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On the determinants of capital costs in Brazil's manufacturing industries

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On the Determinants of Capital Costs in
Brazil's Manufacturing Industries

by

Kálmán Dezséri*

Mai 1990

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1. Introduction and Overview*

The Brazilian economy has undergone profound changes since the early 1970s. During this time, the external and internal economic conditions significantly altered. The two oil shocks, changes of the interest rates on the international capital markets, the following debt crisis, terms of trade deterioration, soaring inflation rate, high external and public deficits are the uppermost phenomena which characterised the Brazilian economy. From the point of view of economic policy, it is very important that the stabilisation programs should be accompanied by a successful structural adjustment process. New investments financed from domestic and/or foreign sources have definite significance in the realisation of such goals. Under these prevailing conditions the clear-cut answer to, and the knowledge of the main determinants of the social and private cost of capital are necessary and sine qua non to a more efficient utilisation of this production factor.

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In this paper the main determinants of cost of capital in the Brazilian manufacturing industries are analysed. From them six sectors are chosen to be samples, which are the following: steel and iron, machinery, electric machinery, automobile, textile, footwear industries. Two of them (steel and iron, machinery) are capital intensive sectors. The following two (electric machinery, automobile) are rather technology intensive sectors. The last two (textile, footwear) are labour intensive sectors.

The central objectives of this paper are the description and analysis of (a) the distribution of capital, (b) the sources of the capital, and (c) the cost of the capital. This is done by focusing on the investment records, on the system of financial intermediation, and on the factors directly determining the cost of capital. The cost of capital at the sector level is calculated in two different ways. The estimates are based on empirical data provided by companies, stock exchanges, and national statistics.

The paper is organised as follows: Section 2 summarises and briefly analyses the theoretical concepts on cost of capital and clarifies the concepts to be used in this paper. Section 3 analyses capital flows from the point of view of financial intermediation as well as distribution among manufacturing sectors. The market and non-market type allocation mechanisms are demonstrated. In Section 4, some macroeconomic factors are presented which directly or indirectly influence the cost of capital. These concern savings, indebtedness, and monetary policy. Then, Section 5 assesses the availability of credit, subsidised and market

rates of interests and the effects of inflation and taxation. Section 6 provides two different estimates of the cost of capital: (a) the Rate of Return on Equity and (b) the Weighted Average Cost of Capital. The final Section provides a summary of the main findings.

2. Cost of Capital Concepts

2.1. Definitions

Corporate profitability calculations are generally made on the basis of the principle of rate of return and/or cost of capital¹⁾. The rate of return is the yield investors can earn on their capital assets (the aggregate portfolio of equity and debt). In the literature the generally used definition of cost of capital is the rate of return that a business could have if it chose another investment with equivalent risk - in other words the opportunity cost of the funds employed as the result of an investment decision. As an alternative definition, the

1) In the investment theories the rate of return - which can be interpreted as a company-based measure - and the cost of capital have been for almost two decades dominated by two theories of investment. The neoclassical theory originated by Jorgenson and the "q" theory developed by Tobin.

The neoclassical theory starts from the firm's optimisation behaviour that is maximising the rate of return or discounted net cash flow or it uses an alternative measure: the user cost of capital (cost of using one more unit of capital in production). To derive the user cost of capital, besides the interest rate, which is the basic determining measure other important factors (depreciation, taxes, inflation, credit subsidies) have to be taken into account, as well. Other methods were developed, too. Some of them are based on the discounted cash flow principle, e.g. the adjusted present value approaches, which are known in corporate finance or on the factor price relations (e.g. Cobb-Douglas production function calculating the capital stock on the basis of the rental cost of capital and the level of output in the present and in the future).

As an alternative to the above, the Tobin's "q" theory says that the investment is a function of q, the ratio of the market value of new investment (debt and equity) to the current value of corporate assets or the replacement cost.

It has been shown (Hayashi, 1982, p. 213) that the modified neoclassical theory and the "q" theory are in long-run actually equivalent.

cost of capital is calculated using weighted average of costs of debt and equity.

In practice the various rate of return concepts differ in several points: (1) whose concern is taken into account (company or investor), (2) the ways of valuation of assets (book value or market valuation), (3) the used broader or narrower definition of return and capital employed (e.g. tax, interest, current value, etc.). Among the most important measures for the rate of return there are the company-based rate of return and capital market-based rate of return (Holland 1984).

The company-based rate of return measures have basically two different calculations and each has before and after tax versions. In the first group, the rates of return on business assets are calculated by relating operation incomes either to (1) inventories plus plant and equipment or to (2) inventories plus plant and equipment plus net monetary assets or to (3) total assets employed in business operations or to (4) total fixed assets employed in business operations. In the second group, the rates of return on equity¹⁾ or net worth or own capital mean the ratio of inflation adjusted profit to the same denominators mentioned in the first group, minus the market

1) There are calculations which are partly modified versions of the second group (e.g. the inflation adjusted profit in the numeraire is corrected with the market value of debt multiplied by change in consumer price index or in addition to it the numeraire is corrected with the change in the value of monetary assets).

value of debt. A partly modified version of this latter ratio will be applied in our analysis of Brazil.

The market-based rate of return measures are even more manifold: (1) the net and real return to investors¹⁾; (2) valuation ratios²⁾; (3) cost of capital developed from Tobin's "q" theory³⁾, which is a measure linking the company based and capital market-based rates of return; or (4) methods applied in corporate finance like among the adjusted discount rate approaches the most well known the MM's formula (Miller-Modigliani 1967, p. 169) and the weighted average cost models. According to the practice one of the most reliable and widely used weighted average cost models is Gordon's dividend-growth model (Gordon 1962). This latter model will be applied in our analysis as an alternative calculation of cost of capital in the Brazilian manufacturing industries.

The company-based and market-based conception groups of cost of capital measurements are seemingly different but analyses have shown (Holland 1984, p. 29 or p. 43) that in long run the two

1) Calculated from the dividends received by stockholders plus net interest received by lenders, plus change in market value of stock, plus ratio of change in market value of debt to market value of stock plus, market value of debt at the beginning.

2) Market value of firm's security to the market value of assets are defined in four different ways.

3) Operating income after tax related to corporate's market value.

rates are to be the same although, in short run they can differ.

In this paper, two cost of capital calculation methods will be applied. First, calculations of rate of return on equity (A). They can demonstrate the opportunity costs of capital at sector levels, and allow inter-sectoral comparisons. Second, the weighted average cost of capital method (B). At the firm level this method means that this value is calculated as a weighted average of the costs of capital of various sources. Among the sources the principal division lies between the shareholder's equity and debt (long and short term).

(A) The first calculation to be applied in this paper is based on the opportunity cost concept. Data on corporate net profits (after monetary correction and before income tax) and net equity (realised social capital plus reserves plus accumulated profit minus accumulated losses) have been used. The rate of return of sector i (r_i) is given by:

$$(1) \quad r_i = \frac{\text{net profit}}{\text{net equity}}$$

The data will be calculated as arithmetic average of rates of return of sample companies in each manufacturing sector.

(B) The second calculation, the weighted average cost model relies on the market capitalisation rate which is one of the basic principles of corporate finance.

The first important element of this model is the cost of equity (k_e):

$$(2) \quad k_e = \frac{d_0}{P_0} + g$$

where d_0/P_0 is the current dividend yield and g is the growth rate of dividend per share. The cost of equity is defined as the rate at which the future dividends must be discounted in order to arrive at the value of the initial time, equal to the market value of the firm's stock. Under high inflationary conditions the variables must be adjusted (Modigliani-Cohn 1979, p. 24) unless they were originally indexed.

The second important part of the model is the real cost of borrowing and the calculation of effective cost of debt (k_b):

$$(3) \quad k_b = (1-T)(IE/B)$$

where T is the effective tax rate, IE the interest payment, and B the average debt outstanding in a given year.

In this approach the cost of capital is a weighted average of the costs of different sources of capital available to the

firm. The weights used in the calculation are set according to the proportions of each source in total capital, i.e.

$$(4) \quad k_{av} = w_e k_e + w_b k_b$$

where e and b represent equity and borrowing (debt), and the weights satisfy the

$$(5) \quad w_e + w_b = 1$$

condition.

2.2. Conceptual and Methodological Problems

The application of the methods used in this paper raise some conceptual and practical questions. Even such simple calculation as the rate of return encounter certain conceptual problems. Among them the most important is that the rates of return based on accounting data can never be free of ambiguities of definition and errors of estimation. Such distortions can be caused either by the imperfect competition on the capital market or by various externalities e.g. government credit policy decisions, fiscal, tax and budgetary policies, oligopolistic conditions, etc. In the conditions of underdeveloped capital and stock markets the social and private rates of return may significantly differ.

Although, many private rates of return are known, correct calculation of sector rates of return is not always feasible because the availability of data on private rates of return is limited. The published company data (Visão, Conjuntura Económica) usually contain information regarding the largest 500-6000 enterprises. Sectors dominated by small and medium size enterprises get underweighted representation, and sector averages are determined by the results of the bigger listed companies. Therefore, the calculated values can be considered only as proxy of sectoral rates of return.

There are some general problems to the practical use of the chosen weighted average cost model, too. First of all, the equity market should be broad enough, i.e. the number of listed companies and the trade in shares have to be large enough. Only under such conditions a reliable assessment of the market value of meaningful segments of companies can be made. In underdeveloped equity markets, equity is often substituted by a significant amount of debt. Information on interests paid is, however, scarce. Thus an adequate market valuation of debt and the total cost of capital becomes even more difficult.

It is a more general methodological problem that the weighted average cost of capital calculations are usually made for two purposes. First, it is generally used by firms, in taking decisions on investment projects. Second, it is used at the macro-economic level to inform the governments on the average cost of capital in the whole economy which can be then influenced by means of incentives and taxation policies. At the

sectoral level the average cost of capital can give useful information on certain determinants (profitability, credit subsidy, etc.) of structural changes. However, the calculations of these estimates suffer from a lack of sufficient aggregated data at the sectoral level and involve some rigorous assumptions.

Besides the general methodological problems there are some special conditions prevailing in Brazil such as the 'savings gap' existing in most developing countries, the adverse impacts of domestic public debt (crowding out effect), and servicing the enormous foreign debt (deteriorating creditworthiness and outflow of capital) on the domestic capital market. The highly regulated Brazilian financial intermediation and banking activities, huge inflation rates, the relatively narrow equity market, and credit subsidisation distort the functioning of domestic capital market and influence interest rates. The distortion of cost of capital leads to a misallocation of capital.

2.3. Investment, Saving, Interest Rate

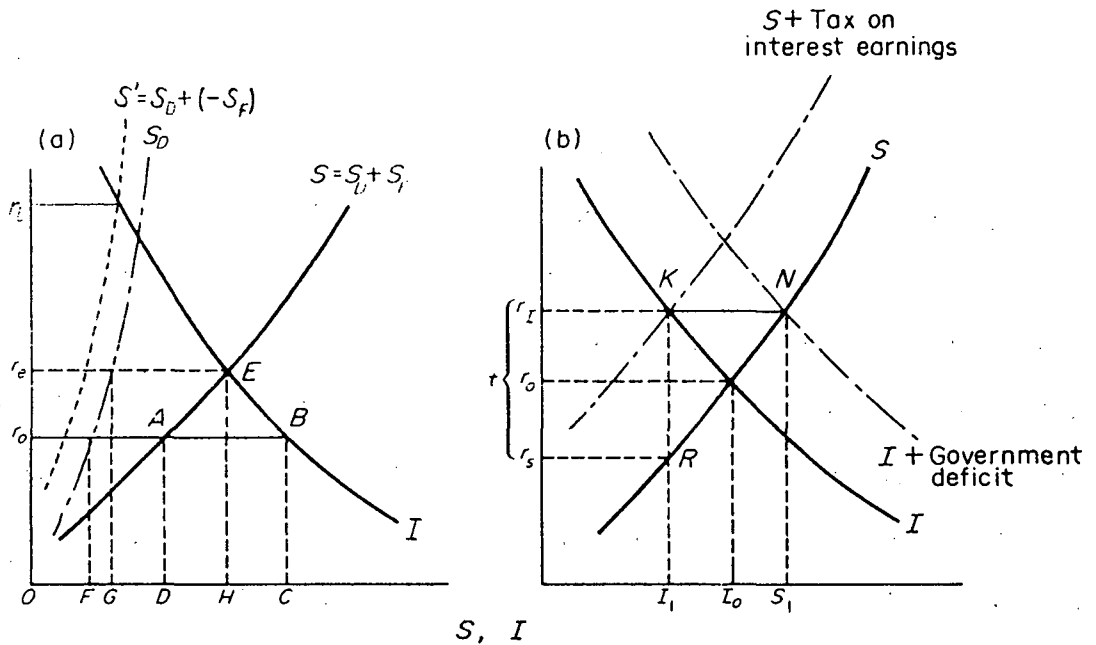
The public sector has a strong impact on savings and investment decisions taken by the private sector. This impact is made both directly through the choice of public investment projects, and indirectly through the impact of government's taxation, spending and domestic credit policies.

Government policies usually aim at stimulating the private sector output and expanding the productive capacity of the public sector. The main economic means to achieve them are basically a supply-side policy on the one hand and public investment projects on the other. It is very important, that the policy means used to increase the public sector's productive capacity do not contradict the incentives favouring private savings relative to consumption, and attractiveness of private capital formation (Khan and Knight, 1982).

The general effects of government policies on private sector saving and investment are illustrated on Figure 1. The horizontal axis of the figure measures real private saving and investment. The vertical axis measures the real return on saving and the real cost of fixed capital investment. As the figure shows the volume of investment is negatively related to the cost of capital. The total supply of funds available to domestic investment (S) consists of domestic savings (S_D) and foreign savings. This latter has the forms of net capital inflows (S_F) and net capital outflows ($-S_F$). They influence the total savings and the interest rates in opposite ways.

Under the conditions of financial repression, ceilings and other restrictions are imposed on the nominal interest rates offered for savings deposits. If, in addition, inflation occurs these interest rate ceilings may imply very low real rates of return on financial savings. As inflation accelerates the real rates frequently become negative.

Figure 1 Effects of Various Policies on Private Sector
Saving and Investment



Source: Khan and Knight (1982) and own modification

The impact of financial repression is illustrated in Figure 1(a). As a result of a combination of domestic inflation and interest rate ceilings, the real return on savings is initially equal to r_0 . At this interest rate, the supply of available total savings is equal to OD , the savings demanded by private sector investors is equal to OC . The amount of private fixed capital formation is constrained by the supply of savings. The interest rate ceilings imply that the economy remains

at point A, where the actual level of fixed capital formation is equal to the amount of savings available at that interest rate. Meanwhile, the domestic savings are equal to OF, the foreign savings, that is the private sector's balance of payments deficit, are equal to FD. The continuous excess demand for investment funds is DC.

If interest rate ceilings were eliminated, the equilibrium in the domestic market for savings would be at E, to the extent that the supply of either domestic or foreign savings is interest rate elastic. The equilibrium interest rate r_e will be above r_0 . As compared with the repressed situation, the private sector's current account deficit would rise from FD to GH. It is brought about by an increased domestic investment financed by foreign capital inflow rather than a low rate of savings. There can be doubt, however, about the extent to which the flow of foreign savings reacts to changes of real interest rates.

Another important issue is the direct effect of government taxation and spending policies on interest rate and their indirect effect on private sector saving and investment. The Figure 1(b) illustrates that a shift of either curve to the left can decrease the real volume of private capital formation. The tax on interest earnings lowers the after-tax return on savings to r_s , raises the cost of investment to r_I and reduces the equilibrium volume of private sector investment from I_0 to I_1 .

The policies that shift either curve to the right have the opposite effect. This shift means a reduction in the tax on interest income which increases the rate of private savings and investment. The total savings is supposed to have a positive real interest rate elasticity.

The overall deficit of the public sector on the private sector investment has the same impact as a change in the tax on saving because it tends to "crowd out" interest sensitive private spending. This is illustrated in Figure 1(b). At the initial balanced public sector budget, the public sector saving and investment are I_0 with an interest rate of r_0 . In the case of public sector deficit, which is measured as equal to KN and financed out of private savings, the interest rate and private savings should rise to r_1 and to S_1 respectively. Meanwhile, private investment must fall to I_1 because the difference is increasingly absorbed by the public sector. This effect is mitigated to the extent that a rise in interest rate induces an inflow of foreign savings.

3. Allocation of Capital and Credit in the Brazilian Manufacturing Industries

3.1. Investment

After an impressive growth rate in the 1960s and early 1970s the Brazilian economy was slowed down after the oil price shocks. The economic performance was further deteriorated by the debt crisis and increasing inflation. During this time the major contributor to the country's economic growth was always industry. The economic policy, especially in the 1970s aimed at, first of all, diversification of the industrial base. This process was led by government owned enterprises (Carneiro, 1987, p. 6). The principal objectives of the massive investment program were (a) import substitution of basic industrial inputs, e.g. steel and other metals, (b) development of the economic infrastructure.

In the 1970s the share of total investment in the GDP was always above 20%. It reached especially high levels in mid of the decade (Table 1). Since the early 1980s, the situation changed and the rate of investment has fallen gradually below the average level of the previous decade.

The more than 10 percentage point decrease in the rate of investment between 1975 and 1983 was basically the consequence of two factors. First, the mounting external debt brought about a significant cut-off of access to international capital markets. The external financial sources, which had previously

Table 1 - Gross Capital Formation in Brazil in Current Millions of Cruzeiros and as % of GDP, 1970-1985

	Total ^a		Private sector		Federal government		State government		Municipal government		Public sector		federal enterprise	
	(1)	as % of GDP	fixed capital formation	as % of GDP	fixed capital formation	as % of GDP	fixed capital formation	as % of GDP	fixed capital formation	as % of GDP	(6)=(3)+ (4)+(5)	fixed capital formation	as % of GDP	fixed capital formation ^b
1970	39913	20.54	27599	14.20	3077	1.58	3616	1.86	1395	0.97	3588	4.42	5528	2.84
1971	54919	21.09	39816	15.29	4697	1.50	3588	1.32	2781	1.07	11066	4.25	5832	2.24
1972	73507	21.09	56225	16.13	5347	1.68	4795	1.38	2323	0.81	13464	3.86	12735	3.65
1973	112834	23.16	84110	17.27	8286	1.70	7376	1.51	3327	0.68	18988	3.90	10648	2.19
1974	181153	25.39	131998	18.50	12066	1.69	11662	1.63	5000	0.70	28728	4.03	29351	4.11
1975	269700	26.83	200120	19.91	19127	1.90	13859	1.38	8438	0.84	41424	4.12	46866	4.66
1976	375714	23.10	293986	13.08	31401	1.93	20565	1.26	13928	0.86	65893	4.05	106908	6.57
1977	547128	22.00	439233	17.66	31148	1.25	30654	1.23	20394	0.82	82195	3.30	154624	6.22
1978	816658	22.55	663195	18.32	38038	1.05	45501	1.26	30343	0.84	113881	3.15	290699	8.03
1979	1361824	22.54	1202927	19.91	47148	0.78	56118	0.93	44153	0.73	147419	2.44	744850	12.33
1980	2836102	22.44	2432451	19.25	89260	0.71	110523	0.37	37052	0.69	293148	2.32	1035907	8.20
1981	5521120	22.32	4753296	19.21	238821	0.97	226347	0.91	172118	0.70	637286	2.58	1908690	7.72
1982	9734843	20.22	8553016	17.76	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	1187322	2.47	n.a.	n.a.
1983	18513612	15.66	17800122	15.06	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	2143134	1.81	n.a.	n.a.
1984	64162487	16.56	56039292	14.46	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	7330298	1.89	n.a.	n.a.
1985	253711722	18.04	218693627	15.55	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	32080525	2.26	n.a.	n.a.

^a (1) = (2)+(6) + correcting items.

^b (7) as part of total (1) gross capital formation.

Note: Total gross capital formation figures are made up mainly by private and public sectors' fixed capital formation plus changes in stocks.

provided the necessary funds to many investment projects substantially dried up. Second, the public sector's deficit played an important role.

The increasing budget deficit, the need to finance it and high inflation rate compelled the authorities to cut the public sector investment significantly. It was reduced by more than half from mid 1970 onwards. The reduction was carried out unevenly among the three government levels (Table 1). In the 1970s, the federal and the state governments reduced their investment expenditures as percentage of GDP by more than 50%. The investments by municipal governments dropped by 25-30%. As a result, the respective shares of investment in GDP became very similar in size.

During the 1970s, the federal enterprises could only increase significantly their investments. It grew not only in value but in share of GDP as well. The federal enterprises' fixed capital formation made up almost 55% of the total gross capital formation of Brazil in 1979, whereas, this share was not higher than 15% in 1970. Over this time period, this could happen only at the expense of the enterprises' increasing indebtedness at home and abroad. Their investment dynamism was slowed down after the second oil price shock from 1980 onwards.

Over the 1970s, the ratio of public sector investments to private sector investments never exceeded the 20-25%. In the

mid 1970s, the decrease of this ratio to around 12-13% was brought about by the significant reduction of public sector investment.

A closer look at the fixed capital formation data of total and selected manufacturing industries between 1970 and 1985 reveals various trends (Table 2). The explanation of these changes and diversity lies in sectoral development policies, in the Brazilian government's economic policy, and in the application of various market and non-market determined interest rates. The analyses of most of these reasons go beyond the scope of this paper. Studies on the manufacturing industries¹⁾ give profound analyses and explanation to the various investment records. Below, the most important trends in investments of manufacturing industries are only listed:

(1) Over the 1970s the share of total manufacturing industry in the total gross fixed capital formation of Brazil was fluctuating and it ended up with a continuous decline from 1976 onwards (Table 2).

(2) The ratios of various manufacturing sectors in the gross fixed capital formation of total manufacturing industry differed. Among the six surveyed manufacturing sectors it was the transport industry that experienced the most significant decline in its share. A similar trend can be seen in the case of the textile industry, meanwhile a relative success was achieved

1) See the sector studies on the Brazilian manufacturing industries published in the Kiel Working Papers Serie of the Institute of World Economics.

Table 2 - Gross Fixed Capital Formation in the Brazilian Manufacturing Industries in Current Billions of Cruzeiros and as % of Total Gross Fixed Capital Formation, 1970-1985

	Gross fixed capital formation (1)	Manufac- turing (2)	Share % (2)/(1)	Tex- tiles (3)	Share % (3)/(1)	Foot- wear (4)	Iron/ steel +		Machi- nery (6)	Share % (6)/(1)	Electr. machi- nery		Trans- port (8)	Share % (8)/(1)
							metal (5)	Share % (5)/(1)			Share % (7)/(1)	Share % (7)/(1)		
1970	36598	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
1971	51420	9253	17.99	825	1.60	n.a.	1323	2.57	480	0.93	269	0.52	1121	2.18
1972	70468	15656	22.22	1344	1.91	n.a.	2027	2.88	761	1.08	475	0.67	1940	2.75
1973	104253	22451	21.54	1890	1.81	n.a.	2763	2.65	1792	1.72	1003	0.96	2338	2.24
1974	262778	33675	12.81	2629	1.00	n.a.	5612	2.14	3291	1.25	1296	0.49	2732	1.04
1975	244840	42392	17.31	3056	1.25	n.a.	8635	3.53	4157	1.70	1860	0.76	2258	0.92
1976	365516	78678	21.53	3922	1.07	n.a.	10288	2.81	7110	1.95	3355	0.92	13197	3.61
1977	529626	107586	20.31	3942	0.74	n.a.	19299	3.64	9285	1.75	7926	1.50	7250	1.37
1978	788878	145757	18.48	5423	0.69	n.a.	25544	3.24	14445	1.83	9855	1.25	7465	0.95
1979	1375102	213889	15.55	9958	0.72	n.a.	29937	2.18	20470	1.49	7416	0.54	15515	1.13
1980	2781575	391783	14.08	20340	0.73	n.a.	78956	2.84	29846	1.07	15573	0.56	23904	0.86
1981	5485281	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
1982	9907402	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
1983	20208435	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
1984	64162487	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
1985	253711722	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.

Sources: Anuario Estatístico, Rio de Janeiro, 1986, p. 453 and UN Industrial Statistics Yearbook, various issues; own calculations.

by the wearing apparel industry. The iron and steel industry, which is to a great extent state owned or controlled could increase its share. This industry has benefited mainly from public loans provided at a reduced rate of interest. The shares of machinery and electrical industries increased as well (Table 2).

(3) Different trends can be seen, too, in the changes of the ratio of gross fixed capital formation to value added at sector levels (Table 3). Between 1972 and 1980, the whole manufacturing sector is characterised by a drop of almost 90 % in the share of investment to value added.

(4) The falling trend in the ratio of gross fixed capital formation to value added is fairly general over the sectors surveyed. This share dropped most drastically in the case of transport machinery. In size of decrease it was followed by the textile sector. The electrical machinery and machinery sectors could increase or maintain their shares before a sudden and significant drop in 1979 and 1980 respectively. It was only the iron and steel sectors which could significantly increase and maintain their shares. Over the 1970s, these shares generally exceeded by 2 to 3 times the average level of the manufacturing industries.

3.2. Financial Intermediation in Brazil

The financial system of Brazil does not fit either in the pattern of industrialised countries nor in the repressed capital market model. Financial intermediation and financial deepening in Brazil has, for the last 3 decades, developed in a

Table 3 - Gross Fixed Capital Formation in the Brazilian Manufacturing Industries in Current Billions of Cruzeiros and as % of Value Added of Each Sector, 1970-1985

	Total ^a Gross Fixed Capital Formation	Total manufac- turing industries	Share		Foot- wear	Steel & Share		Machi- nery	Elec- trical Share		Trans- port mach.	Share of VA		
			% of VA	Textiles %		% of VA	% of VA		% of VA	% of VA				
1970	36598	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.		
1971	51420	9253	15.40	825	13.39	n.a.	1323	32.80	480	12.16	269	8.16	1121	20.71
1972	70468	15656	19.55	1344	16.89	n.a.	2027	42.63	761	12.07	475	10.14	1940	27.09
1973	104253	22451	17.14	1890	14.94	n.a.	2763	37.18	1792	15.10	1003	12.84	2338	22.67
1974	262778	33675	16.80	2629	17.23	n.a.	5612	40.87	3291	17.21	1296	10.79	2732	18.37
1975	244840	42392	14.14	3056	15.28	n.a.	8635	44.51	4157	13.20	1860	10.57	2258	11.64
1976	365516	78678	16.91	3922	11.50	n.a.	10288	39.12	7110	14.78	3355	12.20	13197	38.70
1977	529626	107586	15.61	3942	8.55	n.a.	19299	46.96	9285	13.04	7926	19.33	7250	14.33
1978	788878	145757	13.91	5423	8.05	n.a.	25544	41.60	14445	13.42	9855	14.08	7465	9.15
1979	1375102	213889	12.06	9958	8.04	n.a.	29937	27.02	20470	11.37	7416	6.69	15515	13.26
1980	2781575	391783	10.37	20340	7.94	n.a.	78956	36.28	29846	7.90	15573	6.51	23904	8.06
1981	5485281	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
1982	9907402	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
1983	20208435	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
1984	64162487	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
1985	253711722	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.

^aIn 1984 and 1985, gross fixed capital formation equals gross capital formation (see Table 1) because changes in stocks were included in private final consumption. See Conjuntura Econômica, May 1987, p. 59.

Sources: Anuario Estatístico, Rio de Janeiro, 1986 p.453 and UN Industrial Statistics Yearbook, various issues; own calculations.

round about manner. The changes have happened parallel to industrialisation and rapid growth of the economy. The development and structure of the Brazilian financial intermediation and system have been described in several studies (World Bank, 1984; Teixeira da Costa, 1985; Coopers & Lybrand, 1987; etc.)

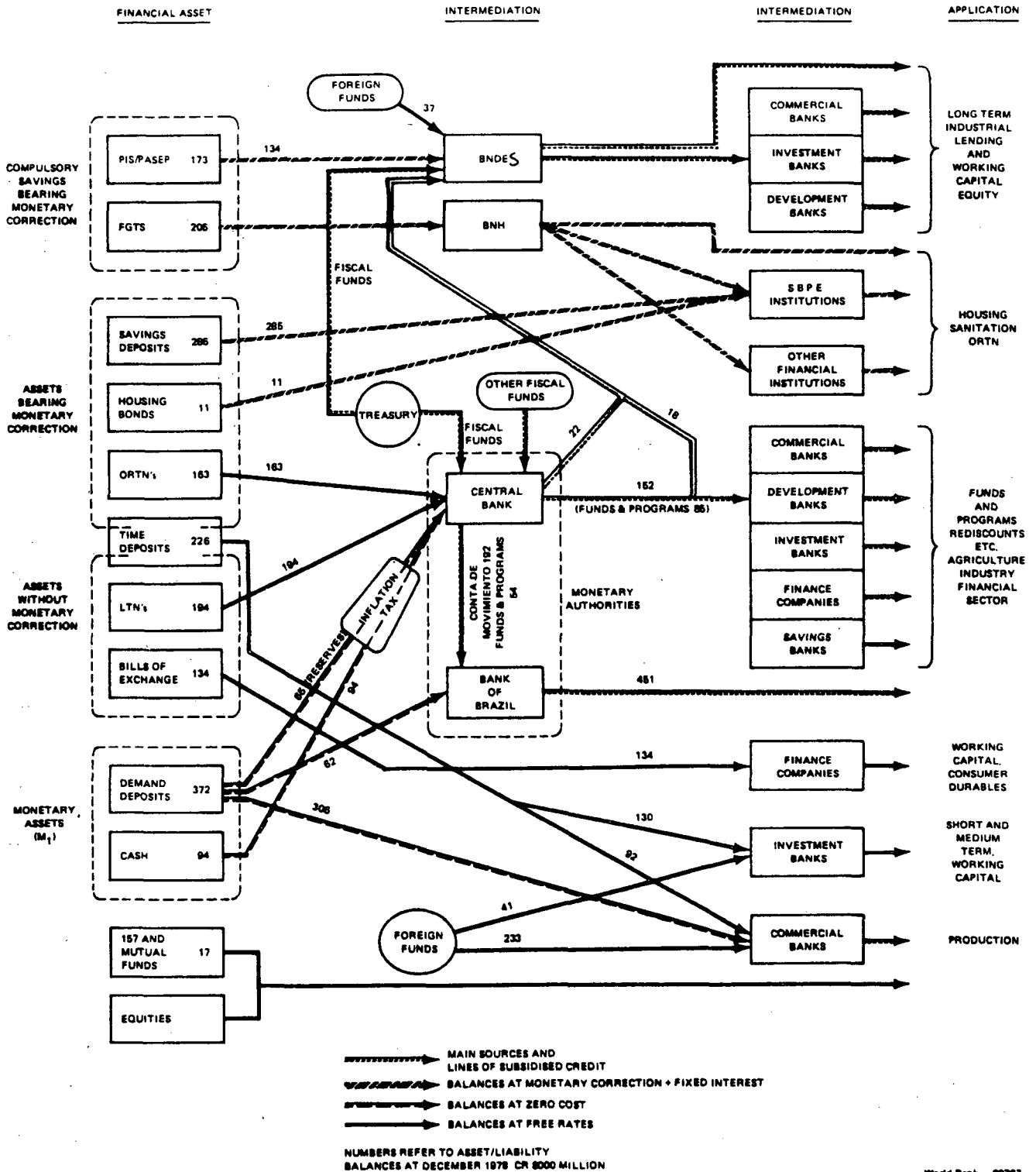
The Chart 1 indicates the structure of the financial system: the types of financial assets are in the left-hand column. The two-stage intermediation consisting of the monetary authorities (Central Bank, BNH, BNDES)¹⁾ and the different groups of banks and financial institutions, are given in the middle section. The various types of fiscal borrowings are in the right-hand column. The monetary authorities channel funds to the second stage financial institutions and to the non-financial sector. The BNDES and the Banco do Brazil are very significant creditors (often at subsidised rate) to the manufacturing sector, as well.

For the last two decades, the system which has emerged, has been characterised by some principal trends such as:

- nation-wide scope of banking,
- segmentation,
- concentration and development of financial conglomerates embracing several types of specialised financial institutions,

1) Monetary Authority = Banco Central do Brasil (Central Bank) and Banco do Brazil; BNH = Banco Nacional de Habitação (National Housing Bank); BNDES = Banco Nacional do Desenvolvimento Economico e Social (National Economic and Social Development Bank).

Chart 1 - Main Elements of Brazilian Financial System



Source: World Bank, Country Study Brazil, Financial System 1984

- significant role of official financial institutions,
- increased sophistication of financial intermediation mechanism,
- the special role of monetary correction,
- credit subsidies according to economic policy preferences.

The most important features among them, as far as the manufacturing industries are concerned are the following:

(A) Segmentation: The financial market was originally segmented and each kind of institution or group of institutions was exclusively required to provide the financial needs for a certain economic sector or activity. Differentiated mechanisms were introduced in order to ensure an adequate flow of funds to them. The legal regulations created a system in which not only the borrower segments were designated to the financial institutions but the financial assets, too. The required funds could be exclusively raised through these assets by the financial institutions.

This market segmentation originally went further than the traditional separation between credit market and security market activities. In the beginning this resulted in rather monopolistic positions with respect to the sources of funding and strictly regulated distribution systems.

Later, when financial conglomerates emerged under the leadership of commercial banks, the clear cut edges of segments disappeared. The banks and financial institutions started operat-

ing in various parts of the market. The new development of the financial system ended up with clustering among the dominating commercial banks influenced by a high degree of government intervention. The selective credit policy became the main government policy.

(B) Concentration: During the 1970s, the financial system experienced a significant process of concentration. It was supported by the government. Large financial institutions merging with small ones resulted in a drop of the number of commercial banks (from 320 in 1965 to 107 in mid 1980s)¹⁾. The activities of the new financial conglomerates included almost every segment of the capital market (e.g. commercial banking, investment banking, insurance and foreign trade). As a consequence, this situation has undermined the competitive nature of financial intermediation and has lead to additional undesirable allocation of financial resources because the special interlocks with the industrial and commercial sectors have had adverse implications for the equality of access to credit.

1) The five biggest banks held approximately 53% of all demand deposits in 1983. By the end of 1985 the Banco do Brasil dominated the banking sector with \$ 4.4 bn in deposits and loans of \$ 5.6 bn. Among the 30 largest banks ranked by the size of deposits, there were 7 owned by either federal or state authorities, a further 8 were foreign banks (e.g. Citibank with \$ 475.5 mn in deposit, Frances e Brasileiro with \$ 294.5 mn and Banco Sudameris, with deposits of \$ 222.8 mn) and 15 banks were privately owned (e.g. Banco Brasileiro de Descontos (BRADESCO) with deposit of \$ 1.9 bn, Itan with deposit of 1.5 bn and Nacional with deposit of \$ 0.9 bn. Besides them there were some 102 commercial banks in operation, of which 22 were foreign owned or had foreign equity affiliation.

(C) Role of the official financial institutions: Till the early 1970s, the official financial institutions were almost the only sources of funds for investments in fixed assets (e.g. Banco do Brasil, the BNDES mainly to the iron and steel industry, Saving Bank, National Co-Operative Credit Bank, Brazilian Northeast Bank, Rubber Credit Bank). This was so, because the liabilities of commercial banks consisted essentially of demand deposits therefore their lending had to be short-term by nature (Teixeira da Costa, 1985). The importance of private banks has significantly increased in the meantime but official financial institutions continue to dominate certain areas of financial activities.

(D) Monetary correction: The monetary correction¹⁾ which was to restore the public confidence in government bonds, became generally used in virtually all contracts with a money value and turned to be a quasi-currency in which now more than 80% of financial assets were denominated. The persistence of monetary correction - especially during the time of high inflation - has impeded the development of the capital market by creating a wide gap between the allocation of savings in short-term and long-term non-monetary assets (Teixeira da Costa, 1985).

1) The most important means of monetary correction is the ORTN (Indexed Treasury Bonds). Its officially set par value is adjusted in line with the inflation rate. Many different assets and monetary contracts are corrected accordingly. The official ORTN value is published monthly. Interest at the agreed rate is to be added on top of monetary correction. A similar system of correction was applied to all other financial instruments as well. Fixed assets, securities, capital, reserves, etc. were all subject to monetary correction for balance sheet presentation and tax purposes.

The financial liabilities of the financial system consist of voluntary and compulsory domestic financial savings with and without monetary correction. In Chart 1 (p. 28) five types of financial assets/liabilities are distinguished²⁾: (a) compulsory funds; (b) voluntary financial savings bearing monetary correction; (c) uncorrected monetary assets; (d) money; and (e) assets without contractually specified yields. The first three types (a, b, c) are non-monetary assets and the fourth includes money narrowly defined as M1. External resources in the form of currency loans assumed an increasingly important supplementary role to domestic sources of finance in the 1970-85 period. Capital inflow was encouraged by high domestic interest rates.

The changes in the shares of monetary and non-monetary assets in the total financial liabilities of financial system and in the ratio to the GDP (Table 4) show the financial deepening of the Brazilian economy. The decrease of monetary assets' share by about 80% and the doubling of the non-monetary assets during one and a half decades represent a rather outstanding achievement. The significant increase in the share of non-monetary assets was almost exclusively due to the very fast growth of assets belonging to the indexed voluntary savings (group b). It is an as obvious trend in a hyperinflationary economy as the

1) The groups of financial assets/liabilities: a) the compulsory funds (FGTS and PIS/PASEP); b) voluntary financial savings bearing monetary correction (saving deposits, housing bonds, ORTN and a part of time deposits); c) uncorrected non-monetary assets (bills of exchange, LTN, and a part of time deposits); d) money (demand deposits and cash) and e) assets without contractually specified yields (mutual funds and equities).

Table 4 - Distribution of Liabilities of the Brazilian Financial System (Data as Percentages), 1970-1985

	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985
Monetary Assets																
Currency	10.65	9.19	8.11	7.58	7.13	6.67	6.75	6.39	6.09	6.62	6.70	4.95	4.20	2.68	2.58	2.53
Demand Deposits	45.50	40.13	36.70	35.72	35.78	31.88	29.54	27.13	25.19	26.49	26.20	18.74	13.47	9.26	8.36	8.76
Total	56.15	49.23	44.81	43.30	42.19	38.55	36.29	33.52	31.28	33.11	32.90	23.69	17.67	11.94	10.93	11.29
Nonmonetary Assets																
- Index-linked Treasury Bonds (ORTN)	14.91	12.30	11.22	9.67	11.31	12.92	12.33	11.70	10.56	9.93	13.57	18.78	26.62	30.11	35.36	36.24
- Housing Bonds	3.18	3.33	3.52	3.01	2.84	1.92	1.43	1.01	0.70	0.51	0.37	0.25	0.12	0.11	0.05	0.00
- Savings Deposits	3.30	4.01	5.42	6.52	9.92	11.87	15.72	17.39	18.69	20.70	22.68	23.51	23.79	26.68	25.56	22.81
- Time Deposits	7.03	10.10	11.94	11.91	11.47	11.73	10.69	13.11	14.66	14.34	14.72	14.77	13.98	13.63	16.22	15.06
- Bills of Exchange	12.46	15.31	14.72	16.07	14.61	11.99	10.00	8.39	8.48	7.38	6.33	4.67	7.43	6.79	6.04	4.41
- Treasury Bills (LTN)	1.11	4.13	7.16	8.03	5.07	8.04	10.14	11.86	12.59	10.68	5.96	10.43	6.08	6.85	2.29	6.54
- State and municipal government bonds	1.86	1.59	1.21	1.49	1.86	2.97	3.39	3.01	3.02	3.34	3.47	3.90	4.30	3.89	3.56	3.65
Other	-	-	-	-	0.01	0.01	0.01	0.01	0.02	0.01	0.00	0.00	0.01	0.00	0.00	0.00
Total	43.85	50.77	55.19	56.70	57.09	61.45	63.71	66.48	68.72	66.89	67.10	76.32	82.33	88.06	89.07	88.71
TOTAL	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Total financial liabilities in value (bn Cr\$)	76.3	113.7	160.2	245.4	342.0	544.3	823.0	1254.9	1810.1	2568.0	4341.2	10575.1	24039.8	68825.6	239742.6	941313.4
as % of GDP	33.4	38.0	44.1	49.4	47.5	53.9	52.7	53.3	52.5	42.5	34.3	42.7	49.9	58.2	61.8	66.9

Source: Banco Central do Brasil, Boletim Mensal, various issues and own calculations.

decline in the share of the assets without monetary correction (group c). From the point of view of lending the increase in share of indexed savings (group b) has to be rated favourably since these assets are of longer term nature comparing to the rather short term, non-indexed assets belonging to group c.

The main sources of credit to the manufacturing sector are PIS/PASEP¹⁾ based on compulsory savings bearing monetary corrections (group a), fiscal funds provided to the BNDES, and various monetary authorities, especially ORTN/LTN which channeled funds through the second stage (banks, financial institutions) of financial intermediation. Banco do Brazil, besides BNDES the second most important single lender of the industry gets its financial funds from demand deposits. The demand deposits are important sources of the commercial banks as well. The investment banks and financial companies rely heavily on assets without monetary correction (time deposit and bills of exchange) for short term or working capital lending. The nature of these sources can explain the high interest rates of lending to the manufacturing industry.

1) PIS/PASEP = Programa de Integração Social (Program of Social Integration) and Programa de Formação do Patrimônio do Servidor Público (Public Employees Financial Reserve Funds).

Direct lending by the three first-stage institutions (Central Bank, Banco do Brazil, BNDES) accounted for 30% of the total lending in 1978, while funds relent through second-stage institutions amounted to 21%. The first-stage lenders' importance and the dependence on them by the second-stage institutions were significant and increasing during the 1970s (World Bank 1984, p. 13). The segmentation is far more pervasive and individual markets are narrower than can be depicted by resource flow patterns. Thus, virtually all direct and indirect lending of the first stage institutions is earmarked for investment narrowly specified by sector and purpose. About 90-95% of all credit extended by official institutions towards the commercial banking sector was regulated.

Credits by final lenders to the private sector declined (Table 5). Both the Banco do Brasil and the commercial banks became less important sources of credit. The slow shift to the non-monetary system was mainly due to the increase in the shares of the federal and state savings banks and housing credit corporations in total lending. These changes did not significantly affect the structure of lending to the industrial sector because, due to the segmentation, the share of the most important lenders (commercial banks, BNDES, investment banks, Banco do Brasil) in the total credits extended to the industry did not change significantly.

Table 5 - Distribution of Credits to the Private Sector by Final Lenders in Brazil (Data as Percentages), 1970-1985

	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985
Through monetary system	53.72	50.97	47.13	50.00	53.59	51.29	50.40	50.27	49.96	50.97	50.04	45.34	40.54	35.90	35.89	38.20
Banco do Brasil	18.89	17.64	16.06	19.03	21.62	22.90	23.39	23.03	21.25	21.23	20.56	16.53	15.62	12.52	9.70	11.02
Commercial banks	34.83	33.33	31.07	30.97	28.97	28.40	27.01	27.25	28.71	29.74	29.48	29.25	24.92	23.38	26.19	27.18
official	.	.	.	9.81	10.06	10.18	9.92	10.12	10.49	10.94	10.93	10.63	7.00	6.64	5.81	6.13
private	.	.	.	21.17	19.18	18.22	17.09	17.13	18.22	18.80	18.55	18.62	17.92	16.74	20.37	21.05
Through non-monetary system	46.28	49.03	52.87	50.00	49.41	48.71	49.59	49.73	50.03	49.03	49.96	54.16	59.46	64.10	64.11	61.80
Finance Co.	12.07	12.10	12.92	15.05	12.55	10.37	8.47	7.16	7.83	7.16	5.90	5.42	10.36	10.50	10.97	10.60
official	.	.	.	0.46	0.56	0.41	0.56	0.55	0.61	0.58	0.47	0.43	0.70	0.74	0.90	1.13
private	.	.	.	14.59	11.99	10.13	7.91	6.61	7.22	6.58	5.43	4.99	9.66	9.75	10.07	9.47
Investment banks	8.20	9.23	11.95	12.70	10.92	10.90	10.04	10.29	10.33	10.82	11.15	10.93	8.57	8.77	9.99	8.64
official	.	.	.	0.13	0.16	0.40	0.32	0.20	0.26	0.32	0.32	0.30	0.23	0.10	0.08	0.10
private	.	.	.	12.57	10.76	10.51	9.72	10.10	10.08	10.50	10.83	10.63	8.34	8.67	9.91	8.54
Banco Nacional da Habitação	7.43	8.00	6.01	3.10	2.49	2.04	1.92	2.10	0.69	0.60	0.61	0.65	2.98	4.11	n.a.	n.a.
Housing Credit Co.	3.56	4.31	5.74	6.08	5.25	5.64	6.02	6.43	6.89	7.01	7.84	9.55	13.09	14.89	16.20	14.36
Savings and loan Associations	0.46	0.62	0.91	1.09	1.29	1.36	1.72	2.05	2.28	2.43	2.68	2.95	2.31	2.15	n.a.	n.a.
Federal Savings Banks	4.80	4.92	4.70	4.90	5.55	7.04	7.90	7.91	7.79	7.07	8.06	9.12	12.02	13.17	17.28	18.42
State Savings Banks	2.01	1.85	1.83	2.14	2.25	2.45	3.31	3.30	3.46	3.33	3.29	4.13	4.83	5.05	4.72	4.30
BNDES (liquid)	4.33	4.21	4.11	2.01	4.18	5.42	6.25	6.57	6.92	6.90	6.63	7.00	2.14	2.36	2.53	2.34
State Development Banks	0.62	0.72	1.04	1.72	2.12	2.47	3.05	3.22	3.28	3.20	3.26	3.65	2.59	2.57	2.26	2.99
PIS	.	0.10	0.72	1.05	1.34	0.79	0.69	0.51	0.36	0.27	0.22	0.16	n.a.	n.a.	n.a.	n.a.
Banco Nacional de Crédito Cooperativo	0.15	0.21	0.13	0.13	0.13	0.24	0.24	0.20	0.21	0.23	0.34	0.60	0.57	0.54	0.16	0.15
Total general	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00

Sources: Anuario Estatístico do Brasil and Banco Central do Brasil, Boletim Mensal, various issues; own calculations.

3.3. Allocation of Credit

The main sources of credit extended by financial institutions to private and public manufacturing industries are (1) the commercial banks (approximately 35-40%), (2) the BNDES system¹⁾ (with an increasing share in the 1980s from 20% to 40%), (3) the investment banks (with a decreasing share in the 1980s from 20% to 12%) and (4) the Banco do Brasil (with a decreasing share from 15% to 7%). The credits extended by the Banco do Brasil and investment banks were destined almost exclusively and those by the commercial banks mainly to the private sector. It was the BNDES only which followed a more balanced lending policy between private and public sectors.

Among the four above mentioned groups of credit institutions the BNDES system is the most important source of long term and

1) The BNDES System consists of the BNDES itself, its subsidiaries: FINAME and BNDESPAR (merged in 1982 from 3 subsidiaries: IBRASA, FIBASE, EMBRAMEL) [see Table A1]. The BNDES was originally organised with the purpose to manage foreign capital invited by development policy to finance large scale industrial projects for import substitution. The bank has played a fundamental role in the diversification of Brazil's industrial structure and in the expansion of its productive infrastructure. The bank is the principal agent for long term development lending and for such specific areas as energy or import substitution programmes. It administers funds garnered from compulsory savings programmes and also furnishes working capital loans to local, mainly national firms. Its activities are supplemented by a number of development banks (e.g. especially the federally owned Banco Nordeste do Brasil, and Banco da Amazonia). The substantial number of state financed development banks provide loans mainly for specific local and regional projects.

very often subsidised credit to the whole industry¹⁾. The affiliated commercial and investment banks, except when they act as BNDES agents, lend regularly at short and medium term for working capital.

The various manufacturing sectors benefited to a different extent from the BNDES subsidised credits. The extent of subsidisation depends on the purpose and on the borrower. The share of the metal industry in the credits given to the whole industry first increased and then declined gradually between 1970 and 1985 (Table 6). The shares of the other surveyed industries have been much smaller and generally declined or could increase to a marginal extent only. These shares in lending reveal an import substitution bias in the applied credit policy. As a consequence, the availability of credit has become more limited for the most efficient sectors, which has automatically driven up interest rates on the free market.

1) This kind of concentration of longer term investment credits is characteristic for the whole economy. Approximately half of fund- and program lending by financial institutions has proceeded through state development banks, and roughly a third of it through commercial banks. All lending included can be categorised as selective and most of them is highly subsidised. In 1978 the BNDES system total disbursement was equivalent to approximately 40% of industrial, gross fixed capital formation. The BNDES Annual Report 1978 estimated that supposing an average debt/equity ratio of about 1 - however this ratio has risen from an average of 0.75 in 1970 to 1.40 in 1977 for the manufacturing industry (World Bank, 1984, p. 129) - the BNDES System lending had been sufficient to supply about 80% of loan requirement for industrial investment.

Table 6 - Credits by the National Bank for Economic and Social Development (BNDES) to Brazilian Manufacturing Industries in Current Millions of Cruzeiros and as Percentages, 1970-1985

	Total ^a	Manufac- turing indus- tries	% of total	Metal ind.	% of ind.	Machi- nery ind.	% of ind.	Elec- tronics ind.	% of ind.	Trans- port ind.	% of ind.	Tex- tiles (*)	% of ind.	Other	% of ind.
1970	1865	1114	59.7	178	16.0	45	4.0	43	3.9	74	6.6	92	8.3	667	59.9
1971	3218	2119	65.8	512	24.2	52	2.5	17	0.8	294	13.9	154	7.3	1076	50.8
1972	4870	3152	64.7	504	16.0	78	2.5	27	0.9	342	10.9	284	9.0	1930	61.2
1973	7508	4066	54.2	1142	28.1	117	2.9	40	1.0	270	6.6	132	3.2	2428	59.7
1974	20340	12469	61.3	3519	28.2	516	4.1	204	1.6	228	1.8	355	2.8	8102	65.0
1975	37743	28158	74.6	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
1976	67663	39230	58.0	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
1977	47459	32694	68.9	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
1978	153384	73837	48.1	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
1979	135996	77500	57.0	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
1980	305939	128900	42.1	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
1981	717339	343255	47.9	159087	46.3	7004	2.0	3603	1.0	1323	0.4	5867	1.7	173327	50.5
1982	830392	393944	47.4	172814	43.9	8451	2.1	4256	1.1	1602	0.4	14325	3.6	200900	51.0
1983	2313752	848026	36.7	321403	37.9	49238	5.8	10919	1.3	7768	0.9	44375	5.2	463524	54.7
1984	6445148	3692488	46.6	1178113	39.2	204226	6.8	34470	1.1	27997	0.9	184933	6.2	1576928	52.5
1985	20443924	8399154	41.1	2622592	31.2	478124	5.7	298383	3.6	168414	2.0	545515	6.5	4764209	56.7

^aBesides industry, total credits by BNDES include credits to agriculture, to the energy sector and for infrastructure/other 'social investments'.

(*) Note: The figures for the textile industry are available between 1970-1974, but there are no figures of wearing apparels for the same period. From 1981 onwards the table contains the figures of non-durable consumption goods in which both subsectors are included.

Sources: Anuario Estatístico do Brasil; BNDES Annual Report, various issues and own calculations.

The Banco do Brasil extended long term and short term credit. Concerning long term credit (Table 7) the manufacturing industry obtained 80-90% of the total disbursed amounts while the shares of individual industries surveyed in this paper had remained rather marginal. The situation of the manufacturing industry was more favourable as far as the working capital by the Banco do Brasil (Table 8) is concerned. Its share was, almost for the whole time, between 70% and 80%. A significant drop was only recorded in 1985. The six surveyed sectors together made up the 35-58% of the credit given to the manufacturing industry. A gradual decline their share stopped and began to increase in 1980.

As far as the sectoral allocation of credit is concerned, the metal industry got disproportionately larger shares from both types of credits than any other sector. This could be explained by the significant differences in capital intensity among the sample sectors, but other reasons cannot be excluded either (e.g. a significant part of the iron and steel industry is state owned or controlled). This situation has forced other industries to look for alternative sources of financing for their operations.

Table 7 - Long Term Credits by Banco do Brasil to Brazilian Manufacturing Industries in Current Millions of Cruzeiros and as Percentages, 1970-1985

Year	Total ^a	Manufac- turing indus- tries	% of total	Metal ind.	% of manuf ind.	Machi- nery ind.	% of manuf. ind.	Electr. mach. ind.	% of manuf. ind.	Trans- port ind.	% of manuf. ind.	Tex- tiles	% of manuf. ind.	Wearing apparel ind.	% of manuf. ind.	Others	% of manuf. ind.
1970	227.8	226.4	99.3	4.6	2.0	6.4	2.8	1.2	0.5	60.2	26.6	30.6	13.5	4.0	1.8	119.4	52.8
1971	294.1	248.1	84.4	60.6	24.4	6.7	2.7	1.6	0.6	8.5	3.4	15.1	6.1	3.6	3.5	147.1	59.3
1972	477.2	458.7	96.1	22.9	5.0	14.4	3.1	3.5	0.8	8.3	1.8	20.1	4.4	15.1	3.3	374.3	81.6
1973	1387.0	1373.5	99.0	26.5	1.9	23.0	1.7	4.5	0.3	7.1	0.5	26.7	1.9	15.2	1.1	1270.5	92.5
1974	1874.9	1781.0	95.0	35.4	2.0	26.4	1.5	5.4	0.3	10.8	0.6	25.8	1.4	17.4	1.0	1659.7	93.2
1975	4812.9	4503.6	93.6	120.9	2.7	29.9	0.7	3.5	0.1	19.6	0.4	109.1	2.4	19.1	0.4	4201.5	93.3
1976	2752.1	2575.0	93.6	32.4	1.3	35.8	1.4	17.4	0.7	13.2	0.5	65.7	2.6	14.4	0.6	2396.1	93.1
1977	7002.4	6427.2	91.8	59.7	0.9	33.5	0.5	4.3	0.1	5.3	0.1	74.6	1.2	10.2	0.2	6239.7	97.1
1978	7093.2	6188.7	87.2	1329.6	21.5	40.7	0.7	7.5	0.1	13.4	0.2	36.0	0.6	38.2	0.6	4723.3	76.3
1979	7764.3	6704.9	86.3	3590.2	53.5	52.6	0.8	11.4	0.2	10.4	0.2	49.9	0.7	69.4	1.0	2920.9	43.6
1980	30580.6	26821.9	87.7	3703.7	13.8	166.0	0.6	6.3	0.0	12.3	0.0	334.8	1.2	60.4	0.2	22538.3	84.0
1981	52346.0	41652.0	79.6	162.0	0.4	102.0	0.2	12.0	0.0	7.0	0.0	102.0	0.2	35.0	0.1	41232.0	99.0
1982	155376.0	20174.0	13.0	111.0	0.6	67.0	0.3	26.0	0.1	194.0	1.0	29.0	0.1	82.0	0.4	19665.0	97.5
1983	65314.0	57179.0	87.5	1678.0	2.9	990.0	1.7	107.0	0.2	33.0	0.1	1520.0	2.7	180.0	0.3	52671.0	92.1
1984	151582.0	132034.0	87.1	25.0	0.0	1026.0	0.8	482.0	0.4	9642.0	7.3	4.0	0.0	431.0	0.3	120424.0	91.2
1985	176644.0	162425.0	92.0	397.0	0.2	75.0	0.0	-	-	13840.0	8.5	81.0	0.0	15600.0	9.6	132432.0	81.5

^a See Table 6.

Sources: Anuario Estatístico do Brasil; Banco Central do Brasil, Boletim Mensal, various issues and own calculations.

Table 3 - Short Term Credits by Banco de Brasil to Brazilian Manufacturing Industries in Current Millions of Cruzeiros and as Percentages, 1970-1985

Year	Total ^a	Manufac- turing % of indus- total tries	Metal % of indus- manuf. try ind.	Machi- % of nery manuf. ind.	Elect. % of machi- manuf. ind.	Trans- % of port manuf. ind.	Tex- % of manuf. tiles ind.	% of manuf. apparel ind.	Wearing % of apparel manuf. ind.	Others % of manuf. ind.
1970	922.4	917.2 99.4	107.0 11.7	28.5 3.1	31.1 3.4	24.9 2.7	184.7 20.1	64.8 7.1	476.2 51.9	
1971	1383.8	1370.4 99.0	141.4 10.3	50.9 3.7	54.9 4.0	41.0 3.0	278.0 20.3	72.0 5.3	732.1 53.4	
1972	1763.4	1745.6 99.0	117.2 6.7	60.4 3.5	39.3 2.3	43.8 2.5	321.5 18.4	88.0 5.0	1075.3 61.6	
1973	2504.5	2473.0 98.7	126.1 5.1	74.5 3.0	46.7 1.9	49.4 2.0	480.2 19.4	119.6 4.8	1576.5 63.7	
1974	8992.9	8338.9 92.7	1098.9 13.2	502.9 6.0	340.3 4.1	425.7 5.1	1148.3 13.8	349.9 4.2	4472.9 53.6	
1975	13687.4	12683.2 92.7	1751.8 13.8	412.0 3.2	177.5 1.4	245.7 1.9	2292.4 18.1	556.3 4.4	7247.4 57.1	
1976	18444.2	14495.5 88.6	2377.5 16.4	550.9 3.8	394.2 2.7	320.8 2.2	2985.0 20.6	705.8 4.9	7161.1 49.4	
1977	26039.3	22930.5 88.1	2707.7 11.8	989.1 4.3	698.6 3.0	627.2 2.7	3961.3 17.3	1321.8 5.8	12624.7 55.1	
1978	44989.5	34788.1 77.3	3908.0 11.2	1528.4 4.4	1014.6 2.9	1434.9 4.1	5213.8 15.0	2041.0 5.9	19647.4 56.5	
1979	62305.4	46476.3 74.6	6118.6 13.2	2057.7 4.4	1056.0 2.3	1600.8 3.4	7064.0 15.2	1881.5 4.0	26697.7 57.4	
1980	152996.7	110650.0 72.3	10498.7 9.5	5315.5 4.8	1840.0 1.7	6091.0 5.5	10488.8 9.5	4617.4 4.2	71798.5 64.9	
1981	327301.0	220364.0 67.3	23411.0 10.6	8836.0 4.0	3978.0 1.8	22120.0 10.0	16804.0 7.6	8586.0 3.9	136629.0 62.0	
1982	593500.0	429999.0 72.5	30889.0 7.2	15255.0 3.5	6032.0 1.4	60095.0 14.0	35846.0 8.3	23120.0 5.4	258762.0 60.2	
1983	1189318.0	987008.0 83.0	89130.0 9.0	43861.0 4.4	14374.0 1.5	48507.0 4.9	82762.0 8.4	108965.0 11.0	599409.0 60.7	
1984	2948694.0	2230858.0 75.7	344856.0 15.5	172742.0 7.7	29773.0 1.3	142840.0 6.4	181364.0 8.1	368704.0 16.5	990579.0 44.4	
1985	22986725.0	8741649.0 38.0	3523627.0 40.3	362078.0 4.1	100584.0 1.2	138105.0 1.6	355634.0 4.1	628940.0 7.2	3632681.0 41.6	

^aBesides the manufacturing industries, total credits by Banco de Brasil include credits to mining, the trade sector and services.

Sources: Anuario Estatístico do Brasil, various issues and own calculations.

3.4. Allocation of Equity

The Brazilian financial authorities have tried to support the financial consolidation of companies by promoting equity trading¹⁾. In spite of an increase in new shares and debentures²⁾ comparatively few companies have gone public. The Brazilian manufacturing industries still substantially rely on internal funding (retained profit) or borrowing (see Table A3). Many of the major Brazilian companies do not issue shares for public acquisition at all or if they do so family interest are represented by the majority shareholders holding over 50% of the equity.

The number of companies which have opted for issuing stocks is rather small, especially if the following facts are taken into consideration: Compared to the other developing countries Brazil has a highly diversified economy; in 1986 barely 900 out

1) A series of policy measures has since 1964 attempted to facilitate the capitalisation and opening of Brazilian enterprises. a) Fiscal incentives: Law 4728 of 1965 income tax deduction for 30% of the value of new shares purchased and for 15% of mutual fund purchases and income and withholding tax exception. Decree Law 157 of Febr. 1967 income tax deduction for mutual funds share certificate. b) Subsidised credit for equity purchase and underwriting: BNDES System (PROCAP and FINAC) schemes to support underwriting and equity purchases. c) Laws for protection of minority shareholders.

2) During the period between 1966 and 1985 the combined volume of stock grew at an average annual real rate of 30%. The value of new shares and debentures increased at an average annual real rate of 27.4% and 7.8% respectively (Coopers & Lybrand, 1987, p. 24).

of 1.7 million individual companies were listed and only half of them take a relatively active part in the stock and debentures markets (Teixeira da Costa, 1985; Coopers & Lybrand, 1987).

A survey on 90 companies (roughly 1/10 of the listed ones) has assessed the sources of their funding (Table 9). In the private sector the internal funding played the most important role, and the respective share further increased in 1978-1982. In the public sector internal funding declined. Borrowing was substantial in both groups.

During the period under observation stock issues were a much less important source of funds. Their share in total financing declined for the private sectors and was rather stable but low for the public sector¹⁾. This result is understandable in the case of private companies with foreign ownership only. For them, the government policy has provided incentives to raise money from abroad. The Brazilian companies had to face regulations preventing companies placing their equity shares directly with the public. The issue of stocks is controlled by the financial system because an intermediary financial institution is legally required to oversee all these financial activities.

1) The BNDES also subscribes to equity. The purchase and promotion of equity have accounted for about 5-10% of its total disbursement (World Bank, 1984). The real importance of it lies in the process of capitalisation and equity strengthening of national enterprises in an economy where the manufacturing industry is, mainly because of traditions, still reserved towards going public.

Table 9 - Sources of Funding: 90 Open or Publicly-Quoted Brazilian Corporations (in Percentage of Total Sources), 1978-1982

1. Private sector, Brazilian ownership					
Year	Internal funding	Stock issues	Sales of assets	Borrowed funds	Total
1978	58.80	14.79	3.66	22.75	100.00
1979	63.88	10.22	2.19	23.71	100.00
1980	62.47	9.06	1.79	26.68	100.00
1981	64.27	3.78	1.90	30.05	100.00
1982	65.66	9.96	1.25	23.13	100.00
2. Private sector, foreign ownership					
Year	Internal funding	Stock issues	Sales of assets	Borrowed funds	Total
1978	76.72	7.43	3.16	12.70	100.00
1979	70.77	11.03	0.75	17.45	100.00
1980	85.59	9.10	0.90	4.40	100.00
1981	82.28	10.35	1.41	5.96	100.00
1982	84.37	1.10	1.01	13.53	100.00
3. Public sector					
Year	Internal funding	Stock issues	Sales of assets	Borrowed funds	Total
1978	50.68	12.11	0.42	36.19	100.00
1979	39.91	8.74	2.86	48.49	100.00
1980	50.47	8.19	3.95	37.40	100.00
1981	39.70	9.52	18.31	32.47	100.00
1982	39.38	11.78	3.14	45.71	100.00

Source: IBMEC, in: R. Teixeira da Costa, 1985, p. 14.

Analysis suggest (World Bank, 1984, p. 131-132) that the bulk of total market value and trading volume has resulted from equities of a few majority state owned enterprises. Individual minority shareholders invested little in equity of private Brazilian industrial companies. Thus, the equity market was worse than is apparent from aggregate statistics. Factors other than stockmarket structure and subsidised industrial credit also contributed to the failure of the equity market to mobilise a greater portion of gross domestic financial savings. Among them, one of the most important could be the combination of the availability of liquid, indexed financial assets and the channelling of credit towards real estate, housing and related investments¹⁾. The equity market became a victim of the segmented structure of the Brazilian financial market, i.e. the diversion of funds to alternative assets and the substitution of industrial borrowing on a free capital market by subsidised state funds.

1) See relevant data of Housing Credit Co and BNH in Table 5.

4. Sources of Capital and Credit for the Brazilian Manufacturing Industries

4.1 Internal and External Savings

The sources of the gross capital formation were varying during the period 1970-85. However, the major part of capital formation was provided from domestic sources (Table 10). Until 1975 the gross national savings represented an increasing share in GDP. Following the first oil shock and capital abundance on the international capital markets during the second half of the 1970s, the share of domestic savings in GDP started to fall gradually. Gross national savings were increasingly made up of private savings. The federal enterprises contributed to the domestic saving to a relatively large extent. The various levels of government played very different roles. Over the period, their total contribution was declining and by the mid 1980s, it became negative.

To increase aggregate domestic saving, incentives based purely on high real interest rates were not sufficient in the situation prevailing in Brazil in the 1980s. Interest rates have been high but have not resulted in the necessary higher aggregate savings because, as evidence showed, the high interest rates (1) increase the public sector deficit, (2) raise the cost of working capital, and (3) discourage private investment (Zini 1988). Thus,

Table 10 - Gross National Savings (Sources of Gross Capital Formation) of Brazil in Current Millions of Cruzeiros and as % of GDP, 1970-1985

	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979
Gross national savings	37356	48043	64723	102559	133084	215562	311854	490344	690985	1075292
as % of GDP	19.22	18.45	18.57	21.05	13.65	21.45	19.18	19.71	19.08	17.80
private	19203	25943	36496	55538	74785	130436	195121	300664	437833	773523
as % of GDP	9.88	9.96	10.47	11.40	10.48	12.98	12.00	12.09	12.09	12.80
federal enterprises	7536	6879	11161	16336	26267	46277	46681	92027	147175	161464
as % of GDP	3.88	2.64	3.20	3.35	3.68	4.60	2.87	3.70	4.06	2.67
government	10617	15226	20066	30685	32032	38849	70052	97653	35977	140305
as % of GDP	5.46	5.85	5.76	6.30	4.49	3.87	4.31	3.93	2.37	2.32
federal	2366	6819	10180	14989	15671	15541	35884	34827	9022	29120
as % of GDP	1.22	2.62	2.92	3.08	2.20	1.55	2.21	1.40	0.25	0.48
state	6101	5714	6873	11765	10937	16014	19582	42584	47413	57643
as % of GDP	3.14	2.19	1.97	2.42	1.53	1.59	1.20	1.71	1.31	0.95
municipal	2150	2693	3013	3931	5424	7294	14586	20242	29542	53542
as % of GDP	1.11	1.03	0.86	0.81	0.76	0.73	0.90	0.81	0.82	0.89
	1980	1981	1982	1983	1984	1985				
Gross national savings	2162389	4431169	6807629	14565978	64244625	252215622				
as % of GDP	17.11	17.91	14.14	12.32	16.56	17.94				
private	1764142	2871047								
as % of GDP	13.96	11.61	6637000 ⁺	13663000 ⁺	74952062 ⁺	363470926 ⁺				
federal enterprises	228636	1290726								
as % of GDP	1.81	5.22	13.78 ⁺	11.56 ⁺	19.32 ⁺	25.35 ⁺				
government	169611	269396	170629	902978	-10707437	-111255304				
as % of GDP	1.34	1.09	0.36	0.76	-2.76	-7.92				
federal	-81902	-42650	n.a.	n.a.	n.a.	n.a.				
as % of GDP	-0.65	-0.17	n.a.	n.a.	n.a.	n.a.				
state	150225	121417	n.a.	n.a.	n.a.	n.a.				
as % of GDP	1.19	0.49	n.a.	n.a.	n.a.	n.a.				
municipal	101288	190629	n.a.	n.a.	n.a.	n.a.				
as % of GDP	0.80	0.77	n.a.	n.a.	n.a.	n.a.				

⁺ Aggregate of private and federal enterprise savings.

market incentives to increase the saving ratio could not yield significant results. It is particularly unfavourable, that the market for long-term financial assets is actually nonexistent and that the high real interest rates inhibit investment in the face of uncertainty about inflation.

External savings became increasingly important after the first oil shock. The availability of external financing at relatively low interest rates covered the potential external gap and helped to sustain growth. The share of external savings in GDP was fluctuating; nevertheless it became 5 times higher by the early 1980s than it had been at the beginning of the 1970s (Table 11).

After 1982, the debt crisis reduced the flow of foreign capital and led to a drying up of these sources in subsequent years. The high interest rates on international capital markets and the recession in the industrialised world hit the Brazilian economy with double force. The situation became severe because the direction of capital flows turned around. Outflow of capital took place just at a time when the Brazilian economy badly needed new capital both to finance the debt service and to urgently carry out the economic adjustment process postponed in previous years. The conditions became very unfavourable to Brazil because the domestic savings were not sufficient when interest rates for external savings increased significantly and there was a sharp decline in the availability of these external sources.

Table 11 - External Savings of Brazil in Current
Millions of Cruzeiros and as % of GDP,
1970-1985

Year	External		
	savings (1)	GDP (2)	% of GDP (3)=(1)/(2)
1970	2562	194389	1.32
1971	6871	260393	2.64
1972	8784	348605	2.52
1973	10275	487151	2.11
1974	48069	713524	6.74
1975	54138	1005048	5.39
1976	63860	1626349	3.93
1977	56784	2487465	2.28
1978	125673	3620927	3.47
1979	286532	6041457	4.74
1980	673713	12639293	5.33
1981	1089951	24737492	4.41
1982	2927214	48147762	6.08
1983	3947634	118194847	3.34
1984	-82138	387967701	-0.02
1985	1496100	1406077084	0.11

Note: By definition the external and internal savings ratios (tables 10,11) have to add up to the calculated gross capital formation ratios in Table 1.

Source: Anuario Estatístico do Brasil, 1986,
p. 451-453.

4.2 Indebtedness - Public Debt, Foreign Debt

During the 1970s, the Central Government Budget always showed surpluses. These accounted for between 0.5 and 3.5% of GDP. After 1980, there were public deficits which reached about 10% of GDP in 1985 (IMF, Government Finance Statistics Yearbook, var. iss.). Analyses of the central authorities' financial performance show an even more unfavourable picture. The balances of Consolidated Central Government Accounts and that of the Consolidated General Government Accounts (Table 12) were almost always negative and the deficit of both accounts exceeded 10 % of GDP by 1985.

It should be pointed out, that even the Central Government Budget surpluses in the 1970s have little meaning if they are considered in isolation. One has to look at these three accounts simultaneously with the federal debt records. The amount of this debt increased incessantly. The total federal debt in bonds and bills grew from 5.2 % of GDP to 28.6 % of GDP over the 1970-1985 period (Table 13).

The forms of the federal debt were very frequent LTN and ORTN issues. Until 1979, this increase was brought about mainly by expanded LTN issues. As soon as the inflation rate had jumped up and indexation got vital importance the ORTN issues took over the dominant role in financing the deficit (Table 13).

Table 12 - Consolidated General Government Accounts of
 Brasil at Year Ending in Current Billions of
 Cruzeiros and as % of GDP, 1970-1985

Year	Total revenue & grants	Total expenditure & lending minus repayments	deficit (-) or surplus (+)	as % of GDP
1970	54.5	57.0	-2.5	-1.29
1971	71.4	74.3	-2.9	-1.11
1972	96.8	99.6	-2.8	-0.80
1973	138.3	138.7	-0.4	-0.08
1974	197.2	192.3	4.9	0.69
1975	274.8	291.3	-16.5	-1.64
1976	434.9	459.7	-24.8	-1.52
1977	731.4	773.0	-41.6	-1.67
1978	1091.4	1191.4	-100.0	-2.76
1979	1795.9	1869.4	-74.5	-1.23
1980	3668.9	4041.3	-372.4	-2.95
1981	7721.6	8568.6	-847.0	-3.42
1982	16216.0	18210.4	-1994.4	-4.14
1983	38647.5	44945.0	-6298.0	-5.33
1984	115924.0	138147.0	-22223.0	-5.73
1985	467382.0	646527.0	-179145.0	-12.74

Note: Consolidated General Government Accounts = Conso-
 lidated Central Government Accounts + State and
 Local Government Accounts

Sources: IMF, Government Finance Statistics Yearbook 1987,
 p. 201; IMF, IFS Supplement on Government Finance
 1986, p. 105 and own calculations.

Table 13 - Federal Public Debt and Debt of the Central Bank in Brazil at Year Ending in Current Billions of Cruzeiros and as % of GDP, 1970-1985

	Federal Public Debt Outside Central Bank				Central Bank Portfolio				Total Federal Debt in Bonds and Bills			
	ORTN	LTN	Total	as % of GDP	ORTN	LTN	Total	as % of GDP	ORTN	LTN	Total	as % of GDP
	(1)	(2)	(3)=(1)+(2)	(4)	(5)	(6)	(7)=(5)+(6)	(8)	(9) = (1)+(5)	(10) = (2)+(6)	(11) = (3)+(7)	(12) = (4)+(8)
1970	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	9.4	0.7	10.1	5.20
1971	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	11.6	3.9	15.5	5.95
1972	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	16.0	10.2	26.2	7.52
1973	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	20.9	17.4	38.3	7.86
1974	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	33.0	14.8	47.8	6.70
1975	58.4	22.1	80.5	8.00	1.7	15.3	17.0	1.70	60.1	37.4	97.5	9.70
1976	80.9	64.7	145.6	8.95	3.5	4.7	8.2	0.50	84.4	69.4	153.8	9.46
1977	97.7	106.2	203.9	8.19	21.7	14.8	36.5	1.47	119.4	121.0	240.4	9.66
1978	151.3	161.9	313.7	8.66	11.2	32.6	43.8	1.21	163.0	194.5	357.5	9.87
1979	233.6	163.9	397.5	6.58	17.6	106.2	123.8	2.05	255.0	266.0	521.0	8.62
1980	439.5	186.1	625.6	4.95	159.7	72.6	232.3	1.84	289.1	255.0	544.1	6.68
1981	1357.6	788.3	2145.9	8.67	628.0	313.6	941.6	3.81	1986.0	1102.0	3088.0	12.48
1982	4027.3	709.7	4737.0	9.84	2372.0	752.8	3124.8	6.49	6399.4	1463.3	7862.7	16.33
1983	8783.0	360.4	9143.4	7.74	11940.0	4351.7	16291.7	13.78	20723.4	4712.0	25435.4	21.52
1984	51247.6	2213.2	53460.8	13.78	33525.6	3683.0	37208.6	9.59	84773.0	5502.0	90275.0	23.27
1985	249597.0	8892.0	258489.0	18.38	91536.0	52708.0	144244.0	10.26	341132.0	61603.2	402735.2	28.64

Note: LTN and ORTN are financial market instruments to finance the government deficit. LTN is used for short term financing within the banking sector for 35 days. Its interest rate is inflation rate adjusted. ORTN is used for long term financing, bought by commercial banks (as part of legal reserve requirements), corporations and institutional investors (as portfolio investment). The maturity varies between 60 days and some years. The interest rate is inflation rate adjusted.

Sources: Banco Central do Brasil, Boletim Mensal, various issues and own calculations; Conjuntura Econômica 1988, No. 2, p. 184.

The government bonds have some peculiarities that make them inflationary instruments¹⁾.

A significant part of the debt was in the hands of public sector institutions. This practice, therefore, served to redistribute resources within the public sector toward the monetary authorities for relending, primarily to agriculture and substantially to industry. The issues of treasury bonds and bills served to dry up excessive liquidity arising from the expansion in subsidised credit programs and the inflow of foreign resources. The increased government demand for credit had the effect of driving up domestic market interest rates, thus crowding other borrowers out of the limited unregulated domestic financial market.

The increasingly higher interest rates attracted foreign capital inflows, leaving the net effect of domestic debt issue to be an increase in official domestic liabilities paralleled by a rise in official foreign assets and non-official foreign indebtedness. Portfolio switches occurred between official and non-official institutions as well as between domestic and foreign asset/liability positions. The costs of monetary policy were, thus, borne first and foremost by those borrowers lacking access to government's subsidised credits and foreign loans.

1) Treasury bonds are indexed to the General Price Index and are held as very short term assets. The 2-3 day applications are typical. These bonds are near-money with almost full liquidity and they pay interest. The bond issues to finance government deficits push interest rates up but do not reduce liquidity in the economy because these bonds can be used to repay debts at financial institutions.

4.3 Effects of Monetary Policy

The Brazilian monetary system is a very peculiar one. A special institutional arrangement¹⁾ enables the government to bypass the conventional fiscal budget. Furthermore, the monetary system contains built-in bias toward the expansion of money supply. The federal government has the authority to print money to finance its deficit and also to extend subsidised loans. This authority can be exercised independently of Congressional approval. Given these conditions, inflation is hard to prevent.

Over the period 1970-85, the Brazilian monetary policy was characterised by short cycles of contractionary and expansionary episodes. The assets of the monetary authorities frequently expanded more rapidly than their monetary liabilities. They usually exceeded the projected monetary budget expansion and led to an increase in the monetary base. As a result, inflationary pressures aggravated. During the 1970s, the continued growth of the monetary base was rather attributed to foreign capital inflows and to special extra-budgetary activities of the government.

1) Over time three different public budgets evolved in Brazil. There is the common fiscal budget, proposed by the executive and passed by Congress. In addition, there are the consolidated budget of state enterprises and the monetary budget. This latter is often called as the program for the monetary base which reflects the activities of the Central Bank and the Banco do Brasil which is a commercial state bank. This bank has no reserve requirements and its monetary liabilities are part of the monetary base. As information on total revenues and expenditures of the public sector are not available, the overall balance can only be obtained from the government's borrowing from domestic and foreign sources.

The Brazilian government usually tried to curb the inflation by tightening the monetary policy and implementing sterilisation measures. These included higher compulsory reserves for the commercial banking system and a higher proportion of reserves to be held in foreign currency. These measures represented attempts to sterilise expansion of the monetary base arising from capital inflows and subsidised credit expansion. The effects were a contraction of demand deposits available for free lending and an upward pressure on free market interest rates.

5. Credit Terms for the Manufacturing Industries

5.1. Credit Availability

The Brazilian government intervention in the banking system has grown alongside with ownership concentration and was generally related to two priorities: determining credit allocation and managing public debt. As a result of government intervention only 40% of demand deposits were available for unregulated lending (World Bank 1984, p. XVI). This segmentation of the financial system has resulted in widely differing interest rates. Basically there are two categories: market determined and subsidised interest rates.

Credits to the manufacturing sectors were extended at subsidised or market terms as well. Due to the wide range of government involvement into the lending policy and to the interest rate preferences provided for certain development and economic policy targets, there were significant differences in credit availability and credit terms depending upon the sector, purpose, region and nature of the borrower (Table 14). By the end of 1970, the annual interest rate differentials between different segments of the credit market amounted to over 70%¹⁾.

1) Type of lending and its average interest rate in 1978 (Central Bank guesstimates): relending of funds supplied by the Central Bank 7.0; to exports, and associated rediscounts 8.0; to agriculture 12.7; industrial lending including BNDES direct and indirect loans 28.5; discounts of Bankers' Acceptances 36.0; funds borrowed abroad through Resolution 63 59.7; personal loans 60.0; working capital (raised through time deposits and bills of exchange) 61.0; BNH and SFH loans, directly and through financial institutions 65.0; not identified 65.0; total 43.7 (World Bank, 1984, p. 41).

Table 14 - Characteristics of Credits to the Brazilian Manufacturing Industries at Special Subsidised and Market Terms, 1970-1985

Lender	Sources of Money	Functions	Sectors	Interest Rate
<u>Credits at Subsidised Terms</u>				
1. BNDES				
directly indirectly through - subsidiaries - on-lending programs (the total outstanding credit of BNDES is substantially larger than those of all investment banks combined, and only a little smaller than those of all investment banks and all other development banks combined).	- federal budgetary resources - special funds - foreign aid - international banking sector funds - own reinvested profits	financing capital formation by long-term credit	priority to public sectors, private sector	wide variety of terms: monetary correction plus a specified interest rate but not highly subsidized Subsidy has been gradually reduced by revised monetary correction (in 1978) average terms: monetary correction (inflation): 34.7% (1978), 93.8% (1982); interest rate: 5.4% (1978), 6.8% (1982); lending term: 40.1% (1978), 100.6% (1982)
Subsidies:				
a) FINAME		supporting capital equipment production in Brazil by financing, through the banking system, the purchase by Brazilian firms of capital equipments produced by Brazilian companies		subsidized tending (in 1978) because of real rates varied between -4% and +2% p.a. depending on region, size of enterprise, lending program and purpose of the loan; lending for technological development; "0%" interest rate and without monetary correction
b) BNDESPAR		participation in the equity (both ordinary and preferred shares) of private Brazilian firms. Support to new market issues and co-lead management for large underwritings of corporate issues	private sectors	no information available of special term

Table 14 continued

Lender	Sources of Money	Functions	Sectors	Interest Rate
<u>Credits at Market Terms</u>				
1. Investment banks (activities are rather mixed with commercial banks)	CD foreign loans	originally banks were supposed to meet long-term (1 or more years) financial needs. In practice investment banking has never been done. Rather working capital is provided. Longer-term financing through debentures and leasing.	banking sectors institutions have to submit 70% of their total loans to Brazilian companies. The amount which can be lent to public sector companies and institutions is limited.	market interest rate
2. commercial banks	demand deposits	most types of normal commercial banking activity (some exceptions); lending essentially short term in nature, with a widening scope of services	all sectors	market interest rate
3. leasing companies (Law 6099 of 1974, treasury decrees and Central Bank resolutions) dominated by foreign financial institutions	limited access to local currency funds (cannot accept public deposits) mainly refinanced through dollar loans. Foreign debt situation influences amount available.	providing medium and long term capital for the purchase of fixed assets	often lending to Brazilian companies linked to foreign companies	(negotiable conditions, favourable (tax deduction, corporate income) tax, contracts valid for more than 2-3 years)
4. foreign banks (24 private foreign commercial banks operating in Brazil) No foreign participation in commercial banks leading conglomerates, only in the investment banks; 1/3 of all leasing companies, predominantly conglomerates are associated with foreign interests	foreign funds, commercial bank deposits (5% of total), investment bank deposits (50% of total deposits of banks with significant foreign interests)	investment banking and leasing	all sectors	market interest rate

Sources: Own compilation from information of The Economist Publications: Brazil. - Expanding Financial Centres Nº 3 (1988).
- EIU Country Quarterly Review and Country Profile, various issues. - World Bank, Brazil - Financial System Review (1984).

5.1.1. Subsidised Credit

The volumes¹⁾ of highly subsidised credit and estimates of the subsidy element inherent in low of the interest rates are given in Table A5²⁾. The subsidies amounted to about 130 billion Cr\$ in 1977 and roughly 190 billion CR\$ in 1978 and accounted for about 5.5% of GDP or about 45-55% of public revenues in each year.

The credit subsidies had two main sources. About 80 % of the subsidies came directly from the monetary authorities. The other

1) Over 1/3 of the outstanding balance of loans to the private sector was highly subsidised (World Bank, 1984, p. 27).

2) The large volume of slightly subsidised credit originating from negative real remuneration of compulsory savings and savings deposits is not included. Because of the multitude of special lines of subsidised credit and programs and the dependence of the subsidy component upon loan maturity, the precise computation of the subsidy over a given period is not feasible. Table 5 presents the annualised values of the subsidy flows implicit in selected financial balances at the end of 1977 and 1978. The subsidy is calculated as estimated average interest rate minus "base" interest rate. The base rate at which the interest subsidy is assumed to be zero is ideally an average rate which would prevail in the absence of credit subsidies and capital market segmentation. The free interest rates are volatile and frequently far above reasonable levels for a unified market because of narrow free capital markets and savings earmarked for lending at negative real interest rates. The marginal cost of foreign funds can provide a plausible estimate of the base rate (1.5% p.a. for 1977 and 3.0% p.a. for 1978). These rates correspond to the yield on 91 day LTNs are equivalent to real interest rates of -2.7% for 1977 and 3.1% for 1978. This method does not provide indication of the subsidy component of individual loans because the balance could be made up of short-term loans with small subsidy or highly subsidised long-term loans.

major source was the commercial banks but this subsidy was financed actually in an indirect way¹⁾ by the monetary authorities as well. Concerning subsidy recipients about 60% of the total subsidy was directed to agriculture and almost 40% to industry while the share of financial institution was below 5%.

The general influence of the interest rate subsidies is not easy to evaluate. Subsidy effects are overshadowed by the influence of protectionist policies which are supposed to be offset by the subsidies, and the impact of market instability brought about by controls of prices, imports and exports. Furthermore, the fungibility of money means that subsidised credit has been used to replace rather than supplement funds from other sources. Other adverse macroeconomic effects of subsidised lending include uncontrolled monetary expansion, destabilising tendencies, high market interest rates, and increasing public debt.

The most important subsidised credit schemes were designed for agriculture, export promotion and development of small - and medium sized companies (Table 15). Interest rate subsidies were to compensate these sectors for the adverse consequences of price

1) It happened through concessions on the composition of reserves held by the banks. The annualised loss of seigniorage to the monetary authorities from reserve holdings in ORTNs rather than in non-interest bearing balances was approximately Cr\$ 10.6 bn at the end of 1977 and Cr\$ 14.0 bn at the end of 1978. Seigniorage was lost on reserves held in ORTNs because these bear interest and monetary correction. In addition to this a portion of the subsidy was paid in the form of increased interest payments on federal debt brought about by the increase in free interest rates. Causality between subsidy and level of free interest rates can be found.

Table 15 - Special (Subsidized) Credit Schemes in Brazil, 1970-1985

1. Agriculture Credit Scheme

Agents	Terms	(Subsidized) Interest Rate
commercial banks (part of legal requirements to channel an important proportion of deposits into subsidized lending; between 10 and 30% of net deposits, depending on bank size ¹) 60-65% through Banco do Brazil; 30-35% through other banks (e.g. BNB, BNDES, BNCC, etc.); 5% through 13 "small programs" (SNCR)	vary according to the credit instruments involved and categorisation of the individual borrowers	3-10% (effective) (depending on the level of development of the regions ²)
2. <u>Export Finance Scheme (FINEX)</u> ³		
2.1. <u>FINEX</u>		
(Funds only for Brazilian companies) for financing specific export of manufactured goods.	long-terms; usually 1 year duration, plus special conditions (conditions depend on company's export performance in the previous year)	generally subsidized; e.g. local currency interest rates are subsidized (15% points) according to the increase in exports
2.2. <u>CACEX</u>		
(Funds only for Brazilian exporters of manufactured goods)	120-180 days to 1 year maturity (similar conditions)	subsidized by CACEX through banks
2.3. <u>Banco do Brazil</u>		
(Funds to foreign purchasers through CMN (National Monetary Council, Concex Res.68 of 1971))	credits extended in US\$; 1-3 years maturity. (The difference between the rate payable by importer and (LIBOR + spread) is financed by CACEX funds).	below international rates
Res. 509 of 1979	It indexes the scheme of Res. 68 to make funding available via private commercial banks	

¹Legal requirements of minimum proportion of deposits to lend in rural credits at subsidized interest rates. Small banks: 10%; medium banks: 20%; large banks: 30%. - ²The subsidisation of the interest rates depends on the level of development of each region, e.g. the interest rate is 10% in the more developed southern areas, 3-8% in the less developed areas of the north and north east. - ³Total FINEX financing through these schemes covers around 1/4 of Brazilian's exports of manufactures.

controls and exchange rate overvaluation. Several studies (using linear programming and production function analysis) analysed the productivity of capital inputs in agriculture. The results frequently suggested underemployment of invested capital¹⁾. Other research revealed that farms' annual expenses and investment on average represented about 2/3 of the total funds available from credit and own funds (Araujo-Meyer, 1978). The interest rates were distorted by fixing agricultural loan rates lower than those permitted for other loans. The real interest rate for loans to agriculture have been negative. Similarly, the export credit schemes were not free of adverse results either. A study by Browder (1987) described how trading companies could enhance their profits through the lucrative circulation of their subsidised funds in the commercial short-term money market²⁾. Since the public sector financial institutions supply a large proportion of both of these funds the general public bears actually the cost of the massive resource drain implied by the schemes.

The size of subsidised credit extended to manufacturing industries has been much less significant than that of the other schemes. The main source of long term credit at favourable terms

1) The ratio of agricultural credit subsidies to the value of agricultural production increased steadily. Most of the subsidy was directed to export crops, but they appeared to have been insufficient to compensate exchange rate overvaluation and other controls (World Bank 1984, p. 30).

2) Credit extended to the exporters was either longer term than they actually needed or the working capital circulation took shorter time than was supposed by the subsidised credit scheme. This idle capital was used on the short-term money market to gain extra profit.

to industry has been the BNDES system. The average, seemingly not highly subsidised terms conceal considerable disparities in specific cases. The scope of credit and the extent of the subsidy have been gradually reduced by revising the former very low prefixed monetary correction in 1978. Certain schemes (e.g. lending for technological development and public sector company loans) have, however, maintained their very favourable credit terms. The "negative spread" of BNDES credits was covered by Central Bank financing.

5.1.2. Credit at Market Rates

Usually short-term credits are extended at market interest rates because little long term lending takes place on the free capital market. Regular roll-over of short term credits is the very usual and expensive way of converting short term credits into longer term ones (Table 16).

The free market rates rose relatively steadily. They did so especially after the debt crisis. This increase in interest rates was caused by soaring inflation, growing reserve requirements for subsidised lending and constraint on the volume of resources available for unrestricted lending (Table 17).

The Central Bank bill rate (LBC) is generally accepted as the key indicator for shorter term papers. LBC interest rates have tended to keep pace with the inflation rate with a lag of

Table 16 - Loan Instruments in the Brazilian Capital Market Used by Manufacturing Industries, 1970-1985

Category	Terms	Size	Interest Rate
<u>1. Short term (local currency) loan instruments</u>			
discounting trade bills promissory notes	30-180 days (can be rolled over with new interest rates) variable rate long-term instrument	limited resources, available	above the average of the categories here listed
investment bank loans	in spite of the original functions mainly working capital finance is provided. Funded through CDs via time deposits. Max. 90 days, but rollovers are common.	more readily available	see above
direct inter-company loans	loans from non-financial institutions 10-90 days (interest is only payable until the loan is repaid)	limited volumes available	connected with investment bank loans
indirect inter-company loans	the borrower sells ORTN via money market dealers and at maturity he buys the ORTN back on the same way	less common than direct inter-company loans	ORTN
<u>2. Longer term (local currency) loan instruments</u>			
flexible mortgage loan	for 5 years, loan in exchange for a mortgage on real estate owned by the borrower, endorsable		interest rate is recontracted every 6 months usually above the market rate on CDs
bonds	- non-convertible - convertible into share	limited	interest rate is restructured every 6 months
leasing	3-5 years, largely depends on dollar financing (alternative to debenture funding) because sources of funds of leasing companies are foreign	important source of long-term funding till early 1980s	leasing terms are adjustable
debenture	by investment banks	significant	

Note: Non-financial institution's local currency borrowings are predominantly short-term: loans over 6 months are rare, though rollovers are common, and there are some long-term borrowings with flexible interest rates, linked usually to yields on CDs. Because of the shortage of long-term local currency loans brought about the inflation, companies have long time depended on direct foreign loans of banks belonging to foreign parent companies and on supplier credits. Longer term lending is more or less confined to on-lending of government funds.

Table 17 - Effective¹ Domestic Interest Rates in Brazil, 1970-1985²

A. Credit Market												
Short Term Credit			Resolution 63 ³			Discounting Trade Bills			Credit to Small and Medium Companies			
Monthly	Annual	Real Annual	Monthly	Annual	Real Annual	Monthly	Annual	Real Annual	Monthly	Annual	Real Annual	
1974	2.8	38.5	7.0	3.4	49.9	16.9	2.4	32.9	0.0	1.7	21.7	-5.1
1975	2.8	39.7	4.1	3.8	57.0	12.7	3.1	43.9	10.0	1.7	21.7	-12.6
1976	3.6	52.9	4.4	3.8	56.8	9.2	3.9	57.7	8.0	1.7	21.7	-15.2
1977	4.0	59.7	16.8	3.4	49.4	8.0	4.2	63.7	19.1	1.7	21.7	-12.1
1978	4.5	70.4	18.4	4.4	68.5	12.3	4.5	69.7	19.8	1.7	21.7	-18.6
1979	5.2	83.5	0.1	9.1	187.1	47.9	5.4	87.6	4.6	1.7	21.7	-37.6
1980	5.4	89.0	-13.4	6.2	105.9	-5.2	6.3	110.0	-1.8	2.2	29.9	38.9
1981	7.6	141.7	25.7	8.4	162.4	36.4	8.3	160.1	34.5	3.4	50.8	-22.6
1982	8.3	160.3	24.6	10.5	248.9	64.3	10.3	223.9	60.7	4.6	72.2	-26.2
1983	11.4	266.8	13.4	12.9	333.2	34.7	11.7	279.7	20.9	8.0	160.3	-18.5
1984	13.3	348.6	36.4	12.3	303.7	22.9	13.8	379.8	45.4	12.5	312.4	27.3
1985	12.5	314.2	32.1	12.4	310.4	22.2	15.9	496.4	86.5	9.4	205.2	15.0

B. Money Market									
Overdraft Loans					Negotiable certificates (CDB/LC) ⁵				
Net					Net				
Gross Monthly	Monthly	Annual	Real Annual		Gross Monthly	Monthly	Annual	Real Annual	
1974	1.34	1.3	17.3	-11.9	31.8	2.0	27.5	-1.4	
1975	1.66	1.7	22.0	-5.7	36.0	2.3	31.8	-1.8	
1976	2.91	2.9	41.3	-2.9	40.0	2.6	36.2	-7.0	
1977	2.96	3.0	42.3	3.3	48.0	3.1	43.8	5.2	
1978	3.23	3.2	46.7	4.7	50.3	3.2	45.9	1.3	
1979	3.00	3.0	43.0	-18.2	57.5	3.5	51.2	-17.6	
1980	3.23	3.2	47.3	-29.6	64.1	3.8	56.9	-27.7	
1981	5.46	5.5	89.7	-1.5	106.8	5.7	94.3	1.0	
1982	6.77	6.8	120.7	11.8	116.4	6.1	103.6	-2.5	
1983	9.59	9.4	196.6	-2.5	160.8	8.0	152.9	-21.9	
1984	11.15	10.1	219.6	-1.5	240.8	10.3	227.4	0.9	
1985	11.69	10.4	229.7	4.1	285.4	11.3	264.2	11.6	

¹ 'Effective' figures include nominal interest rate plus tariffs plus taxes plus commissions plus reciprocities. - ² 1970-1973 = not available. - ³ Resolution 63: Foreign borrowings by commercial, investment and development banks, which are then on-lent. At the time of introduction in the 1960s, the on-lending terms had to be identical to those agreed with the foreign lenders. The Brazilian banks could simply earn a commission. Greater flexibility is now allowed. Long term foreign borrowings are widely used to finance short term lending, often for periods as short as 90 days. Loans are usually either rolled over or immediately re-lent to another client. The bank has to bear the exchange risk. Any amounts not on-lent have to be deposited with the Central Bank. - ⁴ Commercial banks have to lend minimum proportions of deposits to smaller companies at subsidised interest rates. The proportions vary according to the banks' size categorisation

small banks (demand deposits up to 9 million US\$) 16% of deposits

medium banks (demand deposits 8-38 million US\$) 14% of deposits

large banks (demand deposits over 31 million US\$) 12% of deposits

⁵ The financial system trades actively in LTNs and ORTN/OTNs, but raises finance domestically mainly through savings deposits and time deposits in the form of non-transferable accounts (RDB's) or negotiable certificates of deposits (CDB = Certificate of Deposits of Bankers) or non-interest bearing demand deposits, and acceptance bills (LC = Letras de Câmbio).

around 2 weeks. Real LBC yields (adjusted by the IPCA/INPC index) have generally been very small. It is typically in a range up to 0.5% per month, but averaging only about 0.2%.

Bank CD rates fluctuate in line with inflation. In real terms they are generally 1-2% per month, averaging about 1.5%, equivalent to a real annual return of 20%. Assets whose value can be fully inflation adjusted via the ORTN have far lower nominal yields. The rates of these assets are linked rather more closely to international rates, but the expected depreciation in the real currency rate is taken into account as well. The severe indebtedness of the country means that the link with world money market rates is never a close one.

As most subsidised credit has been conceded at fixed nominal interest rates the gap between them and free interest rates has widened. While this is the case, most credit subsidies have responded usually soon and positively to any increase in inflation or rising free interest rates. In the case of some major subsidised credit programs these changes have taken place very slowly.

Foreign liabilities rapidly increased their share in the total debts of the financial system during the 1970s: it was reduced after the debt crisis but has still remained significant. By the early 1980s, foreign loans accounted for more than 1/3 of total bank liabilities which was roughly equal to the loans extended to the private sector.

The availability of foreign funds did actually cause lending rates to fall and to remain relatively low till the mid 1970s. Then, the trend turned back and especially after the debt crisis lending rates reached very high levels (Table 17). The changes in lending rates were influenced by a combination of several factors. The Eurodollar rates (LIBOR) and the US Prime rate went through several up and down phases (Table 18). The spread on loans to Brazil has been rising from around 0.5-0.75% in early 1980 to 2.5-3% by mid 1980. The indebtedness has deteriorated the general creditworthiness of the country. The rate of devaluation particularly against the dollar has been accelerated basically to match inflation. Exchange risk has increased the cost of foreign borrowing especially after the two maxi-devaluation in 1979 and 1983. As a result, the real average interest rate paid by the country on net debt increased from negative to very high positive levels in 1978 (Table 18).

5.2. Equity Supply

In the 1970s and 1980s, the expansion of capital markets was influenced in contradictory ways. It was enhanced by the usually high level of real interest rates, especially in the 1980s, and by demand for corporate issues stimulated not only by the performance of listed companies but also by government poli-

Table 18 - Effective Interest Rates on Net Foreign Debt of Brazil, US Prime Rate and LIBOR, 1970-1985

Years	Nominal Average Interest Rate on Net Debt ¹	Real Average Interest Rate on Net Debt ²	Prime Rate in USA	LIBOR ³
	(%)		(monthly average)	
1970	6.2	-5.9	7.29	8.52
1971	7.3	18.0	5.35	6.54
1972	7.3	-5.6	5.80	6.33
1973	9.5	-19.6	9.84	10.43
1974	10.5	-12.7	10.37	10.41
1975	12.5	12.5	7.25	7.38
1976	10.5	-3.9	6.23	5.37
1977	10.8	-9.6	7.75	7.52
1978	10.9	21.2	11.58	12.14
1979	13.2	2.8	15.23	14.39
1980	15.4	8.6	20.18	18.03
1981	19.1	26.7	15.77	14.12
1982	17.9	25.8	11.50	9.83
1983	12.1	18.4	11.00	10.39
1984	11.7	6.6	11.24	9.50
1985	10.2	8.7	9.50	8.11

¹ Computed as the ratio of interest payments over net debt of previous year.

- ² Computed as $(1 + r)/(1 + p^x)$, where r is the average interest rate and p^x is the rate of change in dollar export prices. - ³ LIBOR = London Interbank Offer Rate. The figures are in nominal term. They were negative in real term between 1973 and 1975.

Sources: C.L. Martone (1987), p. 23; Banco Central do Brasil, Boletim Mensal, Vol. 24, 1988/5, p. 487.

cies¹⁾. The acceleration of stock exchange activities was bolstered considerably by the government policy of promoting private sector investment and the attempt to reduce government deficits and indebtedness through privatisation²⁾.

The government deficit increasing since the early 1970s had an adverse effect on stock prices. Since the public debt pushes up the interest rates on bonds, i.e. the opportunity cost of holding capital, stock prices fall in response. Falling prices are the short run effect of crowding out³⁾.

The high inflation rate may affect stock markets, but shares provide, in principle, certain defences against inflation, since they represent real assets. Evidence shows that shares could in fact provide a hedge against inflation. The share prices, have on

1) The government intervened to reverse the downward trends in trading volumes and stock prices by making government funds available to improve market liquidity and by increasing the institutional funds channelled into the market and by granting tax incentives to stockholders in publicly-quoted companies. Certain sectors of the economy were required by the government to invest part of their funds in shares and debentures. This policy aimed at widening the equity base of companies via institutional investors and providing an increasing flow of funds through the capital market.

2) Shares of companies owned by BNDES and other federal entities were sold to the public.

3) In the long run public debt will crowd out productive capital and increase its marginal productivity. Therefore the long run effect on stock prices is ambiguous.

average, been giving returns higher than the changes in inflation rates or in the value of ORTN as the following accumulated changes of share prices (in % of annual averages between 1974 and 1984 demonstrate¹⁾:

IBOVESPA	IBV	IPBV	IGP-DI	ORTN
42,067.23	31,541.54	40,020.00	36,786.08	14,785.11

Source: Teixeira da Costa, 1985, p. 103.

5.3. Effects of Inflation and Taxation

Among the economic policy factors determining interest rates the subsidised credit policy can be mentioned as one with important effect, because initially the subsidies were financed by money creation. The long time prevailing view that subsidised credit eases inflationary pressure by lowering financial costs to borrowers, ignores the consequences of credit subsidies for monetary expansion and excessive demand, thereby inflation and high real free interest rates¹⁾ and shortening borrowing terms. The inflation and high free interest rates are associated but the causality has run predominantly from inflation to interest rate levels. The supplementing of domestically raised resources by official funds and foreign loans has actually undercut the effectiveness of free rates in reducing demand and pressure on prices.

1) IBOVESPA = Sao Paulo Stock Exchange Index; IBV = Rio de Janeiro Stock Exchange Index; IPBV = Rio de Janeiro Stock Exchange Price Index; IGP-DI = General Price Index.

Corporate profitability increased since the time of the late 1960s, and early 1970s when a series of changes and adjustment to inflation was made²⁾ in the tax system. Generally, the corporate taxes are at a level comparable with many other countries. The two main taxes are: corporate income tax and withholding taxes on dividends and interests. The standard rate of corporate income tax is 35%. Dividends and interest payments to individuals are taxed at 23-25%. There are some other additional charges on income e.g. municipal service tax and PIS (Social Integration Program)[Edwards 1988, p. 107 and Coopers & Lybrand 1987, p. 63).

1) The excessive consumption demand created by rural credit subsidies played an important role in the failure of the Cruzado Plan.

2) E.g. annual indexation of book value of property and plant, the effect of inflation on working capital was taken into consideration in determining taxable profit, income tax rate changed at source on dividends paid by publicly quoted companies, etc.

6. Capital Costs in Brazil's Manufacturing Industries

6.1. Rate of Return on Equity

In 1970-1985, the pre-tax rate of return on equity¹ for the entire sample fluctuated (Table 19). In one sector (iron & steel) the downward trend in aggregate profitability was prevailing. In two sectors (electrical engineering and textiles), there was an increase. The decrease or increase in the other sectors depended on the incidence of cost inflation and other cyclical factors.

Chart 2 shows the changes in profitability of the manufacturing sectors between the beginning and the end of the period. The sectors are represented by black points which are placed according to the vertical axis measuring the profitability in 1970 and horizontal axis measuring the profitability in 1985. Manufacturing sectors represented in the upper right corner had high rates of return in both years. The lower right corner implies an improving position of rates of return because the profitability in 1985 was higher than in 1970. In the case of sectors in the lower left corner the rates of return were always low and they actually deteriorated further.

To analyse these data i.e: the difference between the rate of return on capital invested and the effective interest rate, the so-called leverage has to be calculated. The rate of return on equity is a part of the rate of return on total capital. Their

1) The rate of return is calculated as the ratio of total net profit to the total net equity.

Table 19 - Rate of Return¹ on Equity of Stockholders (Before Tax) in the Brazilian Manufacturing Industries as %, 1970-1985

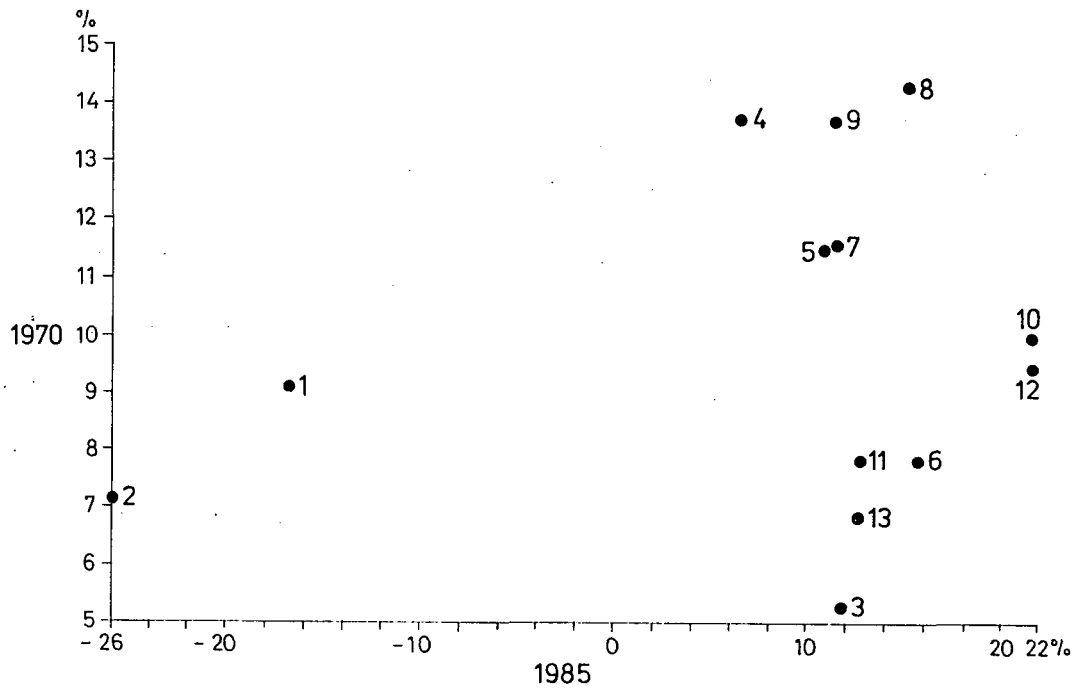
	1970	1975	1979	1985
<u>Iron & Steel</u>				
average ratio of the sample	9.1	13.2	-5.7	-16.9
average ratio of the state owned companies	7.1	5.2	-12.5	-26.1
- median	5.3	15.9	-10.7	11.8
average ratio of the private and foreign companies	13.8	27.2	5.6	6.5
- median	11.5	20.5	12.5	10.8
<u>Automobile</u>				
average ratio of the sample (private and foreign companies)	7.8	16.9	2.6	15.8
ratio of the median company	11.6	17.4	7.1	11.4
<u>Machinery</u>				
average ratio of the sample (private and foreign companies)	14.3	20.4	11.7	15.1
ratio of the median company	13.8	25.2	6.9	11.6
<u>Electrical Machinery/Electronics</u>				
average ratio of the sample (private and foreign companies)	10.0	18.4	17.9	21.9
ratio of the median company	7.8	17.2	14.9	12.7
<u>Textiles</u>				
average ratio of the sample (private and foreign companies)	9.4	13.3	13.6	21.9
ratio of the median company	6.8	13.9	9.4	12.4
<u>Footwear</u>				
average ratio of the sample (private and foreign companies)	n.a.	53.0 ²	26.9	13.5
ratio of the median company	n.a.	53.0	31.1	10.5

¹Ratio is calculated as the ratio of net profits (after monetary correction and before tax) to net equity (realised social capital plus reserves plus accumulated profit minus accumulated losses) of stockholders, data from the data of the largest Brazilian companies.- ²Calculated from values of only 2 companies.

Sources: Visão 1971, 1976, 1980, 1986 (August) and own calculations.

Chart 2

Cross-time illustration of rates of return of the Brazilian manufacturing sectors in 1970 and 1985



1. Average ratio of iron & steel sector
2. Average ratio of state-owned iron & steel companies
3. Ratio of the median state-owned iron & steel company
4. Average ratio of private iron & steel companies
5. Ratio of the median private iron & steel company
6. Average ratio of automobile sector
7. Ratio of median automobile company
8. Average ratio of machinery sector
9. Ratio of median machinery company
10. Average ratio of electrical/electronics sector
11. Ratio of median electrical/electronics sector
12. Average ratio of textile sector
13. Ratio of median textile company

Source: Table 22

difference depends on the leverage and the debt equity ratio¹⁾. Because of the lack of sufficient data a full scale of evaluation cannot be made. It is well known, if the leverage factor is small, additional debt financing cannot help to stem the tide of decreasing profitability of total capital. If interest rates rise as a result of accelerating inflation and the profitability of capital decreases, then, the changes in leverage reduce the rate of return on equity. The higher the debt equity ratio, the more severe is this negative leverage effect. Some dominating factors can be mentioned which affect the development of the rate of return besides competition, management decisions and taxation, namely financial risk and interest rates.

The financial risk is the risk associated with high debt financing. The wide spread of return on equity among sectors can be brought about by varying leverage, i.e. by different debt equity ratios. Interest payments on debt have to be made regardless of the development of profitability of total capital. However, credit subsidies reduce this effect. Through higher nominal interest rates or shorter amortisation periods creditors can successfully protect their credits from erosion by inflation. Therefore, the rates of return of sectors are influenced by shares of lending at subsidised and free market interest rates as well.

1) $NRE = NRT + (NRT - EIR) DER$, where
 NRE = nominal rate of return on equity
 NRT = nominal rate of return on total capital
 EIR = effective interest rate
 DER = debt equity ratio
 NRT-EIR = leverage

6.2. Effective Cost of Borrowing

The effective cost of borrowing can be obtained as the ratio of interest payment (IE) to average debt outstanding (B) on which the interest is paid. Thus, the nominal before tax cost of debt is:

$$(9) \quad K_n = IE_t / B_t$$

and the after-tax cost of debt is

$$(10) \quad k_b = (1-T)(IE_t / B_t).$$

The effective tax rate (T) can be obtained as ratio of tax payments and before tax earnings. Our calculated tax rate figures are realistic since the corporate income tax is 35% (Section 5.3).

The results of calculations of real effective after-tax cost of debt vary widely among manufacturing industries (Table 20). The widest gap is between the cost of debt for textiles and iron & steel industries. The almost fourfold difference was mainly the result of the significant amounts of subsidised credits extended to the iron & steel industry.

Table 20 - Effective Cost of Borrowing in p.c., 1980-1987

	nominal before tax ¹	real ef- fective tax rate ²	real ef- fective cost (k _b)
Iron & steel	8.3	37.2	5.2
Automobile	17.6 ³	36.9	11.1
Machinery	17.6 ³	38.5	10.8
Electrical ma- chinery, elec- tronics	30.6	38.1	18.9
Textiles	32.0	37.0	20.2
Footwear	26.8 ⁴	34.8	17.5

¹ Calculated as ratio of interest paid to debt from data of Conjuntura Economica. - ² Calculated from before tax earnings and paid tax figures published in Anuario Economico Fiscal, various issues. - ³ Machinery and automobile are in the same groups. - ⁴ Includes clothes and garments.

Sources: Conjuntura Economica, Oct. 1981, July 1988; Anuario Economico Fiscal, various issues; own calculations.

7. Conclusion

The analysis has shown that in the period 1970-1985 cost of capital in the Brazilian manufacturing industries were directly and indirectly affected by several factors. They can be summarised as it follows:

1. The share of total investment in the GDP has, since early 1980s, fallen gradually. It was basically the consequence of two factors, the external debt and the public sector deficit. The share of the manufacturing industries in the total gross fixed capital formation tended to decline. An increasing part of the value added produced in the manufacturing sectors was used for other purposes than investment or was invested in other sectors of the economy. Among the manufacturing sectors an uneven situation developed. While the share of iron and steel sector in total investment increased, first of all the textile and then the electronic machinery and machinery sectors were discernibly worse off among the surveyed sectors.

2. A special structure of financial system has developed in the course of the last three decades. It was characterised by some principal trends like: segmentation of the financial market, concentration of the financial institutions, monetary correction. The financial liabilities/assets - consisting of voluntary and compulsory domestic financial savings - as well as monetary and non-monetary assets were highly regulated. Thus, the flows of funds were very often predetermined. In particular, lending

manufacturing sectors was bearing relatively high interest rates compared to the other economic activities.

3. The main sources of loans to manufacturing industry were banks and official credit institutions. The BNDES (subsidised) credit policy was rather conservative. Access to credit was limited for the more efficient sectors which automatically drove the market interest rates up by the increasing credit demand on the free market. The Banco do Brasil extended rather working capital than long term loans to the manufacturing industries. The sector structure of credit allocation showed disproportionately larger shares from both types of credits in favour of the metal industry.

4. In spite of government promotion to expand equity trading comparatively few companies have gone public. The manufacturing industries traditionally rely to a great extent on internal funding or borrowing. Moreover, due to the credit subsidies, direct allocation of credits, indexed financial assets, etc. the equity market became a victim of the segmented financial system. The equity market failed to mobilise a greater portion of gross domestic financial savings.

5. The major part of capital formation was always provided from domestic sources although the ratio of gross national savings to GDP decreased significantly between 1970 and 1983. To increase aggregate domestic savings by incentives based purely on relatively high interest rates proved to be ineffective. The high

interest rates increased the public sector deficit, raised the cost of working capital, and discouraged private investment.

6. External savings became increasingly important but after the debt crisis the flows of foreign credit was reduced. The interest rates of the 1970s from relatively low, often negative levels increased very fast to high levels in the early 1980s, making foreign borrowing very expensive.

7. Available loanable funds have, especially since 1980, been reduced by the increasing public deficit and public borrowing. The total federal debt grew fivefold between 1970 and 1985. As a consequence of the crowding out effect interest rates were further increasing.

8. The Brazilian monetary system enabled the government to bypass the conventional fiscal budget. The built-in bias allowed the expansion of money supply by printing money to finance the budget deficit and by extending subsidised loans. The monetary policy was not effective enough to curb the fast increasing inflation rate. It brought about contraction in free lending and upward pressure on market interest rates.

9. The Brazilian government intervention in banking in favour of social priorities resulted in widely differing interest rates. Basically there were two categories: market determined and subsidised interest rates. The most important subsidised credit schemes were designed for agriculture, export promotion and development of small and medium sized companies. They had several

adverse effects, especially on the manufacturing industry which had to rely on free market borrowing. Among the adverse effects are the impact on the functioning of the capital market and the upward pressure on the prevailing free market interest rates.

10. The expansion of capital markets was influenced in contradictory ways. The stock prices were adversely affected by the high interest rates due to the government deficit financing. The inflation had relatively small effects on equity financing because the shares could provide a hedge against it.

11. The calculated rate of return on equity for the entire sample fluctuated. The downward trend in aggregate profitability is mirrored basically in one sector (iron & steel). In two sectors (electrical engineering and textiles), this ratio was, however, increasing. The falls and increases in the other sectors depended basically on the incidence of cost inflation and cyclical factors.

12. The result of the average cost of borrowing showed that the effective cost of debt is the lowest for the iron & steel industry. It was half as much as that of the automobile and machinery industries and roughly 1/3 to 1/4 of the same figures of the electrical machinery, textiles and footwear industries.

Table A1 - BNDES System Gross and Net Disbursements in Current Billions of Cruzeiros, 1970-1985

Year	BNDES gross		Transfers to subsidiaries		BNDES net		FINAME		BNDESPAR		Subsidiaries		Total	
	(1)		(2)		(3)=(1)-(2)		(4)		(5)		(6)=(4)+(5)		(7)=(3)+(6)	
	value	%	value	%	value	%	value	%	value	%	value	%	value	%
1970	n.a.		n.a.		n.a.		n.a.		n.a.		n.a.		n.a.	
1971	n.a.		n.a.		n.a.		n.a.		n.a.		n.a.		n.a.	
1972	n.a.		n.a.		n.a.		n.a.		n.a.		n.a.		n.a.	
1973	n.a.		n.a.		n.a.		n.a.		n.a.		n.a.		n.a.	
1974	10.6	85	0.9	7	9.7	78	1.9	15	0.9	7	2.8	22	12.5	100
1975	21.0	94	4.1	18	16.9	75	4.4	20	1.1	5	5.5	25	22.4	100
1976	30.5	93	10.3	31	20.2	62	10.4	32	2.1	6	12.5	38	32.7	100
1977	44.5	90	15.9	32	28.6	58	18.0	36	2.8	6	20.8	42	49.4	100
1978	62.1	84	22.3	30	39.8	54	28.2	38	6.1	8	34.3	46	74.1	100
1979	90.2	81	33.9	30	56.3	50	43.6	39	12.0	11	55.6	50	111.9	100
1980	138.3	79	49.9	29	88.4	50	66.9	38	20.2	12	87.1	50	175.5	100
1981	214.9	73	65.1	22	149.8	51	116.8	40	26.1	9	142.9	49	292.7	100
1982	604.1	77	106.0	14	498.1	64	218.2	28	63.9	8	282.1	36	780.2	100
1983	n.a.		n.a.		n.a.		n.a.		n.a.		n.a.		2237.0	100
1984	5203.9	81	470.0	7	4733.9	73	1232.1	19	479.1	7	1711.2	27	6445.1	100
1985	15893.6	78	1990.6	10	13903.0	68	5531.6	27	1009.3	5	6540.9	32	20443.9	100

Sources: BNDES Annual Report, various issues and own calculations.

Table A2 - BNDES System Gross and Net Disbursements
at Constant Prices of 1985, 1975-1985

Year	value	growth %
1975	21,026.8	+ 56
1976	21,732.0	+ 3
1977	23,014.2	+ 6
1978	24,887.4	+ 8
1979	24,414.1	- 2
1980	19,124.4	- 22
1981	15,196.9	- 21
1982	20,725.7	+ 36
1983	23,346.9	+ 13
1984	20,980.1	- 10
1985	20,443.9	- 3

Source: BNDES Annual Report, 1985, p.10.

Table A3 - Sources of Funding: 32 Major Open or Publicly-Quoted Private-Sector Brazilian Companies (in Percentage of Total Sources), 1948-1974

Years	Internal funding				Borrowed funds			
	Depreci- ation and provisions	Profit	Other	Total	Long- term	Short- term	Capital increases by rights issues	Total
1948-54	16	36	2	54	8	27	17	52
1955-59	14	23	6	43	10	31	16	57
1960-64	13	25	3	41	8	42	8	58
1965-69	21	24	5	50	7	36	7	50
1970-74	16	26	-	42	19	34	6	59

Note: An open company is one which has opened its share capital to public subscrip-
tion.

Source: IBNEC, in: R. Teixeira da Costa, p. 13

Table A4 - The Foreign Debt of Brazil in Current Millions of US\$, 1970-1985

Year	Long-term debt	Short-term debt	IMF credit	Gross external liabilities ¹	Gross foreign debt ² (short and long term)
1970	4939.8	n.a.	.	n.a.	n.a.
1971	n.a.	n.a.	.	n.a.	n.a.
1972	9978.6	n.a.	.	n.a.	n.a.
1973	n.a.	n.a.	.	n.a.	n.a.
1974	19186.7	n.a.	.	n.a.	n.a.
1975	23736.4	n.a.	.	n.a.	n.a.
1976	28771.2	n.a.	.	n.a.	n.a.
1977	35120.0	n.a.	.	n.a.	n.a.
1978	46347.1	7068.0	.	53415.1	52187.0
1979	51479.3	n.a.	.	n.a.	55803.0
1980	56773.5	13526.0	.	70299.5	64244.0
1981	64725.2	15321.0	.	80046.2	73963.0
1982	73575.2	17451.0	550.2	91576.4	85303.0
1983	81327.1	14204.0	2644.3	98175.4	93556.0
1984	89589.6	13186.0	4185.4	105274.4	102039.0
1985	91094.6	11017.0	4619.3	106730.9	105126.0

Sources: ¹World Bank, World Debt Tables 1982/83, p. 158, 1984/85, p. 172, 1985/86, p. 274, 1987/88, p. 38; ²Inter American Development Bank, Annual Report 1988, p. 580.

Table A5 - Estimated Credit Subsidies in Brazil, 1977 and 1978

Origin of Subsidy	Balance Outstanding (Cr\$ million)		Estimated Average Cost of Credit (% p.a.)	Implicit Annualized Sub- sidy (Cr\$ million)	
	31 Decem- ber 1977	31 Decem- ber 1978		1977 ("Base" - 40% p.a.)	1978 ("Base" - 44% p.a.)
<u>Monetary Authorities</u>					
<u>Credits to Financial Institutions</u>	<u>152838</u>	<u>152502</u>		<u>39721</u>	<u>46541</u>
Loans & Advances to Financial Institutes	26403	24656	24.0	4224	4931
Central Bank Funds & Programs	91813	85000	11.0	26626	28050
Rediscounts	20834	28099	4.3	7437	11436
(Manufactured Exports)	(17496)	(24621)	(3.7)		
(Coffee)	(2064)	(1869)	(7.7)		
Other credits	13788	14747	29.6	1434	2124
<u>Bank of Brazil Loans</u>	<u>301309</u>	<u>404944</u>		<u>66545</u>	<u>104569</u>
Agriculture: Production	136474	184156	12.0	38212	58930
Commercialization	24568	28183	12.0	6879	9019
Cooperatives	9108	14475	12.0	2550	4632
Industry: Production	75982	98199	27.5	9498	16203
Commercialization	36317	59691	27.5	4540	9849
Financing IAA	6481	5986	7.7	2093	2173
Financing Minimum Prices	12379	14254	17.6	2773	3763
<u>Central Bank Subsidies to BNDE</u> ¹	<u>6806</u>	<u>8576</u>	9.5	<u>2076</u>	<u>2959</u>
(excluding Monetary Reserve)					
<u>Total: Monetary Authorities</u>	<u>460951</u>	<u>566022</u>		<u>108342</u>	<u>154069</u>
<u>Federal Treasury</u>					
BNDE Loans with 20% prefixed ² monetary correction	22240	35850	26.0	3114	6453
<u>Commercial Banks</u>					
Agriculture Lending: 15% of Deposits	32250	45424	14.0	8385	13627
Small-Scale Industry: 12% of Deposits	25800	36340	1.3	9985	15517
<u>Total: Commercial Banks</u>	<u>58050</u>	<u>81764</u>		<u>18370</u>	<u>29144</u>
<u>Total Balances and Credit Subsidies</u>	<u>541243</u>	<u>683636</u>		<u>129826</u>	<u>189666</u>
Average cost of credits (% p.a.)	16.0	16.2	16.0		

¹ Estimate based on liabilities on December 31, 1977 as recorded in December 1978.

² Estimate based on assumption of 15% of BNDES's loan portfolio bearing 20% correction + 6% interest.

Table A6 - After-Tax Cost of Debt, 1980-1987

Year	Interest rate on short-term market borrowing ¹			After tax cost ²		Implicit subsidy
	R_N	inflation rate h as %	r	nominal $(1-T)R_N$ T=35% as%	real (R_T) $(1-T).r$ - $\frac{Th}{1+h}$	
1980	88	110.2	-13.4	57.2	-2.7	18.3
1981	141.7	95.2	25.7	92.1	-0.4	17.1
1982	160.3	99.7	24.6	104.2	-1.5	17.5
1983	266.8	211.0	13.4	173.4	-15.0	23.7
1984	348.6	223.8	36.4	226.6	-0.5	24.2
1985	314.2	224.4	32.1	204.2	-3.3	24.2
1986	62.0	62.4	6.4	40.3	-9.2	13.4
1987	560.4	366.0	30.8	364.3	-7.5	27.5

¹Data from Table 19. ²The standard corporate income tax rate is 35%.

Source: Own calculations.

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