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Changing international investment strategies: The "new forms" of foreign investment in Brazil

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CHANGING INTERNATIONAL INVESTMENT STRATEGIES: THE “NEW FORMS” OF FOREIGN INVESTMENT IN BRAZIL

Eduardo A. Guimarães
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Presidency of the Republic**
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TEXTOS PARA DISCUSSÃO INTERNA

Nº 45

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1. Introduction
2. Foreign Investment in Brazil: General Issues Government Policy
3. Technology Transfer: An Analysis of the 1960s and Some Evidence on the 1970s
4. The 1970s: New Forms of Foreign Investment
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Appendix A: The Evolution of Legislation on Foreign Investment in Brazil

Appendix B: Joint Ventures Between State Enterprises and Foreign Capital

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This is a progress report of the project being conducted at IPEA/INPES jointly with the OECD Development Center on the subject of New Forms of Foreign Investment in Developing Countries. Not to be quoted without permission of the authors.

1. INTRODUCTION

This is the second progress report on the project being conducted at IPEA/INPES jointly with the OECD Development Center since 1980. The first progress report by José Tavares de Araujo, Eduardo A. Guimarães and Pedro S. Malan, entitled "New Forms of Foreign Investment in Developing Countries: the Case of Brazil", was presented for discussion at the March 2-6, 1981 Progress Evaluation Meeting in Paris. The present report is a continuation of the previous one in the sense that it covers additional ground as accorded in the Progress Evaluation Meeting's Aide Memoires I and II.

This report is organized as follows. Section 2 examines foreign investment in Brazil in historical perspective, presenting background information and discussing the general government policies towards foreign capital (the evolution of Brazilian legislation on foreign investment is presented in Appendix A). Section 3 analyses the technology transfer process during the 1960s and present some evidence on the characteristics of this process during the 1970s. Section 4 examines the joint ventures established during the 1970s with the participation of state, as well as the contracting of overseas credits by foreign subsidiaries in Brazil. Finally, Section 5 presents some concluding remarks on the role played by the "new forms" of foreign investment in the strategy of the multinational corporations.

2. FOREIGN INVESTMENT IN BRAZIL: GENERAL ISSUES, GOVERNMENT POLICY AND BACKGROUND INFORMATION

Brazil has traditionally benefited — or suffered — according to the political views of the analyst — from the attraction that the size of her domestic market, her skewed distribution of income, Westernized urban consumption patterns and protection practices have exercised on foreign investment. Indeed, partly due to one of the most favorable legislations with respect to foreign capital,¹ as early as 1956 the country was third only to Canada and the United Kingdom in terms of US direct investment in manufacturing.²

This is certainly no longer true, after years of massive US direct investment in Europe beginning in the late 1950s. The book value of US capital stock in Europe more

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- 1 As was recognized by the Brazilian government itself, "the Brazilian legislation is, traditionally, one of the most favourable in the world with respect to foreign capital". Relatório da SUMOC (now the Central Bank), 1959, p. 37. The Brazilian government noted that the absolute freedom of capital movements through the free exchange market went beyond the Bretton Woods arrangements, which allowed for restrictions on capital movements. See Resenha do Governo Kubitschek (Rio de Janeiro: Imprensa Nacional, 1960), p. 102.
 - 2 See US Department of Commerce, US Investments in the Latin American Economy, 1957, p. 64. It should be noted that Venezuela appears as third on the list due to oil investments. Well over half of the US\$ 1.2 billion invested in Brazil was in the manufacturing sector (US\$ 701 million), the comparable figure for Venezuela being US\$ 114 million. According to this source, the stock of US capital in Brazil was US\$ 323 million in 1946, US\$ 644 million in 1950 and already US\$ 1 013 million in 1952, op. cit., p. 161.

than trebled from 1957 to 1964, investments in manufacturing increasing nearly fourfold.³ The creation of the European Community seems to have been the driving force behind these capital movements, since it not only discriminated against US exports in favor of European goods, but also considerably increased the size of the market for the individual producer located within the Community.⁴

These structural changes in the international division of labor have had a clear influence on the patterns and timing of Brazilian industrialization from the mid-1950s on. Recent studies have analyzed in detail the extent to which the impressive growth both of direct investment and of suppliers' credits during the Kubitschek years (1956-1961) — and after — could be seen as associated with the growing competition for market positions among European and North American firms.⁵ It was essentially the threat of being cut (through protective measures)

3 See US Department of Commerce, American Business Investments in Foreign Countries, 1960, pp. 92-95, and Survey of Current Business, September 1965, p. 24.

4 See B. Balassa, Trade Liberalization among Industrial Countries (New York: McGraw-Hill, 1967), p. 126.

5 It is illustrative that in the case of the automobile industry, European firms, not American firms, were the first to bet on the potential of the Brazilian market. Oligopolistic competition and the threat of being cut out of the Brazilian market through protective barriers brought American firms in shortly after. See E. A. Guimarães, "Industry, Market Structure and the Growth of the Firm in the Brazilian Economy," unpublished Ph.D. dissertation, University of London, 1980.

from supplying (through exports) a promising and large domestic market which encouraged most multinationals to establish more or less vertically integrated production facilities in Brazil. Indeed, since the work of Penrose, Hymer, Rowthorn, Vernon, Knickerbocker, Caves and others, foreign investment has been understood mainly through the theory of the growth of the big firm, especially the reaction of firms in oligopolistic market structures to the actual or perceived threat (to their respective market shares) presented by the activities of other firms in a generally non-price-competitive market structure.

In other words, when we are talking, in a relevant sense, about foreign investment proper today, we do not mean decisions to locate small repair shops or groceries in Karachi or Tegucigalpa, but usually about huge sums of indivisible expenditures in an attempt to gain or retain control of specific resources and/or promising markets. To quote Raymond Vernon: "Foreign investments in oligopolistic industries are often made in order to counter a threat to the stability of the oligopoly structure itself, that is, in order to protect and prolong an existing oligopoly rent."⁶

In our view, nearly all of the so-called "new forms"

6 R. Vernon, "A Program of Research on Foreign Direct Investment," in C. F. Bergsten (ed.), The Future of the International Economic Order: An Agenda for Research (Lexington, Mass., 1973), p. 100.

of foreign investment this research intends to scrutinize could and should be analyzed in terms of this basic insight. This seems to us to apply to technology transfers, licensing agreements, management contracts, joint ventures and turn-key operations. Their relative importance unquestionably varies from one country to another, but the basic motivation of the foreign firm is always related to some form of rent-seeking.⁷

Certainly most of us would agree with Vernon — even for these "new forms" of foreign investment — when he states that "the evidence is persuasive that the investment process is a relatively rational phenomenon— rational in the sense that it is consistent with an effort to maximize profit and minimize risk. The environment in which these activities take place, however, is one in which oligopoly is the normal state, scale factors are very large, and uncertainties of various sorts dominate the calculation."⁸

A good many of these uncertainties are related to government policies in the host countries, both in terms of the general attitude and legislation, and in terms of the specific negotiations surrounding each of the so-called new forms recently emerging as new patterns of inter-firm competition at

7 See A. Krueger, "The Political Economy of the Rent-Seeking Society," American Economic Review, Vol. 64, n^o 3 (June 1974), pp. 291-303.

8 See R. Vernon, op. cit., p. 96.

the international level. These will be discussed in other sections of this report. Here it suffices to point out the general policy orientation of successive Brazilian administrations with regard to foreign investment.⁹ That this orientation was, is and continues to be liberal will be made even clearer through the presentation of the relevant empirical information on the growth of foreign-owned capital stock.

As tables 2.1 and 2.2 indicate, foreign-owned capital stock in the Brazilian economy by year-end 1979 was around US\$ 30 billion. The disposition of the income flows generated by this significant stock has historically allowed for impressive asset transfers within the economy. According to a recent US Congressional Committee report on multinationals in Brazil, acquisition of existing assets has increasingly become a preferred form of foreign investment.

Whereas in 1956-1960 approximately 33% of new North American subsidiaries established in Brazil were formed through acquisitions, this percentage has risen as follows: 38% in 1960-1965, 52% in 1966-1970, and 61% in 1971-1972, at the height of the boom.¹⁰ One could well ask what is wrong

⁹ A brief survey of the relevant legislation is presented in Appendix A.

¹⁰ R. S. Newfarmer and W. F. Muller, "Multinational Corporations in Brazil and Mexico: Structural Sources of Economic and Non-Economic Power," Report to the Subcommittee on Multinational Corporations of the Committee on Foreign Relations, US Senate, Washington, D.C., August 1975.

if higher levels of efficiency, technological innovation, access to international markets, and better management are involved. Or to use Hirsch's expression, what is the problem if FDI is "shortening the transition period" between the phase of "inefficient and protected production for the domestic market" and the phase of opening-up towards exporting industrial products? To answer these questions, one would need much more LDC research (in the Hufbauer-Adler-Reddaway tradition) in the area of the relation between FDI and trade flows, but for Brazil, at least, the scanty evidence is not reassuring. For the single year in which detailed balance-of-payments-type accounts for individual firms were collected (1974), only 115 multinationals in Brazil had imported US\$ 3.0 billion — more than Brazil's huge oil bill (US\$ 2.7 billion). Their exports were a mere US\$ 840 million. The trade deficit of these one hundred or so firms (US\$ 2.16 billion) represented nearly 50% of the total trade deficit in 1974 (US\$ 4.68 billion).¹¹ Of course, one could attempt to give an economic interpretation of this in terms of an inappropriate (overvalued) exchange rate, anticipatory buying in the face of expected policy changes on the part of the new administration, and so forth.

11 See P. S. Malan and R. Bonelli, "The Brazilian Economy in the Seventies: Old and New Developments," World Development, Vol. 5, n^os 1/2, p. 44, fn. 56.

However, recent experience, associated with mounting balance-of-payments difficulties, does suggest that, while a liberal attitude will continue to prevail, there is a general area in which one could well expect progressive intervention cum stimula of the Brazilian government. This is in the promotion of exports by multinational corporations operating in Brazil. Ongoing research is confirming the relationship between foreign capital, external indebtedness and a high propensity to import, which are not matched by a comparable flow of industrial exports. Paradoxically enough, Brazil will probably move to more selectivity and control of foreign investment, precisely because it needs to expand foreign participation in the economy, but as a net foreign-exchange earner, since the balance-of-payments constraint - as usual in our history - is the overriding concern.

2.1 FOREIGN INVESTMENTS AND PROFIT REMITTANCES

The importance of foreign investments is depicted in Table 2.1, which gives the stock of registered capital and the flow of direct investments and reinvestments in Brazil from 1966-1980.¹² The inflow grew from US\$ 159 million in 1966 to

12 Reinvestment amounts to two simultaneous accounting operations: 1) a certain amount of profits produced by the subsidiary is converted into the original currency of the investment and "remitted" to the overseas investor; 2) at the same time, this amount of resources "enters" the country, and is added to the stock of capital registered under the investor's name. Since the two operations are simultaneous, their net effect on the balance of payments is nill; reinvestments, therefore, are not accounted in drawing up the balance of payments. Their only effect is therefore to increase the amount of registered foreign capital. It should be noted that the date on which the reinvestment is registered depends exclusively on when the foreign company decides to hand in this information.

US\$ 1,923 million in 1980, at an average growth rate of 19.5% per year (11.8% in real terms, when deflated by the US consumer price index). In turn, the stock of foreign equity capital registered at the Central Bank grew from US\$ 1,632 million in 1966 to US\$ 17,480 million, at an average yearly growth rate of 18.5% (10.8% in real terms).

We should mention some of the difficulties involved in these estimates of foreign capital stocks. The Central Bank registers direct investments in the currency in which they enter the country. Thus the determination of the total stock of foreign capital at any given moment requires that the original stocks from a variety of countries-and registered, therefore, in various currencies-be converted into a single monetary unit. The Bank's current conversion practice consists of using the dollar exchange rates of each currency registered on December 31 of the year for which the stock is being measured. Thus, if $x_{i,t}$ is the capital stock registered in currency i during year t , and $p_{i,t}$ the exchange rate of currency i relative to the dollar on December 31 of the same year, the total stock of foreign capital, in dollars, can be expressed as:

$$E_t = \sum_{i=1}^n x_{i,t} \cdot p_{i,t}$$

The problem with this estimation method is that the difference between the stocks of foreign equity capital in two periods is not equal to the flow of investments and reinvestments over the same time span. The stock of foreign capital registered in currency i during period t can be expressed as $x_{i,t} = x_{i,t-1} + \Delta x_{i,t}$ where " $\Delta x_{i,t}$ " corresponds to the flow of investments and reinvestments during period t . Therefore the total stock E_t

can be rewritten as $E_t = \sum_{i=1}^n x_{i,t-1} \cdot p_{i,t} + \sum_{i=1}^n \Delta x_{i,t} \cdot p_{i,t}$

The first member of the second term of this expression

$(\sum_{i=1}^n x_{i,t-1} \cdot p_{i,t})$ is the estimate of capital stock in the period t-1, expressed in the value of a single currency (dollars) according to the exchange rate for the period t. If we write the variation of the exchange rate as $\Delta p_{i,t}$ (i.e., if $p_{i,t} = p_{i,t-1} + \Delta p_{i,t}$), capital stock for period t can be expressed as

$$E_t = \sum_{i=1}^n x_{i,t-1} \cdot p_{i,t-1} + \sum_{i=1}^n x_{i,t-1} \cdot \Delta p_{i,t} + \sum_{i=1}^n \Delta x_{i,t} \cdot p_{i,t}$$

or

$$E_t - E_{t-1} = \sum_{i=1}^n x_{i,t-1} \cdot \Delta p_{i,t} + \sum_{i=1}^n \Delta x_{i,t} \cdot p_{i,t}$$

The Central Bank's measurement of changes in the foreign capital stock can therefore be broken down into two parts. The first is the dollar variation of stocks during period t-1, calculated from the variations in exchange rates relative to the dollar between t-1 and t. The second refers to the flow of direct investments and reinvestments during period t, that is to say, the increase in the stock of various currencies. It should be noted, however, that although related to that flow, this second part referred to in the expression above does not exactly equal the flows calculated by the Central Bank, since the Bank apparently convert the various currencies into their dollar equivalents at the moment the investment or reinvestment is registered (and not on the basis of the December 31 exchange rates, as implicit in $p_{i,t}$).

Besides these methodological difficulties, there is evidence that the Central Bank underestimates foreign capital stocks. It is revealing here to compare the evolution of U.S. equity capital in Brazil as measured by Brazil's Central Bank and by the US Department of Commerce (Table 2.2). It can be seen that, with $p_{it} = 1$ for any t , the above-mentioned problems of conversion to a single currency do not exist in this case; in addition, the variation in stocks observed between periods $t-1$ and t do correspond to the period's actual capital flow in period t ($\Delta E_t = I_t$). Comparison of the two series reveals that Central Bank figures are consistently below those of the Department of Commerce, at the significantly stable rate of approximately 53%. It is true that the two series are not strictly comparable, since Department of Commerce data include not only equity capital (as do those of the Central Bank) but also loans between the home company and its subsidiary. However if we assume that the percentage of equity capital in the total of US capital stocks in Latin American manufacturing (based on information from the same source) is applicable to the case of Brazil, the resulting estimate of US equity capital stocks in Brazil is still significantly higher than the Central Bank statistics presented in Table 2.2.

Table 2.3 gives the evolution of the country-of-origin break-down of foreign equity capital registered in Brazil during the 1970s. Here we see a trend toward the reduction of the relative weight of some traditional investors-notably the US, Canada and the UK-and a significant growth of the shares of Japan and Switzerland. It should be observed, however, that such fluctuations are the result not only of actual foreign

investment flows from the various countries, but may also reflect changes in the parity of various currencies in relation to the dollar.

The evolution of foreign investment and reinvestment flows is nevertheless presented in Table 2.4. Here the influx from seven major investors is registered in the investments' original currency value. The figures correspond to the share of capital stock in December 1980 which entered the country during the period under consideration. The results corroborate those of Table 2.3, and particularly highlight the relative importance of Japanese investments during the first half of the 1970s, and Swiss investments during the last five years.

The breakdown of foreign equity capital into sectors of economic activity over recent years reveals a decline of the relative weight of public utility and manufacturing, and an increase in the share of the service sector (Table 2.5). This tendency, however, basically reflects the expansion of the share of holding companies in foreign equity capital (from 2.6% in 1971 to 10.3% in 1980), and conceals the ultimate destination of a major part of these resources. Within the manufacturing sector, there has been a remarkable increase in investments in Machinery, and a drop in the shares of Chemicals and Tobacco; the share of the remaining manufacturing sectors remained significantly stable over the decade.

Table 2.6 presents the distribution by sectors of the equity capital stock of seven major investors in 1981. The figures reveal the predominance of manufacturing; and even in the case of where this share is smaller (about 60% for France

and the UK), the weight of foreign equity capital in holding companies (28.4% and 13.0%, respectively) may actually conceal final investments in manufacturing. On the other hand, foreign capital in the service sector (excluding holding companies) only show a degree of relative importance in the cases of France, Japan, the US and the UK. Within the manufacturing sector, Machinery, Vehicles and Parts are important in relation to the US, German and Swiss capital. Chemicals, in relation to the US, Switzerland, the UK and France capital; Metallurgy and Electrical and Communications Equipment, in relation to the Japan and Canada capital; and Food Products, in relation to the Swiss capital.

As already mentioned, direct investments in the form of equity capital are not the only means by which foreign resources enter the country through the Brazilian subsidiaries of foreign companies. The inflow of resources also includes loans contracted abroad by these subsidiaries.

The foreign indebtedness of Brazilian firms - public and private, national and foreign - grew significantly over the past decade, both through credits taken directly by these firms (loans controlled by Resolution n^o 289 and Law 4131) and under the auspices of the national banking system (operations controlled by Resolution n^o 63). The evolution of this indebtedness is presented in Table 2.7. We do not, however, have data on the evolution of loans taken by foreign companies. Yet a study carried out by the FIRCE in 1974 indicates that, for a sample of 115 large foreign firms, the net inflow of loans (new loans minus amortizations) was 4.2 times greater than the net inflow of investments and reinvestment in 1974

(US\$ 551 million, as opposed to US\$ 131 million).¹³ Another source also indicates that, in 1979, 32% of loans taken under Law 4131 (US\$ 8,602 million) had been taken by foreign companies.¹⁴ This figure equals half the total stock of direct investment in 1979.¹⁵ In addition, this means that at least 17% of Brazil's total foreign debt was the responsibility of foreign subsidiaries operating in Brazil.

It is worth noting here that the foreign loans contracted by these subsidiaries are different in nature from those taken by local firms, since the foreign credit operations of the subsidiaries, except for their legal format, are difficult to distinguish from risk capital investments. The semblance with equity capital investments is evident in the case of loans between the parent company and its subsidiary. Both consist of a simple transfer of funds within a single multinational corporation, a mere reallocation of resources among its constituent parts. Yet even a subsidiary's indebtedness to the international financial system can actually be compared to a homeoffice equity capital investment in the subsidiary, since

13 These 115 companies accounted for 4.7% of all direct investments in that year (reinvestment data is not available), and for 22.5% of the growth in foreign indebtedness under the control of Law nº 4131, between 1973 and 1974.

14 See Paulo Nogueira Batista Jr., "Câmbio e Capital Financeiro Externo: Discussão de Alguns Aspectos da Evolução Recente da Política Cambial Brasileira," unpublished article, IBE/FGV, June, 1980.

15 This percentage cannot be compared to the figures relative to US investments in Latin America used in Table 2.2 estimates (approximately 85% in 1979), since the latter refers only to loans between the parent company and the subsidiary.

the loan can be interpreted as substituting the alternative of home-office indebtedness to the international financial system and a subsequent transfer of funds to the overseas subsidiary.

The counterpart of this inflow of foreign capital is the remittance of profits, repayment of loans and interest and payment for transfer of technology contracts by the foreign companies. Table 2.8 shows the evolution of remittances paid under these headings for the Brazilian economy as a whole. Information is not available on the evolution of payments by foreign companies for loan repayments, interest and transfer of technology. The sampling of 115 major foreign subsidiaries revealed the following make-up of these payments in 1974: profits and dividends - 40%; interest and amortization - 47%; payments for transfer of technology - 9%; others - 4%. It should be noted, however, that, except for profits and dividends, these figures do not necessarily refer to payments made to the parent company abroad. As for a more recent period, if we assume that the share of operations controlled by Law n^o 4131 in the total of the country's interest and amortization payments is equal to the percentage of Brazil's foreign debt corresponding to those operations, and that 32% of interest and amortization payments made under Law n^o 4131 were made by foreign subsidiaries, we can estimate that these subsidiaries' remittances made under the form of interest and amortization payments were 2.6 times greater than profit and dividend remittances for that year. Remittances made under transfer of technology contracts by manufacturing industries from 1965-70 will be examined below.

2.2 Participation and Performance of Foreign Subsidiaries in the Brazilian Economy

A recent study by Calabi, Reiss and Levy evaluates the relative importance of foreign companies in the Brazilian economy.¹⁶ The study is based on information presented in the income tax declarations of companies operating in Brazil. Two samplings were extracted from a total of 540,000 firms:

Sample A - covering 10,432 major companies in 1975, which account for 46.6% of total operational receipts from the 540,000 firms. Within the manufacturing sector, operational receipts from the sample firms accounted for 82.1% of the total.

Sample B - covering 5,285 companies selected from those included in Sample A. These companies are responsible for 32.8% of total operational receipts, and 63.4% of those produced by the manufacturing sector, within the universe of tax-paying firms.

Table 2.9 gives the foreign firms' share of total sales, total assets and book value of the firms covered by Samples A and B in 1975. These shares vary depending on the variable, being higher in the case of sales (24.7% for Sample A) than in that of total assets (18.0%) and book value (17.4%). These differences basically reflect the high capital intensity of the state-owned companies. For private firms alone, the relative weight of local and foreign firms in the value of sales, total assets and book value are similar.

16 A.S. Calabi, G.D. Reiss and P.M. Levy, Geração de Poupanças e Estrutura de Capital das Empresas no Brasil, Sao Paulo: Instituto de Pesquisas Econômicas, 1981.

For a more recent period, the only information on the relative weight of multinational corporations refers to the 200 largest non-financial enterprises. Table 2.10 shows the ownership breakdown for these firms' book value and sales from 1972 to 1980. The preponderance of state-owned firms is significantly greater here than in the previous sampling. This reflects the major presence of the public utilities, all state-owned, among the 200 largest non-financial firms. This particularity is also reflected in the state firms's share of total book value. Table 2.10 also shows, along with a significant stability of the percentages relative to local private firms, an expansion of the state-owned firms' shares of book value and sales, at the expense of foreign subsidiaries, especially since 1975. Nevertheless, the latter's share of sales remains significantly higher than that of local private companies (31% and 22%, respectively, in 1980).

Tables 2.11 and 2.12 give the three sectors' respective shares of book value and value added, on the basis of Sample B, for 1969 and 1975. These firms, we will recall, accounted for 32.8% of all companies' operational receipts, and 63.4% of the manufacturing sector's total in 1975. The figures in these tables show a concentration of foreign subsidiaries in the manufacturing sector, where they accounted for 21.4% of book value and 28.9% of value added by the entire sample in 1975. These shares show a small decline in relation to 1969, when they were 24.1% and 33.0% respectively. Within the manufacturing sector, foreign participation is most significant in the Metal-Machinery and Chemical sectors. The share controlled by foreign subsidiaries surpasses 50% of book value and of

value added in the following industries: Electrical and Communications Equipment, Transport Equipment, Rubber, Chemicals, Pharmaceuticals, Perfumery and Tobacco. The foreign-controlled share lies between 50% and 33% in the case of the Non-metallic Minerals sector (value added), Machinery and Sundries; and in the 25-33% range for Non-metallic Minerals (book value) and Metallurgy (book value). Foreign participation remains below 25% in all other branches of manufacturing and of the other sectors of activity.

Finally, we should examine the relative performance of the foreign subsidiaries. Tables 2.13 and 2.14 suggest that the average profitability (the liquid profit to book value ratio) of local and of foreign firms covered by Sample A are nearly equal to each other (18.3% and 17%, respectively) and higher than that of the state-owned companies (5.8%). The proximity of the two rates is even more notable in manufacturing (16.6% and 16.5%, respectively, and 6.1% for state firms). These tables, however, also show that the overall figures conceal quite different results obtained when we consider the firms' size and specific area of activity. The results in relation to size, in particular, are quite regular: local firms are more profitable than foreign subsidiaries in the smaller size range (20.7% and 10.4% in the category of the smallest firms); but the situation is inverted in the two classes covering the largest firms (8.1% and 18.2% for the highest class).

The only available information for more recent years is that regarding the 200 largest non-financial firms, and it confirms the tendencies observed above for the largest firms. Foreign subsidiaries among the 200 largest are more profitable. The net profit to book value ratios for local private, foreign and state-owned companies are, respectively: 16.7%, 18.5% and 8.9% in 1977; 18.2%, 21.2% and 8.1% in 1978; 11.9%, 14.6% and 4.9% in 1979; and 15.0%, 14.1% and 4.1% in 1980.

TABLE 2.1

DIRECT INVESTMENT, REINVESTMENT AND FOREIGN EQUITY CAPITAL IN BRAZIL - 1966/1980

YEAR	INVESTMENT		REINVESTMENT		INVEST + REINVEST		FOREIGN EQUITY CAPITAL(a)	
	A	B	A	B	A	B	A	B
1966	74	188	85	216	159	404	1 632	4 142
1967	76	187	39	96	115	283	1 760	4 336
1968	63	149	48	113	111	263	1 857	4 398
1969	189	425	133	299	322	724	2 179	4 898
1970	146	310	22	47	168	357	2 347	4 984
1971	169	343	395	802	564	1 145	2 911	5 915
1972	337	664	201	396	538	1 060	3 404	6 711
1973	977	1 813	512	950	1 489	2 763	4 579	8 497
1974	945	1 579	...	...	...	...	6 027	10 073
1975	1 106	1 693	...	...	...	...	7 304	11 182
1976	1 145	1 658	...	...	...	...	9 005	13 030
1977	935	1 270	...	...	...	...	11 228	15 253
1978	1 196	1 511	975	1 232	2 171	2 743	13 740	17 357
1979	1 685	1 912	721	818	2 406	2 730	15 963	18 117
1980	1 512	1 512	411	411	1 923	1 923	17 480	17 480

SOURCE: Boletim do Banco Central, several issues.

A - current dollars.

B - dollars of 1980; deflated by the U.S. consumer price index.

(a) Data refer to 31 December. Estimated according to the expression $\sum_{i=1}^n x_{it} P_{it}$ where x_{it} is the stock of foreign capital in currency i in December of the year t and P_{it} the exchange rate between the dollar and the currency i on the same day.

TABLE 2.2
U.S. EQUITY CAPITAL IN BRAZIL - 1969/1980

YEAR	million dollars				
	(I) BRAZILIAN CENTRAL BANK	(II) SURVEY OF CURRENT BUSINESS(a)	(III) EQUITY CAPITAL ACCORDING TO SURVEY OF CURRENT BUSINESS(b)	I/II PERCENTAGE	I/III
1969	816	1 636		49,4	
1970	986	1 847		53,4	
1971	1 096	2 066		53,0	
1972	1 272	2 505		50,8	
1973	1 717	3 199		53,7	
1974	2 022	3 763	2 935	53,7	68,9
1975	2 395	4 579	3 663	52,3	65,4
1976	2 901	5 416	4 441	53,6	65,3
1977	3 418	5 930	4 922	57,6	69,4
1978	3 822	7 175	6 027	53,3	63,4
1979	4 374	7 514	6 312	58,2	69,3

SOURCE: Boletim do Banco Central, several issues; Survey of Current Business, several issues.

(a) Includes equity capital and loans between the parent company and the subsidiary.

(b) Estimate.

TABLE 2.3
FOREIGN EQUITY CAPITAL IN BRAZIL, BY COUNTRY OF ORIGIN^(a)

	1971		1975		1980	
	Million Dollars	Percentage	Million Dollars	Percentage	Million Dollars	Percentage
United States	1 096	37.7	2 295	31.4	5 004	28.6
Germany	331	11.4	871	11.9	2 448	14.0
Switzerland	192	6.6	736	10.1	1 768	10.1
Japan	125	4.3	841	11.5	1 725	9.9
United Kingdom	273	9.4	430	5.9	1 111	6.4
France	130	4.5	300	4.1	702	4.0
Canada	294	10.1	411	5.6	641	3.7
Others	466	16.0	1 420	19.5	4 073	23.3
TOTAL	2 911	100.0	7 304	100.0	17 480	100.0

SOURCE: Boletim do Banco Central, several issues.

(a) Currencies of the different countries were converted into dollars according to the exchange rate of 31 December of the corresponding year.

TABLE 2.4

DIRECT INVESTMENTS AND REINVESTMENTS IN BRAZIL, BY COUNTRY OF ORIGIN^(a)

	BEFORE 1950	1951/60	1961/70	1971/75	1976/80	TOTAL
United States	2.0	8.2	13.8	32.0	44.0	100.0
Germany	0.0	5.5	16.8	31.6	46.1	100.0
Switzerland	3.7	7.3	10.5	26.6	51.9	100.0
Japan	0.1	1.8	6.4	48.5	43.2	100.0
United Kingdom	1.4	8.5	15.1	35.5	39.5	100.0
France	1.0	6.2	17.1	29.1	46.6	100.0
Canada	15.1	9.8	21.2	32.3	21.3	100.0

SOURCE: Boletim do Banco Central, Separata, April 1981.

(a) Values were estimated according to the currency of the country of origin; the numbers correspond to the ratio between the investment and reinvestment during the period and the equity capital registered in December 1980.

TABLE 2.5
FOREIGN EQUITY CAPITAL IN BRAZIL, BY RECEIVING SECTOR^(a)

	1971		1975		1980	
	Million Dollars	Percent age	Million Dollars	Percent age	Million Dollars	Percent age
<u>Mining</u>	26.1	0.9	154.4	2.1	487.4	2.8
<u>Manufacturing Sector</u>	2 073.1	81.8	5 572.2	76.3	13 005.4	74.4
Nonmetallic Minerals	61.6	2.1	189.8	2.6	321.3	1.8
Metallurgy	213.6	7.3	565.5	7.7	1 388.8	7.9
Machinery	123.7	4.2	510.9	7.0	1 704.6	9.8
Electrical and Com. Equip.	261.6	9.0	620.0	8.5	1 394.3	8.0
Transport Equipment	405.5	13.9	988.7	13.5	2 344.4	13.4
(Motor Vehicles)	(309.8)	(10.7)	(740.5)	(10.1)	(1 743.9)	(10.0)
(Motor Vehicle Parts)	(76.6)	(2.6)	(203.2)	(2.8)	(492.6)	(2.8)
Paper and Pulp	67.9	2.3	150.9	2.1	374.0	2.1
Rubber	103.4	3.6	170.6	2.3	384.9	2.2
Chemicals	624.5	21.5	1 076.2	14.7	2 435.8	13.9
(Basic Chemicals)	(352.3)	(12.1)	(728.9)	(10.0)	(1 813.3)	(10.4)
	(197.3)	(6.8)	(236.2)	(3.2)	(393.2)	(2.2)
Pharmaceuticals	113.4	3.9	292.2	4.0	722.4	4.1
Textiles	69.7	2.4	229.8	3.1	369.4	2.1
Food Processing	135.4	4.7	317.8	4.4	765.3	4.4
Tobacco	112.1	3.9	196.6	2.7	137.0	0.8
Other	87.3	3.0	263.3	3.6	663.2	3.7
<u>Public Utilities</u>	157.4	5.4	218.8	3.0	44.2	0.3
<u>Agriculture</u>	20.7	0.7	26.4	0.4	164.4	0.9
<u>Services</u>	276.3	9.5	1 190.5	16.3	3 425.5	19.6
Finance and Insurance	89.8	3.1	288.3	3.9	658.8	3.8
Holding Companies	77.0	2.6	463.6	6.3	1 797.6	10.3
Other	109.5	3.8	438.6	6.0	969.1	5.5
<u>Other</u>	47.3	1.4	141.0	1.9	353.2	2.0
TOTAL	2 911.5	100.0	7 303.6	100.0	17 480.0	100.0

SOURCE: Boletim do Banco Central, several issues.

(a) Currencies of the different countries of origin were converted into dollars according to the exchange rate of 31st December of the corresponding year.

TABLE 2.6
PERCENTAGE DISTRIBUTION OF FOREIGN EQUITY CAPITAL BY COUNTRY OF ORIGIN AND RECEIVING SECTOR - 1981^a

	US	GERMANY	SWITZELAND	JAPAN	UNITED KINGDON	FRANCE	CANADA	TOTAL
<u>Mining</u>	5.4	1.8	0.2	1.6	0.5	2.6	1.2	2.8
<u>Manufacturing</u>	74.4	89.5	83.4	72.1	60.1	62.8	80.6	74.4
Metallurgy	4.3	11.8	1.4	15.9	1.9	6.8	13.6	8.1
Machinery	11.9	17.4	4.3	8.1	4.2	6.4	24.0	9.8
Eletrical and Com. Equip.	8.8	6.7	9.2	11.7	1.9	2.9	11.8	8.0
Motor Vehicle and Parts	11.7	32.0	18.9	4.2	0.6	1.4	0.0	10.8
Chemicals	13.2	7.3	15.3	3.2	35.1	19.9	12.2	12.7
Pharmaceuticals	5.9	4.2	4.8	0.1	1.6	3.2	17.5	4.1
Textiles	0.9	0.2	2.5	8.8	6.1	1.0	-	2.1
Food Processing	4.1	0.9	13.1	2.5	0.4	2.9	0.0	3.9
<u>Services</u>	17.8	7.3	14.0	19.6	37.2	31.6	18.2	19.6
Holding Companies	8.6	2.5	9.0	3.6	28.4	13.0	17.0	10.3
Other	2.4	1.3	2.5	6.7	2.1	4.2	0.0	3.1
TOTAL	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

SOURCE: Boletim do Banco Central, Separata, April 1981

^aCurrencies of the different countries were converted into dollars according to the exchange rate 31 of December 1981.

TABLE 2.7
INVESTMENT, REINVESTMENT, FOREIGN EQUITY CAPITAL
AND FOREIGN DEBT - 1970/1980^a

million dollars

YEAR	INVEST- MENT	INVEST. + REINVEST.	FOREIGN EQUITY CAPITAL	CURRENCY LOANS- STOCK (Law 4 131) ^b	CHANGE IN CURRENCY LOANS- STOCK (Law 4 131)	CURRENCY LOANS- STOCK (Res.63) ^b	FOREIGN DEBT
1970	146	168	2 347	1 631	459	653	5 295
1971	169	564	2 911	2 210	579	983	6 622
1972	337	538	3 404	3 510	1 300	2 018	9 521
1973	977	1 489	4 579	5 450	1 940	2 398	12 571
1974	945	...	6 027	7 892	2 442	3 319	17 166
1975	1 106	...	7 304	10 827	2 935	3 734	21 171
1976	1 145	...	9 005	13 479	2 652	4 715	25 985
1977	935	...	11 228	16 289	2 810	5 240	32 037
1978	1 196	2 171	13 470	22 227	5 938	7 272	43 511
1979	1 685	2 406	15 963	26 902	4 675	7 723	49 904
1980	1 512	1 923	17 480	27 896	994	9 924	53 847

SOURCE: Boletim do Banco Central, several issues.

^aData on stock refer to December of the corresponding year.

^bCurrency loans by non-financial firms.

^cCurrency loans by banks.

TABLE 2.8
OUTFLOW OF CAPITAL AND SERVICES - 1970/1980

million dollars

YEAR	REMITTED PROFITS AND DIVIDENDS	PROFITS AS A PERCENTAGE OF FOREIGN EQUITY CAPITAL	PROFITS PLUS REINVEST.	INTEREST	PRINCIPAL REPAYMENTS	INTEREST AND PRINCIPAL REPAYMENTS (Law 4 131) ^a	TRANSFER OF TECHNOLOGY
1970	119	5.5	141	284	1 433	529	104
1971	119	5.1	514	344	850	398	132
1972	161	5.5	362	489	1 202	623	154
1973	199	5.8	711	840	1 672	1 089	166
1974	250	4.6	...	1 370	1 920	1 513	212
1975	237	5.2	...	1 828	2 172	2 046	311
1976	383	5.0	...	2 091	2 992	2 637	363
1977	458	4.6	...	2 462	4 060	3 316	513
1978	561	5.0	1 536	3 342	5 324	4 427	591
1979	740	5.4	1 461	5 348	6 356	6 309	...
1980	544	3.4	955	7 457	5 020	6 464	...

SOURCE: Boletim do Banco Central, several issues.

^aEstimate.

TABLE 2.9
PERCENTAGE DISTRIBUTION OF RECEIPTS, TOTAL ASSETS AND BOOK
VALUE BY OWNERSHIP - 1975

OWNERSHIP	SAMPLE A				SAMPLE B			
	Number of Firms	Re-ceipts	Total Assets	Book Value	Number of Firms	Re-ceipts	Total Assets	Book Value
Local Firm	9 010	58.5	44.1	37.3	4 476	55.2	45.9	40.3
Foreign Subsidiary	816	24.7	18.0	17.4	507	30,6	22.1	22.1
State Firm	136	8.1	30.5	38.3	39	5.2	24.8	30.0
Unknown	468	8.7	7.4	7.0	263	9.0	7.2	7.6
TOTAL	10 432	100.0	100.0	100,0	5 285	100.0	100.0	100.0

SOURCE: Calabi et al., op.cit., Tables 1.3 and 2.3.

TABLE 2.10
PERCENTAGE DISTRIBUTION OF BOOK VALUE AND SALES OF THE 200 LARGEST
NON-FINANCIAL ENTERPRISES BY OWNERSHIP - 1972/1980

YEAR	BOOK VALUE			SALES		
	Local Firm	Foreign Subsidiary	State Firm	Local Firm	Foreign Subsidiary	State Firm
1972	16	20	64			
1973	14	20	66			
1974	16	17	67	23	42	35
1975	..	..	72			
1976	15	13	72			
1977	14	13	73	21	38	41
1978	13	9	78	20	33	47
1979	14	8	78	22	31	47
1980	15	9	76	22	31	47

SOURCE: Visão, Quem é Quem na Economia Brasileira, several issues.

TABLE 2.11

PERCENTAGE DISTRIBUTION OF BOOK VALUE BY SECTOR AND OWNERSHIP - 1969 AND 1975^(a)

	LOCAL FIRM		FOREIGN SUBSIDIARY		STATE FIRM		UNKNOWN		TOTAL	
	1969	1975	1969	1975	1969	1975	1969	1975	1969	1975
Mining	0.3	0.5	-	0.1	0.1	-	-	-	0.4	0.6
<u>Manufacturing Sector</u>	<u>30.1</u>	<u>27.3</u>	<u>24.1</u>	<u>21.4</u>	<u>3.5</u>	<u>4.7</u>	<u>6.7</u>	<u>6.4</u>	<u>64.4</u>	<u>59.8</u>
Nonmetallic Minerals	2.5	1.8	0.9	0.9	-	-	0.4	0.4	3.8	3.2
Metallurgy	6.1	6.2	5.5	4.8	2.4	2.0	1.8	2.0	15.9	15.0
Machinery	1.9	2.2	1.4	1.5	-	-	0.4	0.5	3.8	4.2
Electrical and Com. Equip.	1.0	1.3	2.2	2.1	-	-	0.2	0.1	3.4	3.6
Transport Equipment	1.1	1.3	3.8	3.1	-	-	0.3	0.3	5.2	4.7
Timber	1.1	1.0	-	-	0.2	1.6	-	-	1.3	2.6
Furniture	0.2	0.2	-	-	-	-	0.1	0.1	0.3	0.3
Paper and Pulp	2.1	1.5	0.5	0.4	-	-	0.1	0.1	2.7	2.0
Rubber	0.1	0.2	1.4	1.3	-	-	-	-	1.5	1.5
Leather	0.3	0.2	0.1	-	-	-	-	-	0.3	0.2
Chemicals	1.3	1.2	4.6	3.6	0.8	1.1	0.7	0.7	7.4	6.6
Pharmaceuticals	0.2	0.2	0.7	0.8	-	-	-	-	0.9	1.0
Perfumary and soap	0.2	0.2	0.3	0.3	-	-	-	0.1	0.5	0.5
Plastic Material	0.2	0.3	-	-	-	-	-	-	0.2	0.3
Textile	3.1	2.4	0.6	0.4	-	-	1.1	0.9	4.7	3.6
Apparel	0.5	0.7	-	0.1	-	-	0.3	0.3	0.8	1.0
Food Processing	5.5	4.0	1.4	1.0	-	-	0.4	0.3	7.3	5.5
Beverages	1.5	1.2	0.2	0.2	-	-	0.7	0.6	2.5	2.1
Tobacco	-	-	-	0.1	-	-	-	-	-	0.1
Editorial and Printing	0.7	0.6	-	-	-	-	-	-	0.7	0.6
Other	0.6	0.5	0.4	0.4	-	-	0.1	0.1	1.0	1.0
Public Utility	2.6	2.3	-	-	17.8	21.6	0.2	0.1	20.6	24.0
Building	2.6	4.0	0.1	0.2	-	-	-	0.1	2.8	4.2
Agriculture	0.3	0.3	-	-	-	-	-	-	0.3	0.3
Transport	0.9	1.1	-	-	0.7	0.5	0.4	0.2	2.0	1.9
Communication	0.1	0.1	-	-	2.9	2.9	0.3	0.3	3.2	3.3
Commerce	4.1	4.0	0.3	0.3	-	-	0.4	0.2	4.7	4.4
Others	0.8	0.9	0.2	0.2	0.5	0.3	-	0.2	1.6	1.5
TOTAL	41.9	40.3	24.8	22.1	25.3	30.0	8.0	7.6	100.0	100.0

SOURCE: Calabi et al. op.cit., Table 2.19.

(a) Sample B.

TABLE 2.12

PERCENTAGE DISTRIBUTION OF VALUE ADDED BY SECTOR AND OWNERSHIP - 1969 AND 1975^(a)

	LOCAL FIRM		FOREIGN SUBSIDIARY		STATE FIRM		UNKNOWN		TOTAL	
	1969	1975	1969	1975	1969	1975	1969	1975	1969	1975
Mining	0.4	0.5	0.1	0.1	0.1	-	-	-	0.5	0.7
Manufacturing Sector	36.2	36.7	33.0	28.9	1.7	2.2	7.7	8.4	78.5	76.2
Nonmetallic Minerals	2.7	2.0	1.0	1.2	-	-	0.4	0.5	4.1	3.6
Metallurgy	5.2	7.2	2.4	3.1	1.1	1.2	1.9	2.5	10.6	13.9
Machinery	2.8	3.5	2.5	2.9	-	-	0.6	0.7	5.9	7.1
Electrical and Com. Equip.	1.2	2.0	8.9	3.1	-	-	0.2	0.2	10.5	5.3
Transport Equipment	1.3	1.8	5.1	4.7	-	-	0.3	0.5	6.7	7.1
Timber	1.1	0.9	-	-	0.1	0.3	-	-	0.6	1.2
Furniture	0.4	0.5	-	0.1	-	-	0.2	0.2	0.6	0.7
Paper and Pulp	1.7	1.8	0.4	0.4	-	-	0.1	0.1	2.1	2.3
Rubber	0.2	0.3	1.6	1.9	-	-	-	-	1.9	2.2
Leather	0.4	0.2	0.1	0.1	-	-	-	-	0.5	0.3
Chemicals	2.0	2.0	4.9	5.1	0.3	0.6	0.8	0.8	8.1	8.4
Pharmaceuticals	0.3	0.4	1.5	1.4	-	-	0.1	-	1.9	1.8
Perfumery and soap	0.3	0.3	0.6	0.7	-	-	0.1	0.1	1.0	1.1
Plastic Material	0.3	0.4	-	-	-	-	0.1	0.1	0.4	0.5
Textile	4.1	3.3	0.6	0.6	-	-	1.3	1.1	5.9	5.0
Apparel	1.1	1.1	0.1	0.2	-	-	0.4	0.4	1.5	1.7
Food Processing	6.2	5.3	2.0	1.6	0.1	0.1	0.4	0.5	8.7	7.5
Beverages	8.8	1.4	0.5	0.5	-	-	0.6	0.5	2.8	2.5
Tobacco	0.1	0.1	0.2	0.5	-	-	-	-	0.3	0.6
Editorial and Printing	1.5	1.4	-	-	-	-	0.1	-	1.5	1.4
Other	1.3	1.0	0.8	0.9	-	-	0.1	0.1	2.1	2.0
Public Utilities	0.5	0.8	-	-	3.3	5.0	0.1	-	3.9	5.8
Building	3.1	4.5	0.1	0.2	-	-	-	0.1	3.3	4.8
Agriculture	0.2	0.2	-	-	-	-	-	-	0.2	0.2
Transport	2.3	2.3	0.1	0.1	0.3	0.2	0.1	-	2.7	2.6
Communication	0.3	0.3	-	-	0.9	0.3	0.1	0.1	1.4	0.7
Commerce	6.6	6.2	0.6	0.4	-	-	0.4	0.5	7.6	7.0
Others	1.5	1.6	0.2	0.1	0.1	0.1	0.1	0.2	1.8	2.1
TOTAL	51.1	52.8	34.1	30.0	6.3	7.9	8.5	9.3	100.0	100.0

SOURCE: Calabi et al. op.cit., Table 2.9.

(a) Sample B.

TABLE 2.13

RATIO BETWEEN NET PROFIT AND BOOK VALUE BY SECTOR AND OWNERSHIP - 1975⁽¹⁾

	LOCAL FIRM	FOREIGN SUBSIDIARY	STATE FIRM	UNKNOWN	TOTAL
Mining	7.3	2.3	11.4	50.3	6.5
<u>Manufacturing Sector</u>	<u>16.6</u>	<u>16.5</u>	<u>6.1</u>	<u>12.3</u>	<u>15.6</u>
Nonmetallic Minerals	13.5	21.8	11.9	14.7	16.0
Metallurgy	12.6	20.0	2.9	10.3	14.5
Machinery	28.6	17.1	0.0	25.1	24.0
Electrical and Com. Equip.	19.6	12.4	0.0	23.1	15.5
Transport Equipment	27.4	13.2	19.6	25.2	18.3
Timber	15.1	- 6.3	- 0.6	881.0	6.0
Furniture	26.7	22.5	0.0	10.7	24.7
Paper and Pulp	7.1	14.3	0.0	- 35.3	7.9
Rubber	24.8	30.9	0.0	0.0	29.9
Leather	17.1	5.1	0.0	3.8	15.2
Chemicals	16.3	13.0	13.8	9.7	14.0
Pharmaceuticals	25.9	10.8	0.0	37.7	14.4
Perfumary and soap	17.0	17.0	0.0	15.6	16.8
Plastic Material	26.1	24.4	0.0	25.7	25.9
Textile	10.7	3.8	1.9	19.7	10.3
Apparel	22.9	54.1	0.0	5.1	23.8
Food Processing	15.7	22.7	4.1	3.8	16.3
Beverages	14.8	11.1	0.0	18.2	14.8
Tobacco	17.8	3.4	0.0	0.0	4.2
Editorial and Printing	16.3	24.8	25.1	158.7	11.6
Other	23.1	13.1	0.0	19.0	19.0
Public Utilities	8.9	0.0	9.8	8.0	9.7
Building	24.5	32.1	- 6.6	45.1	19.9
Agriculture	12.1	73.1	6.3	- 2.9	11.4
Transport	15.6	111.7	0.0	14.8	2.8
Communication	5.5	94.8	4.6	5.7	4.1
TOTAL	18.3	17.0	5.8	12.2	13.1

SOURCE: Calabi et al. op.cit., Table 1.23

(1) Sample A.

TABLE 2.14
RATIO BETWEEN NET PROFIT AND BOOK VALUE BY
SIZE AND OWNERSHIP - 1975^(a)

SIZE	LOCAL FIRM	FOREIGN SUBSIDIARY	STATE FIRM	UNKNOWN	percentage
					TOTAL
I	20.7	10.4	-2.4	3.2	17.1
II	21.1	16.2	0.0	-0.2	18.6
III	18.3	12.8	-11.1	9.1	10.4
IV	19.9	16.1	6.7	2.4	15.6
V	16.5	21.2	3.9	27.9	13.9
VI	8.1	18.2	7.7	23.0	10.3
TOTAL	18.3	17.0	5.8	12.2	13.1

SOURCE: Calabi et al., op.cit., Table 2.14.

(a) Sample A.

3. TECHNOLOGY TRANSFER: AN ANALYSIS OF THE 1960s AND SOME EVIDENCE ON THE 1970s

As already mentioned, up to the end of the 1960s, technical assistance contracts and patent and trademark licenses, alongside direct investments in firms wholly controlled by foreign capital, comprised the main ways that firms from abroad participated in the Brazilian economy. This is not to say that contracts related to technology transfer have lost importance over the last decade. On the contrary, payments made abroad under this heading rose considerably in the 1970s. What it does mean is that foreign firms have come to participate in the domestic economy in additional ways in recent years.

The process by which technology was transferred to Brazil up to 1970 is fairly well understood thanks to a study conducted by IPEA in 1973 on technical assistance and licensing contracts registered until that date between domestic and foreign firms.¹ Unfortunately, similar information is not available for the 1970s. Only now is a study being carried out to update the IPEA report. The results of this study, under way at the National Industrial Property Institute (Instituto Nacional de Propriedade Industrial - INPI) are not available yet. We do, however, have some scattered information on the more recent period.

1 F. Biato, E. A. Guimarães and M. H. P. Figueiredo, A Transfere-
ncia de Tecnologia no Brasil (Rio de Janeiro: IPEA/INPES,
1973).

The 1960s

What follows is a summary of the most important information contained in the IPEA study of the process of technology transfer in the 1960s. Although outdated, such information is relevant since it characterizes a well-defined period in the history of the importation of technology by the country. In fact, important institutional changes made in the early 1970s altered the system for the registration and control of technology transfer contracts. These contracts are now subject to approval by INPI prior to registration at the Central Bank, the idea being to tighten government control over the process of technology transfer.

Information concerning the flow of technology in the 1960s is available due to the legal proviso that all contracts relative to the importation of technology be registered with a view to establishing the rights and obligations of foreign investors, as well as to controlling financial remittances. The corresponding files contain the information needed for a rough evaluation of the type and destination of the foreign technology paid for from January 1963 on.

It is necessary, however, to draw a distinction between the technology transfer indicated by the contracts and those which actually occurred during the period considered. In the first place, many of the contracts concern technical knowledge

already incorporated into the domestic productive process prior to their signing. Second, the unpaid importation of foreign know-how is obviously not recorded. Third, certain technologies introduced in the period covered by the study (up to 31 December 1970) may not be registered because they had not yet generated remittances.

Given the kind of data available, the point of departure for the intended evaluation had to be the determination of the frequency of the technologies imported, as expressed by the number of contracts. In this quantification, the type and quality of the technologies received special attention. For it to be feasible to use the whole mass of information, it was necessary to identify the types of technology imported. The transfers were therefore broken down — always bearing in mind the evidence contained in the registered contracts — and the latter classified accordingly.

The transfers were distributed among five categories: (1) technical assistance, (2) patent licenses, (3) trademark licenses, (4) engineering services, and (5) project development. Because of data shortcomings, it was impossible to ascertain whether the imported technologies applied to processes, manufacturing, or the products themselves. The various categories were defined as follows:

- (1) Technical assistance: permanent appraisal and/or consulting services involving specialized technical knowledge (in-

cluding in the area of industrial engineering) — rendered by individuals residing/domiciled or corporations headquartered abroad, and presupposing a permanent bond between the parties to the contract.

- (2) Patent licenses: concession of the right to use the designs and specifications of patented, registered products manufactured via defined processes — granted by individuals residing/domiciled or corporations headquartered abroad, and holding the parties to a permanent contract.
- (3) Trademark licenses: concession of the right to use trademarks, or "brand names", belonging to individuals residing/domiciled or corporations headquartered abroad, and holding the parties to a permanent contract.
- (4) Engineering services: temporary appraisal and/or consulting services involving specialized technical knowledge — rendered by individuals residing/domiciled or corporations headquartered abroad, and presupposing a provisional bond between the parties (this sort of transfer could be considered temporary technical assistance, including supervision of plant assembly, installation and adaptation of equipment, supervision of purchases, inspection of materials in the country and abroad, supervision of shipments, the contracting of foreign professionals, and the training of personnel).
- (5) Project development: studies based on specific research, or

on technical data banks, that lead to the plans, designs and final specifications for the construction of productive units or for the development of manufactured goods, presupposing a provisional bond between the parties.

It was on the basis of these transfer categories that the frequencies were tabulated, due to the fact that the contracts as counted for determining the frequencies did not correspond to the legally registered contracts. Whenever a juridical contract involved more than one kind of transfer, it was cross-classified in accord with the number of kinds of transfers. If a contract covered technical assistance and a trademark license, for example, it was registered in both categories. Up to 31 December 1970, 2 429 contracts had been registered with the Central Bank. Of these, 1 516 were for the manufacturing industries (excluding petroleum by-products), but owing to cross-classification, the total rose to 1 983.

It should also be pointed out that the difference between the contracts registered with the Central Bank and the concept adopted in the IPEA study affects the analysis of the monetary flows associated with the transfer process. The accounting procedure followed by the Central Bank does not take the various categories into consideration. The payments relative to a given contract were therefore divided by, and equally distributed among, the number of categories included according to the IPEA definition, such that the average values differ from

those that would have been calculated had the registered contracts been used instead.

The information derived from the registered contracts reveals that the manufacturing growth industries are most important with respect to the importation of technical knowledge, with Metallurgy, Chemicals, Machinery, Communications and Electrical Equipment, and Transport Equipment accounting for 64% of the contracts. Moreover, of the 729 industrial firms that maintained contracts, 50% were in the first four industries (Table 3.1).

Turning to the influence of firm size on the use of foreign know-how, by activity, the twenty largest firms in selected industries were identified, and their share and performance in the technology importation process compared with those of other firms in the same industries that had transfer contracts.

The data indicated disparities among the various industries (Table 3.2). Thus, the hypothesis that larger firms absorb more foreign know-how was confirmed for some industries only. The extreme cases are Metallurgy, on the one hand, and Pharmaceuticals, on the other. In Metallurgy, the positive correlation between firm size and the importation of technology was confirmed by the fact that eighteen of the twenty largest had contracts, and that these contracts accounted for 55% of the total for the industry. Moreover, this observation is backed by comparison of the averages for the contracts referring to the twenty largest firms and the remainder, the figures being 11.3

and 2.1, respectively. At the other end, in Pharmaceuticals, only ten of the twenty largest firms had technology transfer contracts, corresponding to 16% of the total contracts for the industry. The average for the contracts maintained by the ten firms cited was 2.1, lower than that for the firms in the smaller size class (3.6). The other industries analyzed came between these extremes.

The destination of the imported technologies was also examined from the standpoint of the use of the goods to which they were applied (Table 3.3). Note that vehicle parts were considered apart, because it was not always possible to ascertain whether they were for capital goods or durable consumer goods. According to this criterion, intermediate goods stand out, answering for 40% of the total number of contracts (in great part due to the shares of the steel industry and chemical products). Capital goods and non-durable consumer goods accounted for roughly equal shares (24% and 20%), while durable consumer goods and vehicle parts each answered for about 8% of the total.

From the point of view of the technologies imported by category, technical assistance contracts predominated, at 47% of the total (Table 3.4). Contracts that established provisional bonds between the parties accounted for 29% of the total (23% for engineering services and 6% for project development), and those of a legal nature for 24% (11% for patent licenses and 13% for trademark licenses).

It should be stressed that the predominance of technical assistance contracts may be partially misleading, due to the law prohibiting the payment of royalties for trademarks and patents between parent companies and their subsidiaries. This legal provision has led foreign firms to omit any references to trademarks and patents, classifying them as technical assistance in their contracts.

As a rule, technical assistance also predominated at the level of individual industries. It is opportune to observe that the exceptions — notably the Steel Industry, Inorganic Chemical Products, and Non-ferrous Metals — are generally processing industries controlled by domestic enterprise. The homogeneous nature of the production of these processing industries implies that the firms require technical aid only during the installation and/or expansion phases and for the solution of specific operational problems, thereby relieving the productive units from the need for long-run technical assistance. In addition, the relatively low share of such contracts in the characteristically domestic industries is also explained by legislation that induces parent companies and their subsidiaries to make use of technical assistance contracts in their mutual dealings.

As to the origin of imported know-how, the IPEA study revealed that the United States was the main source for the manufacturing sector as a whole and for the majority of the individual industries (Table 3.5). Next in importance were West Germany, France, Great Britain, Switzerland, Italy and Japan.

In recent years, however, the share of the United States has diminished, while the shares of West Germany and Japan have increased.

Still looking at the situation from the side of the foreign party, an attempt was made to determine if the contracts between domestic and foreign firms for the importation of know-how were linked to ties of another nature between the same units. To this end, the firms in Brazil that maintained transfer contracts were classified, according to ownership, as domestic or foreign. In turn, the share of each of these groups in the importation of know-how was assessed, and contracts between parent companies and their subsidiaries were identified (Table 3.6).

Domestic firms accounted for the largest share of the contracts in effect (64%), as well as for the largest number of companies maintaining agreements (66%). The same was true in most of the industries considered. Needless to say, these results may simply be reflecting the larger number of domestic firms in the manufacturing sector.

Among the contracts of foreign subsidiaries, the study distinguished between contracts established with their parent companies and those involving other companies devoid of ownership ties. These latter contracts were the most common in the manufacturing sector as a whole and in individual industries. It should be pointed out, however, that this conclusion may be owing to a triangular mechanism sometimes used by foreign firms:

the Brazilian subsidiary contracts the importation of a technology via a firm that belongs to the same group as the parent company. Although this device was identified in some cases, it was impossible to gauge to what extent it is used.

As to the types of contracts maintained by domestic firms, subsidiaries and independent foreign companies, technical assistance agreements predominate in all cases. However, the share of this category is significantly higher among subsidiaries (64%) than among independent foreign companies (52%) or domestic firms (42%). The share of engineering services is highest among domestic firms, and higher for independent foreign companies than for subsidiaries.

It is opportune to note that short-term contracts (engineering services and project development) are most important among domestic firms (35%, in comparison to 22% for independent foreign companies and 13% for subsidiaries). This preference on the part of subsidiaries for agreements that imply permanent bonds between the parties appears to be the outcome of contracts of this sort opening the way for the periodic, fairly regular remittance of larger amounts of financial resources to home offices abroad. Since there was no effective control over the entrance into Brazil of the technologies behind the contracts, it is valid to assume that such financial flows may often be disguised profit remittances without technological counterparts. After all, what matters to a given multinational group is simply the magnitude of the remuneration

received against its "assets" in subsidiaries. From this point of view, the composition of total remittances (profits on capital invested plus payments for technology transfer) should aim, above all, at generating a substantial financial flow to the country of origin. The classification of remittances depends, therefore, on the institutional and legal regulations concerning foreign capital and imported technology. In the Brazilian case, due to fiscal and foreign-exchange provisions, the larger the share related to technology transfer, the more received by the home office.

Such issues are clarified by analysis of payments for imported know-how over the period 1965/1970.

In the case of the manufacturing industries, the structure revealed by the distribution of payments for technology transfer differs from that indicated by the contracts. Upon examining the contracts, it was seen that five industries were responsible for two-thirds of the total. Turning to the payments made in 1965/1970, the distribution was more concentrated, with only three industries — Transport Equipment (40%), Metallurgy, and Communications and Electrical Equipment — accounting for an identical share of total remittances (Table 3.1). At a higher level of disaggregation, Vehicles (32% of the total) and Mechanical Vehicle Parts (7%) stand out in Transport Equipment, and the Steel Industry (7%) in Metallurgy.

This disparity between the distribution of contracts and the distribution of payments means that the average payments per

contract vary according to industry. The highest value (corresponding to Vehicles) is twenty times the average value for the manufacturing sector as a whole. In contrast, about three-fourths of the industries pay less than the sectoral average. Among these are industries important either for the magnitude of their output or for the sophistication of the technology employed, such as the Steel Industry, Metallurgy, Machinery, Electrical Equipment, the Textile Industry, and various branches of the chemical industry. These results suggest that the supposed correlation between the cost of imported technology and its level of sophistication should be regarded with a certain reserve.

The distribution of the payments by the use of the goods that incorporate foreign know-how reflects the above mentioned trends (Table 3.3). The largest share of remittances is for Vehicle Parts (37%), and the lowest for Capital Goods (7%). As to the average paid per contract, the several uses, in decreasing order, follow the sequence: vehicle parts, durable consumer goods, non-durable consumer goods, intermediate goods, and capital goods (the corresponding average payments being in the proportion 15:5:2:2:1).

In the analysis of the relative costs associated with the various kinds of transfers, payments for technical assistance far outweighed all others at 69% of the total, being followed by engineering services (13%), trademark licenses and project development (Table 3.6). Note that 83% of the payments

referred to contracts that established permanent bonds between the parties, and that over the period 1965/1970 the tendency was for the relative share of such contracts to rise.

Although the average paid per contract did vary, the range was narrower than those observed in the analyses by industry and by use of goods. The highest value, corresponding to technical assistance, is only 3.5 times larger than the lowest, referring to trademark licenses.

With regard to the behavior of domestic versus foreign firms, it was substantiated that three-fourths of the payments were made by the latter, with 50% of the total payments resulting from contracts between parent companies and their subsidiaries (Table 3.6). This type of agreement leads to the largest average payments — nine times higher than those made by domestic firms and five times higher than those effected by independent foreign companies.

That payments are concentrated among foreign firms is also confirmed by the 1969 and 1970 data, which reveal that 50% of the expenditures declared for the importation of technology for the manufacturing sector as a whole were accountable to only three firms in 1969 and to five in 1970.

Lastly, it was found that the relative costs of the various kinds of transfers, as indicated by the average paid per contract, varied across groups of firms (Table 3.5). Whereas the largest payments were for project development and engineering services among domestic firms, the heftiest were

for technical assistance in the case of subsidiaries.

Also noteworthy is the fact that, with the exception of engineering services, the average payments for all kinds of transfers are inevitably highest for contracts between subsidiaries and their parent companies. This trend is especially marked in the technical assistance category, where the average value paid is 8 times higher than that paid by domestic enterprises.

Some Evidence on the 1970s

Our information on the more recent period comes from a study by Fung and Cassiolato¹ on the 1972-75 period, and data obtained directly from the INPI on the year 1981. This information is more limited than that analysed above, covering only the number of contracts. In addition, comparison of the two sets of data involves innumerable difficulties.

The first difficulty resides in differences between the information sources. While data on the 1960s refer to contracts actually registered with the Central Bank, the 1970s and 1981 data cover contracts approved by the INPI. This approval, according to the new system adopted in the early 1970s, is a stage that precedes registration at the Central Bank. Secondly, while data on the 1970s refer only to the manufacturing sector, excluding the oil industry, the more

1 S. K. Fung and J. E. Cassiolato, "The International Transfer of Technology to Brazil through Technology Agreements-Characteristics of the Government Control System and the Commercial Transactions," May 1976.

recent information includes other sectors of economic activity. In this respect, while manufacturing contracts (excluding oil) for the first period represented 62.4% of the total, the same percentage for 1972-75 (thus including oil) came to 66.5%. As for 1981, while available information does not allow us to determine the exact percentage corresponding to the manufacturing sector, it is possible to locate it in the 57-77% range.

The sectorial distribution of contracts appears in Table 3.7. Data on the various segments of the manufacturing sector highlight the growing concentration of contracts in a small number of branches. Thus the percentage of manufacturing contracts subscribed by the four branches showing the highest frequency rose from 54.6% in the 1960s to 63.6% for the 1972-75 period. The share of contracts of these same four branches as a percentage of the entire economy rose from 42.3% to 50.3% between the 1972-75 period and 1981. It is also noteworthy that three of the four most important branches in terms of concentration of contracts in the 1960s were also among the top four in 1981. Metallurgy, Machinery and Chemicals are among the top four in all three periods, and only the Electrical and Communications Equipment industry (predominant in the 1960s) is replaced by Textiles in the 1972-75 period and in 1981. Metallurgy leads the list in all periods, with a growing share of the total. The order of the remaining sectors by number of contracts is relatively stable: the Spearman coefficient for contract frequency in the various periods is 0.755 (significant

at the 1% level) when comparing the 1960s to the 1972-75 period, and 0.762 (significant at the 5% level) when the latter period is compared to 1981. We can finally observe that the 2,951 manufacturing contracts signed from 1972-75 were held by 873 companies, which means an average of 3.4 contracts per company. This average, however, was significantly higher in the Metallurgical and Transport Equipment branches (6.2 contracts per company).

The distribution of contracts by manufacturing branches was compared to the sectorial distribution of foreign capital investments registered at the Central Bank, through the estimation of Spearman coefficients among the rankings determined by each distribution criteria. Significant results were only obtained in the comparison of technology transfer contracts in the 1960s with the stock of foreign capital in 1971 (Spearman coefficient of 0.6, significant at the 1% level). The correlation coefficients between 1972-75 contracts and foreign capital stocks in 1971 and 1975, as well as between 1981 contracts and 1980 investments, were not significant.

As for the nature of contracts signed following the 1960s, the available data (Table 3.8) gives significantly different results in comparison to the first period. There is a notable decline in the share of technical assistance contracts, which falls from 47% to 22.9% in 1972-75, and to 13.2% in 1981, along with a jump in the percentage including engineering services and project development (29.3%, 70.9% and 59.1%). However these results may well reflect the coverage of the 1960s

information (manufacturing, excluding oil) in contrast to the more recent data (the economy as a whole), since the available data suggests that engineering and project services contracts are predominant in the service sector and represent almost all of the oil sector's contracts. Therefore the broader coverage of the 1972-75 and 1981 information in itself implies a greater share for these contracts. Yet this is not the only explanation for the difference observed over the two decades. It also appears that stricter INPI examination of technology transfer contracts after 1970 has brought a reduction in technical assistance agreements. The 1981 figures in particular may reflect the fact of the INPI having in the last two years refused to approve nearly all technical assistance agreements applied for between parent companies and subsidiaries.

The distribution of technology transfer contracts by ownership of the Brazilian contractor appears in Table 3.9. When compared to the 1960s distribution, the figures show a decline of the foreign firms' share (35.7% in the 1960s, 30.7% in the 1972-75 period and 26.7% in 1981). It should be noted, though, that the decline observed between the first two periods (1960s and 1972-75) may simply derive from the broader coverage of the study on the latter period (including services and the oil industry), where foreign capital is less preponderant. Among foreign companies, the share of parent-company/subsidiary contracts, while constant from the 1960s to 1975 (around 36%), jumps to 65% in 1981. As for local companies, the share of contracts signed by state-owned companies was 49% in 1972-75,

and 42% in 1981. The 1981 data show that only 12% of contracts signed by local private firms were with foreign partners of the Brazilian firms.

Table 3.10, finally, presents the country-by-country distribution of foreign contractors for 1972-75. As in the 1960s, the US, Germany and France lead the list, again with approximately 2/3 of all contracts (the US share, however, shows a decline from 41.3% to 34.9% between the two periods, while Germany rose from 17.9% to 21.6%). As for the other countries, we should note the decline share of Swiss contracts (from 6.2% to 1.21%), and the growth of Japan's relative weight (from 2.7% to 4.7%), moving from seventh to fourth place on the list.

TABLE 3.1
NUMBER OF CONTRACTS AND PERCENTAGE
DISTRIBUTION OF PAYMENTS FOR THE
MANUFACTURING SECTOR BY RECEIVING INDUSTRY ^(a)

	NUMBER OF FIRMS	NUMBER OF CONTRACTS (b)	PERCENTAGE DISTRIBUTION OF PAYMENTS (c)	INDEX OF AVERAGE PAYMENT PER CONTRACT (c)(d)
Nonmetallic Minerals	54	105	4.8	94.4
Metallurgy	96	371	11.1	58.6
(Steel Industry)	...	(218)	(7.3)	(63.0)
Machinery	94	239	2.2	21.8
Electrical and Comm. Equip.	85	219	9.2	86.7
Transport Equipment	60	195	39.9	365.2
(Motor Vehicles)	...	(27)	(32.0)	(2011.6)
(Mech. Vehicle Parts)	...	(105)	(6.8)	(109.0)
Paper and Pulp	15	39	1.4	82.0
Rubber	11	23	3.8	528.2
Chemicals	92	254	7.6	64.8
(Inorganic Products)	...	(72)	(2.1)	(62.6)
(Petroch. Products)	...	(93)	(2.6)	(63.3)
(Petroch. Raw Materials)	...	(89)	(2.9)	(68.1)
Pharmaceuticals	40	135	5.2	87.0
Textiles	62	138	3.9	58.2
Food Processing	19	37	4.2	195.2
Others	101	228	4.5	39.2
TOTAL	729	1983	100.0	100.0

(a) The petroleum industry is not included.

(b) Contracts registered until 1970.

(c) During the period 1965/1970.

(d) Total payments were divided by the number of contracts which generated remittances during the period 1965/1970.

TABLE 3.2

NUMBER OF CONTRACT AND FIRM SIZE IN SELECTED INDUSTRIES (a)

	NONMETALIC MINERALS.	METALLURGY	MACHINERY	ELECTRICAL AND COMMUNICATION EQUIPMENT	TRANSPORT EQUIPMENT	CHEMICALS	PHARMACEUTICALS	TEXTILES
A - Number of firms with contracts among the 20 largest in the sectors	11	18	12	11	17	14	10	15
B - Number of contracts by firms in (A)	26	203	63	42	97	79	21	58
C - (B) As a percentage of total number of contracts of the industry	24.8	54.7	26.3	19.2	49.7	31.1	15.6	42.0
D - Average number of contracts per firm for enterprises in (A)	2.4	11.3	5.2	3.8	5.7	5.6	2.1	3.9
E - Average number of contracts per firm for enterprises not included in (A)	1.8	2.1	2.1	2.4	2.3	2.2	3.8	1.7

(a) The petroleum industry is not included. Data refer to contracts registered until 1970.

TABLE 3.3

NUMBER OF CONTRACTS AND PERCENTAGE DISTRIBUTION
OF PAYMENTS FOR THE MANUFACTURING SECTOR,
BY RECEIVING INDUSTRY^a

	NUMBER OF CONTRACTS (b)	PERCENTAGE DISTRIBUTION OF PAYMENT (c)	INDEX OF AVERAGE PAYMENT PER CONTRACTS (c)(d)
Capital Goods	470	7.2	32.5
Intermediate Goods	795	28.6	71.0
Durable Consumer Goods	162	13.2	151.0
Non-Durable Consumer Goods	396	13.5	68.4
Vehicle Parts	160	37.3	419.1
TOTAL	1983	100.0	100.0

(a) The petroleum industry is not included.

(b) Contracts registered until 1970.

(c) During the period 1965/1970.

(d) Total payments were divided by the number of contracts which generated remittances during the period 1965/1970.

TABLE 3.4

NUMBER OF CONTRACT FOR THE MANUFACTURING SECTOR
BY RECEIVING INDUSTRY AND TYPE OF CONTRACTS ^(a)

	TECHNICAL ASSISTANCE	PATENTS	TRADEMARKS	ENGINEERING SERVICES	PROJECTS
Nonmetallic Minerals	46	13	4	34	8
Metallurgy	110	22	18	177	44
(Steel Industry)	(36)	(7)	(3)	(146)	(26)
Machinery	165	25	38	10	1
Electrical and Comm. Equip.	140	19	31	22	7
Transport Equipment	115	31	31	15	3
(Motor Vehicles)	(15)	(3)	(5)	(4)	-
(Mech. Vehicle parts)	(62)	(18)	(18)	(5)	(2)
Paper and Pulp	7	1	-	27	4
Rubber	16	3	2	2	-
Chemicals	93	25	20	81	35
(Inorganic Products)	(17)	(5)	(3)	(30)	(17)
(Petroch. Products)	(43)	(10)	(13)	(21)	(6)
(Petroch. Raw Materials)	(33)	(10)	(4)	(30)	(12)
Pharmaceuticals	83	16	36	-	-
Textiles	47	18	31	40	2
Food Processing	16	3	2	12	4
Others	94	32	49	47	6
TOTAL	932	208	262	467	114

(a) The petroleum industry is not included. Data refer to contracts registered until 1970.

TABLE 3.5
NUMBER OF CONTRACTS AND PERCENTAGE DISTRIBUTION
OF PAYMENTS FOR THE MANUFACTURING SECTOR
BY COUNTRY OF SUPPLIER (a)

	NUMBER OF CONTRACTS (b)	PERCENTAGE DISTRIBUTION OF PAYMENTS (c)	INDEX OF AVERAGE PAYMENT PER CONTRACT (c)(d)
United States	818	29.4	67.0
United Kingdom	131	3.4	51.7
France	201	8.4	89.7
West Germany	355	33.2	193.4
Italy	82	6.2	152.7
Switzerland	122	5.5	87.6
Other Western European countries	94	6.0	95.8
Japan	53	3.9	157.4
Others	127	4.0	101.1
TOTAL	1983	100.0	100.0

(a) The petroleum industry is not included.

(b) Contracts registered until 1970.

(c) During the period 1965/1970.

(d) Total payments were divided by the number of contracts which generated remittances during the period 1965/1970.

TABLE 3.6

NUMBER OF CONTRACTS AND PERCENTAGE DISTRIBUTION
OF PAYMENT FOR THE MANUFACTURING SECTOR BY
OWNERSHIP AND TYPE OF CONTRACT (a)

OWNERSHIP	TECHNICAL ASSISTANCE	PATENTS	TRADEMARKS	ENGINEERING SERVICES	PROJECTS	TOTAL
NUMBER OF CONTRACTS ^(b)						
Brazilian	532	123	174	358	88	1275
Subsidiary/Parent	166	28	31	24	10	259
Subsidiary/Independent	234	57	57	85	16	449
TOTAL	932	208	262	467	114	1983
PERCENTAGE DISTRIBUTION OF PAYMENTS BY OWNERSHIP (c)						
Brazilian	16.4	24.5	20.3	71.8	80.7	27.1
Subsidiary/Parent	67.4	30.7	31.8	3.6	14.7	51.8
Subsidiary/Independent	16.2	44.8	47.9	24.6	4.6	21.1
TOTAL	100.0	100.0	100.0	100.0	100.0	100.0
PERCENTAGE DISTRIBUTION OF PAYMENTS BY TYPE OF CONTRACT (c)						
Brazilian	41.5	7.9	4.3	33.9	12.4	100.0
Subsidiary/Parent	82.2	5.1	3.6	0.9	1.2	100.0
Subsidiary/Independent	52.7	18.4	13.2	14.8	0.9	100.0
TOTAL	68.6	8.7	5.8	12.8	4.1	100.0
INDEX OF AVERAGE PAYMENT PER CONTRACT (c)(d)						
Brazilian	44.8	30.0	14.1	58.4	76.9	44.7
Subsidiary/Parent	359.9	167.2	106.1	39.7	105.0	388.8
Subsidiary/Independent	83.1	99.6	73.7	74.6	21.7	80.8
TOTAL	147.0	68.9	41.8	60.5	71.4	100.0

(a) The petroleum industry is not included.

(b) Contracts registered until 1970.

(c) During the period 1965/1970.

(d) Total payments were divided by the number of contracts which generated remittances during the period 1965/1970.

TABLE 3.7
NUMBER OF CONTRACTS BY RECEIVING SECTOR - 1972/1975 AND 1981^(a)

	1972-1975 ^(b)			1981	
	Number of Contracts	Percentage	Number of Firms	Number of Contracts	Percentage
<u>Mining</u>	<u>416</u>	<u>9.3</u>	...	<u>129</u>	<u>8.5</u>
<u>Manufacturing</u>	<u>2 951</u>	<u>66.5</u>	<u>873</u>	...	...
Nonmetallic Mineral	197	4.4	61	...	...
Metallurgy	728	16.4	118	323	21.2
Machinery	364	8.2	130	213	14.0
Elet. and Com. Equip.	130	2.9	42	50	3.3
Transport Equip.	186	4.2	30	49	3.2
Paper and Pulp	133	3.0	38	...	...
Chemical	405	9.1	127	151	9.9
Pharmaceutical	29	0.6	19	54	3.5
Textiles	382	8.6	107	80	5.2
Food Processing	118	2.7	62	29	1.9
Other	279	6.3	...	...	...
<u>Services</u>	<u>1 076</u>	<u>24.2</u>	...	...	...
<u>Other^(b)</u>	...	...	...	447	29.3
TOTAL	4 443	100.0	...	1 525	100.0

SOURCE: Fung and Cassiolato, op.cit., Tables 3.4 and 3.11 (1972-1975) and unpublished data from INPI (1981).

(a) Contracts approved by INPI.

(b) Until June 1975.

(c) Includes non-specified manufacturing sectors.

TABLE 3.8
NUMBER OF CONTRACTS BY TYPE - 1972/1975 AND 1981^(a)

	1972-1975 ^(b)		1981	
	Number of Contracts	Percentage	Number of Contracts	Percentage
Technical Assistance	1 020	22.9	202	13.2
Patents	142	3.2	74	4.8
Trademarks	133	3.0	347	22.8
Engineering Services and Projects	3 148	70.9	902	59.1
TOTAL	4 443	100.0	1 525	100.0

SOURCE: Fung and Cassiolato, op. cit. (1972-1975) and unpublished data from INPI (1981).

(a) Contracts approved by INPI.

(b) Until June 1975.

TABLE 3.9
NUMBER OF CONTRACTS BY OWNERSHIP - 1972/1975 AND 1981^a

	1972-1975 ^b		1981	
	Number of Contracts	Percentage	Number of Contracts	Percentage
Subsidiary/Parent	489	11.0	264	17.3
Subsidiary/Independent	877	19.7	144	9.4
Brazilian/Foreign Partner	1 572	35.4	77	5.0
Brazilian			573	37.7
State Firm	1 505	33.9	467	30.6
TOTAL	4 443	100.0	1 525	100.0

SOURCE: Fung and Cassiolato, op.cit., Table 3.18 (1972-1975) and unpublished data from INPI (1981).

^aContracts approved by INPI.

^bUntil June 1975.

TABLE 3.10
NUMBER OF CONTRACTS BY COUNTRY
OF SUPPLIER - 1972/1975^a

	NUMBER OF CONTRACTS	PERCENTAGE
United States	1 550	34.9
United Kingdom	276	6.2
France	398	9.0
Germany	961	21.6
Italy	196	4.4
Sintzerland	180	1.8
Japan	296	6.7
Othero	586	13.2
TOTAL	4 443	100.0

SOURCE: Fung and Cassiolato, op.cit., Table 3.14.

^aContracts approved by INPI, until June 1975.

4. THE 1970s: NEW FORMS OF FOREIGN INVESTMENT

The technology contracts of the 1960s either involved a parent company and its Brazilian subsidiary, and hence aimed basically at facilitating the transfer of funds within the multinational enterprise, or corresponded to the licensing of a local firm without implying any major control over this firm. To be sure, in the second case, the technology supplier received a share of the profits of the local firm, thereby reducing its internal accumulation and growth potential (effects similar to those which would result from borrowing). Nevertheless, such agreements did not affect decision-making within the local firm, and, in particular, did not associate the multinational enterprise with the process of capital accumulation on the part of the Brazilian firm.

The new feature of the technology agreements of the 1970s was their bringing about, in many cases, equity participation in a Brazilian firm by the supplier of technology. In addition, many joint ventures established during the last decade involved the transfer of technology rather than the supply of funds by the foreign partner. It is worth noting, however, that the proliferation of joint ventures in the Brazilian economy during these years did not merely reflect a new form of payment for foreign technology, but corresponded to a definite strategy pursued by the Brazilian government, as will be suggested below.

Joint ventures are also a phenomenon of the 1970s in another sense. It is true that there were some previous instances of the participation of local capital in foreign subsidiaries. However, this participation implied the existence of minority shareholders in firms fully controlled by foreign capital rather than even an unequal sharing of managerial and decision-making power. As a result, the foreign capital had full discretion over the capital accumulation, as well as the competition and growth strategies of such enterprises.¹

One can posit, therefore, that joint ventures and undertakings in which the supply of technology accounts for the participation of the foreign firm in the equity capital of the Brazilian enterprise are the new forms of foreign investment which emerged during the 1970s. Among the other forms usually referred to in the literature, turn-key operations are irrelevant, while management contracts and franchising are a very recent phenomenon, so far basically restricted to hotel activities. Lastly, international subcontracting involves fully controlled subsidiaries of multinational firms; there is no evidence that local firms are integrated into the world-wide production and distribution

1 An early example of a joint venture is provided, however, by USIMINAS, a State steel enterprise established during the 1960s in which Nippon Steel had a minority share (currently at 19%).

schemes of multinational enterprises.

The new forms of investment which arose in the 1970s were initially associated with the emergence of a petrochemical industry in Brazil. The experience with joint ventures in this sector must be examined in some detail not only because it reflected a well-defined industrial growth strategy with clear-cut political goals, but also because, due to its success, it would later be seen as a potential pattern for other sectors. The first joint ventures in this sector date from the very beginning of the petrochemical industry in Brazil. The plants opened in São Paulo in the late 1960s resulted from joint ventures involving local capital, foreign firms and the State petroleum enterprise — Petrobrás. This experiment differed from subsequent ones as it resulted from the initiative of local capital, which, acknowledging its incapacity to carry out the undertaking alone, turned to foreign firms and the State for support. The latter was, therefore, a passive partner in the undertaking. In any case, this experiment was not successful, and the resulting plants would be taken over by Petrobrás some years later.

The subsequent stage of the expansion of the petrochemical industry in Brazil consisted of the building of a petrochemical complex in the Northeast. Once again, the new undertaking rested basically on joint ventures between State, local and foreign capital. This time, however, the

choice of this alternative was the outcome not of the spontaneous initiative of private capital, but rather of the government policy concerning the expansion of the petrochemical industry. Therefore, even when the first steps towards the setting up of a joint venture were taken by local or foreign firms, the initiative adhered, in a sense, to the official guidelines.

In this context, the diffusion of joint ventures in connection with the emergence of the petrochemical industry in Brazil was certainly not the result of a strategy initiated by the multinational firms. It was, instead, the consequence of an explicit government policy aimed at supporting local capital and forestalling an exclusive dependence on foreign capital, while simultaneously avoiding excessive State intervention in the economy. From this point of view, this policy reflected the "nationalistic" ideology of certain sectors of the Brazilian bureaucracy. To be sure, this was a peculiar kind of right-wing nationalism, quite different from the nationalistic ideology at the core of the left-wing politics of the previous decades. It was based (1) on turning the country into a political and economic power, (2) on confidence in the free market economy, (3) on acknowledgement of the limits of local capital, and (4) on a refusal to allow the State to intervene in the economy to the point of imperiling the free market system. The formula which brought

together the State, local capital and foreign capital seemed the natural compromise between these contradictory ideological beliefs.

It must be emphasized, however, that, despite being induced by government guidelines, the success of this experiment depended on its converging with the strategy of some multinational producers, or, at least, on their willingness to enter into such joint ventures. As it happened, the Japanese petrochemical producers were the most prone to engage in these undertakings. As a result of the follow-the-leader pattern of competition typical of the international oligopolistic industries, the very willingness of the Japanese producers to enter the Brazilian market on a joint venture basis prompted other multinational firms to follow suit. It is worth noting, however, that this development was possible due to the high degree of competition in the petrochemical technology market.

4.1. Joint Ventures in the Petrochemical Industry

An examination of the undertakings included in the Northeastern petrochemical complex reveals three quite distinct groups of enterprises, according to the size of investment and the control of equity capital (Table 4.1). The

2 The data on the Northeastern petrochemical complex presented in this section are published in J. T. Araujo Jr. and V. M. Dick, "Governo, Empresas Multinacionais e Empresas Nacionais: o Caso da Indústria Petroquímica," Pesquisa e Planejamento Econômico, Vol. 4, nº 3 (December 1974), pp. 629-650. It should be noted that these data refer to only some of the undertakings in the Brazilian petrochemical industry. A complete picture of joint ventures between State and foreign capital in this sector is presented in Appendix C.

first group relates to the largest investments, with more than 50% of the total resources being concentrated in only three enterprises. Equity capital is controlled by PETROQUISA, which always holds more than 50% of the shares; no foreign group holds any significant part of the remainder of the stock. The second group comprises medium-sized investments, ranging from US\$ 26 to 72 million. The control of these undertakings is divided among PETROQUISA, local capital and foreign firms, according to the following criteria: (1) in no case may the majority of the shares remain in the hands of foreign firms; (2) PETROQUISA's participation is always equal to or larger than the portion of shares in the hands of foreign firms; (3) no single group may hold the majority of the stock. As a result of these criteria, among these enterprises, each type of partner usually controls one-third of the capital. The third group includes investments which can be considered small, though the upper limit for this group is higher than the lower one for the second. This group comprises only three enterprises, with projects ranging from US\$ 10 to 31 million. There is no foreign participation in their capital and PETROQUISA holds stock in one enterprise only, and even so in a minority position. Among the projects examined, only one could not be placed in one of these three groups: a small-sized undertaking (about twenty million dollars), in which the capital is controlled by PETROQUISA

and the remaining shares belong to a foreign firm. This is the only example where PETROQUISA is associated with a foreign firm with no local partner being present.

Table 4.1 stresses the high degree of concentration in the petrochemical sector, as well as PETROQUISA's control over the complex — especially when one takes into account the fact that the most important raw materials for the plants in the first and second groups are supplied by the enterprises in the first. It also suggests that the government policy concerning the petrochemical industry has enabled local private capital to participate more significantly in a sector where technological sophistication and the capital requirements constitute two considerable barriers to the entry of domestic firms. In fact, in the absence of the new type of enterprises which comprise the second group, the participation of local private capital, as indicated by the undertakings under its exclusive control, would represent less than 5% of the total investment in the sector. However, through association with the State and foreign investors, it has been possible to raise this share to about 30% of global investments.

Table 4.2, which details column (D) of the previous table, shows the distribution of the voting capital in the enterprises analyzed, still classifying the investments by size. It indicates that foreign partners mainly participate in medium-sized projects, that is, in enterprises in

the second group. The fact that their total share of the voting capital is only 16% tends to underestimate the foreign partners' power to influence the decisions related to these projects.

In nine out of the thirteen enterprises in which there was foreign participation, the process know-how and part of the engineering services were provided by the foreign partner. This supply of technology was usually paid for in company shares. As a result, about 35% of the 46 million dollars which corresponded to the voting capital in the hands of foreign groups derived from their technological contribution to the projects. Furthermore, the foreign partner might also be remunerated with a certain percentage of the enterprise's sales (during at least five years from the time the plant went into operation) for the transfer of future developments in the process, for supervision of the installation of the plant, for technical assistance in operating it, for "procurement" activities abroad, for technical assistance for sales, or for use of the trademark in Brazil.

As to the process which led to the establishment of the various enterprises, it is possible to distinguish three paths:

- (A) a local private group decides to invest and PETROQUISA joins as a partner when the project is already in progress

(B) a local private group and a foreign firm submit their investment plans to PETROQUISA and the joint venture is established at the initial stage of the project

(C) PETROQUISA takes the initiative and decides as to the participation of other groups

The first two cases are characteristic of the early years of the industry. In case A, PETROQUISA usually aimed at keeping the control of the enterprise within the country. Nevertheless, its influence on the investment process was relatively slight, as at least two central decisions had already been made: the choice of the foreign partner and of the production process. As a result, the foreign partner was likely to assume the most active role in the subsequent technological decisions.

Undertakings included in case B resulted from projects presented by private investors to the Industrial Development Council (Conselho de Desenvolvimento Industrial — CDI) for the granting of fiscal incentives and import facilities. PETROQUISA was usually invited to join the undertaking before the project was approved by CDI, thus allowing it a more active role in the investment decisions. PETROQUISA's engagement in the enterprise was frequently the decisive factor when CDI had to choose among several projects aiming at the same kind of production. Consequently, foreign interests

who were unwilling to enter into a partnership with a State enterprise often lost the opportunity to invest in the country.

Finally, case C reflected the increasing activity of PETROQUISA in the setting up of the petrochemical industry. PETROQUISA was certainly the most important partner in these undertakings, and the chosen foreign partner, when one existed, was the supplier of the process technology and/or of the basic engineering.

Table 4.3 shows, in relation to the three groups of enterprises previously indicated, the incidence of each kind of negotiation.

The choice of the supplier of process technology was obviously linked to the composition of the enterprise. In the cases where there was no significant foreign participation— projects in the first and third groups according to the previous taxonomy — the procedures followed for this choice were those normally established for the purchase of any input: quality, price, guarantees offered by the seller, previous experience in similar plants, and so on. In the other enterprises, procedures varied according to the type of negotiation which gave rise to the undertaking and to the degree of competitiveness of the supply of technology. Obviously, when technological knowledge was centered in the hands of few foreign groups, the choice of the supplier of know-how depended much more on

the willingness of one of them to participate in an undertaking in Brazil than on the selection criteria of the Brazilian firm. In contrast, when the supply of technology was competitive, there was often not a careful selection of the supplier; rather, the supplier itself tried to steal a march on its international competitors by entering into association with Brazilian groups before others did.

The competitiveness which apparently exists today in the international market for petrochemical technology can, to a large extent, be explained by the pace of technical progress in the sector during the 1950s and 1960s and by the speed at which innovations were diffused throughout the economic system. Evidence of the dynamism of this process of incorporation and diffusion of technology is provided by the Japanese participation in the Brazilian petrochemical industry. Up to the late 1950s, this sector was dominated by American and European enterprises, Japan being a marginal producer at that time. However, in less than twenty years, the Japanese enterprises — through the absorption and development of basically imported technology — managed to become the chief leaders in this market. As can be seen in Table 4.4, in twelve out of the seventeen enterprises in the Northeastern complex, Japanese firms are present, either as investors or as suppliers of engineering services, or as holders of the process; in eleven of these cases, they always supply at least part

of the engineering services. Nevertheless, it should be emphasized that the basic factor which seems to explain the presence of Japanese firms in the Brazilian petrochemical industry is their flexibility in negotiations with the Brazilian government and with local private groups.

The structure of investment and the financing scheme associated with the Northeastern petrochemical complex are presented in Table 4.5. Three points must be stressed. Firstly, the low level of self-financing of this undertaking. Resources resulting from the issue of ordinary shares responded for only 25% of the total investment. This percentage is much lower than the average value for the Brazilian manufacturing sector (about 40% in the period 1966-1970), which itself is quite low in international terms. Secondly, the large share of fiscal incentives and BNDE financing, which accounted for 45% of total investment in the sector. Thirdly, the relatively small participation of international credits (24%). These credits aimed basically at financing equipment imports, and were usually provided by financial institutions from the countries that supplied the equipment.

The small share of foreign financing offered to the petrochemical industry contrasts with that provided other sectors where government enterprises have a marked participation, such as the steel industry. Table 4.6 shows the financing scheme for investments planned for the

period 1972-1976 for the expansion of the three State steelmills (CSN, USIMINAS and COSIPA). These investments aimed at enlarging the productive capacity of these enterprises, raising their joint production from 3.2 million tons/year in 1971 to 7.2 in 1976.

The difference in the financing schemes related to the steel and petrochemical industries is not merely quantitative, but also reflects two distinct criteria. In the case of steel, the contracting of international credits was arranged independent of the technical characteristics of each projects — for instance, before decisions were made as to the kind of equipment to be used or as to who would provide the basic engineering, it was already known that about 600 million dollars of foreign financing would be available for the projects. In the case of petrochemicals, the amount of foreign financing was determined according to the capital goods imports required for each project, which, in turn, resulted from prior decisions concerning the production process to be used and on the suppliers of basic engineering.

Insofar as the option for foreign resources precedes other decisions relative to the technical characteristics of the project, the former conditions the latter. The main consequence is an unnecessary rise in expenditures on imported equipment and foreign engineering services. In fact, whereas 75% of equipment expenditures

are on imports in the steel industry, the corresponding share for petrochemicals is 50%.

The possibility of following the second alternative in the case of petrochemicals reflects a decision to allocate BNDE and SUDENE fiscal incentive resources to these investments; this allowed expenditures in the country to be financed by local sources. Otherwise, it would have been necessary to resort to the preceding scheme, where the main variable explaining the volume of imports associated with each project was international credit, rather than restrictions of a technological nature and/or ensuing from market dimensions.

4.2 The Recent Experience

As previously suggested, the experiment with joint ventures in the petrochemical industry would later be seen as a potential pattern to be followed by other sectors. In fact, this experiment and the development strategy it reflected were emphasized by the II National Development Plan as the main characteristics of the so-called "Brazilian model of industrial capitalism". This Plan stated that "the basic idea of this model is, on the one hand, to facilitate the development of industries through the private sector, and, on the other hand, to ensure an important role for national enterprises in the modern and powerful industrial structure which is desired" (p. 37). Therefore, the Plan

proposed "government support through BNDE, Petroquisa and other official finance organizations, to projects of large national enterprises, or to the participation of national enterprises in large-scale undertakings, including basic sectors and/or spearhead technology" (p. 51). This was to be pursued through "financial and fiscal support to assist Brazilian firms associating themselves in joint ventures projects which may go as far as putting up the money to enable the Brazilian partner to take up his share in the undertaking" (p. 51). This strategy was to be followed especially in relation to the capital goods industry, the petrochemical sector and the production of basic raw materials, which were given priority by the II National Development Plan.

As a result of these guidelines, the National Economic Development Bank (Banco Nacional de Desenvolvimento Econômico — BNDE) set up three subsidiaries — Embramec, Fibase and Ibrasa — to implement such a policy in relation to the capital goods industry, the producers of raw materials, and other industrial sectors, respectively. These subsidiaries offered credit on very favorable terms, as well as participating as minority shareholders in firms operating in these sectors.

It is worth noting that in this case, contrary to the petrochemical experiment, the State was expected to

have a relatively passive role. In fact, BNDE's contribution was to be restricted to supplying funds in order to strengthen the financial capacity of Brazilian firms. Whenever possible, its participation in the firm's equity capital should be in the form of preferential shares, with the Bank subscribing to voting shares when its support was needed to ensure the control of a local partner in a joint venture with foreign capital. BNDE was not expected to intervene in the choice of technology to be used by the enterprise or in its management.

As a result of this policy, the minority participation of Embramec, Fibase and Ibrasa amounted to US\$ 1 150 million at the end of 1979. The joint ventures in which these State financial institutions were brought together with foreign capital are presented in Appendix C. These joint ventures account for 16% of the book value of voting shares and 31% of the preferential shares subscribed to by these subsidiaries (Table 4.7).

Although the policy relative to the capital goods industry and the producers of raw materials was formulated within the same political and ideological framework on which the previous petrochemical policy rested, it implied smaller and less direct involvement of the State in investment and management decisions. This was due to the divergent characteristics of the petrochemical and of the capital goods and raw materials undertakings. In the former

case, a whole investment package was being implemented to create a new industrial sector characterized by close links among the several enterprises; in the latter case, the enterprises supported by the government agencies were dispersed and the investments merely supported the expansion of the existing industries. Furthermore, not only did foreign capital seem less prone to make investments in the country, but also there existed large domestic firms which could carry out such undertakings.

A different policy concerning the relationship between local and foreign capital would be followed in the late 1970s with regard to the computer and the telecommunications equipment industries. The policy designed to promote the emergence of a micro and minicomputer industry in the country established that the entry into this market would be restricted to local firms and to joint ventures under the control of local capital. Furthermore, although the future producers could use foreign technology, a commitment should be made as to the effective transfer of the know-how to the local partner. From this point of view, the government policy was similar to that followed in the case of the petrochemical and capital goods and raw materials industries, as it aimed at ensuring the position of the local capital. In fact, it went further than the previous policy by requiring the

effective absorption of the foreign technology. Contrary to the previous experience, however, the State would not have a major direct participation in the equity capital of the new enterprises. Joint ventures, if they were to be undertaken, would be restricted to local and foreign capital.

As it happened, five enterprises were chosen by the Brazilian government to manufacture micro and minicomputers in the country. All of them were fully controlled by local capital (and, in some cases, by local banking capital); in only one case did government agencies have a share in the equity capital (56%), and also in only one case did a foreign producer hold stock in the enterprise (a 3% share of Ferranti, UK). The foreign suppliers of technology to these undertakings were the British Ferranti, Sycor, the German Nixdorf, the French Logabax, the Japanese Fujitsu and Zilog.

Notably, none of the large computer firms are present either as investors or as suppliers of technology. As a result of their unwillingness to accept the policy guidelines of the Brazilian government and to enter into joint ventures with local capital, they were excluded from the Brazilian micro and minicomputer market, which is, in fact, the most dynamic segment of the Brazilian computer market. At the moment, a debate is in progress on the presence of these large producers

(IBM and Burroughs) in the medium-sized computer market. Their entry has been opposed by the minicomputer producers, who see their presence as a bridgehead for a future encroachment on their specific market. It is worth observing that, to date, the plans of the large producers concerning their activities in Brazil do not include engaging in joint ventures with local capital.

There was a similar experiment in the telecommunications equipment industry. In the context of their plans to substitute temporal central processing units for the conventional units, government telecommunications agencies established that the new equipment would only be bought from Brazilian firms in which the majority share was controlled by local capital. As a result, ITT, Ericsson and NEC — which had been producing conventional central processing units in Brazil for many years — entered, as minority shareholders, into joint ventures with local partners (Pereira Lopes, Monteiro Aranha and Docas de Santos, respectively), aiming at the production of the new equipment.

Finally, a special reference should be made to the joint ventures entered into by Vale do Rio Doce, the State mining firm. Contrary to many of the State enterprises, Vale do Rio Doce has been highly profitable. Hence, it has pursued an expansionary policy which has led not only to its increasing participation in the mining sector, but also to a diversification of its

activities. Nevertheless, this process of diversification has been basically restricted to undertakings whose production is directed, totally or partially, to external markets.

The growth policy of Vale do Rio Doce has brought it into association with foreign capital. The enterprises resulting from this association are listed in Appendix B. These joint ventures are of a different nature, however, than those mentioned above. In those cases, the joint ventures aimed at ensuring the participation of local private capital in undertakings which it was incapable of carrying out alone, while simultaneously avoiding excessive State intervention in the economy. In the case of Vale do Rio Doce, joint ventures are mainly aimed at facilitating access to the external market, as well as at reducing the burden on the State enterprise of financing large investment projects. As a result, these joint ventures have frequently involved export agreements with the foreign partners.

Up to this point we have examined the experience of joint ventures with state participation. We should also look at the cases of association between local and foreign private capital. While these are fairly isolated experiences and could not actually be viewed as a business expansion strategy (as we have shown, the association of foreign with local partners is more a result of state actions and economic policy than of any strategy on the part of foreign investors), there have been joint ventures between entirely private partners. However there is no available information on the exact importance and extent of this particular form of joint ventures.

In order to gather some empirical evidence on this question, an evaluation was carried out of the importance of joint ventures among the largest companies. The shareholder control of the largest 200 non-financial companies was examined. Among them are 82 state-controlled firms; 79 are controlled by local private capital and 39 by foreign capital. Twenty five cases of significant presence of both national and foreign capital were encountered. Among them, four could not really be classified as joint ventures: in one, the local partner has a small share of stocks and no capacity for influencing the company's decision-making process; in two cases, local participation is extremely dispersed among the Brazilian shareholders; and the fourth case is that of a company whose control was assumed by a local managerial group, leaving the original controlling group as a simple minority shareholder.

Thus we can identify 21 private joint ventures between national and foreign capital among the 200 largest non-financial companies. Of the 21, six are controlled by the foreign shareholder and, therefore, included among the 39 foreign firms mentioned above. Six are controlled by state-owned companies (the state is also a minority shareholder in a seventh firm), and the remaining nine joint ventures are controlled by local private capital.

From a sectorial point of view, all of the joint ventures fall into either the mining industry (five) or the manufacturing sector (sixteen). Within manufacturing, the Metallic and Machinery segment is predominant: four in Metallurgy, three in Electrical and Communications Equipment and two in Transport Equip-

ment. The rest come under Chemicals (three), Non-metallic Mineral Products (two), Cellulose (one) and Food Products (one).

4.3 - Overseas Loans Taken by Foreign Subsidiaries

There is evidence that foreign firms operating in Brazil have made intensive use of foreign loans to finance the operation and expansion of their activities in the country. In this respect, it is possible to identify the substitution of equity capital by loan capital, implicit in this contracting of overseas credits, as a form of investment which, while not entirely new, has recently acquired increasing importance.

There is little information available on this tendency. It is only known that in 1979, 32% of foreign currency loans taken by non-financial firms under the provisions of Law Nº 4131 were the responsibility of companies at least partially controlled by foreign capital. The amount involved (US\$ 8.6 billion) thus represented more than half of the stock of foreign investments registered at the Central Bank in 1979. In addition, this figure implies that at least 17% of Brazil's foreign debt for that year was associated with foreign companies. Information is also scarce on the debt service payments made by these companies. Data from a sampling of 115 foreign firms in 1974 reveals that 40% of the resources they transferred abroad correspond to profit remittances, 47% to loan amortization and interest payments, 9% to expenses related to transfer of technology contracts, and 4% to other remittances. Another estimate based on the 32% figure suggests that the foreign companies' debt service was around US\$ 2 billion in 1979, equivalent to

2.7 times the total of that year's remittances of profits and dividends.

The foreign indebtedness of these subsidiaries presents certain ambiguous characteristics that distinguish it from that of local firms. In a certain sense, a foreign subsidiary's overseas credit operations are only distinguishable from a parent-company application of equity capital in the subsidiary in terms of their legal format. The resemblance between the two operations is clear in the case of contracts between the parent-company and the subsidiary: in both cases it amounts to no more than a simple transfer of resources within the multinational corporation (which is a single administrative unit and a pool for the generation and appropriation of profits which includes the parent office and all of its subsidiaries). Yet even the loans taken by a subsidiary from the international financial system are comparable to direct investment operations in that they can be seen as substituting loans that the parent company could have taken out itself to transfer internally to the subsidiary.

It is worth exploring this suggestion in more detail here, in conjunction with an analysis of the multinational corporation's decision to finance its subsidiaries' operations and expansion. This financing can be carried out in five different ways: 1) retention of profits generated by the subsidiary; 2) investment in the form of equity capital; 3) loans made by the parent company to the subsidiary; 4) loans taken by the subsidiary from the international financial system; 5) loans taken by the subsidiary from the financial system of

the host country. The first three options involve only a decision on the allocation of resources within the multinational corporation. Resources transferred under the second or third options, it should be noted, may have originated either in profits retained or in credits raised by the parent company. Thus, behind the external forms of channelling funds to the subsidiary are the forms by which the corporation as a whole mobilizes resources: its own internal accumulation and the use of third-party resources. As for the latter, there is a limit to the multinational's overall indebtedness capacity, which means that the subsidiary's indebtedness reduces the parent company's capacity, and vice-versa. However in the specific case of the subsidiary, the international financial system's country-risk assessment tends to impose specific indebtedness limits and higher interest rates. In this context, the variables influencing a multinational corporation's decision on how to finance its subsidiary are tax rates on profits in the home and host countries, financial and exchange costs related to the transfer of funds and the cost of financial resources for the parent company and for the subsidiary.

Economic theory suggests a possible decision-making criterion for the multinational corporation: the maximization of profits in the firm as a whole. It is true that in contrast to traditional maximization estimates, here we have two profit-generating centers and, therefore, the possibility of reallocating resources among the firm's constituent parts. Yet the allocation of profits themselves can be determined on the basis of the maximization exercise.

The problem with this approach, however, is that it ignores two important aspects relative to the decision on appropriation of profits: possible institutional restrictions to the firm's internal resource flow, and its investment plans for the coming years. These questions are relevant to the decision on the form by which the subsidiary is to be financed in that the form may affect the possibility of future transfers. Indeed, the multinational corporation's degree of maneuverability regarding the channels through which the subsidiaries' remittances will be transferred (remittance of profits, repayment of loans plus interest, expenses related to the transfer of technology) depends on decisions made in the past, especially those regarding the subsidiary's liability structure. It is not that the multinational corporation will seek to maximize the subsidiary's transfers to the home office. We can even assume that the multinational is not concerned with the location of its investments. Yet it will seek to be prepared to transfer the subsidiary's available resources if and when investment opportunities diminish in the host country. Whereby we can assume that concern with the future transferability of resources is a criterion in the selection of forms by which to finance the subsidiary.

The most common interpretation of the revealed preference for credit operations on the part of multinational corporations in recent years emphasizes Brazilian tax legislation regarding profit remittances and interest payments. Profits remitted abroad are subject to a 25% tax up to a limit of 12% of registered capital, and to a supplementary tax when in excess of that limit. For interest payments on foreign loans, also subject to

the same 25% tax rate, a pecuniary benefit was established in the mid-1970s, to be received by the loan taker as percentage of taxes collected. This incentive, whose magnitude has varied over time, has meant a succession of real tax rates on interest payments of 3.75%, 12.5%, 1.25% and 15%. These benefits are part of a policy of reducing the cost of foreign resources and stimulating the contracting of foreign loans. They are an incentive for local firms to substitute domestic credit sources, and for multinational firms to substitute foreign loans for direct investment.

A recent IPEA study of the impact of this tax legislation, however, concludes that the elimination of this bias would have little effect on the multinational corporations' financial policies. This does not imply that fiscal aspects are irrelevant to the preference shown for credit operations. Yet the most relevant aspects of fiscal policy behind this behaviour have more to do with traits common to any tax legislation than with the specific aspects of the Brazilian case--the fact that interest payments are accounted as costs in calculating the subsidiary's profits, and that remittances corresponding to repayment of the principal are not subject to taxation.

It should be emphasized that there are other factors--perhaps of greater relevance than the above-mentioned tax incentives--capable of explaining the multinationals' preference for loans. We refer particularly to the fact that credit operations between the parent company and the subsidiary confer greater flexibility in the repatriation of funds and involve less risk. First of all because the contractual obligation assures a flow of resources

out of the country, independent of the subsidiary's operational performance. And secondly, because the remittance of profits and the return of risk capital are more subject to government controls than are loan and interest payments. Indeed, Brazilian legislation itself corroborates this insight of the multinational corporation by allowing (Law N^o 4131) for the possibility of limiting profit remittances and prohibiting the return of capital in the case of serious balance-of-payments imbalances, while explicitly assuring--even under such circumstances-- fulfillment of the foreign debt service. There is no point however in ascribing to this legal mechanism, the explanation for the policy adopted by the foreign firms. Indeed, it would be ingenuous to imagine that a change in the law would affect their behaviour. The point is that the foreign companies know that it is politically easier for local governments to put the clamps on profit remittances and capital returns than on debt service payments. The former would be a sovereign decision of a national state counterposed to a specific group of foreign investors; the latter, in one way or another, would involve a unilateral declaration of moratorium to which the international financial community could not remain indifferent.

TABLE 4.1
NORTHEASTERN PETROCHEMICAL COMPLEX
DISTRIBUTION OF INVESTMENTS BY PROJECT
SIZE AND CONTROL OF EQUITY CAPITAL

	<u>A</u>	<u>B</u>	<u>C</u>	<u>D</u>
	Total Investment (%)	Number of Enterprises ^a	Average Investment per Enterprise (Index)	Control of Equity Capital
1st Group	55,4	3	277	PETROQUISA
2nd Group	39,8	9	66	Average participation of 1/3 for each type of partner
3rd Group	4,8	3	24	Local Capital
TOTAL	100,0	15	100	

Sources: PETROQUISA and BNDE (National Economic Development Bank).

(a) The Central Units for Utilities and Raw Materials of the Northeastern complex were considered as a single undertaking. As explained in the text, one of the projects does not fit any of the three groups.

TABLE 4.2
NORTHEASTERN PETROCHEMICAL COMPLEX
PERCENTAGE DISTRIBUTION OF THE VOTING
CAPITAL STOCK ACCORDING TO THE SIZE
OF THE INVESTMENT^a

	1st Group	2nd Group	3rd Group	Total
PETROQUISA	70	32	31	54
Local capital	23	36	57	30
Foreign firms	7	32	12	16
TOTAL	100	100	100	100

(a) The project in which PETROQUISA is associated with a foreign firm without the participation of other local partners, not taken into account in Table 4.1, is included in the 3rd Group.

TABLE 4.3
NORTHEASTERN PETROCHEMICAL COMPLEX
NEGOTIATION PROCESS FOR THE FORMATION
OF ENTERPRISES, ACCORDING TO TYPE ^(a)

<u>Type of Enterprise</u>	<u>Type of Negotiation</u>			<u>Total</u>
	<u>A</u>	<u>B</u>	<u>C</u>	
1st Group	1	-	2	3
2nd Group	4	3	2	9
3rd Group	3	-	1	4
TOTAL	8	3	5	16

(a) The Central Units for Utilities and Raw Materials of the Northeastern complex were considered as a single undertaking. The project in which PETROQUISA is associated with a foreign firm without the participation of other local partners was included in the 3rd Group.

TABLE 4.4

NORTHEASTERN PETROCHEMICAL COMPLEX
COUNTRY OF ORIGIN OF THE FOREIGN
PARTNER AND OF THE TECHNOLOGY USED

<u>Enterprise</u>	<u>Foreign Partner</u>	<u>% of the Capital</u>	<u>Foreign Engineering</u>	<u>Process Holder</u>
A	-	-	United Kingdom Japan	United Kingdom Japan USA
B	-	-	Japan USA	Japan Canada
C	-	-	Holland USA	Holland
D	Japan	33	Japan	Japan
E	USA	3	France	France
F	-	-	Japan United Kingdom	Japan United Kingdom
G	USA	30	USA Japan	USA Japan
H	Holland	20	Holland Japan	Holland
I	USA	40	USA Holland	USA
J	W. Germany	33	W. Germany	W. Germany
K	Several ^(a)	13	Japan	Japan
L	Several ^(a)	13	USA Japan	USA Japan
M	Japan	30	Japan	Japan
N	Japan	33	Japan	Japan
O	Japan	33	USA	USA
P	USA	33	USA	USA
Q	Japan	30	Japan USA	Japan France USA

(a) Indirect participation.

TABLE 4.5

NORTHEASTERN PETROCHEMICAL COMPLEX
TOTAL INVESTMENT: USES AND SOURCES OF FUNDS

<u>Use</u>	<u>US\$ Million</u>	<u>Percentage</u>	
Equipment	417.2	35.7	100.0
Domestic	196.9	16.9	47.2
Imported	200.3	18.8	52.8
Engineering and Know-how	117.6	10.1	100.0
Domestic	46.3	4.0	39.4
Foreign	71.3	6.1	60.6
Other expenses (Construction, facilities, financial costs, etc)	634.7	54.2	
TOTAL	1,169.5	100.0	
<u>Source</u>			
Own funds			
Ordinary shares	288.3	24.7	
Preferred shares (SUDENE's fiscal incentives)	199.8	17.1	
BNDE - Financing contracts	336.9	28.8	
Other sources in Brazil	63.3	5.4	
Foreign credits	281.2	24.0	
TOTAL	1,169.5	100.0	

Source: BNDE and PETROQUISA.

TABLE 4.6

SOURCES OF FUNDS FOR INVESTMENTS IN THE
STEEL INDUSTRY IN THE PERIOD 1972-1976^(a)

	<u>US\$</u> <u>Million</u>	<u>Percentage</u>
Own Funds	542	42
Domestic Financing (BNDE)	121	10
Foreign Financing (IDB, IBRD and bilateral credits)	620	48
TOTAL	1,283	100

Source: BNDE.

(a) Enterprises: USIMINAS, CSN and COSIPA.

TABLE 4.7

PERCENTAGE OF THE BOOK VALUE OF EMBRAMEC'S,
FIBASE'S AND IBRASA'S PARTICIPATION IN
JOINT VENTURES WITH FOREIGN CAPITAL
IN DECEMBER 1979

	<u>Embramec</u>	<u>Fibase</u>	<u>Ibrasa</u>	<u>Total</u>
Voting Shares	58.0	13.4	44.8	15.9
Preferential Shares	6.0	40.9	30.4	30.7
TOTAL	8.6	26.8	33.1	24.7

Source: Relatório do BNDE.

5. SOME CONCLUDING REMARKS

The drive of the capitalist economies towards the external market can be seen as the result of the dynamics of oligopolistic industries with a growth potential far superior to the growth rate of their domestic markets. To firms in such industries, the export of commodities arises as an alternative to the diversification of their activities.¹

The export of capital by the firm - by which we mean the undertaking of investment abroad and which does not necessarily imply export of capital by the economy as a whole - arises from this same process which induces the export of commodities. It is true that, insofar as excess of internal accumulation is concerned, one could suppose that this surplus would be continuously absorbed within the country in which capital is accumulated by building up productive capacity destined for the supply of external markets. The pressure to substitute the export of capital for the export of commodities, however, may arise from the process of oligopolistic competition.

It is necessary to distinguish here between the investment directed to the production of raw materials and that directed to the production of manufactured goods. The former is sometimes undertaken for quite a simple reason: it is the only way to assure

1 What is assumed here is that capital surplus may be restricted to individual industries. This situation may occur either in a context of an excess of aggregate demand or in circumstances of insufficient aggregate demand, provided only that the complete mobility of capital between industries is ruled out. Therefore, the drive of capitalist economies to export does not depend on particular conditions of aggregate demand, nor on an overall surplus of capital.

the supply of inputs required by the manufacturing industries, since some developing countries lack the necessary capital, technology and entrepreneurship. In the general case, however, the investment represents a move towards vertical integration by an industrial consumer of a specific raw material, which could otherwise be obtained in the international market, and hence plays an important role in the process of competition in oligopolistic industries.

As to the manufactured goods, the process of oligopolistic competition, which accounts for the decision to substitute the investment abroad for the export of manufactured goods, can take place either in regard to specific national markets or on a worldwide scale.

The protected national market - in particular, the transformation of a non-protected market into a protected one through the imposition of higher tariffs - constitutes the most obvious case in which the access to an external market requires investment abroad. In fact, if such a market is chosen by a foreign firm as an outlet for its growth potential, it has to be tackled from inside.² However, the competition between firms

2 The importance of tariff barriers and other kind of import controls as an inducement to direct investment has been emphasized by many of the recent theoretical and empirical studies on the subject. See, for example, A.E. Safarian, Foreign Ownership in Industry, 2nd edition, University of Toronto Press, 1973; D.T. Brash, American Investment in Australian Industry, Cambridge, Mass.: Harvard University Press, 1970; M. Wilkins, The Maturing of Multinational Enterprise, Cambridge, Mass.: Harvard University Press, 1974; R.E. Caves, "International Corporations: the Industrial Economics Foreign Investment", Economica, vol. 38 (1971) pp. 1-27; T.D. Horst, "The Industrial Composition of U.S. Exports and Subsidiary Sales to the Canadian Market," AER, vol. 62 (Mar 1972) pp. 37-45 and C.A. Michalet, "La Multinationalisation des Entreprises Françaises," Revue Economique, vol. 23 (Jul. 1972) pp. 648-68.

oriented towards the external market may induce some of them to invest in a specific national market, even in the absence of any change in the tariff policy, either to gain some advantage because of the proximity of the market, or to counteract a similar move by some of their competitors.³ The existence of such advantages may induce a potential exporter to steal a march on their competitors and actual exporters by investing in the country in the first place instead of exporting to it.

Since the oligopolistic national industries of different countries become increasingly oriented towards the external market, the oligopolistic firms gradually extend the recognition of mutual market dependence beyond national boundaries. Since their horizon becomes world-wide, the balance between them must be maintained on an international scale; the share of the market a firm must preserve refers to the world market. As a result, the move of a multinational firm into a national market may reflect rather a step in the process of world-wide competition than a specific exclusive interest in this particular national market.⁴

3 The role played by oligopolistic competition and by follow-the-leader practices in the process of establishing subsidiaries abroad is emphasized, for example, in F.T. Knickerbocker, Oligopolistic Reaction and the Multinational Enterprise, Cambridge, Mass.: Harvard University Press, 1973 and R. Vernon, "The Location of Economic Activity" in J.D. Dunning editor, Economic Analysis and the Multinational Enterprise, London: Allen & Unwin, 1974.

4 As Knickerbocker, op.cit., suggests, when one or more rivals of a firm take steps in relation to a specific foreign market, they could imperil not only the income the firms is earning in this market but also the entire competitive equilibrium within the industry if these rivals, as a consequence, acquire capabilities beyond those they already had.

A question which arises from the new international character of the oligopolistic industry is the possible effect upon its productive structure. In fact, the flexibility resulting from the spread of its productive activities, its worldwide horizon, the international scale of oligopolistic competition and the diminishing importance of its original market may induce some redefinition of its locational patterns. Changing from a market-oriented locational tradition to locational criteria which emphasizes the reduction of production costs, the international industry would concentrate some productive process in one or more countries and would export from these productive units to the "world-market." Recent experience provides some evidence that such a tendency may be arising.⁵ It seems, however, too early yet to evaluate its effectiveness and importance. This depends basically on the future evolution of national states, in the context of a world economy based on the international oligopolistic industry.

The preceding comments have focused on the overseas expansion of the multinational corporations through direct foreign investments and the establishment of overseas subsidiaries. These considerations should indeed precede an analysis of the so-called

5 See, for example, Vernon, op.cit., G.H. Heleiner, "Manufactured Exports from Less-Developed Countries and Multinational Firms", *EJ*, vol. 83 (Mar. 1973) pp. 21-47 and G. Adam, "Multinational Corporations and World Wide Sourcing" in H. Radice editor, *International Firms and Modern Imperialism*, Penguin Books, 1975. Vernon suggest that this process occurs mainly in industries in which product differentiation no longer plays a role as a basis for oligopoly and scale economies are not important. In this case, firms have to resign themselves to some degree of genuine price competition and the question of costs takes an added importance.

new forms of foreign investment. Since the establishment of subsidiaries is the prevailing mode of foreign expansion, alternative forms of participation in these markets should be viewed as a departure from the predominant pattern.

The new forms of foreign investment can be grouped under two major headings. The first, involving some form of licensing, covers licensing and technical assistance agreements, franchising, management contracts and turn-key and product-in-line operations. The second involves joint-venture operations, in which the equity capital is shared between local and foreign partners.⁶ The first case implies indirect participation of the foreign firm in a specific national market, through participation in the local producer's appropriation of surpluses over production and sales costs. From an accounting perspective, it does not involve participation in the local firm's profits, since payment related to licensing operations are computed in the calculation of its profits. In addition, while it is actually an appropriation of part of the surplus generated by the market in question, its size and existence are determined independently from the size of the surplus (in this respect, it is similar to interest payments on loans taken by a company). The decision to undertake a joint venture, on the other hand, implies acceptance of the sharing of profits generated in a specific market.

⁶ We see no reason to consider international subcontracting as a new form of foreign investment. As for loans made by the home company to a subsidiary, these operations do not essentially differ from equity capital investment (this issue was discussed in section 4.3).

Both forms of foreign investment are undoubtedly preferable to the absence of the market, since they both assure participation in the surpluses it generates. However, one would not expect these forms to be preferable to access to a market through a totally controlled subsidiary, if

the multinational corporation's overseas expansion is a means of absorbing part of the firm's internal accumulation which does not find easy investment opportunities in markets where it is already operating.

In the case of licensing, therefore, it seems reasonable to assume that this form will more often be undertaken by small firms unable to face the risks or the financial burden of investing abroad and by those large firms which incidentally lack the required funds and/or the managerial capacity to establish a subsidiary abroad or opt for directing their funds and managerial services to alternative investment opportunities.⁷ For larger firms, however, acceptance of indirect presence in a specific national market may be explained not only by the desire to appropriate part of the surplus generated there, but also by the need to avoid weakening their world-wide competitiveness and market position through a drop in its position in this national market, vis-a-vis their competitors.

7 See for example T.O. Horst, "Firm and Industry Determinants of the Decision to Invest Abroad: an Empirical Study", *R. Ec. Stat.*, Vol. 54 (Aug. 1972) pp. 258-66 and B. Wolf, "Industrial Diversification and Internationalization: Some Empirical Evidence", *JIE*, Vol. 26 (Dec. 1977) pp. 177-91, for empirical evidence that larger firms are more likely to invest abroad than smaller ones and that average firm size is more strongly associated with both domestic industrial diversification propensity and the propensity for producing abroad than with the export propensity.

The increasing frequency with which multinational corporations have been resorting licensing arrangements thus seems to be a result of: (i) the advance of industrialization processes in Third World countries and the resulting spurt of investment opportunities, which makes it impossible to participate with subsidiaries in all the emerging national industries at once, whether due to lack of investment funds or lack of managerial resources; and (ii) the new world-wide dimensions of oligopolistic competition, which obliges the multinationals to gain a hold on participation, even if indirect, in specific national markets. In any case, it may be suggested that the alternative of participating in certain national markets through licensing arrangements with local producers, while increasingly common, still comes out as second best in the multinational corporations' competition and growth strategies.

As for the setting up of joint ventures, this option is likely to reflect the same factors which lead the multinational firms to establish overseas subsidiaries. It would be necessary, however, to investigate case-by-case the particular circumstances leading to this type of undertaking with local partners. Joint ventures may be chosen when the foreign investment is not seen as an outlet for the firm's internal accumulation and is not designed to supply local markets, but is aimed rather at increasing the firm's control over the production of raw materials and inputs to be used by the investing multinational firm itself. The lack of required funds and/or managerial services, as in the case of licensing,

may also account for some joint ventures. They may otherwise be induced by the multinational's lack of knowledge about a particular country or by its intent to ingratiate itself with the local government or public opinion-especially when it is investing in a country which is not within its home country's sphere of influence. Furthermore, joint ventures may be forced upon the multinational firms by national government.

In any case, except that where it is aimed at assuring the multinational's control over its raw material and input supplies, the joint venture option is also a second-best from the point of view of the firms' expansion strategy. As with licensing, the growing recourse to this form of investment is mainly a result of the new world-wide dimensions of oligopolistic competition, which often demands the presence of a multinational corporation in certain countries, independent of any specific interest in profits to be generated in the respective markets. By the same token, the global scope of operation of these oligopolies favors efforts aimed at the global organization of necessary raw-material and input supplies; and, as was stated above, the production of these inputs in association with other firms is perfectly congruent with this objective. Other equally important factors in the choice of joint ventures over the establishment of fully-controlled subsidiaries include, as was mentioned, the attempt to ingratiate itself with local governments, as well as governmental decisions which tend to induce, or even oblige, the association of foreign firms with local partners, either

public or private. In this context, the recent growth of the number of joint ventures can also be attributed to: (i) the movement of multinational firms towards markets beyond their home country's sphere of influence, which induces the adoption of operational forms that will facilitate both their insertion into unfamiliar environments and their relation with national government with whom close ties have yet to be established; and (ii) changes in specific national government policies which seek to strengthen local participation in the country's economic activities.

In Brazil, there seems to be no doubt that the establishment of joint ventures during the 1970s is above all a result of governmental policy during the period. This is not to say that there have not been many cases of spontaneous association between local and foreign capital, independent of incentives or requirements based on governmental economic policy. Yet these cases seem to be isolated experiences. As a phenomenon worthy of analysis, the establishment of joint ventures has reflected a reactive behaviour of the multinational corporations in response to governmental policy decisions and directives.

APPENDIX A: THE EVOLUTION OF LEGISLATION ON FOREIGN
INVESTMENT IN BRAZIL

1. Legislation until 1962

The free flow of foreign capital and earnings thereon were first restricted by Decree-Law nº 9 025, enacted on 27 February 1946. The official document limited remittances of profits, interest and dividends to 8%, and repatriation of funds to 20%, of the foreign capital duly registered with the Foreign Exchange Department of the Banco do Brasil. Remittances of profits, interest and dividends exceeding the 8% mark were considered capital transfers.

Six months later, these provisions of Decree-Law nº 9 025 were temporarily suspended by the Superintendency of Money and Credit (Superintendência da Moeda e Crédito — SUMOC) Instruction nº 20 "due to the favorable conditions on the exchange market". Although this Instruction was subsequently rescinded in June 1947, the provisions of the Decree-Law did not come back into effect.

In 1952, however, Decree nº 30 363, established on 3 January, reinstated the provisions of Decree-Law nº 9 025 concerning foreign capital. It also stipulated that remittances of earnings over the 8% allowed would be considered repatriation of capital, and canceled the right to make further remittances if those already made surpassed the capital brought in from abroad, plus the 8% relative to profits,

interest and dividends. It should be stressed that this renewal of restrictions coincided with the appearance of serious balance-of-payments problems. In 1951, the deficit was the highest it had been since the end of World War II.

In spite of the worsening balance-of-payments disequilibrium (the deficit in 1952 was twice that observed in 1951), Law nº 1 807, dated 7 January 1953, repealed the articles contained in Decree-Law nº 9 025 having to do with remittances connected to the foreign capital in Brazil.

At the same time, Law nº 1 807 established a new approach toward remittances by setting different exchange rates: (1) a fixed rate for remittances tied to loans/financing and investments held to be of special interest to the domestic economy, up to the respective limits of 8% and 10% of the capital registered, and (2) a flexible rate for remittances beyond the set limits or linked to investments without priority ranking from the national standpoint. Investments of "special interest" were defined as those allocated to the implementation of government approved plans for the economic development of regions characterized by unfavorable climate or backward conditions, or to the establishment and expansion of energy, communications and transportation services.

From then until the enactment of Law nº 4 131 in 1962, all additional legislation was aimed at encouraging the inflow of foreign capital. Outstanding among this legislation were

Instruction n° 113 of 17 January 1955 and Decree n° 42 280 of 16 September 1957, which authorized foreign investors to import machinery and equipment, without exchange cover, for activities considered essential to the domestic economy. This same Decree also regulated foreign borrowing and the financing of imports without exchange cover. It stipulated that the official exchange rate would apply to remittances for the amortization and payment of interest (1) on loans and financing for investments regarded as essential to the country's economic development or national security and (2) on other loans and financing authorized by SUMOC. In the case of the financing of imports without exchange cover, amortization and interest payments could not exceed 8% per year and depended on the balance-of-payments situation. Exchange priority was granted, however, to the importation of equipment and parts for investments considered essential to the country's development process and national security. Finally, currency investments and loans from abroad, together with the associated earnings, enjoyed absolute freedom of movement on the free exchange market. The system introduced by Decree n° 42 280 came to an end with the adoption of Instruction n° 204 of 1961, which unified the exchange market.

2. Laws n°s 4 131 and 4 390

The current regulations governing the utilization of foreign capital and profit remittances stem from Law n° 4 131,

enacted on 3 September 1962. This Law, together with Decree n° 53 451, which guided it, revived restrictions contained in earlier official documents. Thus, with respect to profit remittances and the repatriation of capital, limits were set at 10% and 20%, respectively, of the value of registered investments. Profit remittances over the established ceiling were considered repatriation of capital. It was also specified that should there be a serious balance-of-payments disequilibrium or solid motives for expecting the imminent occurrence of such a situation, SUMOC could prohibit the repatriation of venture capital for a limited period of time. In such a situation, royalty and technical assistance payments could be held to a maximum 5% annual share of the gross income of the firm, though it was explicitly stated that there would be no restrictions on the remittance of amortization and interest payments relative to duly registered loan contracts.

As to the fiscal treatment of profit and dividend remittances, Law n° 4 131 established that these would be subject to withholding at the rates in effect for dividends on unregistered stock certificates, with an additional 20% charge foreseen in the case of firms engaged in activities regarded as less essential to the domestic economy. Moreover, firms were not to be allowed to purchase foreign exchange for remittances on more favorable terms than those applicable to imports in the general category.

Note that Law n° 4 131 controlled, for the first time,

remittances related to technology transfers to Brazil. Contracts had to be registered by way of justifying remittances, and the effectiveness of the technical assistance appraised by SUMOC. The absorption of the imported technology was promoted via tax breaks.

Although placed within a law whose main concern was the restriction of profit remittances, the provisions on technology transfer sought to provide incentives, alongside these restrictions, to the absorption of technology, even creating a differential incentive structure in accord with the essentiality of the industry to which the technology was directed. In this respect, Law n^o 4 131 limited to a maximum of 5%, over a five-year period, corporate income tax deductions for remittances corresponding to the importation of technology, with amounts exceeding the established limits being classified as distributed profits. The responsibility for setting the deductions allowed the various industries fell to the Ministry of Finance, which used Directive n^o 436 of 30 December 1958 for establishing the level of these deductions.

While technically a mere regulatory statute under Law n^o 4 131, Decree n^o 53 451 introduced important modifications with respect to the control of technology transfer. It not only limited to five years the period during which contracts could legally generate remittances, but also restricted the amount of these remittances to 2% of the manufacturing cost or 2% of the gross income from the sale of the product.

Law n° 4 131 was altered by Law n° 4 390 of 11 September 1964, which is still in effect. On the one hand, the new text removed the limits on the repatriation of capital and on profit remittances stipulated in the previous document. At the same time, however, it limited (to 8% of the registered capital) the remittance of profits derived from foreign capital investments in the production and provision of goods and services for sumptuary consumption, to be defined by Executive decree (since no such decree exists, the limit has never been observed). On the other hand, the new law maintained the emergency restrictions on profit remittances (10%) and technology transfer payments (5%) in case of a serious balance-of-payments disequilibrium, as well as reaffirming the full right to remit loan installments and interest. Finally, by repealing Decree n° 53 451, the new law abolished the limit of 2% of the costs or gross income of a firm for the payment of royalties and technical assistance.

As for the fiscal handling of profit and dividend remittances, Law n° 4 390 introduced a supplementary tax to be levied whenever the average remitted over a three-year period surpasses 12% of registered investments and reinvestments. The shares to be collected are: 40% on profits between 12% and 15% of the registered capital, 50% on profits in the 15-25% bracket, and 60% on those over 25%. The provision of Law n° 4 131 that allowed a 20% surtax in the case of firms engaged in less essential activities was maintained

(a tax never charged, due to these activities not being defined). Note that, according to Article 77 of Law n° 3 470 of 28 September 1958, incorporated in Decree n° 76 186 of 2 September 1975 (Income Tax Regulation), the perceived income — including capital gains on investments in foreign currency — of individuals residing/domiciled, or corporations located, abroad are subject to a withholding tax of 25%. Brazil maintains tax agreements with certain countries, however, that lead to lower percentages (usually on the order of 15%) for the remittance of dividends and/or interest. These countries include West Germany, Austria, Belgium, Denmark, Spain, Finland, France, Japan, Norway, Portugal and Sweden.

3. Legislation on the Transfer of Technology during the 1970s

Under the Industrial Property Code of 1971, technology agreements must be approved by INPI; when payments abroad are involved, the agreement must also be registered with the Central Bank. The registration by INPI is required to remit technology payments abroad, to deduct such payments against income tax, and to prove the working of patents and trademarks registered in Brazil in order to avoid forfeiture or compulsory licensing.

Although the limit of five years for technology contracts established by Decree n° 53 451 was abolished by Decree n° 55 762, INPI's practice during the early 1970s continued to

be to approve an agreement for a maximum of five years, which might then be renewed for another maximum of five years if justified by the applicant, but usually at a lower rate of payment (these are also the time limits for tax deductions related to technology expenditures accepted by the Ministry of Finance). As to payments, INPI has considered each case per se, observing, however, a maximum scale of payment based on the tax-deduction ceilings established by Directive n° 436 of the Ministry of Finance, which varies for different sectors, ranging from 1% to 5%. In the case of trademark licenses, the payment ceiling is 1% of the net sales value. Furthermore, INPI will not approve technology contracts that contain restrictions on the production, marketing or exportation of products, or on the importation of intermediate inputs required for their manufacture (export restrictions are allowed, however, for areas where the licensor has exclusive license agreements for industrial property). Nor will the Institute accept agreements requiring the licensee to use only the trademark of the licensor. Finally, INPI will not accept confidentiality clauses beyond the terms of the agreement, or permit the licensor to control the sales price of the product.

In September 1975, INPI announced its Normative Act n° 15, which established new directives for technology contracts. These were classified as licensing agreements for patents or trademarks, agreements for the supply of industrial

technology (intended for the production of consumer goods and materials), agreements for technical-industrial cooperation (intended for the production of capital goods) and specialized technical service agreements. The Institute also revised its practices relative to the duration of licensing contracts, the period of validity being in accord with the protection of the industrial property rights. As to agreements for the supply of technology and technical-industrial cooperation, the duration should be determined by the time needed to enable the recipient to master the technology. Finally, the contractual duration for specialized technical service agreements was to be the time required to render the services or complete the project.

APPENDIX B:

JOINT VENTURES BETWEEN
STATE ENTERPRISES AND FOREIGN CAPITAL

JOINT VENTURE	SECTOR	STATE ENTERPRISE	LOCAL PRIVATE CAPITAL	FOREIGN CAPITAL
Aracruz Celulose S.A.	Pulp	BNDE - 42% + 22% Fibase - 1% + 43%		Oivind Lorentzen (Bermuda) Brascan, (Canada) Bristh American Tobacco (U.K.) Argentinean Capital
Sibra - Eletrosiderúrgica Brasileira	Metallurgy	BNDE - 35% + 25%	Empreendimentos da Bahia	
Usinas Siderúrgicas de Minas Gerais - Usiminas	Metallurgy	BNDE - 28% + 46%		Nippon Steel (Japan) - 19%
Usiminas Mecânica - Usimec	Machinery	BNDE - 57% + 59% Usiminas - 21%		Nippon Steel (Japan) - 5% Ferrostal, (W. Germany) - 10%
Madef S.A. Ind. e Comércio	Machinery	Embramec - 28% + 23%		B.D.C. International (U.K.) - 42%
Máquinas Piratininga S.A.	Machinery	Embramec - 14% + 47%	Unibanco	Davy International (U.K.) - 20%
Apolo Mecânica e Estruturas	Metallurgy	Embramec - 0% + 91%	Peixoto de Castro - 60%	Yutaka Steel Industries (Japan) C. Itoh (Japan)
Howa do Brasil Ind. Mecânica	Machinery	Embramec - 3% + 40%	Abran (control)	Howa Machinery (Japan) Rockwell (U.S.A.)
Centrex S.A. Fixações Mecânicas	Machinery	Embramec - 0% + 100%		F. Pratt Engineering - 30% B.O.C. International - 25% (ind.)
Radio Frigor Importadora	Machinery	Embramec - 0% + 100%	Frigoria - 35%	Bitzer Kuehlmaschinenbau (W. Germany) - 17%
Renk Zanini S.A. Equip. Indl.	Machinery	Embramec - 14% + 0%	Zanini - 51% CCN - 10%	Zahnradwerk Rank (W. Germany) - 25%
AKZ Turbinas	Machinery	Embramec - 16% + 0%	Zanini - 54%	AEG Telefunken (W. Germany) - 30%
Digicon S.A. Controle Eletrônico	Electrical Equip.	Embramec - 0% + 52%	Investel Repres. e Partic.	Gavazzi Spa (Italy) Nordic Trading Investment Inc. (Panamá)
Randon S.A. Veículos e Implementos	Machinery	Embramec - 0% + 28%	Randon (control)	Kockums Mecaniska Verkstads (Sweden)
Alje Máquinas Operatrizes S.A.	Machinery	Embramec - 5% + 48%	Banco Bozano Simonsen de Inv.	Karl Stolzer Maschinenfabrik (W. Germany)
Alagoas Matérias-Primas e Farmacêuticas	Chemical	Fibase - 24% + 55%		F. Hoffman - La Roche & Co. (Surtzerland)
Aços do Brasil S.A. Ind. e Com.	Metallurgy	Fibase - 0 + 57%		Bundy Corp. (USA)
Braskraft S.A. Florestal e Indl.	Pulp	Fibase - 0 + 58%	Bueno Vidigal	Continental Group Inc. (USA)
Henrique Lage Salineira do Nordeste S.A.	Mining	Fibase - 0 + 60%		Oronzio de Nora Impianti Elettrochimici (Italy)
Polimetal Ind. e Com. S.A.	Metallurgy	Fibase - 66% + 0	Macedo Soares	Mannesmann A. G. (W. Germany)
Cia. de Celulose da Bahia	Pulp	Fibase - 75% + 85%		J.G.C. Corp. (Japan)
Cia. Internacional Fiduciária	Chemicals	Fibase - 0 + 78%	Rocha Miranda (control)	Royal Insurance & Co. (U.K.)
Cia. Nacional de Defensivos Agrícolas	Chemicals	Fibase - 27% + 0	Noronha Brasil Brasilinvest	Rhône - Pontenc S.A. (France)
Cia. Paraibuna de Metais	Metallurgy	Fibase - 8% + 100%	Torquato Com. e Ind. - 60%	Union Minière (Belgica) - 15% Societe Generale de Belgique (Belgie) - 15% Patiño N. V. (Netherland)
Cia. Brasileira de Antibióticos	Chemicals	Fibase - 14% + 100%	Osmar Xanel - 35%	Cia. Indl. Produtora de Antibióticos (Portugal) - 35%
Eucatex S.A. Ind. e Com.	Wood products	Ibrasa - 0 + 72%	Maluf	Brascan Ltd. (Canada)
Minasplac S.A. Ind. e Reflorestamento		Ibrasa - 6% + 21%		Brazilian Equity Holding (Luxemburg) Tesa Tableros de Encalipio S.A. (Panamá)
Ferragens e Laminção Brasil S.A.	Metallurgy	Ibrasa - 0 + 22%	Forsa (control)	Fallek Products Co. Inc. (USA) Walter Kidde & Co. Inc. (USA)
Sifco do Brasil S.A. Ind. Metalúrgicas	Metallurgy	Ibrasa - 31% + 22%	Smith Vasconcellos (control)	Sifco Industries Inc. (USA)
Alpina do Brasil S.A. Maq. e Imp. Agric	Machinery	Ibrasa - 0 + 47%		Alpina S.N.C. (Italy)
Bicicletas Caloi S.A.	Transp. equip.	Ibrasa - 0 + 86%		Atelias de la Motobecano S.A. (France) - 21%
Hatsuta Suzuki Indl.	Machinery	Ibrasa - 43% + 53%		Hatsuta Industrial Co. Ltd. (Japan)
Metalac S.A. Ind. e Com.	Metallurgy	Ibrasa - 0 + 87%	Julio Nicks	Stand Press Stell Co. (USA)
Swat Ind. de Abrasivos S.A.	Machinery	Ibrasa - 0 + 95%	Banco Econômico de Investimentos Abraham Furmahovich	Cia. Financiere de Paris et des Pays - B. (France)
Bergamo S.A. Madeira Cia. Indl.	Furniture	Ibrasa - 6% + 64%		Brazilian Equity Holding (Luxemburg)
Ceara Com. e Ind. S.A	Commerce	Ibrasa - 0 + 30%	Geopar (control)	Sumitomo Shoji (Japan)
Vulcabras S.A. Ind. e Com.	Clothing	Ibrasa - 0 + 20%		Banque de l' Indochine (France)
Cia. Brasileira de Filmes Sukura		Ibrasa - 50% + 62%	Renato Monteiro (4%)	Konishiroku Photo Industry (Japan) - 30% Okura & Co. Ltd. (Japan)
Petroquímica União S.A	Chemicals	Petroquisa - 68%		Hanna Mining Co. (USA) International Finance Company - 3%

JOINT VENTURE	SECTOR	STATE ENTERPRISE	LOCAL PRIVATE CAPITAL	FOREIGN CAPITAL
Nitriflex S.A. Ind. e Com.	Chemicals	Petroquisa - 70%		Goodyear Tire & Rubber Co. (USA)
Politeno Ind. e Com. S.A.	Chemicals	Petroquisa - 30%	Itap, Suzano, Nordesquímica (40%)	C. Itoh & Co. (Japan) - 10% Sumitomo Chemical (Japan) - 20%
Ciquine - Cia. Petroquímica	Chemicals	Petroquisa Fibase - 0 + 16%	Camargo Corrêa Petroquímica da Bahia	Nissho - Iwai Co. (Japan) - 4%
Pronor - Produtos Orgânicos S.A.	Chemicals	Petroquisa	Petroquímica da Bahia	Friedrich Flick K. G. (W. Germany)
CPC - Cia. Petroquímica de Camaçari	Chemicals	Petroquisa	Camargo Corrêa	Mitsubishi Chemical Industries (Japan) Nissho - Iwai Co. (Japan)
Acrinor - Acrilomitrila do Nordeste	Chemicals	Petroquisa - 41%	Fisiba - 18%	Rhône - Poulenc (France) Techint Engineering (Italy) Mitsubishi Rayon (Japan)
Oxiten S.A. Ind. e Com.	Chemicals	Petroquisa - 23%	Lokab S.A. - 23% Ultra - 23%	Holcon International Inc. (USA) - 10% International Finance Corporation
Polibrasil S.A. Ind. e Com.	Chemicals	Petroquisa - 47%	Pronorte - 6%	Royal Dutch - Shell (U.K.) - 47%
Polialden Petroquímica S.A.	Textiles	Petroquisa	Banco Econômico da Bahia	Mitsubishi Rayon (Japan) Nissho - Iwai Co. Ltd. (Japan)
Nitrocarbono S.A.	Chemicals	Petroquisa	Petroquímica da Bahia - 27% Rocha Miranda - 27%	DSM - N.W. (Netherlands) - 21%
Salgema Ind. Química S.A.	Chemicals	Petroquisa Fibase	Ewaldo Luz	Du Pont (USA)
Polipropileno S.A.	Chemicals	Petroquisa - 30%	Cia. Suzano de Papel - 20% Cevekol - 20%	Imperial Chemical Ind. (U. K.)
Polioléfinas S.A. Ind. e Com.	Chemicals	Petroquisa - 28%	Unipar - 24%	National Distillers & Chemical Corp. (US. - 28%) Hanna Mining Co. (USA) Bancamerica Corp. (USA) - 4%
Isocianetos do Brasil S.A.	Chemicals	Petroquisa - 40%	Petroquímica da Bahia - 20%	International Finance Company - 15%
Petrocoque S.A. Ind. e Com.	Chemicals	Petrobrás - 35%	Universal - 25% Votorantim - 15%	Du Pont (USA) - 40% Alcan Aluminium (Canada)
Colorthene Ind. e Com. Ltda.	Beverages	Polioléfinas (Petroquisa) - 40%		National Distillers & Chemical Corp. (US. - 28%)
Polidina Ind. e Com. Ltda.	Chemicals	Polioléfinas (Petroquisa) - 50%		National Distillers & Chemical Corp. (US. - 28%)
Oxiten Nordeste	Chemicals	Oxiten (Petroquisa) - 100%		International Finance Corporation
Copenor - Cia. Petroquímica do Nordeste	Chemicals	Metanol (Petroquisa)	Paskin	Mitsubishi Gas Chemical (Japan) - 28% Marubeni Corp. (Japan) - 12%
Cia. Ind. Químicas do Nordeste - Ciquine	Chemicals	Ciquini Petroquímica (Petroquisa)	Camargo Corrêa	Mitsubishi Chemical Industries (Japan)
Arafertil - Araxá Fertilizante e Produtos Químicos	Chemicals	Petrofertil (Petrobrás) Fibase/BNDE		Bunge & Born (Argentina)
Minas d'El Rey Dom Pedro S.A.	Mining	Cia. Vale do Rio Doce - 51%	Hugo Gouthier - 19%	Goldfields of South Africa - 30%
Celulose Nipo - Brasileira S.A. - Cenibra	Pulp	Cia. Vale do Rio Doce		Japan Brazil Paper and Pulp Resources Development (Japan)
Valesul Alumínio S.A.	Metallurgy	Cia. Vale do Rio Doce - 70%		Reynolds Metals Co. (USA) Royal - Dutch Shell (U.K.)
Empreendimentos Florestais S.A - Flonibra	Pulp	Cia. Vale do Rio Doce		Japan Brazil Paper and Pulp Resources Development (Japan)
Cia. Nipo-Brasileira de Pelotização	Metallurgy	Cia. Vale do Rio Doce - 51%		Kawasaki Steel Corp. (Japan) Kobe Steel Ltd. (Japan) Nippon Kokan Co. Ltd. (Japan) Nippon Steel Co. Ltd. (Japan) Sumitomo Metal Industries (Japan)
Minas da Serra Geral S.A.	Mining	Cia. Vale do Rio Doce - 51%		Kawasaki Steel Corp. (Japan) - 25% Mitsubishi Mining & Cement (Japan) - 6% Kanematsu - Goshu Ltd. (Japan) Nomura Trading Co. (Japan)
Cia. Hispano - Brasileira de Pelotização	Metallurgy	Cia. Vale do Rio Doce - 51%		Instituto Nacional de Indústria (Spain) 49%
Cia. Italo Brasileira de Pelotização	Metallurgy	Cia. Vale do Rio Doce - 51%		Finaziara Siderurgica SpA - Finsider (Italy)
Ferritas Magnéticas S.A - Ferrmag	Chemicals	Cia. Vale do Rio Doce - 20%	Mascarenhas-Carbone-Roscoe - 40%	Terrox ein - und Verkaufs (W. Germany) - 40%
Alumínio Brasileiro Ltda.	Metallurgy	Cia. Vale do Rio Doce - 51%		Light Metals Smelter Association (Japan) Hitsu Aluminum (Japan) Showa Denko Co. Ltd. (Japan) Nippon Light Metal (Japan)

NOTE: When two percentages are associated with the same shareholder, the first indicates voting shares and the second, preferential shares.

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