces private absorption and supply exceeds demand. The return to equilibrium requires an exchange rate devaluation which increases exports and reduces imports, compensating for the decreasing level of absorption effect. Thus, the curve representing internal equilibrium  $AA$  has a positive slope as in figure 1. The points to the left and above  $AA$  are points of excess demand while the points to the right and below  $AA$  represent unemployment.

Figure 1 may be divided into four different regions representing the economy's internal and external equilibrium positions. In region I, we have balance of payments deficits and excessive domestic demand. In Region II we have balance of payments deficit and unemployment. In region III, external surpluses and unemployment and in region IV excessive internal demand and balance of payments surpluses. The point C represents the equilibrium of the economy, both internal and external.

In the money market, demand depends on the domestic interest rate and on real income and we suppose money supply

exogenous. In equilibrium we have:

$$L(r, y) = M$$

$$\frac{\partial L}{\partial r} < 0; \quad \frac{\partial L}{\partial y} > 0$$

Where  $M$  = money supply.

$$L(r, y) = \text{money demand}$$

given  $M$ , an increase in the rate of interest reduces the demand for money and makes money supply greater than demand. To return to equilibrium, output must increase. Thus, in space  $(r, y)$  the money market equilibrium curve is increasing. The second quadrant of figure 2 represents the relation between  $r$  and  $y$  in the model  $(MM)$ , given the domestic money supply. An increase of money supply provokes a left shift of the curve  $MM$  and vice-versa.

Also, in this same quadrant the products market equilibrium curve which was derived from the condition of domestic equilibrium (equation 2), is drawn in space  $(r, y)$ . In this market, an increase of the interest rate reduces the equilibrium output since it decreases absorption. This is curve  $II$  in the second quadrant of Figure 2. The point  $C_1$  is the point of equilibrium of both product and money markets and corresponds to the point  $C$  of external and internal equilibrium in the first quadrant.

Finally we suppose that price is determined by production costs and, amongst these in the case of Brazil, the real exchange

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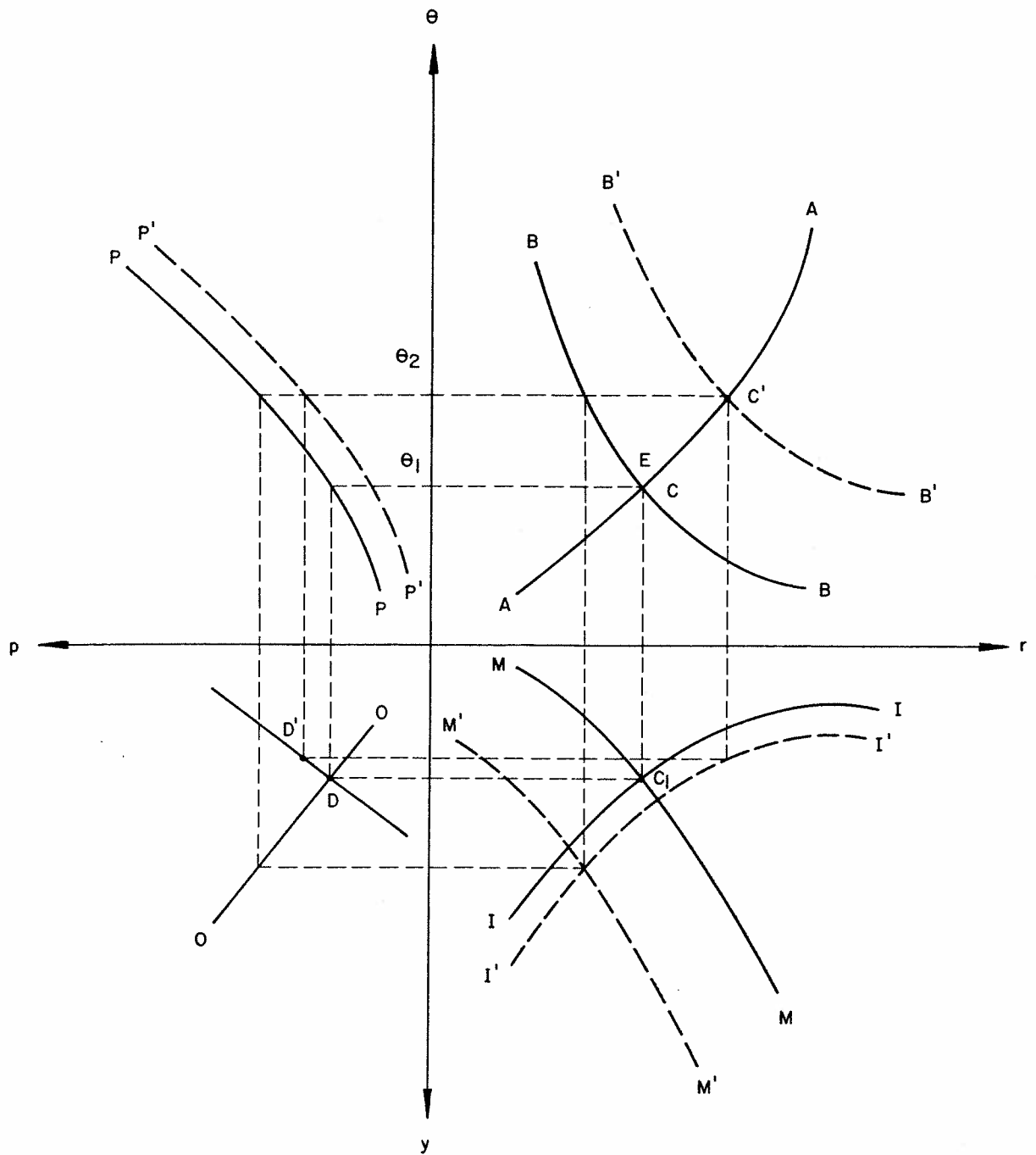


FIGURE 2

rate is the most important one<sup>(\*)</sup>. The fourth quadrant shows the relation between prices and the real exchange rate ( $pp$ ). An increase (decrease) in the real labor cost provokes a left (right) shift of this curve.

Thus,

$$p = p(\theta)$$

We may now deduce the relation between the price level and output. In the first quadrant the curves representing internal and external equilibrium determine the real exchange rate which, in its turn, determines the price level in the fourth quadrant. The equilibrium in the product and money markets generate the output level. For each set of points  $C, C_1$  we have a point of the relation between price and output. If the real exchange rate increases, the price level increases too since  $p=p(\theta)$ . But, as absorption depends on  $\theta$ , the curve II shifts downwards in the second quadrant since a rise of the real exchange rate generates a trade balance surplus and therefore it is possible to obtain a higher output level with the same interest rate. As,

$$A(r) + T | \theta, A(r) | = y$$

$$\text{where } T | \theta, A(r) | = x | \theta, A(r) | - m | \theta, A(r) |$$

the shift of curve II in the second quadrant is denoted by

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\*/ For a more detailed analysis of industrial prices determination in Brazil see CAMARGO, J.M. and LANDAU, E. (1983); LOPES, F.L. and LARA RESENDE, A. (1981); MODIANO, E.M. (1983) and MARTONE, C. (1984).

$$\left. \frac{\partial y}{\partial \theta} \right|_{dr=0}$$

So,

$$\left. \frac{\partial T}{\partial \theta} d\theta = dy \right|_{dr=0} = \frac{\partial T}{\partial \theta}$$

or, the more sensitive the trade balance is to variations of the the real exchange rate, the higher is the shift of curve II when  $\theta$  varies. Suppose that as  $\theta$  moves from  $\theta_1$  to  $\theta_2$ , curve II moves towards I' I'. The trade-off between price and output appears in the third quadrant, for a given level of the external constraint. (00). The higher the output level, the higher the price level. We now have a "Phillips curve" on the third quadrant but for completely different reasons. In this case, a rise of the real exchange rate increases absorption and output. On the other hand, as price is sensitive to variations of the real exchange rate, its increase also raises the price level.

Suppose now that the  $\theta$  variations shown in Figure 2 is the result of an exogenous shock which caused a shift of the external equilibrium curve from BB to B'B'. In this case, the relation between the price level and output also moves to the left, or, in order to obtain the same level of output, the economy has to bear a higher price level. The shift from point C to point C' would result in reduced output and higher inflation as shown in the third quadrant (points D, D'). Thus, an unfavorable external



shock might split into two negative effects on the economy, output loss and inflation. From the schedule, it is easy to note that this result is more probable the smaller the shift of curve II when the real exchange rate varies, and the more sensitive the price level is to  $\theta$  variations. In other words, if the level of economic activity does not depend much on international trade or, if the world economy is growing at high rates in a way that makes it possible to obtain a higher output level with no expressive currency devaluations, and/or if the price level is very sensitive to variations of the real exchange rate, the economy may show an inverted trade-off between price and output. The most interesting result of the model to be pointed out is that under certain conditions (favorable external shocks, for example) an increasing output level may be accompanied by decreasing inflation and vice-versa.

We consider this simple model very useful to the understanding of what happened to the Brazilian economy in the period 1967-1980. As we did in the preceding section we will divide, for better comprehension, these fourteen years into two sub-periods: 1967-1973 and 1974-1980.

We have seen in the beginning of this work that the anti-trade bias generated by the process of imports substitution associated to the low levels of international liquidity have together prevented the continuation of this development strategy towards the sectors of capital goods and basic industrial inputs in the early sixties. This meant a growing disequilibrium of the

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country's external accounts forcing the adoption of a rigid monetary policy with reduction of the expense level and high interest rates.

As shown in the diagram below in 1966 the Brazilian economy faced severe external constraints ( $B'B'$ ) and the adoption of a restrictive monetary policy was necessary for the achievement of internal and external equilibrium.

The policy of fiscal incentives for the exportation of manufactured goods, the crawling-peg, the increase in foreign trade volume and international liquidity and the more aggressive conduct of the country in foreign funds raising, meant from an analytical point-of-view, a left shift of the external equilibrium relation ( $BB$ ). The points denoting balance of payments deficits started to represent external equilibrium or even external surpluses.

The absence of external constraints made possible the adoption of a loose monetary policy and the appearance of public deficits.

As the real exchange rate was maintained around the levels prevailing in the period when external constraints were present, a rapid economic growth took place. At the same time the decrease of the real wage obtained through a restrictive wage policy and trade unions political repression caused a right shift of the curve  $p(\theta)$  and improved the price output trade-off. In

this scenario inflation was substantially reduced and there was rapid economic growth, balance of payments surpluses and reserves accumulation. This was the period of the so called "Brazilian Economic Miracle".

The quadruplication of oil prices, the lowered liquidity and the higher levels of international interest rates had drastic effects on the country's current account. Figure 3 shows these effects. In it, the external equilibrium constraint is split into two components. One is represented by current account balance (FF) and the other by the balance of payments as a whole, taking into consideration net capital inflows (BB). The curve FF denotes the external equilibrium relation when net capital entries are nule ( $f=0$ ). The point C corresponds to the equilibrium point C in figure 2. Given the domestic interest rate, the vertical distance between FF and BB (the global external equilibrium curve) in point C represents net capital inflow to finance the current account deficit.

The result of the variations just described is a right shift of curve FF to the position F'F' in figure 3. If net capital inflow remains constant, the curve BB moves to the right in the same proportion as curve FF. The equilibrium position might be obtained through the displacement of AA and II to the left (public deficit reduction) and increase of the real exchange rate with changes in the relative participation of exports and imports in total aggregate expense. As the monetary policy is

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responsible for the determination of the domestic interest rate,

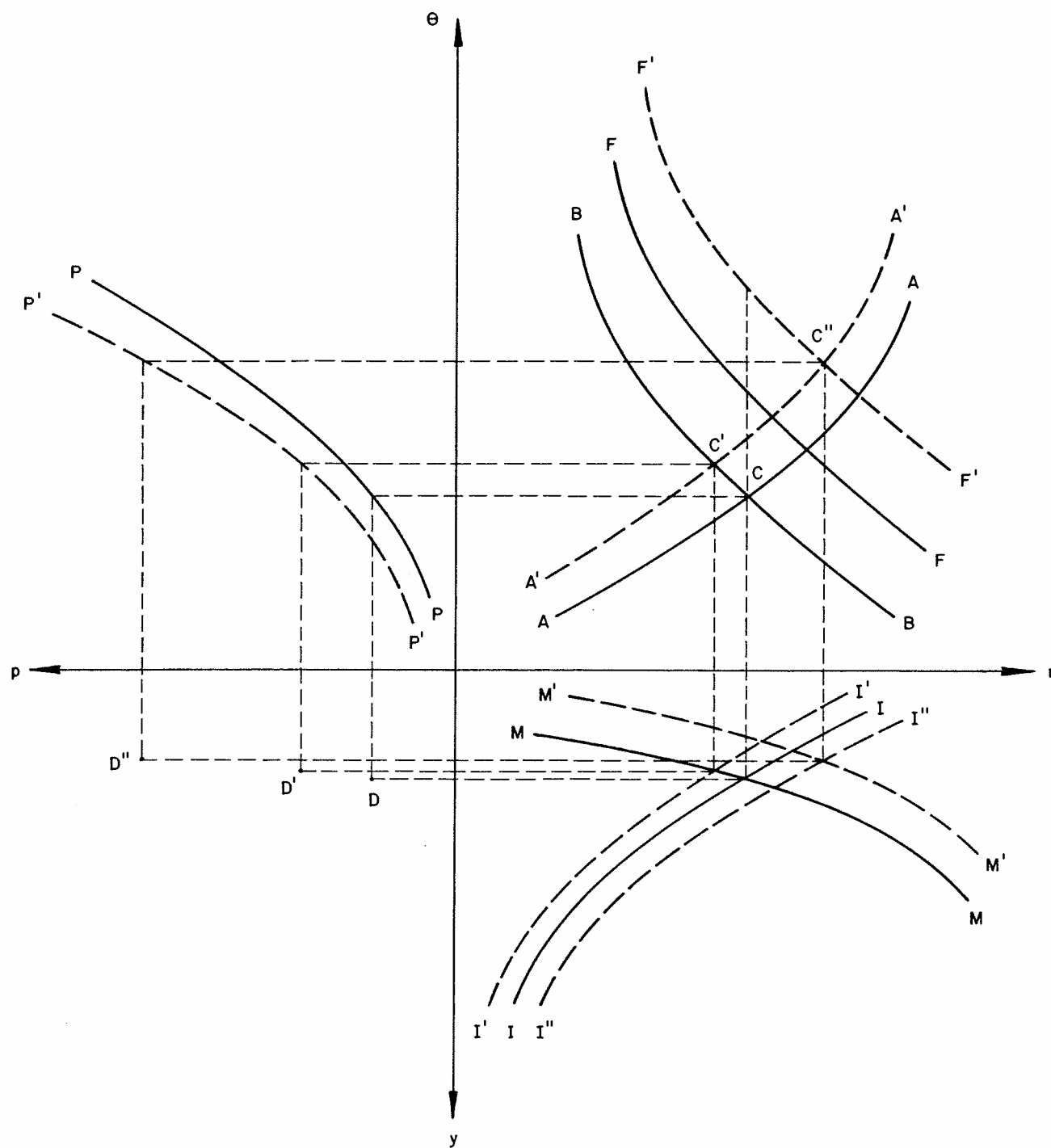


FIGURE 3

it will also determine the distribution of the aggregate expense between its public and private components. The higher the public deficit, the higher the interest rate and the lower the private absorption level compatible with internal and external equilibrium. The maintenance of the level of aggregate expense is only possible through the intensification of net foreign capital inflows.

Although interest rates increased, it was relatively easy for Brazil to continue to obtain net foreign resources until 1981. Therefore, the strategy of deepening the substitution of imports process towards the capital goods and basic industrial inputs sectors, which was interrupted in the period 1967-1973, was retaken by central government. Huge investments with very long maturing periods were made either directly through the state-owned enterprises or through subsidized credits to the private sector. At the same time the consumption level of the high income groups was preserved and an improvement in the distribution of income was attempted through the increase of the real minimum wage (for more details see the next section). According to the model described in this section this meant a small reduction of domestic absorption which was far insufficient to cover the country's current account deficits which were financed through massive net capital inflows, thus raising foreign indebtedness. The rise of real wages displaced curve  $p(\theta)$  to the left worsening the price-output trade-off and, at the same time, the rise of the real exchange rate provoked an acute increase in the inflation rate. The result of the implementation of this strategy was the worsening of the country's financial fragility and the reduction of its indebtedness

capability in the early eighties. These facts, associated to the financial insolvency of other countries (mainly Poland and Mexico) which was caused by the second oil price shock (1979-1980) and by the rise of international interest rates, caused a retraction of international financiers and a virtual stop of foreign capital inflows. Curve BB suffered a drastic right shift coinciding with curve F'F' and generating huge balance of payments deficits. The country was thus forced to adjust its external accounts through the adoption of a policy of real currency devaluations, increase of domestic interest rates, reduction in the absorption level and recession. At the same time, inflation accelerated much.

The only option possible, though not necessarily viable from the political point of view, was the declaration of financial insolvency.

### 3.2 - Tradeables and non-tradeables - a micro model

The model developed above emphasizes the financial aspects of the balance of payments and the importance of foreign capital movements to the achievement of external and internal equilibrium in an economy like the Brazilian one. Due to the aggregation of the model two aspects could not be adequately dealt with which are indeed very important in the case of Brazil, the effects of the oil shocks and the performance of the non-tradeables sector. An alternative model which incorporates the division tradeables and non-tradeable goods and one imported input will be useful to clarify some points\*.

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\*/ See DORNBUSH, R. (1981); CORDEN, W.M. (1981); CORDEN, W.M. (1982); CORDEN, W.M. (1960); SALTER, E.O. (1959); SWAN, T.W. (1955); MALAN, P. (1981).

Suppose an economy producing tradeable and non-tradeable goods using labor and one imported input (energy). The prices of these goods are given by

$$p_t = a_t w + b_t p_m$$

$$p_n = a_n w + b_n p_m$$

where:

$p_t$  = tradeables price

$p_n$  = non-tradeables price

$a_i$  = quantity of labour necessary for the production of one unit of good  $i$

$$i = t, n$$

$b_i$  = quantity of energy necessary for the production of one unit of good  $i$

$$i = t, n$$

$w$  = nominal wage

$p_m$  = imported input price

The relation between the relative prices is

$$p = \frac{p_t}{p_n} = \frac{a_t \omega + b_t}{a_n \omega + b_n}$$

where  $\omega = \frac{w}{p_m}$

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The two kinds of goods supply depend on their relative price

$$Y_t = Y_t(p)$$

$$Y_n = Y_n(p)$$

and their demand depend on their relative price and on global expenditure (E).

Thus,

$$D_t = D_t(p, E)$$

$$D_n = D_n(p, E)$$

In equilibrium demand and supply of the two kinds of products must equal

$$Y_t(p) = D_t(p, E)$$

$$Y_n(p) = D_n(p, E)$$

This is shown in Figure 4. In the horizontal axis we represent the quantities of tradeable goods demand and supply and in the vertical axis the same quantities for the non-tradeable goods.

The effect of a change in the real price of the imported input on the relative price of the two kinds of goods depends on the participation of this input in their unitary production cost. Algebraically

$$\frac{\partial p}{\partial p_m} \cdot \frac{p_m}{p} = \beta_t - \beta_n$$


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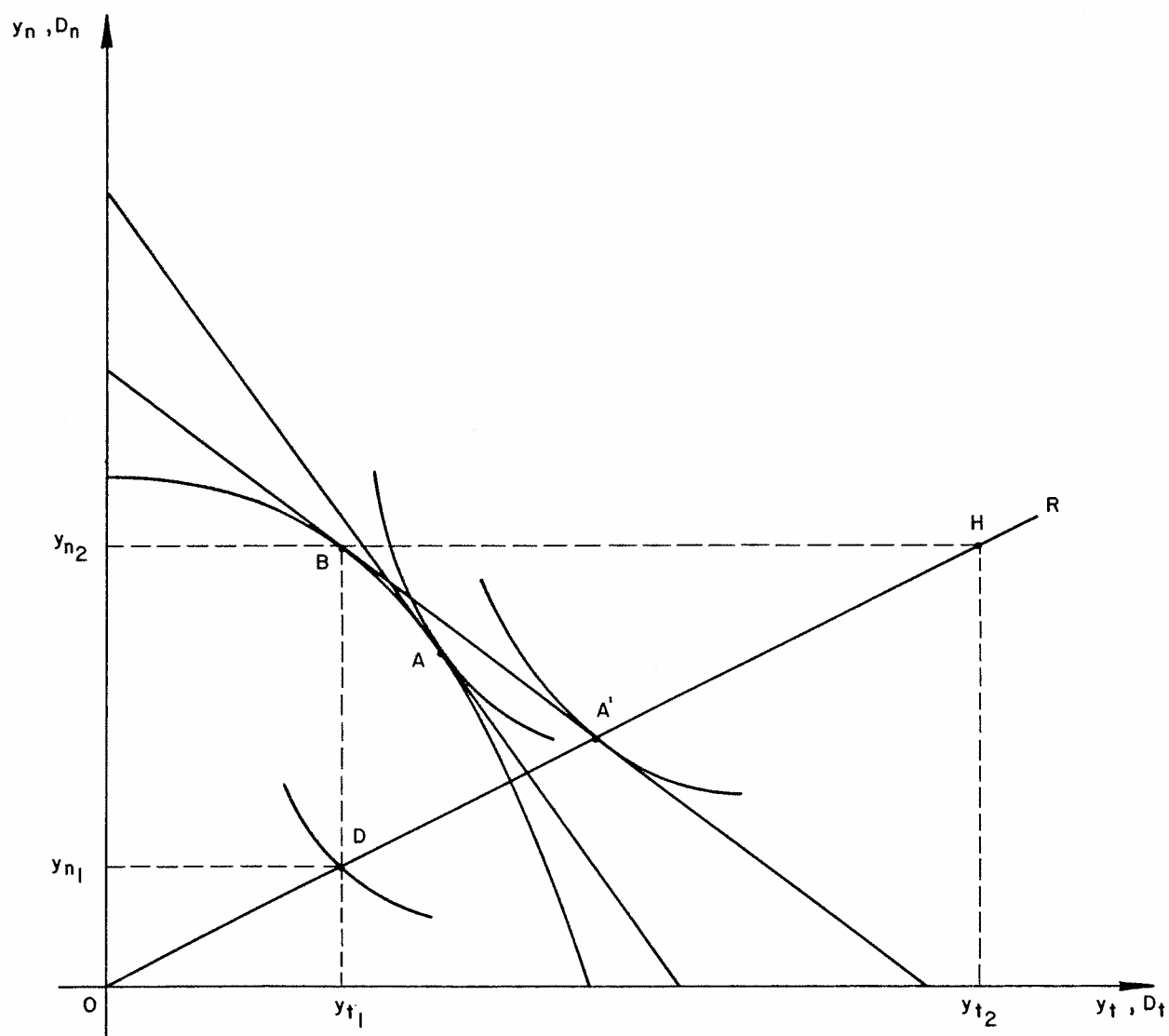


FIGURE 4

Where

$$\beta_i = \frac{b_i p_m}{p_t} = \text{participation of the imported input in the unitary production cost of good } i$$

$$i = t, n$$

We may now introduce some peculiarities of the Brazilian economy in order to better analyse the period 1967-1980.

In 1973, Brazil was a net exporter of primary and industrialized products whose production was intensive in natural resources (mainly in natura or processed food, shoes etc). Therefore the tradeables sector had a relatively high coefficient of labor input and a relatively low coefficient of the imported input. The non-tradeables sector produced basically durable consumption goods (cars, electric home appliances, etc...) some capital goods and basic industrial inputs (cement, aluminium, petrochemicals etc...) and services. Apart from services, the production of this sector was intensive in imported energy and did not use much labor. Thus, for Brazil we would have.

$$\frac{\partial p}{\partial p_m} \cdot \frac{p_m}{p} = \beta_t - \beta_n < 0$$

or, an increase in the price of the imported input rises the non-tradeable goods price relatively to the tradeables. Given the demand and supply functions above this meant substitution in production towards non-tradeables and in consumption towards tradeables. In the schedule, the economy moved from point A to point A' on the demand side and from A to B on the supply

side. If OR is the income-consumption curve compatible with the new relative prices relation, the only external equilibrium position possible is point D where the demand for tradeables equals supply. But, at this point, expense falls short of income ( $E < Y$ ) and there is unemployment. The non-tradeables demand is smaller than supply in the amount of  $Y_{n_2} - Y_{n_1}$  and unemployment may be measured by

$$L = a_n (Y_{n_2} - Y_{n_1})$$

On the other hand, a substantial modification in the pattern of income distribution, which could result in a shift of the social welfare function, might bring the economy to a point such as B, where expense equal income and the supply equals demand of both tradeables and non-tradeables bringing external and internal equilibrium.

In Brazil, the massive foreign capital entries made possible the maintenance of the levels of aggregate expense and non-tradeables production, leading the economy to a point such as H. At this point, the non-tradeables supply and demand are equal but the supply of tradeables falls short of demand characterizing a position of external disequilibrium and trade balance deficit. This deficit may be measured by the distance  $Y_{t_2} - Y_{t_1}$ . The resulting increase of foreign indebtedness made the continuation of the prevailing economic growth strategy impossible in the early eighties.

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These models pointed out two major aspects of the Brazilian economy of the period namely, the suffering of external shocks (NRB products prices, oil prices and interest rates) and the adjustment strategy implemented by the country. This strategy consisted of the maintenance of the aggregate expense through increased indebtedness. The preservation of the domestic expenditure level prevented unemployment and allowed the continuation of the process of imports substitution but, on the other hand, caused the excessive indebtedness of the late seventies.

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## 6. Industrial Growth, Investment Pattern and Income Distribution

The model which has been developed in the previous section points out two factors of fundamental importance for an analysis of the Brazilian economic performance in the period 1967-80. The first one, which has been examined in sections 2 to 4, refers to the existence of external constraints and shortness of foreign exchange supply. The second factor, which will be analysed in this section, deals with domestic absorption which, ultimately determined the country's demand for foreign exchange and industrial growth.

Two aspects shall be considered in the study of the level of domestic absorption. First, there is the division between public and private absorption which is fundamental given the importance of the State in the Brazilian economy. Second, we should distinguish between the behavior of investment and consumption variables. Thus, this section will concentrate on the observed levels of public and private investment, of the real wages as well as income distribution.

As we have done in the preceding sections, we will divide the period 1967-1980 into two sub-periods, namely 1967-1973 and 1974-1980 since these sub-periods, show different features concerning the two aspects mentioned above (investment pattern and income distribution). This section is organized in the following way: initially we show the main features of the country's industrial growth in both sub-periods. Next we analyse the behavior of real wages, of monetary policy and of the levels of public and private investment.

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## 6.1 - Industrial growth: internal market, exports and imports substitution

The excellent conditions prevailing in the international markets with the increase in the prices of NRB products made possible for the Brazilian economy to undertake a period of steady industrial growth beginning in 1967, with no restrictions of foreign exchange.

Between 1967 and 1970 the industrial sectors that grew most were durable consumption goods, transportation, electrics and electric home appliances. From 1970 on, the capital goods sector also experimented exceptional growth rates, more than 20% a year. On the other hand, the non-durable consumption goods grew at modest rates, below the period's average industrial growth rate.

From 1974 on, this scenario is rather modified. The overall industrial growth rate falls from 11.53 per cent a year to 6.79 per cent. Although this loss of approximately 50% might be considered an expressive reduction of industrial activity, this new level was still above the historical rates (Table 1.1). But, a remarkable change took place in growth leadership. While in the preceding period the durable consumption goods sector was the leading one, from 1974 on this position was taken by the intermediate goods sector with average yearly growth rates of approximately 8.28 per cent. The consumption goods sector (durable and non-durable) suffered the major loss. Its yearly growth rate decreased from 10.70 per cent to 4.33 per cent a year.

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Table 6.1 - Industrial production average yearly growth rates  
1967-1980

Sectors	1967/70	1971/73	1967/73	1979/80
Consumption goods	9.48	12.35	10.70	4.33
.durable	18.57	25.44	21.47	7.71
.transportation	20.14	24.24	21.89	3.29
.eletrics and eletric home appliances	15.44	27.99	20.68	15.51
.non-durable	7.96	9.11	8.46	4.53
Capital	8.52	22.69	14.39	7.12
Intermediate	10.45	13.17	11.61	8.28
TOTAL	9.72	13.84	11.53	6.79

Source: BONELLI, R. and WERNECK, D. (1978)

We may estimate the sources of the demand for the Brazilian industrial products using a methodology developed by W. Tyler (W.Tyler, 1976) from the classic article of H. Chenery (H.Chenery, 1960). Using this methodology, we may split the sources of demand for Brazilian industrial production into three components: exports variation, substitution of imports and change of domestic demand. The basic equation for the decomposition of output growth is:\*

$$\Delta X_i = \frac{X_i^1}{Z_i^1} \Delta D_i + \frac{X_i^1}{Z_i^1} \Delta E_i^* + \left[ \frac{X_i^2}{Z_i^{2*}} - \frac{X_i^1}{Z_i^{1*}} \right] Z_i^{2*}$$

where  $X_i$  = total production of industry i

$Z_i = X_i + M_i$

$M_i$  = sector i products imports

$D_i$  = domestic demand for i products

\* See PEÑALVER et al. (1983), page 83.

$E_i$  = industry  $i$  exports

$E_i^* = (I-A)^{-1}E$  = direct and indirect exports generated by  $E$

$A$  = Technical Coefficient Matrix

$Z_i^* = X + M^*$

$M^* = (I-A)^{-1}M$  = direct and indirect imports due to  $M$

The subscripts 1 and 2 indicate the beginning and the end of the period.

The results of this simulations are presented in table 6.2.

Table 6.2 - Manufactured products demand sources of growth

	1970-1979								
	1970/74			1974/79			1970/79		
	SI	$\Delta E$	$\Delta D$	SI	$\Delta E$	$\Delta D$	SI	$\Delta E$	$\Delta D$
Capital goods	-6.6	8.9	97.6	16.1	10.1	75.8	8.8	10.1	81.1
Intermediate goods	-11.6	8.1	103.4	14.6	10.1	75.3	6.1	9.0	85.0
Consumption goods	-5.9	18.4	87.6	2.5	8.1	89.3	0.0	9.1	91.4
Total manufactured products	-8.4	12.0	96.4	10.1	9.4	80.5	4.3	9.3	86.5

Source: PEÑALVER, M. et al page 25.

SI = Imports substitution

$\Delta E$  = Exports increase

$\Delta D$  = Domestic demand increase

The contribution of industrialized products exports to total industrial output growth was only 9.3 per cent of the total during the seventies decade. The expansion of domestic demand was the main source of growth contributing with 86.5 per cent in the period 1970/1980 and 96.4 per cent in the sub-period 1970/1974. The substitution of imports had a negative contribution in the first five years and a positive contribution after 1974, mainly due to its effects on the capital and intermediate goods sectors.



The substitution of imports strategy which had been abandoned in the early seventies was retaken. Finally, domestic demand gave the main support for industrial expansion during the whole period.

## 6.2 - Monetary policy, wages and public investment

The evolution of the Brazilian economy just described is intimately tied to the domestic economic policy adopted in the period which ultimately designed the country's industrial growth pattern. The three major components of this policy are: the wage readjustment policy, the monetary policy and the public sector investment policy.

The wage readjustment policy, imposed by central government, has always had a solid institutional basis in Brazil and is traditionally followed by the whole country. Supported by the organization of labor justice and by the trade unions structure it has always been the focus of the process of urban wages determination, mainly blue-collar wages. This institutional structure, implemented in the fourties, during the first Getulio Vargas government is based on the dependence of trade unions on the Ministry of labor. Its effectiveness made possible the adoption of a very restrictive wage policy by the government ruling after the military coup of march 1964, which was characterized by political repression of trade-union leaderships, prohibition of strikes and closure of the more combative trade-unions. As a consequence, the real minimum wage suffered a major lost between 1964 and 1974. Table 6.3 registers

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real minimum wage values until 1979. We note that the fall of the

\* For a more detailed analysis of this institutional framework see CAMARGO, J.M. (1984).

real minimum wage is expressive using both deflation indices, the Getulio Vargas Foundation cost-of-living index and the DIEESE cost-of-living index (The DIEESE is an institute for statistical support of the trade unions of the State of São Paulo).

Table 6.3 - Real minimum wage 1964-1979

	Real Minimum Wage (CPI-FGV) *	Real Minimum Wage (CPI-DIEESE) **
1964	100	100
1965	97.7	96.7
1966	90.9	82.6
1967	87.1	78.3
1968	86.4	76.1
1969	84.1	73.9
1970	82.6	75.0
1971	83.3	71.7
1972	85.6	70.7
1973	88.6	64.1
1974	84.1	58.7
1975	88.6	62.0
1976	87.1	62.0
1977	87.9	64.1
1978	89.4	66.3
1979	89.4	66.3

Source: J.M. Camargo (1984), pg. 20-21.

\* Cost of living index - Getúlio Vargas Foundation

\*\* Cost of living index - DIEESE.

The relation between minimum wage and wages in general has been object of intense dispute amongst specialists. In a recent work (Camargo, 1984) we show that Brazilian industrial labor market may be split into two distinct segments with different processes of wage determination. The first segment is composed of blue-collar workers whose wage varies according to the prevailing minimum wage. The second segment is composed of managerial and clerical workers whose wage is determined by profits or, in other words, by the excedent of receipts over direct production costs. The wages in this segment are also influenced by the relative availability of professionals<sup>\*</sup>. Thus, the effect of the minimum wage fall was the reduction of blue-collar workers average wage relatively to managerial and clerical workers average wage which worsened income distribution.

This restrictive wages policy was accompanied by a loose credit policy mainly after 1967. The real amount of credit to the private sector and also the means of payment increased. The effects of this policy may be observed in table 6.4.

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\* We estimated a regression in which the dependent variable is the relation between the average wage of managerial and clerical workers and the average wage of blue-collar workers, and the independent variables are real minimum wage variations ( $\hat{z}$ ) and industrial production variation rate ( $\hat{x}$ ).

The results obtained, for the period 1963-1979 are:

$$y = 11.91 - 0.031 \hat{z} + 0.018 \hat{x}$$

(33.9107)      (-3,90618)      (2.96342)

$$R^2 = 0,80$$

$$DW = 2,39$$

$$RHO = 0,006$$

See Camargo (1984) page 37.

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The industrial production variation rate is regarded in the equation as a proxy for profits.

Table 6.4 - Monetary policy in Brazil - 1964/1980  
(different indicators variation rates)\*

Years	FSCPS **	MACPS ***	MP ****
	GPI	GPI	GPI
1964	-13,5	-9,4	-3,2
1965	12,4	-0,3	17,0
1966	6,2	0,6	-1,9
1967	16,1	13,6	5,3
1968	45,5	15,8	15,1
1969	28,7	27,1	9,6
1970	30,7	26,1	7,1
1971	24,5	17,0	8,4
1972	30,2	19,3	11,6
1973	36,3	31,8	27,9
1974	20,4	46,8	7,4
1975	22,3	40,2	4,0
1976	12,7	13,2	-0,2
1977	6,3	7,4	-3,6
1978	9,7	2,7	1,1
1979	2,1	-4,6	-0,8
1980	-12,5	-11,8	-12,2

Source: Brazilian Central Bank Bulletin - various issues.

\* All indicators are deflated by the General Price Index.

\*\* Financial sector credit to the private sector variation rate.

\*\*\* Monetary authorities credit (Banco do Brasil) to the private sector variation rate.

\*\*\*\* Money supply variation rate.

The indicators of monetary policy show the increase of money supply and credit, in real terms, from 1967 to 1974 when monetary policy became more stringent. Thus, until 1974, the real minimum wage decreases sharply and money supply increases much. From 1975

on and until 1980, the real minimum wage rises, the monetary policy becomes more restrictive and money supply falls in real terms after 1976.

The association of a tight wages policy, which caused the decrease of the real minimum wage to a loose monetary policy resulted in rapid industrial expansion leaded by the durable consumption goods sector and income concentration until 1974. The absence of external constraints made this expansion possible without inflationary pressures. The inflation rate (as measured by the General Price Index) decreased from 90.7 per cent a year in 1964 to 15.5 per cent in 1973. Thus, the improvement in the terms-of-trade caused by the association of the increase of exports (mainly NRB products) to a decreasing real wage, resulted at the same time in the elimination of external constraints, an expansive industrial policy and declining inflation. As we have seen in the preceding section, this rather hetherodox result, more economic growth with less inflation, is a quite concrete possibility in an economy whose real exchange rate is a determinant component of prices and in which the external constraints impose the limits to growth.

The changes in the international scenario of 1973/1974 caused the reversion of this trend. On the one hand, the rise of international oil prices had the effect of turning domestic prices sensitive to variations of the real exchange rate. On the other hand, the shrinking of international trade and the rise of interest rates brought the external constraints back to the economic scenario making necessary the implementation of a more active exchange rate policy. Finally, a further lowering of real wages became politically unfeasible and therefore the change of the relative price favoring

tradeables, necessary to slacken the foreign constraint, was not possible. Thus, inflation accelerated increasing from 15.5 per cent a year in 1973 to 34.5 per cent a year in 1974 and reaching 110.2 per cent in 1980. After 1976, the adoption of a very restrictive monetary policy, reducing money supply, was incapable to slow inflation down.

The repercussions of the limited liquidity were directly felt through decreasing industrial output growth rates, mainly in the consumption goods sector (table 6.1). However, the capital and intermediate goods sectors continued to grow at relatively high rates due to the state investments of the period. Table 6.5 shows the evolution of the gross fixed capital formation (GFKF) of

Table 6.5 - Gross fixed capital formation federal government  
entrepreneurial activities, 1970-1980

Years	GFKF (1)	Variation Rate (2)	GFKF State	
			GFKF Total (%) (3)	GDP (%) (4)
1970	5528,3	-	12,1	2,6
1971	4917,4	-11,05	9,6	2,1
1972	9082,0	84,7	15,8	3,5
1973	6212,7	-31,6	9,4	2,1
1974	12570,2	102,3	16,7	4,0
1975	15390,9	22,4	18,0	4,5
1976	25827,9	67,8	27,5	6,4
1977	25824,5	0	28,6	6,1
1978	35360,4	36,9	37,0	7,8
1979	62820,3	77,7	61,6	12,5
1980	46109,4	-26,6	37,4	7,9

Source: Centro de Estudos Fiscais - IBRE/DCS/FGV.

State-owned enterprises between 1970 and 1980. Until 1973, the gross fixed capital formation rate of state-owned enterprises grew at an yearly average of approximately 3 per cent. From 1974 on, the yearly growth rate increased reaching 33.2 per cent a year in average until 1980 and 47.1 per cent a year in average until 1979. The data in columns 3 and 4 of table 6.5 show the increasing participation of the State in the economy. In 1979, from the country's total gross fixed capital formation, the state enterprises contributed 61.6 per cent. The governmental sector participation in GDP grew sharply after 1974. The sectors which benefited most from this increasing investment of the State were the transformation industry, energy, transports and communications. Unfortunately disaggregated information for the different sectors of the transformation industry is not available but, we may affirm that the participation of the State was more significant in the capital and intermediate goods sectors.

Table 6.6 - Gross fixed capital formation federal government-owned enterprises by sectors, 1970-1980 (%)

Years	Transformation Industry	Energy	Transports	Communications	Others
1970	23,5	23,7	31,6	16,9	4,3
1971	32,4	34,6	11,3	6,7	15,0
1972	51,5	21,9	6,7	5,3	14,6
1973	43,5	28,8	5,1	7,4	15,2
1974	35,7	15,2	15,4	21,7	12,0
1975	44,3	18,6	17,0	7,4	12,7
1976	31,6	15,3	16,6	32,4	4,1
1977	27,2	30,4	11,0	15,2	16,2
1978	26,3	14,5	33,0	16,0	10,2
1979	25,2	17,5	41,6	11,5	4,2
1980	30,9	19,2	23,0	18,4	8,5

Source: Centro de Estudos Fiscais - IBRE/IDCS/FGV.

Finally it is important to note that until 1974 this investment was financed by the state enterprises own resources and from this year on, also by an increasing share of borrowed funds (Table 6.7).

Table 6.7 - Savings, gross fixed-capital formation and borrowed funds of state-owned enterprises, 1970-1980

Years	(Cr\$ millions)			
	State-owned enterprises savings (1)	GFKF State-owned enterprises (2)	(1) - (2)	Borrowed Funds (5)
1970	7536	5528	2008	-
1971	6879	5832	1047	-
1972	11161	12735	-1574	-
1973	16336	10648	5688	-
1974	26267	29351	-3084	1332
1975	46277	46866	- 589	-
1976	46681	106908	-60227	49200
1977	92027	154624	-62597	48235
1978	147175	290699	-143524	120530
1979	161464	744850	-583386	556272
1980	228636	1035907	-807271	737249

Source: Centro de Estudos Fiscais - IBRE/DCS/FGV.

Though it is not possible to discriminate between the resources borrowed from domestic sources and from foreign sources we may have an estimate of the importance of foreign lendings through the observation of table 6.8. In it the country's total foreign indebtedness between 1974 and 1980 is split into its private and public components.



Table 6.8 - Brazilian public and private sectors external debt  
1974-1980

(US\$ millions)			
Years	Total Debt	Public Sector Debt (%)	Private Sector Debt (%)
1974	17,166	53.9	46.1
1975	21,171	54.1	45.9
1976	25,985	57.2	42.8
1977	32,037	44.7	55.3
1978	43,511	63.3	36.7
1979	49,904	68.2	31.8
1980	53,847	69.2	30.8

Source: Banco Central do Brasil.

Truly the increase of the State owned enterprises foreign debt is explained in part by their investments and in part by the deterioration of their capability to generate savings. Public foreign indebtedness was the main source of funds for the continuation of the process of imports substitution towards the capital and intermediate goods sectors which was retaken in 1974. These investments sustained the country's industrial expansion during the second half of the seventies.

## 7. Conclusions

This paper studied the effects of the boom of NRB products prices in the early seventies and of the oil prices increases of 1973/74 on the Brazilian economy. The sharp increase of NRB products prices associated to the trade policies adopted by the Brazilian government resulted in rapid increase of export revenues and eliminated the foreign exchange constraints, an ever-present feature of the Brazilian economy until 1967. This lack of external restrictions made possible the adoption of a loose monetary policy which, in combination with the reduction of real wages of blue-collar workers, resulted in income concentration, rapid industrial growth and reduction of inflation. At the same time, the change in the relative prices of agriculture against food production generated the sector's stagnation.

The increase of oil prices in 1973/74 and of international interest rates after 1973 produced the reversal of this trend. Central government implemented an investment program directed to retake the import substitution process towards the capital and intermediate goods industrial sectors, thus maintaining absorption levels and avoiding unemployment. In this scenario of foreign exchange constraints and huge current account deficits, this program had to be financed in large part by international capital inflows. As a result external debt increased sharply generating an extreme financial fragility by the end of the decade. This was the origin of the Brazilian debt crisis of the early eighties, when capital ~~inflow was curtailed and the country became unable to honor its~~ financial compromises.

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