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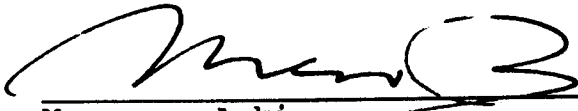External Debt and Foreign Direct Investment:

The Brazilian Experience

A dissertation submitted in partial satisfaction of the

requirements for the degree Doctor of Philosophy

in Economics

by

Maria Carolina da Silva Leme

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The dissertation of Maria Carolina da Silva Leme is
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This dissertation is for Tomas
since we are in all this together

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ABSTRACT OF THE DISSERTATION

External Debt and Foreign Direct Investment:

The Brazilian Experience

by

Maria Carolina da Silva Leme

Doctor of Philosophy in Economics

University of California, Los Angeles, 1993

Professor David K. Levine, Chair

The purpose of this dissertation is to investigate some features of the external debt problem and its consequences on foreign direct investment in Brazil during the last two decades. The dissertation is divided in five parts. The introduction presents an overview of the Brazilian economy during the period of analysis, stressing the issues related to the foreign investment and external debt. The first chapter develops a model that analyzes the information problem associated with international lending between private international banks and a government of a sovereign country. The main implication of the model is that impairing incentives cannot solve the information problem. By

restricting credit banks force the problematic borrower to resort to the IMF that promoted the policies to repay the debt. In the second chapter the IMF adjustment programs are analyzed from the perspective of the foreign investment. The view of the debt problem as temporary, was the basis for the policies adopted by the countries, which not contemplated structural reforms to overcome the negative consequences on growth and development. The reaction of international firms to this situation is analyzed using a "Wait and See" type of argument that, implies a delayed reaction in the investment and disinvestment of those firms. This delayed reaction may aggravate the crisis if the country insists in those short run accommodating policies or help it out of crisis if the country is engaged in economic reforms. In the third chapter the empirical evidence of Brazil is analyzed. Time series analysis separating inflows, reinvestment and outflows of foreign investment were performed, confirming most of the predictions of the "wait and see" argument. Since the Brazilian experience is similar to other countries, a panel data study for 19 countries was also realized and confirmed the general predictions of the model. Finally, all those arguments are summed up in the conclusions.

Introduction

In the last two decades, the Brazilian economy has passed through three stages that resembles Kindelberger's manias, crashes and panics. Between 1970 and 1978, on average output growth was 9%, the investment rate, 22.5% of GDP and the inflation rate, 34%.[1] Meanwhile, the external debt had increased from US$ 6,621 millions in 1971 to US$ 43,511 millions in 1978, as it was financing huge import-substitution investment projects.

During the second period, from 1979 to 1982, the output rate widely fluctuated, reaching 9.25% in 1980 and then falling to -4.38% in 1981; the average rate of expansion was only 3% a year. The rate of investment fell to an average 21% of GDP and the inflation rate averaged 95% per year. The external debt increased to US$ 70,000 millions in 1982 representing 27% of 1982 GNP. This was a period when the government was unable to cope with a changing international situation aggravating macroeconomics problems.

Finally, during the 1983-1990 period, the external debt problem and systematic economic mismanagement led to a semi hyperinflationary and stagnant economy. The output rate, after a decline of 3.4% in 1983, expanded on average 4.7%

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1. For national standards, this rate indicates that inflation was under control.

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until 1990, when it collapsed again, declining 3.7%. The average investment rate fell to 16% of GDP and the inflation rate passed from 100% in 1982 to 1500% in 1990. External debt increased until 1987, when it was US$ 107,524 millions and declined afterward; in 1990 it was US$ 96,546 millions.

In what follows, we analyze the performance of the Brazilian economy in those periods, focusing mainly on the different roles external debt and foreign direct investment played on them.

1. Financing Development: The 1970 to 1978 Period

This period of analysis embodies two distinct phases of the import-substitution strategy of the Brazilian economy. Until 1973, the engine of growth was an import-substitution industrialization of durable consumption goods. Output expansion, since 1968, was no less than 10% a year and investment rate 22% of GDP. Foreign and domestic private capital led the process. After 1974, growth was sustained by an investment plan for domestic production of capital goods and industrialized inputs. This plan was promoted by the government, and support by external debt financing. The investments were to be carried out by public and private,

domestic and foreign, capital. This period consolidates the state participation in productive activities through the state firms. Output expansion averaged 7% and the investment rate was, on average 24% of GDP.

1.1 The Role of Foreign Direct Investment

Although foreign direct investment stock, in Brazil, was low when compared to total output, 5.5% and the annual flow a small fraction of the total investment, 5,7% its importance for the economy, in the early 1970s, should not be underestimated.[2]

The largest fraction of these flows of investment occurred in very dynamic industries, with important externalities and linkages with the rest of the economy (Hirschman, 1967). Moreover, domestic firms did not master the techonology of these industries.

Few sectors received most of the flows: Metallurgy, Electric Equipment, Transportation Equipment, Chemicals and Mechanics answered for about 70% of the industrial flows and 50% of total flows received by the country during this

2. One of the first measures of the military government that took power in Brazil after 1964 was with respect to foreign capital legislation. The law 4390 determines a 25% tax on dividends and profits remittances uo to 12% of the registered capital. Above this percentage a steeply supplemental tax is applied. Capital repatriations are allowed after a twelve years period of permanence in the country. This legislation has remained the same since then.

period. Foreign capital participation in production of those industries was 68% in transportation equipment, 40% in electric-electronic and mechanics and 20% in steel and chemicals.[3]

Those figures reflect the insertion of multinational firms in the industrialization process during this period. Initially, when the import substitution process was centered in automobiles, foreign firms dominated production in this industry. Domestic firms were mainly in production of non durable consumption goods and, only after this process was consolidated, they started producing durable goods and, frequently, in some kind of association with foreign capital. Next, in 1974, when the import-substitution process was for production of capital goods and inputs, foreign and (highly subsidized) domestic firms were supposed to produce capital goods and, in association with the public sector, industrialized inputs under the control of the state holdings.[4] During the rapid industrialization of this period, the flows of foreign capital represented 24% of private investment.

3. These figures are based on a study by Willmore (1987) from corporate income tax data since there are no official statistics. In another study, based on a sample of 12,435 multinational corporations, Goncalves (1987) found that the participation of multinational firms were 69% in transportation equipment, 62% in electric and electronics, 43% in mechanics, 35% in steel and 20% in chemicals.
4. See Villela (1984), for a detailed analysis of the structuring of the Brazilian holdings in oil and chemical, steel, energy and tele-communications.

1.2 The Role of External Debt

During this period, foreign debt permitted the Brazilian economy to accommodate the first oil shock of 1973 and helped finance the high rates of investment of the import-substitution plan promoted by the government. From 1973 to 1978, external debt jumped from US$ 12.5 billions to US$ 43.5 billions, while the non factor current account to GDP ratio increased, on average, from 1.27% in the 1970-1973 period to 3.04% in 1974-1978[5]. This increase roughly corresponds to the increase of the investment rate, from 22% of GDP to 24% in the same period, suggesting that there was no crowding out of external saving on domestic savings.

During this period, 48% of the value of currency loans registered in the Central Bank was for the private sector while 52%, for the public sector. Less aggregate data, from Eurocurrency publicized loans indicates that 68% of public sector loans were for state owned firms, about 35% of the total value of the loans[6]. These loans were allocated among

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5. According to Cardoso and Fishlow (1989) in the period 1970-1973 this ratio was 1.27% and increased to 3.04%.
6. Central Bank's data is aggregated. It is only possible to separate loans to financing institutions (Resolucao 63) and regular loans (Instrucao 4131) for public and private sector. The data from "Borrowing in International Capital Markets" highly underestimates loans to the private sectors during 1973/1978. Actually, it is only reported 21% of the value at Central Bank's register. On the other hand, for public loans this percentage is 80%. For the 1979-1981 period the figures, in both publications, are very similar.

the six holdings - ELETROBRAS (electric power) 32%, PETROBRAS (oil and chemical) 5%, SIDERBRAS (steel) 12%, TELEBRAS (telecommunications) 11%, NUCLEBRAS (nuclear power) 3%, CVRD - Cia Vale do Rio Doce - (mining) 4% and the transportation infrastructure (subways, railroads, roads, airports, and ports) 34%. Transportation infrastructure and electric power, two non tradable sectors, received the largest fraction of the loans, 66% as, they were the bottle-necks inherited from the previous period of growth.

For the domestic private sector, international bank lending was an important source of long term credit that was not supplied by the imperfect domestic capital market[7]. The external flows were channeled directly, for the large firms, and indirectly, through domestic banks[8]. Public banks played an essential role in this process. The BNDE, the leading Brazilian investment bank for economic development, accounted for 13 % of public Eurocurrency publicized loans of the period. Multinational firms were also very active borrowers during this period, but their borrowing was mainly among coligated enterprises[9] to avoid the restrictions on profit remittances and capital repatriations.

7. See Cruz (1984).
8. The Resolucao 63, allows banks to borrow in the international market and to repass the loans to domestic firms.
9. According to the World Bank, foreign firms accounted for 47% of private Eurocurrency publicized loans in the period. But, as private loans were highly underestimated (see footnote 4), this figure may be biased.

2. Prelude to the Debt Crisis: The 1978 to 1982 Period

Signs of macroecomic disarray were already showing up at the beginning of 1979. The government deficits were been financed through external and domestic credit. The inflation rate was reaching 40% a year, double its pre-1973 level. The overvaluation of real exchange rate was 14% with respect to the 1970-1978 period. The trade deficits, that used to be 11% of the current account deficits in the 1970-1978 period, increased to 36%. Finally, the external debt itself that, at the end of 1978, net of international reserves, was six times higher than at the end of 1972.

An attempt to reduce external and domestic imbalances through a more aggressive exchange rate policy and restrictions on domestic credit and external borrowing failed, because of its recessive consequences and was replaced by a supply side policy.[10] The new policy included a pre announced increase in public prices and a major exchange rate devaluation. It also provided credit expansion to the agricultural and energy sectors and a new wage law mandating a shorter adjustment period. These policies boosted inflation further: the annualized rate of 56% in the first semester of 1979, jumped to 100% in the second

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10.Private banks were forbidden to issue bank certificates and a deposit corresponding to 50% of the value of the loan was required in international borrowing (Baer, 1991)

semester of this year. Those measures also fueled an output in 1980, when GDP increased 9%, but aggravated the external problems. Helped by the increase in oil prices the current account deficit increased to US$ 12.4 billions. The deficit was financed by new borrowing and, for the first time, short term debt answered for more than half the increase in total debt.

As seen in table 1, there is a reversion of factors causing current account deficits with respect to the previous period: the trade deficit that responded for the largest part of the current account deficit, became a small fraction of it. On the other hand, interest payment, that was already important, increased its participation to 60% of the deficit.

TABLE 1

Trade Deficit and Interest Payments
as Percentage of Current Account Deficits

Periods	Trade Deficit	Interest Payment
1970/1972	10.78	27.41
1973/1978	36.22	29.42
1979/1982	7.13	60.11

Source: Banco Central do Brasil

Brazilian total external debt jumped from US$ 48,1 billions in 1978 to US$ 83.3 billions in 1982. Dornbusch and

Cardoso (1988) computed that the external shocks - the oil price rise, the international interest rates increase, the terms of trade deterioration and the international trade reduction - accounted for 73.8% of the increase in Brazilian foreign debt given the country's strategy to accommodate these shocks through increasing indebtedness in the period. But it was the public sector indebtedness that increased.

From 1979 to 1981, the public sector responded for 80% of currency loans of the period being 49% from state owned firms and 26% from federal, state and local government. This process known as "statization of the external debt", penalized very badly public sector firms since the new borrowing was just to finance debt service. ELETROBRAS and PETROBRAS alone were responsible for 32% of the total value of the loans in this period. None of these state firms produced exportable goods; quite the opposite, PETROBRAS was always a large oil importer. Therefore this strategy was dismantling state enterprises, as it became clear few years later

The foreign exchange constraint that resulted from the adverse external situation forced the economy into a recessive adjustment. The GDP growth rate was negative in 1981 and nil in 1982 and the trade deficit turned into a modest, around US$ 1 billion, trade surplus in those years.

Foreign investment was less affected by the recession of these two years: its participation in total investment was, on average 4.6%, while for the whole period it was 4.3% and 5% during 1971 to 1978.

3. Disruptive Passive Policies: The 1983 to 1990 Period

During this period, the only active sector in the economy was the external sector: exports were on average US$ 27.5 billions a year assuring an average US$ 12.3 billions trade surplus. Manufacture exports respond for 55% of this total. This time, however, the external constraint didn't succeed to promote a sustainable expansion for the economy. On the other hand, the government successive attempts to stabilize prices through heterodox programs imposed four wage-price freezes during this period. The last one, under Collor administration, included also a general, temporary, monetary asset freeze, at the Central Bank. Those experiments generate more instability in the economy and capital flights.

3.1 Negotiating the External Debt

At the end of 1982, with deterioration of the international situation, the external debt was US$ 86,3

billions, 30% of it of less than one year of maturity. The Brazilian government had to apply for an IMF extended facility loan and to reschedule the debt with the private creditors.

Negotiation with private banks resulted in four different credit lines: a new loan of US$ 4.4 billions, US$ 4.3 billions for the renegotiation of medium and long term debt due in 1983, US$ 10.4 billions for short term trade credit and US$ 6 billions for the foreign branches of Brazilian official banks. The terms for the new loan and rescheduled debt were: spread of 2.125% over the Libor, flat fee of 1.5%, average maturity of eight years and a grace period of two years and half.

This negotiation implied a harsh credit constraint, since the "new money", the new loan to pay the interests due, was well below the Balance of Payments needs[11]. On the other hand, compared to other debtors, the results of the renegotiation were mix: The "new money" was only smaller than the one of Mexico. Those loans were given only to large debtors, in a clear sign that banks were tough but wanted to avoid major defaults. On the other hand, the spread on the interest rate (and the flat fee) was also among the highest, and higher than those charged before the crisis. As for all

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11. As stressed by Sachs (1989) "new money" packages have covered only fraction of the interest due to the same creditors. So when the country gets the new loan it writes a check to the creditors.

countries with debt payment difficulties, the banks required the monitoring by the IMF.

Agreement with the IMF resulted in a stand by credit of US$ 2.0 billions and a trade surplus of US$ 6.5 billions, in 1983. This surplus was the result of an increase of 9% in exports, a decline of 20% in imports and a decrease of 3.4% in output.

In 1984, Brazil had to restart negotiations with private banks for the debt due in this year. This second renegotiation resulted in US$ 6.4 billions of new money and better terms: the spread went down to 2%, the flat fee to 1% and maturities to nine years. Other countries that had to reschedule their debt in this period also obtained an improvement on the loans but Brazil received the highest amount of "new money". As the trade surplus was around US$ 12.5 billions dollars in 1984 and 1985, there was no need for further negotiation with private banks in this period. Those surpluses resulted from an increase of 25% in exports and a further 10% reduction in imports.

To help accomplish Balance of Payment targets required by the IMF program a very aggressive exchange rate policy was adopted in the period, beginning with a 30% devaluation of the cruzeiro in 1983. With the same purpose, the government modified the external trade regulations: the system of controls on imports became more restrictive. Many

products were forbidden to be imported, mainly, durable consumption goods[12]; a minimum foreign financing, at varying maturities, was required for imports above certain limits[13]. Simultaneously, Central Bank actively exercised its discretionary power in authorizing import licenses. Exports policy was also modified: exporters were exempt from payment of value added and other indirect taxes on exports and of duties on imports goods used in the production for exports.

Despite all those efforts, the relationship with the Fund was not very successful. In the first two years, 1983 and 1984, the Brazilian government had submitted seven letters of intent to the IMF as the targets on fiscal deficit and the inflation rate were not met and had to be modified.[14] Those targets were set on non realistic basis. The Brazilian government evaluated the crisis as temporary and believed that the return to the credit market would be quick. The government had the view that if it was not for the Mexican crises, the debt problem could have been secondary[15], therefore, it tried to avoid been identified as

12. In 1989-1990, when it was abolished, there was more than 2,000 products forbidden to be imported.
13. For capital goods, for instance, this requirement was between three and eight years.
14. Now Mexico's President Salinas, then Finance Minister of de la Madrid administration, commented that Brazil had invented the "indexed intent letter"
15. Apart from the 1979 episode, there was no serious mismanaged of the economy during the 1970s with debt financing overvalued exchange rates, unproductive

a problematic borrower. In the attempted to minimize the problem, the government underestimated the financing requirements to met the debt service and accepted the nominal targets on public deficits of the IMF. These targets of the IMF standard stabilization of that period were difficult to attain in a highly indexed economy, like the Brazilian (Cardoso and Fishlow, 1989).

The IMF program focusing mainly in exchange rate, fiscal and monetary policies was inconsistent with stabilization, growth and even to a long run commitment to pay the debt, unless structural reforms were attempted. The adjustment approach adopted by the government resulted just in, temporary, monetary and fiscal repression. As discussed above, when the crisis erupted, the federal government responded for a large fraction, 45% of the long term debt. To pay back the interest due on its external debt the government had to "buy" the trade surplus from the private sector. Without a major fiscal reform, this was done through inflationary tax. Public savings became negative, and there was no stimulus to increase private domestic savings or to attract foreign direct investment, quite the opposite. The indebtedness of the state enterprises was very large, 20% of the long term debt, and precluded them to make new investments. The financial problems of these enterprises

expenditures and capital flights (see Cardoso and Dornbusch, 1989).

were deepened by the exchange rate devaluation policy that revaluated their liabilities. Also, the government, frequently, controlled public price to repress inflation, resulting in prices increases lagged behind the exchange rate devaluation, increasing the burden of interest payments. As discussed above, those state firm monopolized vital productive activities in the economy. The absence of a plan to restructure those activities resulted in shortages in several inputs as early as 1986.

Aggravating this picture, the imports repression was so severe that its coefficient to GDP fell from 12% in the middle of the 1970s to 6%, 1983. This decline was more related to a technological downgrading of investments (Frischt and Franco, 1989) than to self-sufficiency in capital goods production, as many analysts believed (Castro e Souza, 1988).[16]

At the beginning of 1986, with the first stabilization plan, the government attempted to get rid of IMF monitoring in a new agreement with private banks. In this agreement Brazil didn't get "new money" and, although the spread on rescheduled debt was 0.75 percentage point below the one in the previous negotiation, maturities went down to seven years. Private banks didn't accept the multi year agreement the Brazilian government proposed, they only reschedule the

16. For a exposition of these problems for the Japonese direct investment in Brazil see Kume (1989).

loans due in 1985. The absence of IMF had consequences in other fronts too: the Paris Club (Eximbanks and other official creditors) didn't accept to negotiate in these conditions and as result of the conflict, Brazilian government stopped paying interest on their debt. A year later, in February of 1987, Brazil stopped making interest payments to private banks too.

3.2 The Debt Moratorium

The external debt moratorium was decided after the failure of the stabilization plan that attempted, simultaneously, to eliminate inflation and promote growth.[17] At the beginning of 1987 the economy was showing signs of exhaustion and accumulating unbalances in the domestic and external front. The inflation rate was reaching 20% per month and was expected to accelerate even more, the real exchange rate was overvalued in 15% with respect to its pre plan level, and an incipient trade deficit was developing. In this context, by February 1987 it was evident that the US$ 2 billions of interest payments due on foreign debt would leave the economy very short on international

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17. This period fits very well in the description of macroeconomics populism of Dornbusch and Edwards (1990). Although, as in many other episodes, the fast reaction of the trade balance eased the foreign exchange constraint before it forced realism on policy makers.

reserves, therefore some arrears or a "technical moratorium" was unavoidable.

On the other hand, a concerted solution would require a previous agreement with the IMF. The non submission to the Fund's monitoring and to the private creditors demands were an important piece of rhetoric of the government weaken by the failure of the stabilization plan. The outcome was the unilateral decision to stop paying the interest on medium- and long-term commercial debt[18]. A few months later, the government tried to use the moratorium as a pressure instrument for a better agreement with private banks. The Brazilian proposal contemplated some debt relief: part of the debt should be converted into long term bonds, capturing part of the secondary market discount. Those bonds were also to be used in debt/equity conversions.

The moratorium failed in all its purposes: it didn't help to stabilize the economy, growth was not resumed and it didn't work as a pressure instrument in debt negotiations. The agreement finally signed, in September 1988, was a conventional one, although with lower interest rates spreads and longer maturities on rescheduled and on the new loan of US$ 5.2 billions. No debt relief was contemplated and conditionalities to World Bank and IMF were maintained. Additionally, banks required debt/investment conversion, by

18. Profits remittance and dividends payments of foreign firms were also suspended.

face value, of 35% of the new loan and the reopening of relending operations at the Central Bank[19].

In a preliminary agreement with the private banks, the government accorded to pay back, along 1988, all interest in arrears. Therefore, during this year, interest payments would amount US$ 13.8 billions: US$ 10.3 billions of interest due in the year and US$ 3.5 billions in areas. The government also decided to promote auctions for debt conversion.

3.3 Foreign Investment and Debt/Equity Swaps

External debt conversion, i.e., the exchange of foreign debt for other country's liabilities, is limited to long term investment in Brazil[20]. After 1982, it became an important form of foreign direct investment. In this year, in the attempt to reduce external debt, the government adopted a 10% corporate tax exemption on the amount converted (Banco Central, 1989).[21] The reaction was immediate and by mid-1984, 63% of the total foreign

19. A relending operations was the relending of an old debt deposited at the Central Bank to another borrower.
20. The foreign direct investment rules with respect to dividends and profit remittance and capital repatriation apply to this "new" investment.
21. Until 1991, foreign capital was restricted to direct investment, therefore, this was the only modality of debt conversion. Debt conversion, mainly between branches of the same international firm, ocurred, in insignificant amounts, since 1965.

investment was from debt conversion. By the end of 1984, the government eliminated the subsidy and limited conversions to the original owners of the loans. Foreign banks that in 1983 responded for less than 10% of debt conversions by the end of 1986 were responsible for more than 80% of those operations.

TABLE 2

Foreign Direct Investment and External Debt Conversion (average flows US$ millions)				
	Inflows FDI	Total FDI	Debt Conversion	Secondary Market Prices	Discounted FDI
1973-1981	1351	1818	68	–	1351
1982	1513	2926	143	–	1362
1983	1019	1556	452	–	917
1984	1236	1596	746	–	1112
1985	1067	1347	581	–	1067
1986	641	328	206	0.75	277
1987	995	1286	344	0.54	1128
1988	2735	3159	2096	0.47	1916
1989	1409	1209	946	0.30	599
1990	989	965	283	0.23	759

Source: Banco Central do Brasil

In February 1988 new rules established three mechanisms for debt/investment conversion: i) Auctions, for conversion of restructured and Central Bank's debt, half in any sector and half in development projects; ii) Direct conversion – applying the average discount of previous auctions upon the register of the investment at the Cental Bank – for

conversion of remaining public sector debt and private debt, iii) Direct conversion, with no discount, for conversion of debt of the original owner of the loan, as in 1984.[22]

Debt conversion was a strong stimulus for foreign investment after 1988, despite the discount appropriated by the government. The loosening of the 1984 restriction, which limited debt conversion to the original owner of the loan, is the most likely cause of the observed increase. In the 1988-1990 period, conversions represented 65% of inflows of foreign direct investment

The average total flow of foreign capital the 1986-1990 period, even in nominal terms, was below the average of previous periods. On the other hand, the average increase observed in the 1987-1990 period vanishes when the gains from debt conversion are not considered.

Relaxing of the restriction on original ownership changed the attractiveness of the activity sectors for debt conversion. According to the Brazilian Central Bank (1989), the 1988 auctions attracted 63% of conversions for the manufacture sector, Electric-Electronic equipment and

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22. The other mechanism of conversion, informal conversion was very active, in Brazil during all this period. There are two kinds of operations: In the first, a domestic debtor pays his debt in cruzeiros, the creditor cancels the debt at the Central Bank and sells the cruzeiros to a multinational firm with a subsidiary in Brazil. In the second, there is debt buy- back, intermediated by a broker, through the black market. According to the Central Bank (1989) about US$ 4 billions of external debt was canceled by this mechanism between 1988 and 1989.

Chemicals alone responded for 24% of it. On the other hand, investment banks, with smaller participation, 6.4% were third in the rank.

Although, debt conversion was not the only factor affecting international firm in this period, as is seen in table 3, the composition of total flows was affected in the same direction[23]. The financial system, represented by commercial and investment banks, increased its participation, while the manufacture sector decreased. On the other hand, the industries in the non-traditional sectors became more representative inside the manufacture sector.

TABLE 3

Sectoral Participation of Foreign Direct Investment Flows			(in %)
	1973-1978	1979-1982	1983-1989
Manufactures	73.32	64.23	65.29
Metallurgy	8.69	4.72	9.00
Mechanics	9.86	11.42	6.57
Electric-Electronics	8.41	4.62	10.58
Transportation.Equip.	13.08	12.01	11.40
Chemicals	12.62	12.08	11.40
Financial Services	3.89	3.71	9.60
Others	22.79	32.06	25.11

Source: Banco Central do Brasil

23. There was a confront between the car industry and the governemnt on price policy during all period, but specially after the begining of the stabilization plans.

The evaluation of the costs and benefits of debt/equity conversion for the Brazilian economy must be analyzed from two different perspectives: the consequence of the exchange of foreign assets (external debt/ foreign direct investment) and the consequences of the exchange of public sector liabilities (external debt / domestic debt) implied by the conversion. This last one has non trivial consequences for the economy, since most of the external debt is public debt.

TABLE 4

| | Average Returns on Foreign Assets | | | |
	Profit Remitt. Reinvvestment % FDI stock (a)	Interset Payment % Ext.Debt (b)	(US$ millions) Profit Remitt. (c)	Interest Payment (d)
1872/1978	13.14	7.11	321	1,376
1979/1982	9.36	14.4	706	7,753
1983	6.88	13.61	758	9,555
1984	5.70	12.55	796	10,202
1985	7.35	10.60	1,057	9,659
1986	7.17	9.73	1,350	9,327
1987	5.58	8.64	909	8,792
1988	7.17	9.14	1,539	9,831
1989	9.10	9.39	2,383	9,632
1990	5.44	8.97	1,590	8,906

Source: Banco Central do Brazil

From the point of view of the exchange of foreign assets the results seem to be positive. Comparing the rate

of return of external factors, the rate on foreign direct investment (column a) is lower than the effective interest rate on external debt (column b), although the difference is not very large[24]. In terms of Balance of Payments impact, there is also a gain, since dividends and profit remittances (column c) are lower than interest payments (column d). But, in the last few years, dividends and profit remittance turned into an important source of capital flight.

On the other hand, annual data of dividends and profit remittance must be analyzed with caution since, at least in three occasions the Central Bank centralized and suspended temporarily those operations: during 1983, when the government was renegotiating the external debt with the private banks, during 1987, when the government declared the moratorium on the external debt and during 1989, when the government, again, suspended interest payment on external debt. Also, delay on remittance abroad was a device frequently used by the Central Bank in periods of Balance of Payments restrain (Franco, 1990). Analyzing the disaggregated data, it is clear that there were strong anticipation and some overshooting of dividends and profit remittance abroad in the three episodes of exchange control by the Central Bank.

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24. This rate must be analyzed with caution since the registered stock of capital at the Central Bank is underestimated and there are other transference not accounted for.

FIGURE 1

PAYMENTS TO EXTERNAL FACTORS

□ INTEREST/GDP   + PROFIT REM/GDP
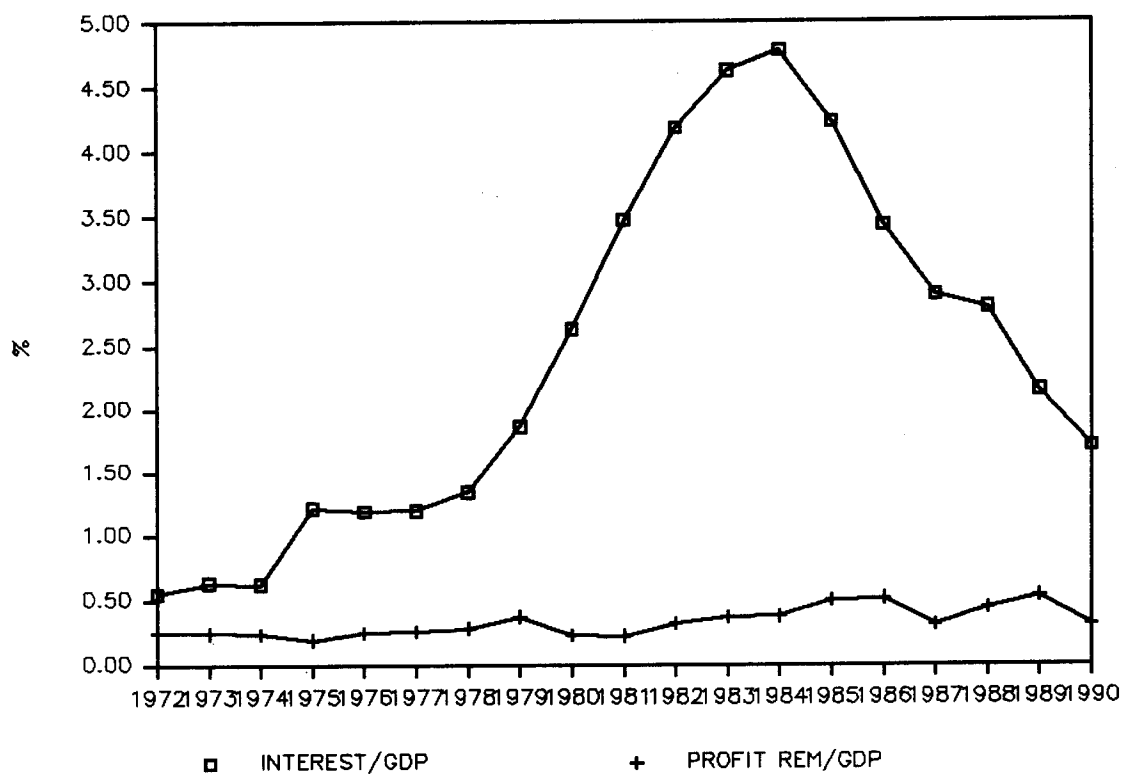
TABLE 5

Dividends and Profit Remittance during Central Bank
Exchange Centralizations

July 1983 (1983 Debt Crisis)		February 1987 (Moratorium)		July 1989 (Moratorium)	
I/82	412	I/86	512	II/88	735
II/82	451	II/86	880	I/89	1486
I/83	481	*I/87	541	*II/89	897
*II/83	281	*II/87	340	I/90	1341
I/84	387	I/88	806		

* Retention of dividends and profits remittance
Source Banco Central do Brasil

As it can be seen in figure 1, above, the ratio of dividends and profits remittance to GDP, apart from those periods of anticipation, is more stable than the ratio of interest payments to GDP, suggesting pro cycle behavior, as it should be expected. Nevertheless, the ratio of interest payments to GDP is falling systematically since 1984 while the ratio of dividends and profit remittance to GDP presents an upward trend that attenuates the benefit from debt swaps, in the long run.

On the other hand, the evaluation of debt conversion must be also, of its effects on the public sector debt, since the government owns 90% of the mid and long term external debt. Public sector debt conversion implies monetary expansion when it refers to federal and restructured debt that belongs to the Central Bank. In the high inflationary environment of the Brazilian economy, the Central Bank has to sterilize the monetary expansion but there is only market for the short term, at high interest rates, bonds. Consequently, domestic rates tend to be higher than international rates. Aggressive exchange rate policies tend to reduce this difference, as in 1988, when the government was paying an annual real rate of 9.3% on its domestic debt and about 8% on its international one. The government can capture some part of the secondary market

discount on the external debt as in 1988, when the average discount of all forms of conversion was 18%.[25]

Those conversions implied debt reduction of US$ 3.8 billions (3.5%) of the external debt and foreign direct investment stock increase of US$ 3.1. The gain associated to the discount was US$ 680 millions, of which US$ 580 millions for the government, well below the gain implied by the secondary market price on Brazilian debt. As the low discount obtained by the conversions didn't compensate the exchange of a long term debt for a short term one, the government suspended, indefinitely, debt conversion[26]. This decision included suspension of the conversion by face of the loan of the private banks and of the relending operations of the previous agreement with the international banks. The government only authorized direct conversion with the discount, since it didn't involve monetary expansion and permitted to capture part of the secondary market gains.

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25. In 1988, the Central Bank authorized total conversion of US$ 3.2 billions: US 1.5 billions in auctions, with an average discount of 25% implying in debt reduction of US$ 2 billions; Direct Conversion implying in monetary expansion, of US$ 487 with an average discount of 23.8%, and US$ 516 millions, not implying in monetary expansion with an average discount of 12.5% and US$ 845 with no discount. These figures don't match with Table 5 that are from Balance of Payment.
26. Increases of the domestic debt tend to have stronger deleterious effects on inflationary expectation than increases of the external debt. due to the fear that government will not honor it

After these measures, debt conversion was considerably reduced.

3.4 The "White" Moratorium and the Semi Hyperinflation

During 1988, to meet the terms of the agreement with the private banks, the country followed a very aggressive exchange rate policy that resulted in surpluses of US$ 19.2 billions in trade and US$ 4.2 billions in current account. The current account surplus implied in a large monetary expansion and the real exchange rate devaluation in an increase in the public deficit. Therefore, the government would have to engage itself in a very active fiscal reform if the monetary targets agreed with the IMF were to be fulfilled. But the government maintained its "accommodation policy" (Cardoso, 1992) and by the end of 1988 the Fund suspended the second part of the stand-by loan. The "crossed conditionalities", (Baer, 1990) between IMF, World Bank and private banks loans, resulted in US$ 1.8 billion less of disbursements for 1988 than planned in the negotiations. A second, non quarrel rupture, with the financial system was the result. As in the 1987 moratorium, stopping interest payments on external debt was no solution for the crisis as inflation kept rising and output declining. Since then,

interest payment on external debt has been very irregular. The government is trying to qualify, without much success, to an agreement under the Brady Plan. These agreements, which seems to be the farthest private banks are willing to accept as debt relief schemes, require a previously adjusted economy; the country has to carry out all the necessary structural reforms to qualify to them. The government is still reluctant to departure from its short run policies and to commit more actively to structural reforms. Consequently, the country's huge external debt has no visible solution and the economy is experiencing disinvestment of its foreign capital stock.

Summing up, in the last ten years Brazil has passed of being one of the most dynamic developing economy to a stagnant hyperinflationary one. This downturn must be understood at the light of the process involving the debt crisis. As all other debtor countries, under the supervision of the IMF, Brazil had to adopt short run measures to guarantee prompt repayment of interest due on the external debt. The resource transfer from these countries prevented a major international financial crisis and, in about five years, there was little risk of insolvency for the creditor banks (Sachs, 1988). But the costs of the adjustment process in terms of growth and development in the indebted

countries were very high and implied in several tradeoffs (Edwards, 1989a).

For Brazil, an important tradeoff, resulting from those IMF policies, was between the trade surplus and direct foreign investment. It was a tradeoff in the Balance of Payment as the increases in dividends and profits remittance and the reductions in capital inflows eroded part of the trade surplus. But it was also a tradeoff with growth and development, given the dynamism of the international firms in the Brazilian economy.

After the debt crisis most of the analyses of behavior of foreign investment have been in terms of the costs and benefits associated with the debt/equity swaps (see Bullow and Rogoff, 1988, Dooley, 1988, Krugmam, 1989 and Edwards, 1990 among others). Some analyses stress the importance of attracting direct foreign investment for indebted countries to substitute for bank lending (see Cardoso and Dornbusch, 1989 and Edwards, 1990). Although, they recognize that debtor countries are unlikely to be attractive locations for new investment, the discussion does not associate this fact to the debt crisis.

This dissertation analyzes how the adjustment policies adopted by some indebted countries, like Brazil, to meet the terms of the debt repayment as renegotiated with the banks, impaired the attractivness of those economies for foreign

direct investment. For the Brazilian economy the behavior of these flows is an important component of the crisis the country is facing today. Therefore, reversing this behavior is fundamental but, to improve the country attractivness for this flows is important to understand what went wrong after the eruption of the debt crisis.

4. Plan for the Work

The dissertation is divided in four chapters. The first chapter deals with the information problems associated with international lending between private banks and government of sovereign countries. The relationship between a bank and a borrowing government is developed in a model in which there is imperfect information with respect to risk reducing activities and policies to repay the debt. The main implication of the model is that imparing incentives, alone, cannot solve this problem. By restricting credit banks force the problematic borrower to resort to the IMF and therefore, to submit to the Fund's adjustment programs, that promote the necessary policies to repay the debt.

In the second chapter the IMF adjustment programs are analyzed from the perspective of foreign direct investment. The international financial institutions had the view that the crisis was only a temporary liquidity problem in the

indebted countries; nevetheless, its magnitude could threaten international financial stability. This view was the basis of programs and policies imposed on countries. Program objectives and targets mainly focused on short run issues, most of them did not include structural reforms or attempted to overcome the negative consequences on growth and development. The reaction of international firms to this situation is analyzed using a "Wait and See" type of argument that implies a delayed reaction in the investment and disinvestment decision of those firms.

In the third chapter the empirical evidence of Brazil is analyzed. Time series analysis separating inflows, reinvestment and outflows of foreign direct investment were performed. Several tests for structural changes associated to the debt crisis were made. The estimation confirmed most of the predictions of the "Wait and See" argument for the Brazil. Since the Brazilian experience is similar to other countries, a panel data study was performed for 19 countries and 15 years. The impacts of debt conversion, at secondary market prices, were also analyzed. Although the data didn't allow to test some implications of the model, the general predictions of the analysis were confirmed

1. Incentives Problems and the Less Developed Countries External Debt

Introduction

This chapter considers some features of the foreign debt problem some less developed countries have experienced in the last ten years. During the 1970s various LDCs were able to borrow in the international credit market. The experience was not a happy one: after some years of heavy borrowing almost all of these countries were unable to repay their debts. Banks rescheduled the debts but the new terms, maturities and spreads, were worse than in the original loans. These countries were also forced to resort to IMF resources and, therefore submit to its adjustment program and monitoring. Despite the presence of the Fund, the countries had to reschedule further portions of their debt but, with few exceptions and for minor periods, most countries met their interest payments. The adjustment process to generate the trade surplus to meet the debt service was very costly. In all debtor countries, it caused severe decline in real income and employment. Attempts to increase new financing for these countries to resume growth, as the Baker Plan, failed due to the resistance of private banks to participate with resources. But, as time passed

and the crisis was not solved it was becoming evident, to debtor countries, that any return to the voluntary credit market was in the remote future. It was also clear that the trade sanctions, for not meeting their debt obligations, were not particularly harsh. Consequently, five years after the beginning of the debt crisis, several countries had suspended, at least partially, the interest payment of their debt. The conventional approach to debt management started to break down[27]. But, by then the debt crisis stopped threatening to cause systemic crisis and even for more deeply involved banks, there was little risk of insolvency because of their LDC exposure (Sachs, 1988). The nine US money centers had sufficient equity and reserves to withstand a complete loss of Latin American assets (Fisher, 1987)

The objective of this chapter is to explain the pattern of negotiations during this period, reflecting information issues that arise in international relations between private banks and governments of less developed countries. Part One presents an overview of the information

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27. The conventional approach to debt management was defined by Sachs (1988) as having six components: prompt payment of interest at full market rate; rescheduling of principal; some new lending to refinance portions of interest due; debtors country should submit to conditionality under IMF supervision; new loans by international instititutions made on high-conditionality basis and innovative financing arrangements should be made on voluntary basis as part of a menu options.

issues involved in the debt problem of the 1970s. Part Two develops a model, that tries to encompass those problems. Finally, Part Three presents some conclusions.

I. An Overview of the Problem

The relationship between private banks and governments of less developed countries can be characterized by serious information problems arising from the sovereign risk (Eaton, Gersovits and Stiglitz (1986). International loans to governments have no collateral though there are penalties on default. These penalties are not imposed or can be appropriated by the banks. A typical penalty is the loss of access to the international credit system necessary to participate in international trade. But this penalty has no financial counterpart and, therefore, cannot benefit any of the creditors.

Banks attempted to diversify the risks associated with this peculiar situation in a fundamental way: they made syndicated loans to a large number of countries - around 45 East European and less developed countries got loans during the 1970s and each loan involved a large number of banks. As a result, there were more than 3.000 banks, led by a core of 24 to 50 large commercial banks, financing a large number of projects in each country. As can be seen in Table 3, in

the appendix 2, major banks'participation in number of loans ended up being higher than their participation in the debt of the five largest debtors.

This pattern of risk minimization meant that banks ended up having little information about the projects they were financing. The cost for monitoring all the loans in all countries tended to be very high and, with so many banks involved, as noted by Sachs (1984), collective action problems are likely to occur among the members of the syndicate. So monitoring of investment projects was apt to be insufficient due to its public nature. Also, free rider between different syndicates was to be expected when the country was being financed in several projects at the same time.

Of course, the safest way to overcome these problems would be to co-finance projects with some international institution like the World Bank or to have the country submit to the IMF monitoring. But, co-financing with the World Bank is not very flexible, given all the restrictions the Bank sets on its loans and therefore, not very attractive for either party but, mainly to the banks. Accepting an IMF program reduces a country flexibility and, in general, is politically hard to justify domestically, making this a very difficult option for countries to adopt voluntarily.

Therefore, it is reasonable to assume that international lending took place with banks having imperfect information on actions and policies in the countries that could influence the outcomes of investment projects. A more careful look to the terms of the original contracts and to the process of renegotiation seems to indicate that the banks used some devices to overcome these information problems.

First of all, there were the contract terms, in which two clauses played a fundamental role: the cross default and publicly guaranteed debt clauses. The first one states that a loan will be considered in default if the borrower defaults in any other loan, the second that the central government is the responsible for the loan. Of course these clauses intended to blur the differences in risk between individual loans within a country and to give, in case of debt-servicing problems, an incentive to rescheduling rather than defaulting. So the task of monitoring individual projects was passed to the country's government and the risk of default replaced by the risk of rescheduling.

At the same time, banks had to make sure that governments did monitor projects and adopted policies that would avoid debt financing difficulties leading to loan rescheduling. Of course, not all rescheduling is costly to

the banks. Before 1982, several loans were informally rescheduled with countries getting more favorable terms than in the original ones. Calvo and Kaminski (1991) suggest that term revisions occurring before the debt crisis should be viewed as debt reduction associated with implicit contracts between banks and countries. At the other hand, if refinancing involves a large volume of loans within a country and /or a large number of countries at the same time, it may be costly for the banks, since such reschedulings can signal bad loan management to the market. Losses would not be reported in banks' book value but in their stock prices (see Sachs, 1988; and Sachs and Huizinga, 1988). In this circumstances, although the banks knew that the countries would only reschedule in case of financing difficulties, we should not expect them to ease the loan terms in case of rescheduling. Since they were not observing and monitoring the borrower activities, risk sharing would not stimulate risk reducing activities.

Table 1 shows the average terms of publicized loans made form 1973 to 1981, average terms in 1981 and the terms from the first round of rescheduling. Evidently, loan spreads increased for all countries. This sudden deterioration in contract terms is hard to explain by referring to a rise in country risk[28]. In the previous

28. Edwards (1985a and 1985b) empirical analyses for the period previous to the debt crisis, indicated that the

period, country risk, as measured by the conventional variables (debt/gnp, interest payments/gnp etc), was higher for most indebted countries, but was not accompanied by an increase in the spreads on new loans. Of course, in 1982, the economic situation of those countries was very bad, but this indicates only that countries were forced to reschedule their debts because they had problems paying the debt and interest due and not because they were seeking better loan terms.

TABLE 1

INTEREST RATE SPREADS ON LOANS TO LDC
PUBLICIZED LOANS RESCHEDULED

COUNTRY	Averages 1973-1981	Averages 1981	Max	Min	1982/1983
ARGENTINA	0.75	0.765	2.25	0.688	1.375
BRAZIL	1.27	2.004	2.25	0.682	2.125
CHILE	0.96	0.889	2.375	0.799	2.125
COSTA RICA	1.13		2.000	0.875	1.625
ECUADOR	0.91	0.704	2.25	0.750	2.25
HONDURAS		1.397			2.25
IVORY COAST	0.92	1.472	1.875	0.75	1.875
JAMAICA	1.84	1.662	2.000	1.15	2.00
MEXICO	0.98	0.869	1.375	0.50	1.875
MOROCCO	0.91	1.047	0.873	1.047	1.75
NIGERIA	1.04	0.882	2.125	1.000	1.5
PANAMA		1.078			1.625
PERU	1.8	1.068	2.25	0.875	2.25
ROMANIA	0.73	0.713	1.625	0.625	1.75
SENEGAL	1.01	2.000	2.286	0.875	2
URUGUAY	1.12	0.925	1.875	0.875	2.25
VENEZUELA	0.62	0.765	1.375	0.75	1.125
YUGOSLAVIA	1.1	1.250	1.75	0.875	1.625

Source: World Bank "Borrowing in the International Capital Markets" and World Debt Tables

interest rate spread charged on loans to borrowing countries were associated to some country risk variables

Besides toughening the terms of rescheduled loans, in very few cases the renegotiation process involved restructuring part of the interest payment due and new money, to meet this obligation, was also rationed as can be seen in Table 2 below. Therefore, countries had to resort to IMF for credit.

TABLE 3

	Total Commitments	"New Money" by Commercial Banks Amounts Disbursed					
		1983	1984	1985	1986	1987	1988
Argentina	6,750	500	0	3,096	1,207	1.050	350
Brazil	15,500	4,400	6,500	0	0	0	0
Chile	2,865	1,300	780	520	215	0	0
Costa Rica	277	152	50	75	0	0	0
Ecuador	631	431	0	200	0	0	0
Mexico	16,500	5,000	2,850	950	500	3,872	1,100
Nigeria	320	0	0	0	0	0	0
Peru	650	250	100	0	0	0	0
Philippines	925	0	0	0	400	525	0
Uruguay	240	240	0	0	0	0	0
Yugoslavia	600	600	0	0	0	0	0
Other*	0						

Source: World Debt Tables

Some of the above ideas are presented in more formal terms in the following model.

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* There are about eighteen countries that rescheduled their debt but didn't get any concerted lending from private banks.

2. The Model

Consider, first, a two-period relationship between a bank and a country. In the first period the bank gives a loan L to the country that must be repaid in the following period. Although bank loans have no explicit risk sharing, rescheduling can be viewed as a way to make payments state contingent. In a two-period model this shows upas the banks charging interest conditional on the state of the world when the loan is repaid. Let x represent a country's level of monitoring of the way in which the loan is used. Let $p(x)$ be the probability of the good state given x, $C^*(x)$ the cost of the activity and let i^o be the interest rate charged in the good state, i.e., the original rate, i^r in the bad state, i.e, the rescheduled rate, r^b the discount rate for the bank and Θ^r the cost of rescheduling the loan to the bank.

Assume that when x is maximum $p(x)$ is less than one and when it is minimum $p(x)$ is greater than zero. Therefore, the lender cannot tell how much monitoring took place by just observing the output. In formal terms:

$$\lim_{x \to \underline{x}} p(x) = p > 0$$

and

$$\lim_{x \to \overline{x}} p(x) = p < 1$$

and $p'(x) > 0$, $p''(x) < 0$. Let's also assume that   is linear
and $c^{*'}(x_i) > 0$

The loan's present value, PV, to the bank is

$$PV = -L + (1+r^b)^{-1}[p(x)(1+i^o)L + (1-p(x))(1+i^r)L - \Theta^r]$$

Of course, the loan's present value for the bank increases
with the interest rate charged on the loan i.e.

$$dPV/di^o > 0 \text{ and } dPV/di^r > 0$$

The bank will desire that the country takes some positive
action when

$$dPV/dx = p'(x)[(1+i^o)L - (1+i^r)L + \Theta^r] > 0.$$

meaning that the bank cannot profit from rescheduling.
The country maximizes the discounted value of consumption
over time

$$\underset{x}{\text{Max}} \quad C_1 + (1+r)^{-1}[p(x)(C_2{}^g) + (1-p(x))C_2{}^b]$$

where
$$C_1 = Y_1 + L - C(x); \quad C_2{}^g = Y_2{}^g - (1+i^o)L \text{ and } C_2{}^b = Y_2{}^b - (1+i^r)L$$

The first order condition for a maximum is

$$p'(x)(1+r)^{-1}[Y_2{}^g - Y_2{}^b + (i^r - i^o)L] = c^{*'}(x)$$

Total differentiation of FOC with respect to i^o, i^r and x

$- p'(x)Ldi^o + p'(x)Ldi^r + p''(x)(Y_2{}^g - Y_2{}^b + (i^r - i^o)L)dx$

Therefore:

$dx/di^o = p'(x)L/p''(x)(Y_2{}^g - Y_2{}^b + (i^r - i^o)L) < 0$ and

$dx/di^r = -p'(x)L/p''(x)(Y_2{}^g - Y_2{}^b + (i^r - i^o)L) > 0.$

since $p''(x)(Y_2{}^g - Y_2{}^b + (i^r - i^o)L) < 0$ by second order condition for a maximum.

In words, an interest rate increase in the good state of the world results in a lower risk reducing activity level, by making the benefits associated with this state less favorable. An interest rate increase in the bad state of the world rises risk reducing activity in order to avoid this state that became more unfavorable. If rates were such that country consumption were the same in both states of the world, no risk reducing activity could be expected..

Although the two period model is useful for showing the incentive problem it is an incomplete representation of the relationship between banks and countries because it assumes that the country will repay in either state of the world. A more realistic representation can be attained in model with a three period relationship between bank and country. In the first period the country gets the loan, make the investment and engages itself in the risk reducing activity, this

affecting the probability of the outcome in the second period. In the second period if the good state occurs the country repays the bank and their relation ends. If the bad state occurs the loan is rescheduled but a fraction α, $0 \leq \alpha \leq 1$, of the interest due is paid in this period. Also, in this circumstances, the country has again to engage itself in risk reducing activities, affecting the probable course of events in the third period. The loan and the remaining of the interest due have to be paid in the next period. If the good state occurs the country repays the bank, but otherwise it defaults and in the future its income will be an autharchy income $Y^a < Y^g$.

Assume the penalty on default for the country, Θ^c, which is neither imposed or appropriable by the banks. As before, let i^o be the rate of interest charged on the original loan and i^r on the rescheduled loan. These rates have two components: the market rate of interest on the safe asset, r and the spread. For simplicity r is taken to be fixed and equal to the rate of time preference of the country and bank. Let r^b be the rate the bank gets on other loans. Therefore, it will get the return

$$\sum_{t=i}^{\infty} (1+r^b)^t \qquad i = 2 \text{ or } 3$$

on the debt, or portion of it, after being repaid.

The bank and country are assumed to be risk neutral. The expected present value of the loan for the bank is:

$$PV = -L +$$

$$(1+r)^{-1}[p(x_2)(1 + i^o)L+(1-p(x_2))\alpha i^o L](1 + \sum_{t=3}^{\infty}[(1+r^b)/(1+r)]^t)+$$

$$(1+r)^{-2}(1-p(x_2))p(x_3)(1+(1-\alpha)i^o)(1+i^r)L(1+\sum_{t=4}^{\infty}[(1+r^b)(1+r)]^t)+$$

$$-[(1-p(x_2))[(\Theta^r)(1+r)^{-1} - (1-p(x_3)(\Theta^d)(1+r)^{-2})]$$

where Θ^r is, as before, the cost of rescheduling the loan for the banks, mainly a cost associated with the bank's reputation, if rescheduling signals the banks' bad loan management to the market and Θ^d is the additional penalty if default takes place. Both are assumed to be once for all penalties as it can be seen in the last line of the above expression.

For the Country:

$$EU = C_1 + (1+r)^{-1}E(C_2) + (1+r)^{-2}E(C_3) + \sum_{t=4}^{\infty}E(C_t)(1+r)^{-(t-1)}$$

where:

$$C_1 = Y - L + I-C^*(x_2)$$

$$E(C_2) = p(x_2)(Y_2^g - (1+i^o))+ (1-p(x_2))(Y_2^b-\alpha i^o - C^*(x_3))$$

$$E(C_3) = p(x_2)(Y_3^g) + (1-p(x_2))[p(x_3)(Y_3^g-(1+(1-\alpha)i^o)(1+i^r)L) + (1-p(x_3))(Y^b - \Theta^c)]$$

$$\sum_{t=4}^{\infty} E(C_t) = [p(x_2)+(1-p(x_2))p(x_3)]\sum_{t=4}^{\infty} Y^g{}_t + (1-p(x_2))(1-p(x_3))\sum_{t=4}^{\infty} Y^a$$

We assume that the bank chooses the terms of the loan contract. In order for the contract to be accepted by the country a certain level of expected utility U^* must be assured. This level is assumed to be determined outside the model.

Consider now the case in which the banks do not observe the level of the risk reducing activity chosen by the country in the two periods after the loan is made. Therefore, if the bad state of the world occurs, the bank is not able to determine if it could have been avoided by a higher level of the activity.

If there was no incentive problem, the bank would prefer to set i^o higher than i^r since its effect on the discounted present value is stronger and set $\alpha = 1$. But it must take into account the effects of those rates and of α on the choice of x_2 and x_3 by the country. The bank will also prefer x_3 to be positive and x_2 too, if rescheduling is costly enough.

The country chooses x_2 and x_3 in order to maximize its expected utility. The FOC are:

$X_2 = dU/dx_2$ and $X_3 = dU/dx_3$ are:

$$X_2 = -C^{*\,\prime}(x_2) + p'(x_2)(1+r)^{-1}\{[(Y_2{}^g - (1+i^o)L) - (Y_2{}^b - \alpha i^o L - C^{*}(x_3))]$$

$$+ (1+r)^{-1}[Y_3{}^g - p(x_3)(Y_3{}^g - (1 + (1-\alpha)i^o)L(1+i^r))$$

$$- (1-p(x_3))((Y_3{}^b - \Theta^c) - (\sum_{t=4}^{\infty} Y^g(1+r)^{-t} + \sum_{t=4}^{\infty} Y^a(1+r)^{-t}))]\} = 0$$

and

$$X_3 = (1-p(x2))\{p'(x3)[(1+r)^{-2}((Y_3{}^g - (1+(1-\alpha)i^o)L(1+i^r))$$

$$- (Y_3{}^b - \Theta^c)) + (\sum_{t=4}^{\infty} Y_t{}^g(1+r)^{-(t-1)} - \sum_{t=4}^{\infty} Y_t{}^a(1+r)^{-t-1})]$$

$$- (1+r)^{-1}C^{*\,\prime}(x_3)\} = 0$$

To observe the effects of changes in the interest rates on the choice of x_2 and x_3 we total differentiate the above expressions with respect to i^r, i^o and α.

$$\frac{dx_2}{di^r} = \frac{X_{23}X_{3i^r} - X_{33}X_{2i^r}}{X_{33}X_{22} - X_{23}{}^2}$$

$$\frac{dx_3}{di^r} = \frac{X_{23}X_{2i^r} - X_{22}X_{3i^r}}{X_{33}X_{22} - X_{23}{}^2}$$

$$\frac{dx_2}{di^o} = \frac{X_{23}X_{3i^o} - X_{33}X_{2i^o}}{X_{33}X_{22} - X_{23}{}^2}$$

$$\frac{dx_3}{di^o} = \frac{X_{23}X_{2i^o} - X_{22}X_{3i^o}}{X_{33}X_{22} - X_{23}{}^2}$$

$$\frac{dx_2}{d\alpha} = \frac{X_{23}X_{3\alpha} - X_{33}X_{2\alpha}}{X_{33}X_{22} - X_{23}{}^2}$$

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$$\frac{dx_3}{d\alpha} = \frac{X_{23}X_{2\alpha} - X_{22}X_{3\alpha}}{X_{33}X_{22} - X_{23}{}^2}$$

where:

$$X_{22} = p''(x_2)(1+r)^{-1}\{[(Y_2{}^g - (1+i^o)L) - (Y_2{}^b - \alpha i^o L - C^*(x_3))]$$

$$+ (1+r)^{-1}[Y_3{}^g - p(x_3)(Y_3{}^g - (1 + (1-\alpha)i^o)L(1+i^r))$$

$$- (1-p(x_3))((Y_3{}^b - \Theta^c) - (\sum_{t=4}^{\infty} Y^g(1+r)^{-t} - \sum_{t=4}^{\infty} Y^a(1+r)^{-t}))]\}$$

$$X_{33} = p''(x_3)(1-p(x_2))\{[(1+r)^{-2}(Y_3{}^g - (1+(1-\alpha)i^o)L(1+i^r)) -$$

$$(Y_3{}^b - \Theta^c)] + (\sum_{t=4}^{\infty} Y_t{}^g(1+r)^{-(t-1)} - \sum_{t=4}^{\infty} Y_t{}^a(1+r)^{-(t-1)})\}$$

$$X_{23} = -p'(x_2)p'(x_3)\{[(1+r)^{-2}(Y_3{}^g - (1+(1-\alpha)i^o)L(1+i^r)) -$$

$$(Y_3{}^b - \Theta^c)] + (\sum_{t=4}^{\infty} Y_t{}^g(1+r)^{-(t-1)} - \sum_{t=4}^{\infty} Y_t{}^a(1+r)^{-(t-1)})]$$

$$X_{2i}{}^o = (1+r)^{-1}p'(x_2)(1-\alpha)L[(1+r)^{-1}p(x_3)(1+i^r) - 1]$$

$$X_{3i}{}^o = -(1+r)^{-2}p'(x_3)(1-p(x_2))(1+i^r)(1-\alpha) < 0$$

$$X_{2i}{}^r = (1+r)^{-2}p(x_3)p'(x_2)(1+(1-\alpha)i^o)L > 0$$

$$X_{3i}{}^r = -(1+r)^{-2}(1-p(x_2))p'(x_3)(1+(1-\alpha)i^o)L < 0$$

$$X_{2\alpha} = (1+r)^{-1}p'(x_2)i^o L[1 - (1+r)^{-1}p(x_3)(1+i^r)]$$

$X_{3\alpha} = (1+r)^{-2}(1-p(x_2))p'(x_3)i^oL(1+i^r) > 0$

The second order condition for a maximum requires that:

$X_{22} < 0$, $X_{33} < 0$ and $X_{22}X_{33} - X_{23} > 0$

X_{22} and X_{33} are negative since $p''(x) < 0$ by assumption and consumption in the good state should be, for most periods, higher than in the bad states. The second order condition imposes restrictions only on the relative magnitude of X_{23}, its sign can be positive or negative but, if X_{33} is negative the term in brackets has to be positive, i.e.

$$(1+r)^{-2}[(Y_3{}^g -(1+(1-\alpha)i^o)L(1+i^r)) - ((Y_3{}^b - \theta^c)] +$$

$$(\sum_{t=4}^{\infty}Y_t{}^g(1+r)^{-(t-1)} - \sum_{t=4}^{\infty}Y_t{}^a(1+r)^{-(t-1)})] > 0$$

This term is exactly the same as in X_{23} therefore its sign is also negative. The direct effects of i^o, i^r and α on x_3 are also well defined. Increases in i^o or i^r decrease consumption in the good state of period 3 after rescheduling, therefore is atractiveness is reduced with negative impact on the risk reducing activity for period 3. Increases in α has the opposite effect, because it increases consumption in period 3: it is $(1-\alpha)$ the fraction to be

repaid in the good state of this period. The direct effect of i^r on x_2 is also clear, since i^r decreases consumption in the good state after rescheduling, it decreases the attractiveness of rescheduling and increases x_2. On the other hand, the effects of i^o and α on x_2 are ambiguous: i^o has full impact on consumption in the good state of second period but, in case of rescheduling, the impact is spread out in the second and third period. If the first impact dominates the second then $X_{2i}{}^o$ is negative otherwise, is positive. Considering some values from the real world, a 3 percentage point spread above the libor or prime rate, makes $(1+i^r)/(1+r) \approx 1.027$, so any value of $p(x_3)$ less than 0.97 would make $X_{2i}{}^o$ negative. The sign of $X_{2\alpha}$ is the opposite of $X_{2i}{}^o$, α decreases consumption in the bad state in period 2, therefore with positive effect on x_2, but it increases consumption in the good state of period 3, diminishing the incentives to avoid rescheduling, with negative impact on x_2. As it is more likely that the first effect dominates the second, $X_{2\alpha}$ tends to be positive.

The total effect of i^r on x_2 and x_3 is well defined: $dx_2/di^r > 0$, $dx_3/di^r < 0$: an increases in the rate charged on the rescheduled loan have a positive effect on the risk reducing activity on period 2, working like a punishment that the country tries to avoid. Nonetheless, once rescheduling takes place, i^r makes the good period

less favorable and gives no incentives to risk reducing activity for the third period. In other words, there is a debt overhang problem of the kind investigated by Krugman (1985) and others.

The impact on x_2 and x_3 of i^o and α are still ambiguous when X_{2i}^o is negative and $X_{2\alpha}$ positive as assumed above. If direct effects dominate then changes in i^o have a negative impact on x_2 and positive on x_3, while changes in α have positive effect on risk reducing activity in both periods. If this is the case it is clear that what works as a positive incentive to induce the country to engage in risk reduction in one period becomes a negative incentive in the next period, suggesting that banks should try to intervene more directly in the choice of one of the variables.

If the level of one of the risk reducing activities can, somehow, be chosen by the bank, then the total effects of i^o, i^r and α on them are represented by the direct effects X_{ji}^o, X_{ji}^r and $X_{j\alpha}$ above, $j = 2$ or 3.

As we argued in the first section, bank intervention in the actions taken by the countries when the loans were made in the first place, was a very costly and difficult proposition. But in rescheduling, that in principle involves fewer countries in a more fragile situation, intervention would be easier and could be done by some

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international institution. Therefore, the "natural candidate" for direct intervention would be the level of x_3, while the level of x_2, would be chosen, indirectly through i^o, i^r and α.

So, if $X_{2i}^o > 0$, an increase in x_2 is obtained by increasing i^o, i^r or decreasing α. Evaluating X_{2i}^o and X_{2i}^r at $x_2 = x_3$, such that $p(x_2) = p(x_3) = p(x)$ we have:

$$X_{2i}^o - X_{2i}^r = (1+r)_{-2}p'(x)p(x)(1-\alpha)(i^r - i^o) -$$
$$(1+r)^{-2}p'(x)p(x)\alpha - (1+r)^{-1}p'(x)(1-\alpha)$$

at $i^o = i^r$ we get that the impact of i^r on x_2 is stronger than the impact of i^o. If $X_{2i}^o < 0$ (which, as argued above, is more likely) the bank can induce an increase in x_2 by decreasing i^o and increasing i^r and α.

This last pattern is what we observe as a result of the renegotiation that took place during 1982 and 1983. Banks toughened the terms of rescheduled loans ($i^r > i^o$) and involved restructuring part of the interest payment due only in a very few cases. In terms of the model, α was set equal to one for most countries as it can be seen in table 3 below.

It can be argued that by making α close to one or, by not rescheduling the whole debt banks also forced the countries to get resources elsewhere. In the extreme credit

rationing situation of the period, countries had to ask for IMF loans. As it is well known, to get resources from the Fund, a country must to submit to its programs and supervision. Loans are made in tranches, conditioned on the country's performance. As Edwards (1989b) notes, exchange rate policies were present in all Fund programs so that a trade surplus would be guaranteed. In this sense x_3 can be interpreted not as risk reducing activity for investment but as a risk reducing activity for trade surplus.

3. Concluding Remarks

We have argued that imperfect information on countries' risk reducing activities by the private international banks may explain the terms of the rescheduled loans in the 1982 debt crisis and the monitoring activities of the IMF in those countries. The observed increase of the spreads charged on the rescheduled debt may be interpreted as a bank mechanism to induce countries to engage in risk reducing activities. But this deterioration of loan terms creates a debt overhang problem, with a raising probability of default in the future. To avoid this result, banks should try to choose, somehow, the level of the risk reducing activity by the countries. Since direct bank intervention is costly, subject to collective action problems and

unacceptable to sovereign countries, an international
institution like the IMF is the most suitable alternative.

The credit rationing to refinance interest payment forced
countries to use IMF credit and, therefore, to submit to its
programs and monitoring. The presence of the IMF not prevent
further debt rescheduling of the debt, but prevented a major
crisis of the international financial system.

The bank problem is to solve

$$\begin{aligned}\operatorname*{Max}_{i^o, i^r} \quad & (-L + (1+r^b)^{-1}p(x)(1+i^o)L + (1-p(x)[(1+i^r) - \Theta^r) - \\ & \mu_0 (Y + L - C(x)) + (1+r)^{-1} [p(x)(Y^g - (1+i^o)L) + \\ & (1-p(x))(Y_b-(1+i^r)L)-C\} - \mu_1[(1+r)^{-1}p'(x)(Y^g-Y^b + \\ & (i^r - i^o)L)-C'(x)]\end{aligned}$$

The first order conditions are:

$$(1+r^b)^{-1}p(x)L - \mu_0(i+r)^{-1}p(x)L - \mu_1 p'(x)(1+r)^{-1}=0 \qquad (1)$$

$$(1+r^b)^{-1}(1-p(x))L- \mu_0(i+r)^{-1}(1-p(x))L + \mu_1 p'(x)(1+r)^{-1}=0 \quad (2)$$

$$p'(x)(1+i^o)L - p'(x)((1+i^r)L-\Theta^r) - \mu_0(1+r)^{-1}p'(x)(Y^g-Y^b+$$

$$(i^r-i^o)L)-C'(x)) - \mu_1 p''(x)[(1+r^b)^{-1}(Y^g-Y^b + (i^r-i^o)L)= 0 \quad (3)$$

$$E(C)-\bar{C} =0 \qquad (4)$$

$$dEC/dx = 0 \qquad (5)$$

Replacing (5) in (3) we get

$$(i^o-i^r)L = p'(x)\Theta^r-\mu_1 p''(x)(Y^g-Y^b)/p'(x)+\mu_1 p''(x)$$

From (1)

$-\mu_1 = p(x)(1-\mu_0)/p'(x)$

in (2)

$(1-p(x))(1-\mu_0) + p(x)(1-\mu_0) = 0$

or $\mu_0 = 1$ and $\mu_1 = -p(x)/p'(x)$

Therefore

$(i^0-i^r) = -[p'(x)^2\theta^r + p(x)p''(x)(Y^g-Y^b)/[(p''(x)^2-p(x)p''(x)]$

since the denominator is positive

$(i^0-i^r) < 0$ if $-p(x)p''(x)/p'(x)^2 < \theta_r/(Y^g-Y^b)$

BANK PARTICIPATION ON LOANS AND DEBT AND BANK EXPOSURE (%)

MEXICO

	CITI CORP.	BANK OF AMERICA	CHASE MANHATTAN	MORGAN GUARANTEE	MANUFACT HANOVER	CHEMICAL BANK
%LOANS	15.53	17.81	15.07	9.59	6.85	7.76
%DEBT	5.08	3.88	2.62	1.6	2.68	2.33
EXP.	54.60	52.10	40.0	34.80	66.70	60.00

	CONTINEN ILLINOIS	BANKERS TRUSTERS	FIRST CHICAGO	SECURITY PACIFIC	WELLS FARGO	FIRST BOSTON
%LOANS	3.65	5.48	4.57	7.76	4.11	4.57
%DEBT	1.08	1.36	1.34	0.82	0.95	0.35
EXP.	32.40	46.20	50.10	31.20	51.00	28.10

ARGENTINA

	CITI CORP.	BANK OF AMERICA	CHASE MANHATTAN	MORGAN GUARANTEE	MANUFACT. HANOVER	CHEMICAL BANK
%LOANS	12.50	6.25	5.00	5.00	10.00	2.50
%DEBT	4.31	1.93	3.55	3.00	4.87	1.47
EXP.	18.20	10.20	21.30	24.40	47.50	14.90

	CONTINEN ILLINOIS	BANKERS TRUSTERS	FIRST CHICAGO	SECURITY PACIFIC	WELLS FARGO	FIRST BOSTON
%LOANS	5.00	11.25	0.00	1.25	1.25	1.25
%DEBT	1.51	0.99	0.99	0.69	0.39	0.00
EXP.	17.80	13.20	14.50	10.40	8.30	0.00

VENEZUELA

	CITI CORP.	BANK OF AMERICA	CHASE MANHATTAN	MORGAN GUARANTEE	MANUFACT. HANOVER	CHEMICAL BANK
%LOANS	12.35	9.88	7.41	7.41	12.35	8.64
%DEBT	4.01	7.36	3.72	2.00	4.04	2.57
EXP.	18.20	41.70	24.00	17.50	42.40	28.00

TABLE 3

BANK PARTICIPATION ON LOANS AND DEBT AND BANK EXPOSURE (%)

VENEZUELA

	CONTINEN ILLINOIS	BANKERS TRUSTERS	FIRST CHICAGO	SECURITY PACIFIC	WELLS FARGO	FIRST BOSTON
%LOANS	3.70	4.94	1.23	1.23	1.23	0.00
%DEBT	1.70	1.75	1.10	0.28	0.90	0.00
EXP.	21.60	25.10	17.40	4.50	20.40	0.00

CHILE

	CITI CORP.	BANK OF AMERICA	CHASE MANHATTAN	MORGAN GUARANTEE	MANUFACT. HANOVER	CHEMICAL BANK
%LOANS	24.66	5.48	13.70	19.18	16.44	9.59
%DEBT	5.08	2.56	4.22	2.55	6.24	3.13
EXP.	10.00	6.30	11.80	9.70	28.40	14.80

	CONTINEN ILLINOIS	BANKERS TRUSTERS	FIRST CHICAGO	SECURITY PACIFIC	WELLS FARGO	FIRST BOSTON
%LOANS	5.48	6.85	4.11	6.85	5.48	0.00
%DEBT	2.32	1.70	1.70	1.06	0.63	0.00
EXP.	12.80	10.60	11.60	7.40	6.20	0.00

BRAZIL

	CITI CORP.	BANK OF AMERICA	CHASE MANHATTAN	MORGAN GUARANTEE	MANUFACT. HANOVER	CHEMICAL BANK
%LOANS	10.05	9.28	11.34	9.79	5.93	8.25
%DEBT	7.96	4.16	4.34	3.05	3.64	2.35
EXP.	74.00	48.00	57.00	54.00	78.00	52.00

	CONTINEN ILLINOIS	BANKERS TRUSTERS	FIRST CHICAGO	SECURITY PACIFIC	WELLS FARGO	FIRST BOSTON
%LOANS	3.87	3.35	2.58	N.A.	2.32	3.61
%DEBT	0.89	1.58	0.89	N.A.	0.88	0.33
EXP.	23.00	46.00	40.60	29.00	41.00	23.00

Source:World Bank"Borrowing in International Capital Market"
        Cline, W.(1984)

2. Debt Crisis and the International Firm

Introduction

Debt negotiations, between private banks and governments of countries with debt payments problems, after the 1982 crisis, were sheltered by the International Monetary Fund. The IMF had the view that the debt crises just reflected a temporary liquidity problem in indebted countries but, given its magnitude, could threaten international financial system stability. This view acted as the basis for the programs and policies imposed on countries under its supervision: program objectives and targets mainly focused on exchange rate, monetary and fiscal policies. They are best described as "emergency stabilization programs" (Edwards, 1989a) based on fiscal repression and investment cuts. Most of them did not include structural reforms or attempted to overcome the negative consequences of the crisis on growth and development in these troubled e economies.

Although the degree of compliance with the fiscal and monetary targets was very low (see Edwards 1989b), the programs were very successful in generating trade surpluses[30] and most countries did manage their servicing

30. Edwards (1989b) argues that the current account improvements were also experienced by countires that did not

payments with the international banks. But, as the crisis was not solved and access to the voluntary credit market not restored, the indebted countries were excessively penalized by the resource transfer. By the end of 1987, several countries were not paying all service due and it was obvious that the debt problem was not temporary.[31]

The most serious consequence of the debt crisis was on the rate of investment in countries with debt servicing problems.[32] In the same direction was the reduction in foreign investment in these countries, while other LDC experienced a significant increase of these flows, as can be seen in Table 1 below.

TABLE 1

FLOWS OF DIRECT FOREIGN INVESTMENT (US WHOLESALES PRICE 1980=100)				$US MILLIONS
	ARGENTINA	BRAZIL	CHILE	MEXICO	VENEZUELA
77-82	456.27	2204.63	227.01	1519.24	105.54
83-87	338.54	955.54	76.55	756.80	36.76
	COLOMBIA	KOREA	SINGAPORE	THAILAND	TURKEY
77-82	137.43	26.50	854.47	148.31	53.51
83-87	531.65	168.70	809.99	237.87	85.92

Source: World Debt Tables and International Financial Statistics

have IMF porgrams and are explained by the sudden halt in capital flows in the period.
31. In 1987, nine Latin American Countries were not, at least part of the interest of the debt: Bolivia, Brazil, Costa Rica, Dominican Repubkic, Ecuador, Honduras, Nicaragua, Panama and Peru.
32. See Greene and Villanueva (1991) for an empirical study comparing debtors and nondebtors LDC.

The decline in foreign investment aggravated the Balance of Payments problems, increasing the effort to generate the trade surplus. At same time, this decline exacerbated the investment crisis, contributing therefore, to the problem most countries still face today.

The objective of this chapter is to determine whether the decline in the flows of foreign direct investment can be explained by the effects of debt crisis. In the first part the reasons way the debt problem may have affected foreign investment in the indebted countries are discussed. In the second part, the reaction of an international firm to this situation is analyzed in terms of a "wait and see the resolution of the crisis" argument. Finally some concluding remarks are made in the third part.

1. The Consequences of the Debt Crisis on the International Firm

The severe decline of the investment observed in countries with debt servicing problems is usually associated with the debt crisis. Foreign debt can affect investment through two channels: the credit rationing, imposed on this countries after the debt crisis, and the debt overhang

effect resulting from the large resources transfers to private banks.[33]

The capital flows reversion due to the international credit rationing and continuing interest payment on the debt was very severe. Latin American as a whole, for instance, transferred US 147.5 billions to the rest of the world or 23.4% of its exports of good and services, between 1982 and 1987. During the 1970s, international bank lending was important in financing investment in most indebted countries[34]. At the same time that it was financing the current account deficits, it helped to keep domestic interest rates down and replaced the imperfect, long run, capital markets of those economies. To maintain both: the resource transfer and the investment at its pre crisis level would require a radical increase in domestic savings and/or other forms of foreign savings. For most countries, to increase domestic savings would mean to increase public savings. But this increase could only be achieved, in permanent basis, through a reform of the state and, in particular, of the highly indebted public firms that were seriously affected by the crisis. Otherwise, it would turn into fiscal repression, just like in the IMF programs. To

33. See Borensztein (1990) for a simulation of these two channels in a heavily indebted country.
34. In several countries external debt was also financing consumption expenditures and capital flights. See Dornbusch (1984) for an analysis of these components in the four largest debtors

increase other forms of domestic and foreign savings, would also demand difficult reforms, like trade liberalization and other deregulations of the economy.

On the other hand tese reforms were even harder to be implemented since as pointed out by Sachs "A heavy debt burden acts like a high marginal tax rate on economic adjustment. If the economy successfully imposes austerity, much of the benefit accrues to the foreign creditors" (Sachs, 1989, p28). To overcome the bias against investment a different approach to the debt crisis would be necessary as discussed by Krugman (1988) and others. But countries couldn't rely on this because private banks resisted any change in the conventional approach: The Baker plan failed because the banks didn't supply the resources as presumed and countries's iniciatives to exchange debt for long terms bonds were also repeled by them.

The bank credit constraint didn't affect the international firms. Although they also borrowed in the international market during the 1970's, this borrowing was mainly transfer among related firms, to overcome restrictions on capital repatriation that most countries apply and was not affected by the crisis.

On the other hand, the debt overhang effect must be analyzed more carefully because of the way governments promoted the resources transfers to external creditors. In

most indebted countries the bulk, about 80%, of the debt was owned by governments, with no exports revenue. Therefore, to pay the interest due on its external debt governments had to get the surplus from the private sector. When this resource transfer was financed through increased corporate taxes, multinational firms were highly damaged. Unlike domestic firms, they do not have the possibility of becoming, even partially, informal. Consequently, tax avoidances should play an important role in their location decision. Actually, most governments favoured the transfer through investment cuts and inflationary taxes. These forms of financing implied proportional less direct burden on foreign firms, since they were not involved in business with the governments and could avoid the inflationary tax by remitting their profits and dividends abroad.

To generate a trade surplus and meet debt payments most countries cut down on imports and stimulated exports through several mechanisms: exchange rate devaluation, rise in tariffs and quantitative restrictions on imports and exports subsidies. Therefore, for non indebted firms in the export sector the burden of the crisis was greatly attenuated by the exports subsidies and the exchange rate devaluations, but for firms producing mainly to the internal market, then it would suffer a double loss: finance the resource transfer to the banks and to the export

sector.   The multinational firms in less developed
countries, according to Cave's survey (1983), showed a high
propensity   to   import,   compared   to   their   national
equivalents, and produced mainly for the domestic market35.
Therefore, the new orientation was not beneficial for these
international corporations. On the other hand, these firms
have comparative advantages to obtain   international trade
credit and to sell in the   international market, than their
domestic equivalents. Therefore, they can easily switch to
produce a tradable good and benefit from the exports and
exchange rate incentives.

The devaluation of the exchange rate, independent of
exports considerations,   has an ambiguous effect on the
inflows of direct investment. While the currency devaluation
can attract new investment, as assets become cheap by
foreign   standards,   it   simultaneously   crimps   profit
remittance for firms already in the country.

Another factor that may have affected   the flow of
direct investment   was the priority given to the interest
payment on the external debt. With the threat of collapse of
the international financial system the prompt interest
payment was the major concern of   international
institutions, like the IMF. Therefore, for the countries the
priority was to honor obligations with the private banks and

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35. Franco and Frischt (1988), confirm these findings for
the Brazilian case.

not with the foreign investors. Delaying on profit remittance became a common practice in several countries.

Those short run measures were not neutral, for foreign investment (see Helleiner, 1989). On the other hand, the contraction of domestic demand, was stronger in sectors dominated by foreign capital: durable consumptions and investment goods. Therefore, multinational firms had also their share on burden to pay the debt. These short run measures were adopted under the assumption that the debt problem was temporary and the prompt payment of interests was necessary to avoid a major international financial crisis. The worst consequences of this adjustment approach was that, by postponing the necessary reforms, it gave time for the the economies to accomodate to the crisis and to build up resistences to changes in the future. Therefore, if the crisis were not temporary and the governments didn't change the approach to deal in a more consistent way with the problems, they would trigger reactions from international firms.

2. The "Wait and See" Strategy for an International Firm

The adjustment policies adopted by most countries with debt payments problems had negative impact on current and

expected profits of the foreign firms. It is reasonable to assume that from the beginning it was difficult to evaluate if the debt problem was temporary requiring only the adopted short run measures or if it was a serious one requiring structural reforms. If investment and disinvestment were not costly, even for a temporary crisis, the best response would be to get out and come back when the crisis was over. On the other hand, if these costs are high and it is impossible to evaluate the seriousness of the crisis and, more important, the reactions of the country to it, it is better to wait. After some time, it will become clear if the crisis was temporary and, if not, how the country is going to deal with it.

This "wait and see strategy" for the foreign direct investment can be discussed in terms of a "search type model" with no recall (Lippman and McCall (1976), considering the possibility of crisis resolution and the costs of disinvestment like in Bernanke (1985).

Let's assume that the costs associated with initial investment and total disinvestment are very high due to imperfect secondary markets on capital goods and legal restrictions at the time of repatriation. Profit remittance is not restricted and reinvestment is not costly.

Let r^g be the net per period return of capital when there is no crisis and a r^b, smaller return, when there is

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a crises. Let r^* be the net period of the capital disinvested and reinvested outside the economy.

Total returns are:

$$R^g_t = \sum_{i=0}^{\infty} \beta^i r^g_t$$

$$R^b_t = \sum_{i=0}^{\infty} \beta^i r^b_t$$

and

$$R^*_t = \sum_{i=0}^{\infty} \beta^{t+i} r^*_t$$

Although the return on capital invested outside the economy is independent of the state of the world in it, the value of the capital stock of the firm sold in the secondary market is not. Therefore R^* is a random variable with density function $dF(R^*)$ on R^* and $\underline{R}^*$.

In period 1 the debt crisis begins and the first consequences for the firm are lower profits with respect to the previous situation and even lower with respect to the international market. The firm must decide, on the basis of the alternative expected returns, to leave the country or to stay. If the decision is to leave, this is a definitive resolution, at least for the relevant time horizon, due to high cost of initial investment and total disinvestment. If the decision is not to leave, this is a decision concerning only this period and can be revaluated in the next period, when a similar decision is taken again if the crisis

persist. If the firm decides to stay it has to decide on how much of the profits it will remit, reinvest or, even, if it is going to make a new investment.

The duration of the crisis is uncertain. At the beginning is not possible to know if it is just a temporary problem that will be solved in the short run with the adjustment measures of the IMF programs. The firm believes that if the crisis is over, the good state will last forever, or at least, over the relevant horizon. The longer the crisis lasts the greater is the subjective probability that it will persist in next period since, it is more likely that the problem is a structural one and, as time passes, it becomes more difficult for the country to take measures to solve it.

Let p_t be the subjective probability that the crisis will be over next period, p_t decreases monotonically towards zero. Therefore, there is a period T where the subjective probability that the crisis will be solved is zero and the firm expects the bad state to last forever.

The analysis can be separated in three stages: The first corresponds to the period when the crisis is still viewd as temporary. In the second stage, the crisis is viewed as serious but the firm is still very caution with respect to a definitive decision. Finally, the third stage the crisis is viewd as permanent.

During the first stage, when the crisis is viewd as temporary, current and expected profits are depressed by the crisis but the total expected return of staying is higher than maximum return that can be obtained by selling the firm and investing the outcome in the international market.

In this stage we could expect a decline in reinvestment since current profits were lower and, with respect to the pre crisis situation, expected profits declined. Therefore, for the firm that is already established in the country, in period t < T

$$E(R_t{}^d) = r^b{}_t + \beta p_{t+1}R^g{}_{t+1} + \beta(1-p_{t+1})[r^b{}_t + \beta[p_{t+2}R^g{}_{t+2} +$$

$$\beta(1-p_{t+2})[r^b{}_t + \ldots + \beta[p_{T-1}R^g{}_{T-1}+\beta(1-p_{T-1})[r^b{}_t+R^b{}_T]\ldots]$$

where, $E(R^d{}_t)$ is the expected return of staying in the country and,

$$\bar{R}^* < E(R^d{}_t) < E(R^d{}_{t-1})$$

At the same time, in this stage we should not expect no major new investment from outside. As discussed by Dornbusch (1990), for the repatriation of Mexican capital, when investment costs are high and the investor can get

information by waiting, the option value is very high. Therefore, for the new investment that can wait outside, yielding r^*_t, until the problem is solved:

$$E(R_t) = r^*_t + \beta p_{t+1} R^g_{t+1} + \beta(1-p_{t+1})[r^*_t + \beta[p_{t+2} R^g_{t+2} +$$

$$\beta(1-p_{t+2})[r^*_t + ... + \beta[p_{T-1} R^g_{T-1} + \beta(1-p_{T-1})[r^*_t + R^*_t]...] > E(R^d_t)$$

since $r^* > r^b$. $E(R_t)$ is the expected return to keep the option to outside and enter only when the crisis is solved.

As time passes the firm reviews its subjective probability about the crisis being solved in the short run. Therefore, in the second stage:

$$\underline{R} < E(R^d) < \overline{R}$$

But the firm is still waiting either for the crisis to be over or the country undertake the correct mesures to avoid a permanent crisis. On the other hand, since the opportunities outside the economy are better than inside, the firm is already searching for the best price to sell its stock of capital to leave the country. In this period we should expect no new investment, no reinvestment but still, no significant disinvestment.

In formal terms, in period t, when τ periods remain until $p_T = 0$, and the firm is still in the country, the decision of the firm can be expressed as:

$$V_t = EMax \{R^*_t \; ; \; r^b_t + \beta[(p_{t+1}R^g_{t+1} + (1-p_{t+1})V_{t+1}]\}$$

or

$$V_t = \int_{\underline{R}^*}^{r^b t + \beta[(p_{t+1}Rg_{t+1} + (1-p_{t+1})V_{t+1}]} [r^b_t + \beta[p_{t+1}R^g_{t+1} + (1-p_{t+1})V_{t+1}] \, dF(R^*) \; +$$

$$\int_{rb_t + \beta[(p_{t+1}Rg_{t+1} + (1-p_{t+1})V_{t+1}]}^{\overline{R}^*} R^*_t \, dF(R^*)$$

So, if there is an offer to sell the firm for a value that exceeds V_t it should be taken, if less than V_t is better to turn it down and take the chance in the next period.

The standard results of the search models apply: the reservation price V_t is higher than V_{t+1}, reinforced by the fact that $p_t > p_{t+1}$ and the higher the reservation price the longer the duration of search.

It can be shown that V_t reacts positively to changes in R^g and in the distribution of p_t:

$$dV_t/dR^g = (p_{t+1}+(1-p_{t+1})\beta dV_{t+1}/dR^g) \; .$$

$$F(r^b_t+\beta(p_{t+1}R^g_{t+1}+(1-p_{t+1})V_{t+1}) > 0$$

since $dV_{t+1}/dR^g > 0$ (see appendix), and

$$dV_t/dp = [\beta(R^g_{t+1}-V_{t+1})+(1-p_{t+1})dV_{t+1}/dp] .$$

$$F(r^b_t+\beta(p_{t+1}R^g_{t+1}+(1-p_{t+1})V_{t+1}) > 0$$

Since $R^g_{t+1} - V_{t+1} > 0$ and $dV_{t+1}/dp > 0$ (see appendix).

Therefore a shift in the probability distribution of the state of the world or in the return of the good state, changes the reservation price in the same direction.

A change from $F(R^*)$ to $G(R^*)$, where $F(R^*)$ presents first order stochastic dominance over $G(R^*)$ implies in a decrease in the reservation price and consequently in the waiting time. Hence, if we consider that the average price of capital goods in the secondary market declines with the duration of the crises, the waiting time will be shorter. Also, an improvement in investment opportunities outside the economy implying in a higher returns in the international market (or in another country) may have the same effect.

As time passes and the crisis is not solved and the country doesn't change its strategy to deal with the problem, there is less and less chances that will changed in

the future. The third stage in a firm's decision-making process starts when the subjective probability that the crisis will be solved is zero, therefore,

$$E(R^d) = R^b < \underline{R}^*$$

and, if the firm is still in the country, it is just waiting for any offer to leave forever. In this period, we should expect disinvestment to take place or the complete depreciation of the capital.

3. Concluding Remarks

If this wait and see strategy describes the reaction of the international firms to the debt crisis, we should expect to observe some characteristic results. During the first years after the beginning of the problem, if the international firms shared the IMF view of the crisis, we should expect the flow of investment to slow down. Nevertheless, declines of reinvestment should be more associated to the recession itself than to change in expectatives about the future of the economy. New investment should present a stronger reaction, since the problem, even if temporary, exist. On the other hand, the exports

opportunities open by the crisis itself should work as an attraction factor for new investment.

When the perception about the seriouness of the crisis changed, the need of drastic reforms to increase domestic savings and attract capital from outside became clear. If the country reacted with structural reform in the external and domestic sectors, we should expect a reversion on the above tendencies: increase in reinvestment and in capital inflows. Of course, reinvestment should react faster than new inflows, that demands a more definitive solution to the crisis. On the other hand, if the country persists with the short run measures, inconsistent with long run sustained growth, those tendencies will accentuate and foreign capital will flight from the country.

Multinational corporations, by their own nature, have more mobility with respect to the location of their physical capital than domestic firms. Althought, industrial organization considerations are the most important explanation for foreign direct investment in developing countries (Caves, 1983); While profits considerations are better motivations for general foreign investment since the higher return offered by the other country can be achieved through portfolio investment, an easier route than direct investment. Foreign firms are not enclaves inside developing countries that can profit and pursue its own strategies

independent of the macroeconomic environment of the country. Among different developing countries there are always several that qualify as host for multinational considerations. Therefore, foreign investment responds more radically, even if slower, to changes in the attractiveness of owning assets in a country than domestic investment. The programs adopted by most indebted countries ignored those consequences.

Appendix

The proof that $dV_{t-1}/dR^g > 0$ and $dV_{t-1}/dp > 0$ is very simple: There is a period T+1 when $p_{T+1} = 0$, although search may continue for some time lets assume that T is the terminal period, in the sense that the firm will leave in the next t periods with certainty.

Therefore at T

$$V_T = EMax\{ R^*_T \; ; \; R^b\} = E(R^*)$$

at T-1, if the firm is still in the country

$$V_{T-1} = EMax \{R^*_{T-1} \; ; \; r^b + \beta[(p_T R^g + (1-p_T)E(R^*))]\}$$

This expression is of the kind

$$K \int_{\underline{X}}^{K} dF(X) \quad + \int_{K}^{\overline{X}} X dF(x)$$

by integrating by parts the second term, the expression becomes:

$$= KF(K)-XF(X) + \overline{X}F(\overline{X})-KF(K) - \int_{K}^{\overline{X}} F(X)dX$$

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$$= KF(K) - \underline{X}F(\underline{X}) + \overline{X}F(\overline{X}) - KF(K) - [T_{F(\overline{X})} - T_{F(K)}]$$

where,

$$T_{F(X)}{}_{K}^{\overline{X}} = \int_{K}^{\overline{X}} F(X)dX$$

Therefore

$$dV_{T-1}/dR^g = F(r^b + \beta[p_T R^g + (1-p_T)E(R^*)])\beta p_T > 0$$

and

$$dV_{T-1}/dp_T = F(r^b + \beta[p_T R^g + (1-p_T)E(R^*)])\beta(R^g - E(R^*) > 0$$

3. Debt Crisis and Foreign Investment: Empirical Evidence

Introduction

Foreign direct investment, in Brazil, presented a different pattern of adjustment to the debt crisis when compared to total investment. In the first years of the crisis, both rates declined significantly, after 1986 the total investment rate stabilized at its lower level while the foreign investment rate declined further. By the end of 1990 these flows were one third of what they used to be in 1982. This response to the crisis suggests that foreign firms reacted with caution to the debt problem, waiting to see what was the nature of the crisis and the reaction of the government to it. As the crisis was perceived as a serious one and the government resisted adopting a structural adjustment program and persisted with accommodating policies to the crisis, international firms presented a stronger reaction.

The objective of this chapter is to analyze the empirical evidence on foreign direct investment flows testing the hypothesis that international firms changed their reaction to the crisis in the way discussed above. Part 1 estimates the behavior of the foreign flows in Brazil, separating inflows, reinvestment and outflows. As

the Brazilian experience was close to the experience of other indebted countries, a pooled-time series cross-section equations were estimated in Part 2. Some conclusions are presented in Part 3

1. The Brazilian Empirical Evidence

Foreign direct investment (FDI) presented a strong reaction after 1982 when, not only the flows of investment were reduced but also profits remittance increased substantially. As can be seen in table 2 below, there is a fall of 95% of the flows of FDI comparing the period 83-89 with 77-82. After 1986, with the increasing economic instability of the country, the average flow became negative. In the last years debt conversion became an important channel of foreign investment in Brazil. As a part of debt/equity swaps is done at secondary market prices, in line (a) the gains in those operations were discounted from the value of the flows of FDI.[36]

36. In 1986 the amount converted was $176.1 millions, and the secondary market price on average 75% of the face value. In 1987 $335.5 millions at 54% of face value. In 1988 it was converted $1500 millions in the government auctions with a 25% spread and $587 millions at 15% spread. In this year the average price in the secondary market was 47%. In 1989 and 1990 the amounts converted were $945.6 millions and $283 millions and the secondary market price 30% and 23% respectively.

TABLE 1

Net Flows of Foreign Direct Investment
(Net Foreign Investment - Profit Remittance
(annual average - US$ millions)

		(*)
1971/1978	1085.03	
1979/1982	1924.05	
1983/1986	507.95	496.94
1987/1990	451.52	-102.73

Source: Banco Central do Brasil
(a) Discounting gains from debt conversion (see footnote 1)

The analysis of the behavior of the flows of foreign direct investment must consider the period before the beginning of debt crisis, from 1970 to 1982 and the period after it, from 1983 to 1990. For the purposes of the analysis is also important to separate in the last period, the years in which the country carried out the IMF programs, from 1983 to 1985 and after 1986 when it tried all kinds of heterodox experiments and refused, systematically, to undertake any structural reform to solve its financing problem. It is also after 1986 that debt conversion became an important source of foreign investment.

As can be seen from the table 2 below, during the period in which the external debt was being contracted total investment was increasing, mainly due to the increase in reinvestment. This result suggests that a complementary relation between the external debt, that was financing

mainly public investment, and foreign investment already established in the country. Inflows and outflows do not present results markedly different from the previous period.

In the period that follows the beginning of the debt crisis until 1986 the retraction of the flows was very strong: reinvestment and new inflows presenting strong similar contraction. Outflows were high but lower than in the previous period. Finally, in the 1987-1990 period, there was a small increase in reinvestment and inflows were surprisingly high. This increase was due mainly to debt conversion as can be seen in the columns (a) that computes the amounts effectively spend to make the new investment (see footnote 1). Considering the debt conversions, results are quite different showing a further decrease in new inflows. Capital outflows, both foreign and from Brazilian investors, were very high showing the seriousness of the crisis.

TABLE 2

Foreign Direct Investment
(annual averges - US$ millions)

	Inflows	Outflows	Reinvestment	Inflow
1971/1978	898.16	62.67	482.84	903.16
1979/1982	1772.67	188.48	857.40	1772.68
1983/1986	990.62	323.57	539.58	979.62
1987/1990	1531.72	410.77	533.77	977.47

Source: Banco Central do Brazil.
(*) discounting the gains from debt conversion

The evidence above is in line with the "wait and see" strategy discussed before, although the reduction on reinvestment was higher than it should be expected.

The date is available in quarterly basis for the 1971-1990 period and it is possible to do a separate analysis for inflows, outflows and reinvestment. Time series analysis must be performed carefully to avoid spurious correlations between the variables and to accomplish the stationary requirements of econometric estimation. The tests for unit roots of the series followed the procedure suggested by Dickey and Fuller (1981) and the test of cointegration of the variables and of use of an error correction mechanism, the two step methods by Engle and Granger (1987).

The results of the augmented Dickey-Fuller test (ADF) for unit root test are presented in Table 4 in the appendix. The choice of the number of lags in the Dickey-Fuller regression is not trivial: a too low order leads to invalid statistics due to autocorrelation remaining in the residuals, while a too high implies a reduction in the power of the test. Dolado and Jenkinson (1987) suggest a number of lags ranging from 1 to 8 for quarterly data. For most series three to four lags seem to be enough to remove the autocorrelation of residuals (in terms of significance of

t-ratios), although, in some cases, specially in the cruzeiros denominated series, more lags were included.

Before proceeding the analysis of the relationship between the variables is important to examine more carefully the series of inflows, outflows, and reinvestment rate. As can be seen in Figure 3.1, which display the log of inflows of foreign investment, there is a decrease in the mean of the series after the third quarter of 1982 and after the first quarter of 1986. There is also an increase in the persistence of the series after the first quarter of 1987, with a high peak in the third quarter of 1988 and a low trough in the first quarter of 1990. The change in the persistence of the series may suggest a change in its specification. At the other hand, there are some specific events in the economy during the period that may explain this change and make it more likely to be temporary: the debt conversion auctions in 1988, probably implied some anticipation of investment, explaining part of the increase in this year and the fall in the subsequent one; the uncertainty surrounding the presidential election in 1989, polarized between a left wing and a right wing candidate, suggests postponements of investment in this year; Finally, in 1990, the victory of the right wing canditate and the liquidity constraint imposed by the asset retention of the stabilization plan may explain the observed increase.

FIGURE 3.1

Inflows of Foreign Direct Investment

□   log of inflows
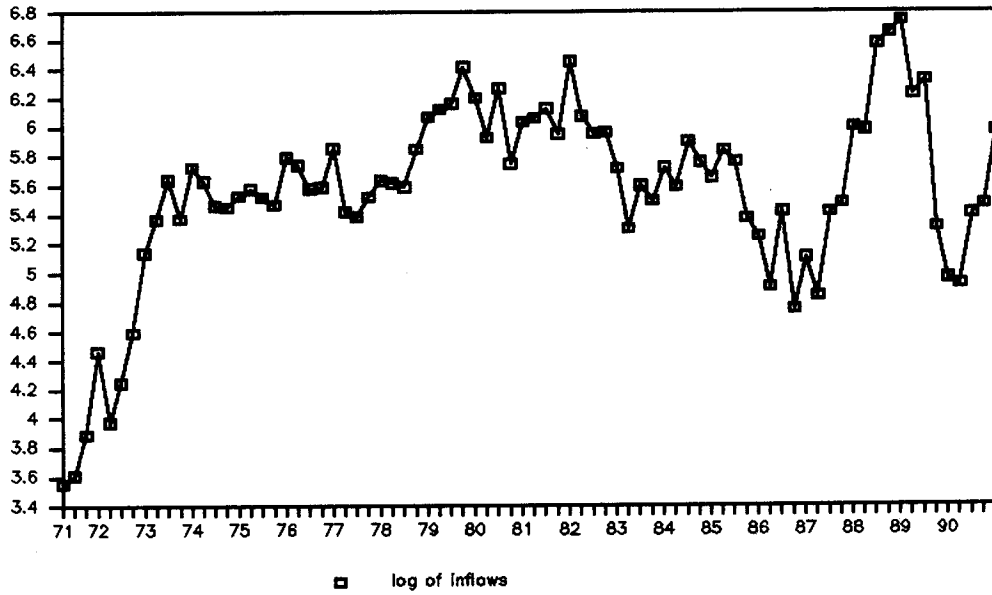
FIGURE 3.2

Inflows of Foreign Direct Investment
(First Difference)

□   log of inflows
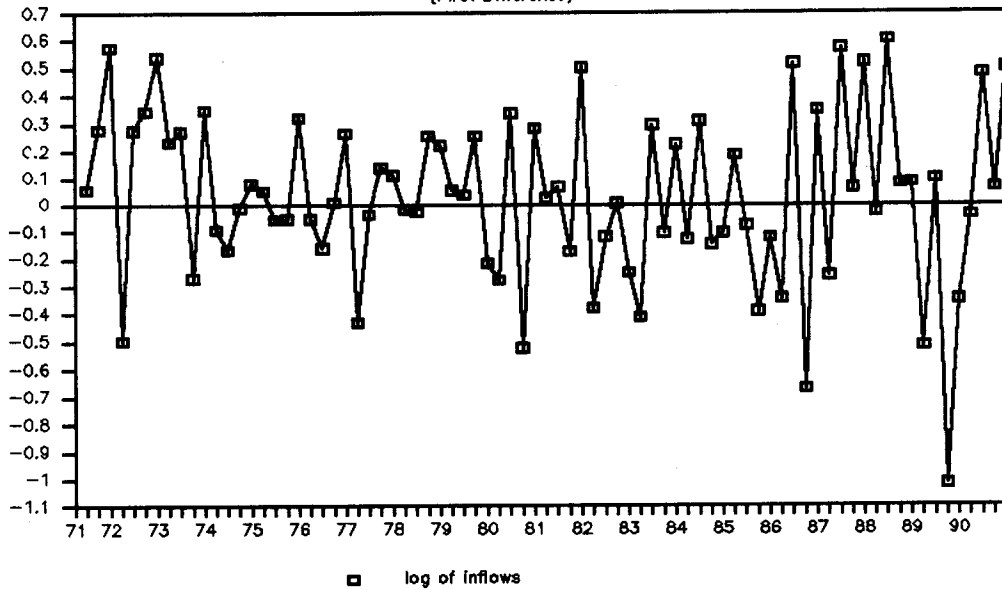
FIGURE 3.3

Foreign Direct Reinvestment Rate
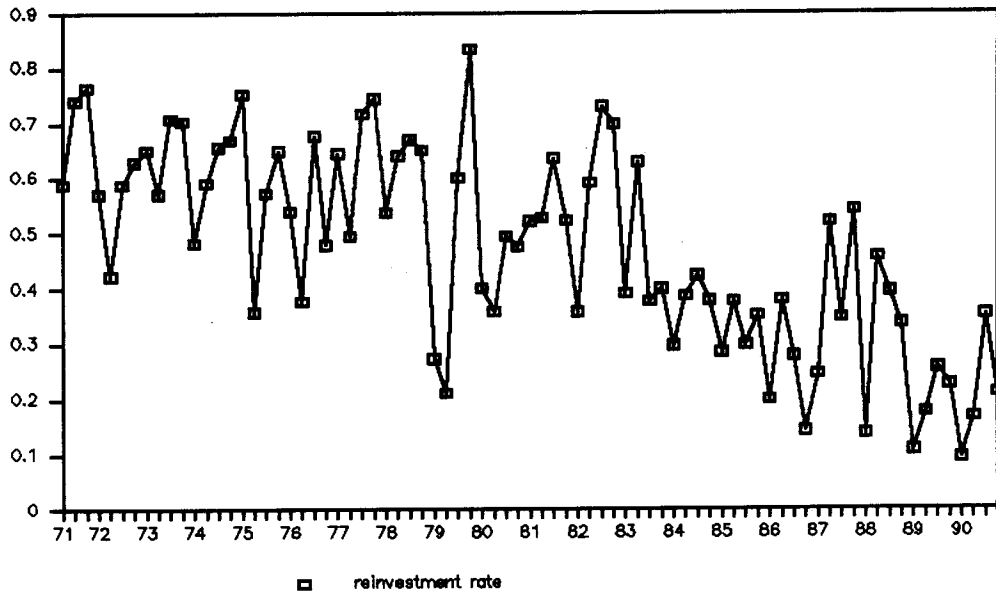
reinvestment rate

FIGURE 3.4

Foreign Direct Reinvestment Rate
(First Difference)

reinvestment rate
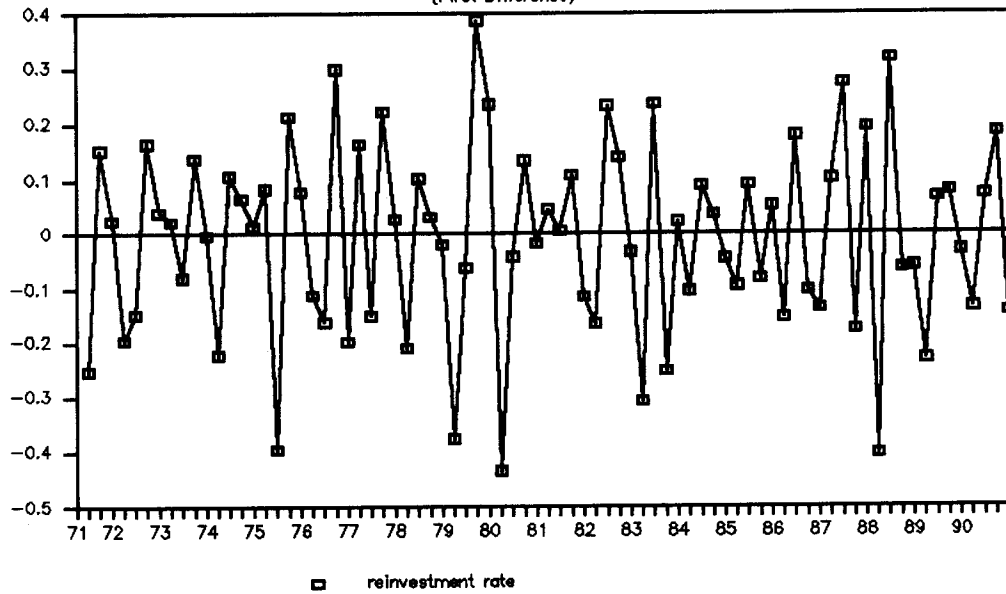
FIGURE 3.5

Outflows of Foreign Direct Investment

□   log of outflows
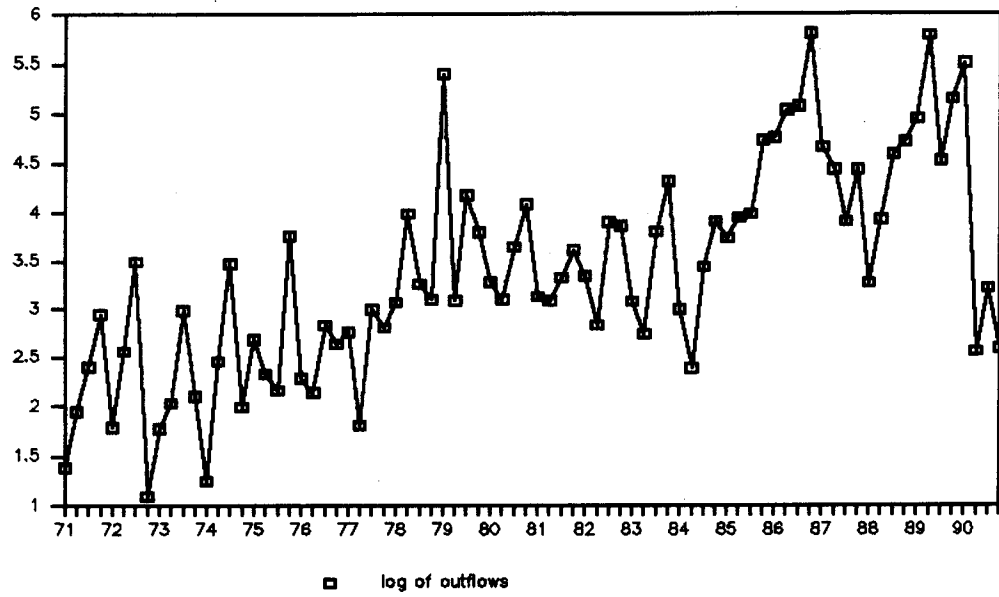
FIGURE 3.6

Outflows of Foreign Direct Investment
First Difference

□   log of outflows

FIGURE 3.7

Inflows* of Foreign Investment
Discounting Gains from Conversion

log of inflows*

FIGURE 3.8

Inflows* of Foreign Investment
(First Difference)

log of inflows*
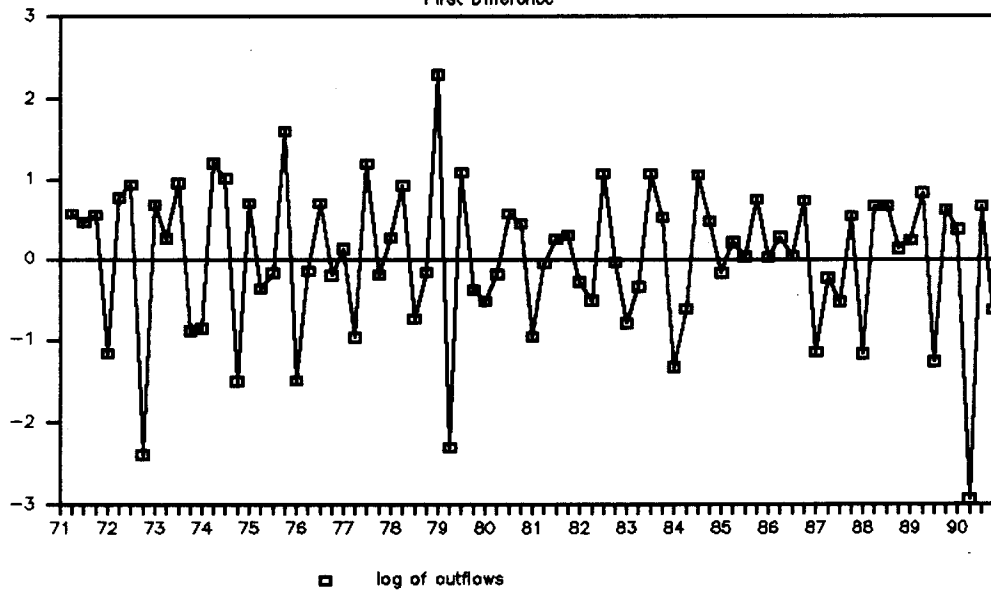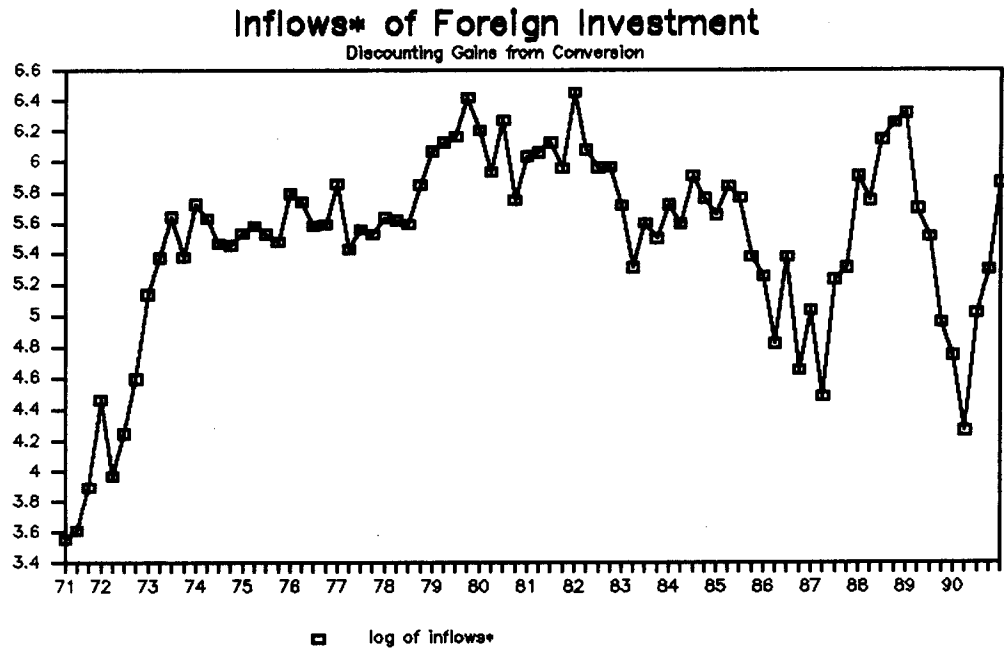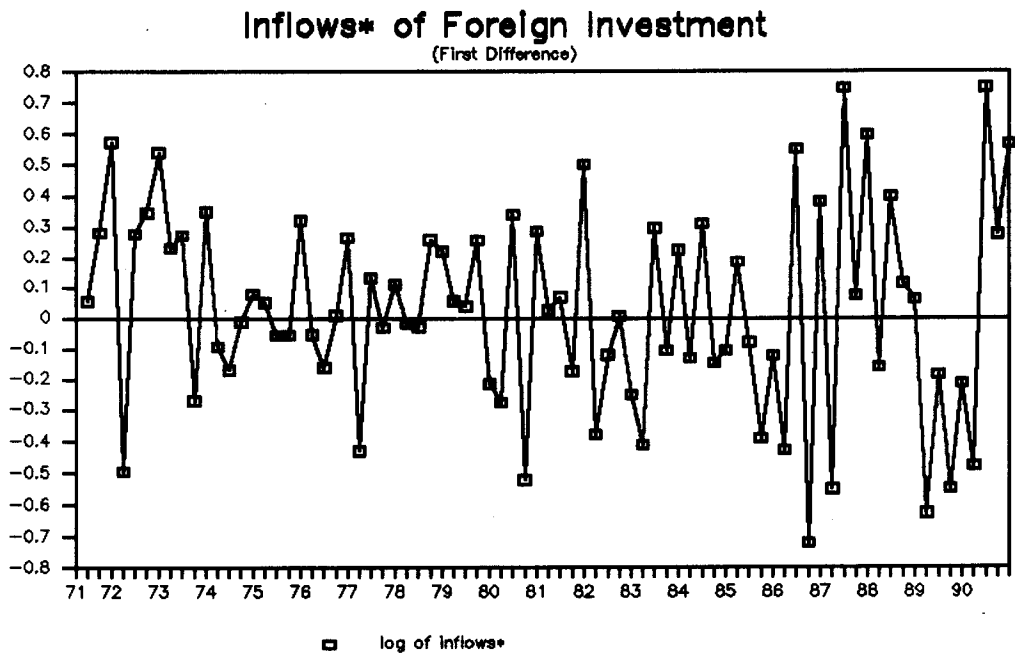
The changes in the mean are also more likely to be a one time shift in the trend function associated with the debt crisis.

The reinvestment rate presents a similar behavior to the inflow series, as can be seen in figure 3.3 The downward shift in the mean occurs after the third quarter of 1983, and the increase in the persistence of the series after the first quarter of 1986. This delayed reaction may reflect involuntary reinvestment due to the profit remittance controls that were imposed by the Central Bank at the beginning of 1983 and released by the end of the year.

The outflow series shows a stabler behavior until the third/fourth quarter of 1985 in terms of mean and persistence, that is reversed after this period, as can be seen in Figure 3.5. Again, the same interpretation as in the inflow case can be given to this behavior: The increase in persistence may reflect some temporary phenomenon like the debt moratoria during 1987 and 1989, that implied a halt in capital outflows. The decline of outflows, during 1990, may reflect either confidence in the new government that was elected promising to undertake several structural reforms or just the liquidity constraint imposed by the asset freeze of the new government.

For the analysis is important to test if those changes affected the stochastic structure of the series or just the

deterministic part of them. The split-sample and full-sample Dickey-Fuller statistics for the three series are reported in Table 4. It is a known result that the use of split samples implies test with lower power. On the other hand, in the presence of exogenous change in the mean level of a time series, standard unit root tests are biased toward nonrejection of the unit root hypothesis, when the full sample is used (see Perron 1990).

For the inflow and reinvestment rate series, the sample was split around the debt crisis in 1982 and the null hypothesis of a unit root cannot be rejected. At the other hand, the split samples series are of the same integration order as the full sample series. Of course this result may reflect the small sample bias therefore, is not conclusive. To test if the change of the persistence of inflows, reinvestment and outflows series implied some modification in their stochastic structure, the observations, corresponding to this period, were dropped. The results of the test with the smaller sample were compared to the results of the full sample. Again, the integration order of the series is the same in the two samples and for all series.

Although those results are not conclusive and must be interpreted very carefully, they seem to indicate either that there is no change in the stochastic structure of the

series or that the change is still too recent to be
captured by the tests.

TABLE 3

Period	Splitted Sample ADF Tests				
	ADF(1)	ADF(2)		ADF(1)	ADF(2)
	I(0)			I(1)	
Inflows					
71:1 90:4	4.63	3.36		11.76	7.89
71:1 82:3	2.93	2.36		8.25	6.38
82:4 90:4	1.82	1.33		12.87	8.57
71:1 85:4	3.51	2.35		10.42	7.64
71:1 86:4	3.71	2.48		12.24	8.77
Outflows					
71:1 90:4	3.41	2.28		12.93	8.67
71:1 85:4	3.30	2.60		25.36	16.91
Reinvestment Rate					
71:1 90:4	3.16	2.73		25.96	16.91
71:1 83:2	4.66	3.13		14.46	9.65
83:3 90:4	3.07	2.94		10.38	6.92
71:1 85:4	3.91	2.97		15.78	10.53

ADF(1) unit root with a drift
ADF(2) unit root

At the other hand the change in the mean of the series
may be interpreted as a one-time permanent shift in the
deterministic component of the series due to the debt
crisis. Since the split sample results have low power, the

full sample test, suggested by Perron (1990), was undertaken to verify if the integration order of the series was affected by the change in the mean, associated with the debt crisis. An additive-outlier model was estimated: The usual characterization of Dickey-Fuller type of regression is generalized to allow a one-time change in the structure of the series occurring at time TB, ($1 < TB < T$).

$$\bar{Y}_t = \alpha \bar{Y}_{t-1} + \sum_{j=1}^{k} c_j \, d\bar{Y}_{t-j} + vt$$

where $dYt = Y_t - Y_{t-1}$

and $\bar{Y}_t = Y_t - \mu - \beta DU_t$

DU_t = 0 if t ≤ TB
= 1 otherwise

For the inflows series, TB should be the third quarter of 1982, after the Mexican moratoria. The change in the mean in the reinvestment rate is some quarters later, probably because of the constraints on capital outflows in the beginning of 1983. So, in this case, TB was set at the third quarter of 1983. For the outflows series TB was set at the first quarter of 1985 and cannot be associated to any major event as the other two but to the general perception that the debt crisis was not a temporary one and was not been treated properly. The results of the estimation are reported in Table 5 below and the t_α is the t-statistics for

testing the null hypothesis that $\alpha = 1$. The critical values of t_α are in Table 4 of Perron (1990 pg 158).

TABLE 4

Perron's Test for Change in Mean of the Series

series		$t\alpha$	$t\alpha* = 5\%$
inflows	0.7991	-2.254	-3.38
reinvestment	0.6588	-2.1792	-3.38
outflows	0.6588	-2.1792	-3.33

By this test the null hypothesis of unit root cannot be rejected for any of the three series. Hence, even if the observed shifts in the mean are one time shifts in the deterministic component of the series there seems to be no model misspecification, confirming the split sample tests. Therefore, it is reasonable to assume that debt crises affected only the deterministic part of the series. The effects of this crisis on the flows of foreign direct investment can be captured by dummies variables.

Each series, log of inflows of foreign investment (INF), the reinvestment rate (RR) and log of outflows of foreign direct investment (FDO), was estimated using the two- steps approach of Engle and Granger (1987): The

residuals of the co-integrating regression were fitted as an error correction mechanism in the regression estimated with the stationary variables.

It was considered for the analysis, the domestic sector related variables like the log industrial production (IND), the domestic interest rate (r), the annualized inflation rate (π) or the log of the general price index (GPI-BR), the log of tax revenue (TAX), the log of minimum wage (W);the external sector related variables like the log of the exchange rate (EX), log of exports of manufacture (XM), log of total and capital goods imports (MT and MK, respectively); the international related variables like the US Treasury Bill rate (TBILL) and the log of the US consumption price index (CPI-US); The external debt related variables like the log of the external debt itself (DEBT), the log of the interest payments on the debt (INTER), the log of the international reserves (RESERV) and the log of the stock of foreign direct investment (FDIS) in the country. A description of the variables and sources is given in the appendix.

The inclusion of variables in the co-integrating regression should obey some criterion. The t-ratios of the variables are biased, given the degree of autocorrelation of residuals, and with an upward bias in case of positive autocorrelation. Following Dolado and Jenkinson (1987), only

variables with high t-ratios were included in the equilibrium regressions.

All variables are measured in logarithms, therefore the coefficients in the equations, except for the inflation and the interest rate variables, have the dimension of elasticities.

Inflows of Foreign Investment

In the long run estimation of the inflows series the industrial output, the foreign debt, the lagged stock of foreign investment, the manufacture exports and the annualized inflation rate, were significant at 5% level. Manufacture exports and inflation present the expected signs while the positive coefficient of external debt indicates some kind of complementariness with foreign investment. Industrial output has a negative sign, showing that inflows of foreign investment present a counter cyclical behavior with respect to output and take advantage of the slowdowns of the economy. Other variables that should be expected to be related to these flows in the long run, as the related to the labor market or to public finance, were not significant, therefore were not included.

To test the effects of the debt crisis in the long run equilibrium of inflows of foreign direct investment, the

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regressions included dummies for change in the intercept and in th e slope of same variables. The results can be seen in Table 5.

TABLE 5

Tests for Structural Changes - Inflows

Intercept dummies			slope dummies external debt			exports	$\overline{R}^2$	CRDW
83/90	83/85	86/90	83/90	83/85	86/90	83/90		
-0.48 (-2.46)							66.88	1.05
	-0.52 (-3.13)	-0.20 (-1.13)					68.28	1.12
			-0.03 (-3.14)	-0.01 (-1.14)			68.29	1.12
			-1.32 (-2.47)	-1.30 (-2.48)	1.08 (-2.42)		70.31	1.34
		-1.23 (-2.24)				1.01 (2.02)	68.52	1.23
	0.36 (2.29)	-1.32 (-2.47)				1.08 (2.41)	70.31	1.34

Besides the dummies for the intercept, only debt (dummy*debt) and manufacture exports (dummy*xm) presented a significant change in their coefficients after the debt crisis. The results are reported in Table 5, the coefficients of the remaining variables in the co-

integrating regression (manufacture exports, external debt, industrial output, inflation rate and lagged stock of foreign investment) were omitted since, in all regressions, they were almost the same.

As it can be seen in table 5, the intercept dummy for the whole period after 1982 is negative and significant, but, splitting the period after 1986 it becomes not significant. The same results are observed with the slope dummy for external debt, what is interesting since the dummy86-90*debt should capture the reductions of the external debt due to debt/equities swaps. On the other hand, when the slope dummy for exports of manufactures is included there are some modifications in the results: The intercept dummy for 1986-1990 period is positive and significant suggesting that, on average, there be an improvement in the flows after 1986. Also, the regressions present better adjustment in terms of R2 and the CRDW is also higher. Therefore, the equation reported in the last line was chosen as the co-integrating regression.

$$INF = 29.41 - 3.75FDS_{-1} + 1.09XM - 0.002d\pi + 2.21DEBT - 1.25IND$$
$$\quad\ (4.82)\quad (-5.75)\qquad (3.13)\quad (-2.12)\quad (3.76)\qquad (-2.35)$$

$$-\ 1.32DUMMY8390*DEBT + 1.08DUMMY8690*XM + 0.36DUMMY8690$$
$$\quad (-2.46)\qquad\qquad\qquad (2.41)\qquad\qquad\quad (2.30)$$

$\bar{R}^2$ = 0.7031   SEE = 0.321 D.of F.= 70 CRDW = 1.3424 ADF =8.42

Both, the CRDW and ADF statistics reject the null hypothesis of non cointegration comparing with the critical values from

Table 2 in Engle and Grange (1987). But since the R^2 is not high the results must be viewed with some caution (see Perman, 1991 and Valls Pereira, 1988).

Using the error correction representation suggested by Engle and Granger (1987), the lagged residual of the co-integrating regression (RESt-1) in the short run adjustment equation, we observe that this variable has the correct negative sign for an error correction and is significant at 5% level.

$$dINF = -0.46RES_{-1} + 0.48dXM - 0.25d^2GPI + 0.38dRESER_{-1}$$
$$(-4.83) \qquad (2.05) \qquad (-1.43) \qquad (2.128)$$

$$-0.134dREMIT \quad -0.02d1 + 0.08d2 - 0.15d3 + 0.08d4$$
$$(-2.50) \qquad (-0.31) \quad (1.27) \quad (-2.71) \quad (1.48)$$

$$\overline{R}^2=0.4729 \quad DW = 1.81 \quad D.of\ F. = 65 \quad SEE = 0.225$$

The growth rate of manufacture exports and lagged reserves are significant and with the expected sign, inflation rate , although having the correct sign is not significant. Profit remittance is significant and presents a negative influence on inflows.

When the analysis is done, discounting the gains from debt conversion at the secondary market prices (see footnote

2), there are some changes in the results. The coefficients and t-statistics are indicated in in Table 7.

TABLE 6

Tests for Structural Changes - Inflows* Series

Intercept dummies			slope dummies external debt			exports		
83/90	83/85	86/90	83/90	83/85	86/90	83/90	R2	CRDW
-0.48 (-3.36)							74.42	1.37
	-0.49 (-3.34)	-0.45 (-2.88)					74.10	1.38
				-0.04 (-3.37)	-0.04 (-2.88)		74.12	1.39
				-1.12 (-2.09)	-1.11 (-2.08)	0.81 (2.00)	75.17	1.57
			-1.08 (-2.02)			0.78 (1.95)	75.38	1.55

From the first two lines in Table 7 it is clear that, although the dummies for the second (1983-1985) and third period (1986-1990) are significant, there are no gains in splitting the analysis in three periods. Better results in terms of R2 are obtained with one dummy for the whole 1983-1990 period. With respect to Table 6, the intercept dummy for the period after 1986 is negative and significant,

indicating that the average improvement in the flows was associated with the gains from debt conversion. The decline in new inflows is not restricted to the first years after the debt problem but there is no significant change in the recent years, when those gains are discounted.

In terms of specific variables it is clear that export of manufactures became even more important as an attraction factor for the inflows of foreign direct investment after 1983 while the influence of the external debt turned negative. The inclusion of those variables, multiplied by the dummy, takes explanation power from the intercept dummies and gives better results in terms of R2 and CRDW. In view of those results the last specification, i.e., the regression that includes the dummy for the 1983-1990 period multiplied by the external debt and by manufacture exports was chosen as the co-integrating regression. As the CRDW and ADF statistics show co-integration cannot be rejected at 5% level but, again, the results must be viewed with caution since the R2 is not high.

$$INF^* = 28.80 + 2.15DEBT - 3.88FDS_{-1} + 1.07XM - 0.0002d\pi$$
$$(-7.52) \quad (4.60) \quad (-7.51) \quad (3.44) \quad (-3.45)$$

$$- 1.05INT - 0.98DUMMY83-90*DEBT + 0.79DUMMY83-90*XM$$
$$(-2.61) \quad (-2.01) \quad (1.96)$$

$$\bar{R}^2 = .7760 \quad SEE = 0.291 \quad D.of\ F.\ 71 \quad CRDW = 1.55 \quad ADF = 4.6737$$

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The short run regression presents some changes with respect to the previous one. The most important is with respect to profit remittance that is significantly negative only in the later period. As for the original inflows series other short run variables, like international and domestic interest rates, exchange rates were not significant, therefore not included.

$$dINF^* = -0.5142RES_{-1} + 0.46dXM - 0.32d^2GPI + 0.40dRESER_{-1}$$
$$(-5.154) \qquad (2.06) \qquad (-1.94) \qquad (2.30)$$

$$- 0.058dREMMIt - 0.22DUMMY83\text{-}90*dREMMIT - 0.072d1$$
$$(-0.86) \qquad (-2.12) \qquad (0.938)$$

$$+ 0.58d2 \quad -0.11d3 + 0.11d4$$
$$(0.94) \qquad (-2.11) \quad (2.06)$$

$$\bar{R}^2 = 0.6167 \quad SEE = 0.217 \quad DW = 1.86 \quad D.of\ F.= 68$$

It is important to notice that the regressions with the foreign direct investment inflows discounting the gains from debt conversion show better adjustment than the regression with the original series, both: in terms of R2 and of SEE (standard error estimate).

Reinvestment Rate

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The reinvestment rate presents a long run relationship similar to total inflows, with manufacture exports, annual inflation and stock of foreign investment, been significant and affecting it in the same way. Industrial output, at the other hand, has a positive effect while imports and international reserves a negative impact. The negative coefficient of reserves probably reflects the Central Bank delays on profit remittance when they are low.

As it was discussed before, the reinvestment rate presented a delayed reaction to the debt crisis when compared to total inflows: Only after the third quarter of 1983 there is a decrease in the rate that is probably explained by the controls on profit remittance in the previous period. To test if the observed decrease is significant, an intercept dummy for this period was included in the co-integrating regression. Since, after the third quarter of 1986 there is another shift in the dependent variable the equation was also estimated including two intercept dummies: one for the 1983:3 1986:3 period and other to the 1986:4 1990:4 period. It was also tested if the shift could be associated with a change in the coefficients of the explanatory variables. The evidence was only for the external debt variable. The results are reported in Table 7. The coefficients of the remaining variables, in the co-

integrating regression, were omitted since, in all regressions they were almost the same.

TABLE 7

Test for Strutural Change - Reinvestment Rate

Intercept dummies			slope dummies external debt			R2	CRDW
83/89	83/85	86/90	83/89	83/85	86/90		
- 0.35 (-3.05)						66.47	2.04
	-0.30 (-2.09)	-0.38 (-2.97)				66.16	2.03
			-0.03 (-3.06)			66.48	2.04
				-0.026 (-2.09)	-0.033 (-2.97)	66.16	2.03

As in the inflow of investment case, the gain in splitting the analysis in three periods is small, although the coefficients of the intercept and external debt are somehow higher for the 1986-1990 period then for the 1983-1985 period. Nevertheless, better results were obtained considering only the 1971:1 1983:3 and 1983:4 1990:4 period. So, the co-integrating regression was computed including only the corresponding dummy.

$$RR = 1.19 \text{ IND} + 0.85 \text{ XM} - 0.32 \text{ RESER}_{-1} - 0.45 \text{ KM}$$
$$(2.79) \qquad (4.16) \qquad (-3.0 \qquad\qquad (3.42)$$

$$- 1.75 \text{ FDIS}_{-1} - 0.0001 d\pi - 0.35 \text{ DUMMY83-89} + 7.80$$
$$(-5.08) \qquad (-2.12) \qquad\quad (-3.06) \qquad\qquad (5.17)$$

R2 = 66.47   CRDW = 2.043 SEE = 0.28   ADF = 6.34

By the ADF and CRDW tests the variables co-integrate but, again, the results must be taken with some caution since the R^2 is not high.

The short run behavior of the series included the residual of the co-integrating regression as the error correction mechanism. The rate of change of imports and of inflation were also significant for the short run adjustment. The rate of change of taxes was also significant at 5% level. The rate of change of exports is significant only for the after 1983:3 period, showing that the crisis affected also the short run behavior of the reinvestment rate.

$$dRR = - 0.95 \text{ RES}_{-1} + 0.32 \text{ dXM} - 0.61 \text{ dMK}$$
$$(8.41) \qquad\quad (1.04) \qquad\quad (-3.03)$$

$$+ 1.51(\text{DUMMY83-89}*Xt) - 0.000 \, d^2\pi t - 0.21 \text{ dTAXt}$$
$$(3.19) \qquad\qquad\qquad\qquad (3.41) \qquad\quad (-2.44)$$

$$- 0.33 \text{ d1} + 0.44 \text{ d2} + 0.49 \text{ d3} + 0.44 \text{ d4}$$
$$(3.80) \qquad (3.45) \qquad (3.97) \qquad (3.98)$$

$\overline{R}2$ = 06937   DW = 2.02   SEE 0.2556

Outflows of Foreign Direct Investment

The outflows of foreign investment seem to present a long run relationship with variables more related to financial opportunities of the economy rather than to the productivity ones as for new investment and reinvestment. The significant variables were: the taxes, the exchange rate, the domestic interest rate, the annualized inflation rate and the foreign investment stock. Foreign debt was not significant, only the interest payments on the debt, but with an unexpected negative sign. This negative relationship may be capturing the Central Bank delays for capital repatriation in times of current account strain.

As it was discussed before, at first sight it seems that there was no reaction of outflows of foreign investment to the debt crisis until 1985. The introduction of a dummy for the 1985-1990 period, in the long run relationship, although positive was not significant, neither was the inclusion of any variables multiplied by the dummy. Therefore, the long run behavior of the outflows was not affected by the crisis.

$$FDO = \underset{(2.18)}{0.11\ TAX} - \underset{(-5.07)}{3.26\ dEX} + \underset{(5.03)}{2.81\ FDIS_{-1}}$$

$$+ \underset{(6.17)}{0.06\ dr} + \underset{(5.45)}{0.001 d\pi} - \underset{(3.92)}{0.83\ INTER} - \underset{(4.43)}{17.95}$$

$\bar{R}2 = 69.15$ CRDW = 1.844 SEE 0.5856 ADF = 6.99

By the ADF and CRDW test the variables co-integrate but again, the low value of the R2 decreases the confidence in the tests and, therefore the results must be looked with caution.

$$dFDO = -1.04 \; dRES_{-1} + 3.92 \; dDEBt - 3.06 \; d^2EX + 0.00002 \; d^2rt$$
$$\quad\quad\quad (7.11) \quad\quad\quad (1.26) \quad\quad\quad (4.26) \quad\quad\quad (5.10)$$

$$\quad\quad + 0.001 d^2\pi + 0.41 \; DUMMY83\text{-}90 - 0.73 \; DUMMY90$$
$$\quad\quad\quad (3.38) \quad\quad (1.82) \quad\quad\quad\quad (2.03)$$

$$\quad\quad - 0.29 \; d1 - 0.25 \; d2 + 0.36 \; d3 + 0.30 \; d4$$
$$\quad\quad\quad (1.29) \quad (1.10) \quad\quad (1.67) \quad (1.46)$$

$\overline{R}2 = 0.5294$ DW =2.39 SEE = 0.6336

The estimation of the short run equation, the residual of the co-integrating regression was retrieved in the equation in first difference. The dummy for the period after 1985 was included and was significant at 10% level but not at 5%. This result seems to reflect the decline of outflows during 1990 that may reflect the liquidity constraint imposed by the assets retention of the stabilization plan but also some expectations of structural reforms that were promised by the new government. A dummy for 1990 was included (DUMMY90) and is significant, but still, the other dummy was not significant at 5% level. These estimates suggest that foreign investment in Brazil was not showing a significant reaction to the crisis in terms of capital flights.

2. Evidence from a Panel Data

The Brazilian experience was not unique, all countries that had debt payments problems had to submit to very similar IMF programs after 1982. But, different from Brazil, after a while, some of these countries engaged in active reformism. To evaluate, empirically, the effect of the debt crisis on the flows foreign direct investment in other LDC, we compared countries that experienced debt payment difficulties after 1982, with countries that did not reschedule their debts. The same approach was adopted with respect to structural reforms and stabilization. Notwithstanding the "abnormality" of the 1980s (Edwards, 1990) we believe that important lessons can be drawn for the future of foreign direct investment behavior from this analysis.

In view of the various factors, priviously, discussed we tried to evaluate the importance of: i) economic prospects of the country measured by the inflation rate (that can also measure the reaction to inflationary taxation) and increase in output; ii) short run alternatives to the investment measured by the international interest rate and the exchange rate; iii) opportunities to export its products and the possibilities of importing inputs iv) debt crises captured by the flow of external debt, interest payments and (lagged) international

reserves. Obviously the flows of direct investment affect the external sector variables. but, since the effects are through changes in international reserves, the possibility of simultaneous-equation bias was not considered.

The relation was estimated using pooled data for the period 1975-1990 and 19 countries: Eight, although some heavily indebted, which did not present debt payment problems in this period - Colombia, Korea, Pakistan, Sri Lanka, Tunisia, Turkey and Thailand and 12 with debt payment problems in 1982 - Argentina, Bolivia, Brazil, Chile, Costa Rica, Ecuador, Guatemala, Mexico, Peru, Philippines, Uruguay and Venezuela. From this last group, Bolivia, Chile, Costa Rica, Mexico and Philippines undertook economic reforms and did stabilize their economies some years after the beginning of the crisis. The countries and the period were chosen because of data availability.

This analysis was done only for the total direct investment since, the data on reinvestment is available for fewer countries.

$$FDI_{it} = \alpha_0 + \alpha_1 EXCHANGE_{it} + \alpha_2 dGNP_{it} + \alpha_3 dPRICES_{it} + \alpha_4 dDEBT_{it}$$
$$\alpha_5 EXPORTS_{it} + \alpha_6 IMPORTS_{it} + \alpha_7 RESERVES_{it-1} + \alpha_8 PRIME_{it} + u_{it}$$

where: FDI is foreign direct investment, EXCHANGE is the real exchange rate, GNP is Gross National Product, dPRICES

the inflation rate, EXPORTS total exports, IMPORTS total imports, PRIME the prime rate dDEBT is the annual flow of long term debt (the list of the variables and data source appears in the appendix).

A set of dummies variables were defined:

DR = 1 if the country rescheduled after 1982

   = 0 otherwise

DE = 1 if the country undertook structural reforms and
       stabilized the economy after rescheduling

   = 0 otherwise

DC = 1 if country is doing debt/equity swaps

   = 0   otherwise

D83-90 = 1 if t ≥ 1983

       = 0 otherwise

D87-90 = 1 if t ≥ 1987

       = 0 otherwise

D86-90 = 1 if t ≥ 1986

       = 0 otherwise

and

DR83-90 = DR*D83-90

DE87-89 = DE*D87-90

DC86-90 = DC*D86-90

The model was estimated using random effects estiamtors for linear panel data models as suggested by Maddala (1971) and Fuller and Batesse (1975). Estimating the regression, as defined in the equation above, including the three intercept dummies, DR83-90, for countries that reschedule and period 1983-1990; DE87-90, for countries that stabilize and period 1987-1990; and DC86-90, for countries engaged in debt/equity swaps and period 1986-1990. It was included a slope dummy, DC86-90 times external debt. The reductions of the external debt, in these countries, should be highly associated with the debt/equity swaps operations. The only significant variables were imports, lagged reserves the slope and intercept dummies, at 5% of significance. The flow of external debt, exports and the intercept dummy for stabilization, were significant at 10% (see equation 4, in the appendix). The equation was estimated considering only these variables:

(1) $FDI = 0.02 IMPORTS + 0.006 EXPORTS + 0.012 RESERVES_{-1}$
       (5.22)   (1.86)   (3.13)

$+ 0.012 dDEBT - 105.21 DR83-90 + 156.48 DE87-90 + 305.2 DC86-90$
   (1.78)   (-2.13)   (1.72)   (4.32)

$- 0.058 DC86-90*dDEBT$
   (-5.30)

$$\bar{R}^2 = 40.75 \quad df = 292 \quad n = 304$$

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To test whether the structural changes affected the parameters of the main variables, the regression was estimated including the slope dummies. We first estimated the regression considering only the variables multiplied by DR83-90, i.e., the dummy for countries that reschedule and period 1983-1990. As it can be seen in equation 5 in the appendix 2, the same variables were significant for the period previous to the crisis but not the intercept dummies, except DC86-90; dGNP, exports, and the flow of debt were significant for countries that rescheduled after 1982. The equation was estimated including only the significant variables.

$$(2) FDI = 0.006dGNP - 0.005EXCHANGE + 0.02IMPORTS + 0.02dDEBT$$
$$\qquad\quad (2.68) \qquad\quad (-1.44) \qquad\qquad (9.49) \qquad\qquad (3.075)$$

$$+ 0.001RESERVES_{-1} - 0.006dGNP^r - 0.039dDEBT^r + 0.09EXPORTS^r$$
$$\quad\; (3.09) \qquad\qquad\qquad (-3.14) \qquad\quad (-2.95) \qquad\qquad (2.84)$$

$$- 0.032DC86\text{-}90*dDEBT + 276.03DC86\text{-}90$$
$$\quad (-1.84) \qquad\qquad\qquad (3.43)$$

$$\overline{R}^2 = 43.90\% \quad D.F\ 290$$

Where $\delta Y^r = (\alpha_i + \Theta)Y$ and α_i is the original coefficient of Y and Θ is the coefficient of the dummy variable for countries that reschedule in the period after 1983. Therefore, α_i is the coefficient for the variable for those countries before 1983 and for the countries that did not reschedule the debt.

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There are some interesting results: Imports, reserves remained positive and significant for all countries; Increases in GNP and debt, that were positive for countries that did not reschedule and for the others before 1983, became negative for the countries that rescheduled after 1983. These results suggest that increases in product and debt were viewed as resistance to adjustment; Exports became positively related to FDI for the countries that reschedule after 1983.

Finally, to test if stabilization affected foreign direct investment, the equation was estimated including the variables multiplied by the dummy for the 1987-1990 period and for the countries that stabilized. As can be seen in equation 6 in the appendix, there was a reversion in the coefficients, dGNP became positive, exports negative and the flow of debt positive. Estimating the equation including the significant variables, we have:

$$(3) FDI = 0.006dGNP - 0.005EXCHANGE + 0.02IMPORTS + 0.02dDEBT$$
$$ (2.99) (-1.62) (8.74) (3.33)$$

$$+ 0.001RESERVES_{-1} - 0.007dGNP^r - 0.03dDEBT^r + 0.004EXPORTS^r$$
$$ (3.02) (-3.89) (-2.00) (1.31)$$

$$+ 0.012dGNP^e + 0.012dDEBT^e - 0.32EXPORTS^e + 308.73DC86-90$$
$$ (2.75) (2.75) (-1.45) (3.73)$$

$$- 0.058DC86-90*dDEBT$$
$$ (-3.12)$$

$\overline{R}2 = 47.63 \quad DF = 289$

Again, there are some interesting results: imports and international reserves continued to affect positively foreign investment for all countries before 1982 and for countries that didn't present debt payments problems, these results are close to some of Edwards (1990).The exchange rate, as before, was borderline significant and with a negative sign.

For countries that stabilized their economies, increase in output affected positively foreign investment, but the flow of debt continued to be negative. The inclusion of the slope dummies for countries that stabilize and period 1987-1990 turned exports insignificant. The reversion of the coefficient of exports and of dDEBT seem to be associate with changes during 1990. Dropping this last observation from the sample, as can be viewed in equation 7 in the appendix, only the increase in output is significant. Before 1990 the increase of foreign investment flows in the countries that did stabilize was probably more related to other incentives, like privatization. Recently, Mexico and Chile, seems to be reestablishing their creditworthiness.

Another important result is that the coefficient of the dummy for countries that engaged in debt/equity swaps was significant in all regressions. As it is known, the secondary market price for loans of indebted countries is well below their face value and only a fraction of this

difference has been captured by debtor countries in the auctions for debt conversion. Therefore, this became an important stimulus for foreign investment in those countries, as can be seen in Table 1 in the appendix, which computes the amounts effectively spent in foreign investment. The Debt/equity swap was also an important mechanism for external debt reductions as the significant coefficient of dDEBT*DC86-90 indicates.

Although the R^2s are low in the above equations, the results suggest that foreign direct investment reacted negatively to the debt crisis and positively to countries that undertook structural reforms, even taking into account the effects of debt conversion on foreign investment.

3. Concluding Remarks

The empirical evidence gives support to the hypothesis that international firms did react to the debt crisis. The Brazilian evidence suggest that the economy is not yet in the late stage of the process: Inflows and reinvestment are low, profit remittance high but there is no significant disinvestment. Other indebted countries also experience significant reductions of these flows after the debt crisis, but economic reforms are reversing this tendency.

APPENDIX 1

1. Augmented Dickey Fuller Test

$$diY = \beta o + \beta 1t + \alpha 1di\text{-}1Y\text{-}1 + \alpha 2diY\text{-}1$$

$$diY = \beta o + \alpha 2diY\text{-}1$$

$$diY = \alpha 2diY\text{-}1$$

ADF1 Ho:$\beta 1=0$ $\alpha 1=1$ ADF(5%) = 6.73 (unit root with a drift)

ADF2 Ho:$\beta o=\beta 1=0$ $\alpha 1=1$ ADF(5%) = 5.13

Period of Analysis 1971:1 1990:4

	I(0) ADF1	ADF2	I(1) ADF1	ADF2	I(2) ADF1	ADF2
FDI	4.63	3.37	11.76	7.89		
FDR	2.43	4.13	17.26	15.06		
RR	3.16	2.73	25.96	16.91		
FDO	3.41	2.28	12.93	8.67		
REMMIT	3.63	4.86	9.81	7.40		
FDIS	4.32	3.55	8.49	10.14		
DEBT	7.10	4.80	8.63	6.48		
RESER	6.99	6.76	5.88	6.37		
INTER	3.99	2.66	18.92	13.83		
XM	4.55	5.24	9.83	10.60		
MK	3.66	4.02	7.80	8.47		
EX	4.70	3.77	2.57	3.72	16.64	11.46
TAX	2.10	3.63	18.09	13.83		
GPI	4.02	3.17	3.13	3.97	14.62	10.11
CPI	2.24	1.84	6.56	5.13	24.36	17.82
IND	4.42	9.08	10.16	8.84		
EMPL	3.31	2.28	4.97	3.28	14.55	9.76
W	4.82	3.91	2.40	2.13	19.86	13.25
r	3.94	3.52	3.97	2.79	22.26	14.83
TBill	2.41	1.60	9.50	6.33		
π	1.55	1.07	3.67	2.62	22.83	12.25

2. Definition and Source of Variables

Source: Banco Central do Brasil

FDI -   Inflows of Foreign Direct Investment
FDO -   Outflows of Foreign Direct Investment
FDR -   Foreign Direct Reinvestment
PROFIT - Profit Remittance
RR   -   Rate of Reinvestment = FDR/(FDR+PROFIT)
FDIS - Stock of Foreign Direct Investment
DEBT - Total Long Term External Debt
RESER - International Reserves
INTER - Interest Payment on External Debt
EX - Nominal Exghange Rate
TAX - Tax Revenue:Income, Imports and Value Added Tax

Source: CACEX - Carteira de Comercio Exterior

XM - Manufacture Exports
MK - Capital Goods Imports

Source: IBGE-Instituto Brasileiro de Geografia e Estatistica

IND - Industrial Production Index
EMPL - Industrial Employment
W - Minimum Wage

Source: Fundacao Getulio Vargas

GPI - General Price Index
π - Annualized Rate of Inflation based on GPI

Source: ANBID - Ass. Nacional de Bancos de Investimento

r - certificate on bank deposits of 60 days
CPI - US Consumption Price Index
TBILL - US Treasury Bill

3.   Some Indicators of Brazilian Economy
                Debt Related Variables
                    Averages(a)

	Intern. Spreads	Loans Maturities	External Debt	Interest Due	Interest Paid
1971	n.a.	n.a.	6621.6	302.0	302.0
1972	n.a.	n.a	8533.1	359	359.0
1973	1.0700	10	12571.0	514.0	514.0
1974	1.0580	10	17166.0	652.4	652.4
1975	1.7720	5	21171.4	1498.0	1498.0
1976	1.9060	5	25985.4	1809.5	1809.5
1977	2.0310	6	32037.2	2103.5	2103.5
1978	1.6200	10	43510.7	2696.4	2696.4
1979	0.8240	12	49904.1	4185.5	4185.5
1980	1.3960	9	53847.5	6311.1	6311.1
1981	2.0040	8	61410.8	9161.0	9161.0
1982			70197.5	11353.3	11353.3
1983	2.1250	8	81319.2	9555.4	9555.4
1984	2.0000	9	91091.0	10202.7	10202.7
1985			95856.6	9659.4	9659.4
1986	1.2500	7	101758.7	9327.0	9327.0
1987			107514.2	8792.2	5363.7
1988	0.8125	20	102555.0	9831.9	13685.6
1989			99284.9	9632.9	6045.9
1990			96546.0	8906.0	2683.0

                External Sector Variables

	Trade Balance	Current Account	External Reserves	Exports	Imports
1971	-343.0	-1309.0	1723	2904.0	3247.0
1972	-241.0	-1486.0	4183	3991	4232.0
1973	7.2	-1715.1	6415	6199.2	6192.0
1974	-4690.3	-7122.9	5269	7951.0	12641.3
1975	-3540.4	-6702.4	4040	8669.9	12210.3
1976	-2254.7	-6017.7	6544	10128.3	12383.0
1977	96.8	-4037.5	7256	12120.2	12023.4
1978	-1024.2	-5891.7	11895	12658.9	13683.1
1979	-2839.5	-10741.6	9687	15244.4	18083.9
1980	-2822.8	-12807.0	6913	20132.4	22955.2
1981	1202.4	-11734.3	7507	23293.0	22090.6
1982	780.1	-16310.5	3994	20175.1	19395.0
1983	6470.4	-6837.4	4562	21899.3	15428.9
1984	13089.5	44.8	11995	27005.3	13915.8
1985	12485.5	-241.5	11608	25639.0	13153.5
1986	8304.3	-5304.1	6760	22348.6	14044.3
1987	11172.0	-1436.0	7458	26223.9	15051.9
1988	19726.1	4175.0	9140	33789.4	14063.3
1989	16119.6	1033.0	9679	34383.0	18263.4
1990	10990.0	-2201.0	8663	31414.0	20661.0

Domestic Sector Variables

	Rate of Growth GDP	Rate of Gross Capital Formation to GDP			rate of inflation
		Total (current)	(constant)	Private (b)	
1971	11.34	19.91	21.31	n.a.	19.49
1972	11.94	20.33	22.22	n.a.	15.70
1973	13.97	23.58	23.58	n.a.	15.59
1974	8.15	24.7	24.70	n.a.	34.53
1975	5.17	25.77	25.77	20.9	29.34
1976	10.26	25.02	25.02	16.1	46.26
1977	4.93	23.56	23.56	15.7	38.83
1978	4.97	23.51	23.51	13.6	40.73
1979	6.76	22.88	22.88	7.7	77.3
1980	9.25	22.86	22.86	14.5	110.24
1981	-4.38	22.90	20.95	12.0	95.19
1982	0.67	21.40	19.52	11.7	99.72
1983	-3.42	18.10	16.92	9.7	211.00
1984	5.03	16.90	16.30	9.5	223.81
1985	8.26	16.90	16.40	10.5	235.11
1986	7.54	19.10	18.70	12.3	65.03
1987	3.36	22.30	17.90	12.8	415.91
1988	0.01	22.80	17.00	n.a	1037.5
1989	3.54	24.90	16.70	n.a.	1782.88
1990	-3.7	21.70	16.00	n.a.	1476.60

Some Indicators

	X/GNP	X/DEBT	DEBT/GNP	M/GNP	M/DEBT
1974	7.63	30.69	16.48	12.13	73.64
1975	7.12	19.08	17.38	10.02	57.67
1976	6.74	25.18	17.29	8.24	47.65
1977	6.99	22.65	18.49	6.94	37.53
1978	6.46	27.34	22.19	6.98	31.45
1979	6.97	19.41	22.81	8.27	36.24
1980	8.68	12.84	23.22	9.90	42.63
1981	9.22	12.22	24.30	8.74	35.97
1982	7.84	5.69	27.28	7.54	27.63
1983	11.27	5.61	41.84	7.94	18.97
1984	13.43	13.17	45.29	6.92	15.28
1985	11.87	12.11	44.37	6.09	13.72
1986	8.61	6.64	39.19	5.41	13.80
1987	8.97	6.94	36.79	5.15	14.00
1988	10.01	8.91	30.39	4.17	13.71
1989	7.91	9.75	22.84	4.20	18.39
1990	6.16	8.97	18.92	4.05	21.40

Source:(a) Borrowing International Capital Markets - World Bank; (b) Greene and Villanueva and Banco Central do Brasil

APPENDIX 2

1. Results of the Regressions

TABLE 1

	EQ.1	EQ.2	EQ.3
dGNP		0.0056 (2.68)	0.0059 (3.00)
EXCHANGE		-0.0046 (-1.47)	-0.0052 (-1.62)
IMPORTS	0.0207 (5.22)	0.0243 (9.69)	0.0221 (8.75)
EXPORTS	0.0063 (1.87)		
RESERVES-1	0.0013 (3.13)	0.0012 (3.11)	0.0012 (3.02)
dDEBT	0.0116 (1.78)	0.0227 (3.16)	0.0230 (3.33)
DC86-90*dDEBT	-0.0685 (-5.30)	-0.0321 (-1.86)	-0.0582 (-3.12)
DR83-90	-105.22 (-2.14)		
DE87-90	156.48 (1.73)		
DC86-90	333.19 (4.32)	277.87 (3.45)	308.78 (3.73)

		EQ 1	EQ 2	EQ 3
DR8390*dGNP			-0.0115	-0.0130
			(-4.26)	(-5.02)
DR8390*EXPORTS			0.0093	0.0042
			(2.93)	(1.32)
DR8390*dDEBT			-0.0605	-0.0481
			(-4.25)	(-3.48)
DE8790*dGNP				0.0888
				(2.74)
DE8790*dDEBT				0.1496
				(3.51)
DE8790*EXPORTS				-0.0363
				(-1.67)
F-STATIST	INDIV	13.86	9.21	10.6268
	TIME	1.05	1.25	1.5337
	JOINT	8.04	5.59	6.4936
DF		304	290	289
R2		40.76	44.43	47.63
SSR		0.2377	0.2262	0.2008

TABLE 2

	EQ4	EQ.5	EQ.6	EQ.7
dGNP	0.0001	0.0054	0.0042	0.0039
	(0.07)	(2.48)	(2.11)	(2.08)
EXCHANGE	-0.0038	-0.0045	-0.0068	-0.0071
	(-1.15)	(-1.60)	(-2.56)	(-2.61)
IMPORTS	0.0193	0.0250	0.0230	0.0192
	(4.61)	(3.54)	(3.65)	(3.18)
EXPORTS	0.0065	-0.0013	0.0006	0.0040
	(1.92)	(-0.20)	(0.09)	(0.70)
RESERVES-1	0.0013	0.0013	0.0011	0.0010
	(3.08)	(3.05)	(2.73)	(2.77)
dPRICES	0.0130	-0.0165	-0.4224	-0.3642
	(0.63)	(-0.04)	(-1.04)	(-0.94)
dDEBT	0.0107	0.0208	0.0174	0.0181
	(1.61)	(2.75)	(2.50)	(2.79)
PRIME	5.5210	4.5171		
	(1.39)	(1.19)		
DR83-90*dGNP		-0.0104	-0.0093	-0.0102
		(-3.49)	(-3.36)	(-3.93)
DR83-90*EXCHANGE		-0.0010	-0.0001	-0.0000
		(-0.29)	(-0.02)	(-0.00)
DR83-90*IMPORTS		-0.0066	-0.0299	-0.0310
		(-0.65)	(-2.94)	(-3.15)
DR83-90*EXPORTS		0.0154	0.0111	0.0079
		(1.95)	(1.52)	(1.18)
DR83-90*RESERVES-1		-0.0146	0.00002	0.0079
		(-1.09)	(0.00)	(0.60)
DR83-90*dPRICES		0.0291	0.4409	0.3722
		(0.06)	(1.09)	(0.97)
DR83-90*dDEBT		-0.0527	-0.0268	-0.0257
		(-3.42)	(-1.83)	(-1.90)
DR83-90*PRIME		-7.9323		
		(-0.28)		

	EQ 4	EQ 5	EQ 6	EQ7
DC86-90*dDEBT	-0.0675	-0.0370	-0.0788	-0.0702
	(-5.06)	(-2.00)	(-4.17)	(-3.91)
DR83-90	-112.16	53.90		
	(-2.27)	(0.19)		
DE87-90	172.01	100.07		
	(1.87)	(1.03)		
DC86-90	342.19	357.75	532.79	483.23
	(4.38)	(3.38)	(6.27)	(5.76)
DE87-90*dGNP			0.1532	0.1084
			(3.52)	(2.30)
DE87-90*EXCHANGE			-0.0068	0.0070
			(-0.18)	(0.18)
DE87-90*IMPORTS			0.0956	-0.1079
			(1.46)	(-0.80)
DE87-90*EXPORTS			-0.1673	0.0681
			(-2.17)	(0.45)
DE87-90*RESERVES-1			-0.0221	-0.2724
			(-0.14)	(-1.20)
DE87-90*dPRICES			9.3314	12.5312
			(0.90)	(1.08)
DE87-90*dDEBT			0.2169	0.0193
			(2.52)	(0.14)

F-STATIST.				
INDIV	12.02	6.59	6.7612	7.4220
TIME	0.94	0.94	1.0152	1.2631
JOINT	6.98	4.02	4.1494	4.7275
D.F.	288	280	277	258.
R2	41.65	46.43	53.5289	51.2879
SSR	0.2391	0.2345	0.1969	0.1514

2. Data Source:
Foreign Direct Investment, Nominal Exchange Rates, Consumer
Price Index and Prime Rate are from the International
Monetary Fund " International Financial Statistics". Gross
Domestic Output, Debt, Exports and Imports are from World
Bank "World Debt Table".

3.   FOREIGN DIRECT INVESTMENT AND DEBT CONVERSION

	ARGENTINA*	BOLIVIA	BRAZIL*	CHILE*
1986				
SECONDARY MARKET PRICE	0.64	0.06	0.75	0.66
FINAL PRICE	0.64	0.06	0.75	0.76
DEBT FDI CONVERSION	n.a.	n.a.	206	981
FDI	574.0	10.0	177.0	57.0
FDI*	574.0	10.0	125.5	-21.0
1987				
SECONDARY MARKET PRICE	0.42	0.09	0.50	0.65
FINAL PRICE	0.42	0.09	0.50	0.75
DEBT FDI CONVERSION	n.a.	n.a.	300	1905
FDI	-19.0	36.4	1087.0	97.0
FDI*	-19.0	36.4	937.0	-61.7
1988				
SECONDARY MARKET PRICE	0.22	0.10	0.47	0.60
FINAL PRICE	0.33	0.10	0.59	0.68
DEBT FDI CONVERSION	1354	n.a.	2087	2782
FDI	1147.0	30.4	2969.0	125.0
FDI*	234.7	30.4	2109.8	-164.9
1989				
SECONDARY MARKET PRICE	0.15	0.11	0.30	0.62
FINAL PRICE	0.22	0.11	0.36	0.71
DEBT FDI CONVERSION	80	n.a.	946	2784
FDI	1028.0	36.0	1267.0	269.0
FDI*	965.7	36.0	657.0	5.3
1990				
SECONDARY MARKET PRICE	0.16	0.11	0.24	0.66
FINAL PRICE	n.a.	n.a.	n.a.	n.a.
DEBT FDI CONVERSION	n.a.	n.a.	n.a.	n.a.
FDI	2036.0	36.1	1340.0	595.0
FDI*	n.a.	n.a.	n.a.	n.a.

FOREIGN DIRECT INVESTMENT AND DEBT CONVERSION

	COSTA RICA	ECUADOR	GUATEMALA	MEXICO*
1986				
SECONDARY MARKET PRICE	n.a.	0.64	n.a.	0.60
FINAL PRICE	n.a.	0.64	n.a.	0.78
DEBT FDI CONVERSION	n.a.	n.a.	n.a.	363
FDI	57.4	70.0	68.8	1160.0
FDI*	57.4	70.0	68.8	1080.1
1987				
SECONDARY MARKET PRICE	n.a.	0.33	n.a.	0.52
FINAL PRICE	n.a.	0.33	n.a.	0.67
DEBT FDI CONVERSION	145	33	n.a.	1786
FDI	75.8	75.0	150.2	1796.0
FDI*	75.8	52.9	150.2	1208.6
1988				
SECONDARY MARKET PRICE	n.a.	0.21	n.a.	0.47
FINAL PRICE	n.a.	0.21	n.a.	0.61
DEBT FDI CONVERSION	100	259	152	1959
FDI	122.3	80.0	329.7	2594.0
FDI*	122.3	-124.6	329.7	1825.6
1989				
SECONDARY MARKET PRICE	0.15	0.14	n.a.	0.41
FINAL PRICE	0.15	0.14	n.a.	0.53
DEBT FDI CONVERSION	46	32	20	389
FDI	101.2	80.0	76.2	2594.0
FDI*	62.0	52.5	76.2	2412.3
1990				
SECONDARY MARKET PRICE	0.21	0.15	n.a.	0.40
FINAL PRICE	n.a.	n.a.	n.a.	n.a.
DEBT FDI CONVERSION	n.a.	n.a.	n.a.	n.a.
FDI	110.0	82.0	0.0	2663.0
FDI*	n.a.	n.a.	n.a.	n.a.

FOREIGN DIRECT INVESTMENT AND DEBT CONVERSION

	PERU	PHILIP.	URUGUAY	VENEZUELA*
1986				
SECONDARY MARKET PRICE	0.21	0.59	n.a.	0.76
FINAL PRICE	0.21	0.59	n.a.	0.76
DEBT FDI CONVERSION	n.a.	11	n.a.	n.a.
FDI	22.0	127.0	-4.5	16.0
FDI*	22.0	122.5	-4.5	16.0
1987				
SECONDARY MARKET PRICE	0.12	0.64	n.a.	0.67
FINAL PRICE	0.12	0.64	n.a.	0.67
DEBT FDI CONVERSION	n.a.	353	36	n.a.
FDI	32.0	307.0	4.9	21.0
FDI*	32.0	179.9	4.9	21.0
1988				
SECONDARY MARKET PRICE	0.07	0.53	0.55	0.51
FINAL PRICE	0.07	0.53	0.55	0.51
DEBT FDI CONVERSION	n.a.	826	144	50
FDI	26.0	936.0	47.0	89.0
FDI*	26.0	936.0	-17.8	64.5
1989				
SECONDARY MARKET PRICE	0.04	0.49	0.55	0.38
FINAL PRICE	0.04	0.49	0.55	0.49
DEBT FDI CONVERSION	n.a.	474	50	183
FDI	59.0	563.0	0.0	213.0
FDI*	59.0	318.9	-22.5	119.2
1990				
SECONDARY MARKET PRICE	0.05	0.49	0.45	0.40
FINAL PRICE	n.a.	n.a.	n.a.	n.a.
DEBT FDI CONVERSION	n.a.	n.a.	n.a.	n.a.
FDI	34.0	530.0	0.0	451.0
FDI*	n.a.	n.a.	n.a.	n.a.

*

ARGENTINA - DISCOUNT AROUND 50% BETWEEN 1988 AND 1989

BRAZIL - DISCOUNT OF 25.17% IN 1988 AND 18.4% IN 1989

CHILE - 1/3 OF DEBT CONVERSION IN FDI (CHAPT. 19 E D.L.
600).
          DISCOUNTS AROUNT 10% AND 20%

MEXICO - DISCOUNTS AROUND 30%

VENEZUELA - DISCOUNT AROUND 30%

SOURCE: DEBT CONVERSION: BRAZIL, MEXICO AND VENEZUELA
"BALANCE
OF PAYMENTS STATISTICS" ARGENTINA BANCO CENTRAL DO BRASIL
AND "WORLD
DEBT TABLES" 1990-1991. OTHER COUNTRIES: WORLD DEBT TABLES
1990-19/91
SECONDARY MARKET PRICE: WORLD DEBT TABLES 1990-1991
DISCOUNTS IN CONVERSION: "CONVERSAO DA DIVIDA EM CAPITAL DE
RISCO"
BANCO CENTRAL DO BRASIL

Conclusions

Ten years after the eruption of the debt crisis Brazil is still struggling to stabilize and to resume growth, as many other developing countries. For the country, the debt crisis is far from over, from any point of view.

The objective of this dissertation was to investigate, theoretically and empirically, some features of the external debt problem and its relation to foreign direct investment that could help understand the way the crisis evolved in these years.

The first part of the dissertation analyzes the international lending by private banks to governments of less developed countries during the 1970s. Several arguments were advanced to stress that this lending took place in an imperfect information environment and resulted in banks having little information on countries' risk-reducing actives and policies to repay the debt. It was argued that this information problem may explain the punishing terms observed on all debt renegotiations of 1982-1983 and the monitoring of the IMF in all troubled economies. Worst terms on rescheduled loans may increase a country's risk-reducing activities to avoid the conditions carried by this rescheduling. On the other hand, those worsen terms create a problem of debt overhang, raising the

probability of default in the future, unless banks can compel the borrower to adopt the correct policies for debt repayment. The banks, through credit rationing in the rescheduling process, forced the countries to ask for IMF credit and, consequently, to submit to its policies. Therefore, after 1982 the IMF substantially reduced the information problem for the banks.

The results of the Brazilian negotiations with private banks seem to confirm this hypothesis. In the first negotiation, the "new money" was well below the interest due, the fees and interest rate spread on the new and rescheduled debt were increased while maturities were lowered. The agreement was only signed after an accord with the IMF was established and the country accepted its adjustment program. The second agreement, a year later, when it was necessary to reschedule a further portion of the debt, there was an improvement in the terms of rescheduling but the credit constraint was not relaxed. Banks required that the economy remained under the IMF supervision. In the third negotiation, in 1986, as the government rejected the IMF monitoring, there was a step back in the terms of the new agreement. The banks refused the government's propose of a multi-year agreement and there was no "new money" in this renegotiation and the interest rate spread was reduced. Official creditors in the

Paris Club refused to renegotiate without a previous agreement with the Fund.

The results of this sequence of negotiations are quite in line with the discussion above: in the first round of rescheduling, banks punished countries for having to reschedule and imposed the IMF monitoring. This supervision was a guarantee that the country was doing its best to meet debt obligations. Therefore, there was no reason to punish bad outcomes in the second negotiation.

All countries that had to return to a second round of negotiation with the banks, obtained better rescheduling terms this time. This result could be interpreted as reflecting a stronger position of the countries in the negotiation process due to the huge trade surpluses, tough negotiating attitudes or both.[37] The third renegotiation of Brazil contradicts this interpretation. Compared to the previous negotiation, the government was domestically stronger, as the first stabilization plan was still working. The trade surplus, around US$ 15 billions in annualized terms, was of the same magnitude as before. Nevertheless, there was a high cost to get rid of IMF monitoring.

In this interim, banks incentive instruments to induce countries to reschedule instead of default, were losing effectiveness. The argument that the crisis could be quickly

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37. See Devlin (1986).

resolved was less and less convincing. Consequently, the reward for debtors' good behavior, the return to voluntary credit, was becoming a mirage. At the same time, renegotiations had turned into an endless process, with a paralyzing effect on the economy. The Brazilian debt moratorium confirmed countries suspicion that the remaining penalty on default, the loss of trade credit, was also unconvincing.[38]

On the other hand, the moratorium experience made clear to the countries that as much as conventional negotiation was no solution to the debt crisis, open confrontation was not a solution either. Stopping interest payment, in this circumstances, didn't help to stabilize and resume growth and the debt problem kept hanging over the economy conflicting with other international affairs.

Therefore, as much as the banks lost their incentive instruments to avoid default, the countries realized that they didn't have a pressure instrument either. This was a turning point in the renegotiation process and may explain why agreements under the Brady Plan succeed, while a few

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38. At the beginning of the 1987 moratorium there was a reduction in the trade credit lines with a temporary reduction of maturities and increase in interests charged on them. There was also a fine of US$ 500 millions when payment was resumed. Of course it is possible that the lack of penalties just indicated that the moratorium was not taken very seriously by the banks as the finance minister that started it was dismissed from his job two months latter.

years before, the softer Baker Plan failed[39]. Under the Brady Plan, banks accept debt relief schemes and countries accept to give guarantees in their debt. On the other hand, to qualify for this kind of agreement the economy must be already stabilized and structural reforms must be in their way. Brazil is struggling to get this kind of agreement but, as long as the economy is not stabilized, the chances are meager. This resistance to adopt the necessary policies and the low pace of reforms can be traced back to the adjustment pattern chosen by the country, under the IMF supervision, to the debt crisis.

The IMF had the view that the debt crisis was just temporary and, as it was sheltering all debt negotiations, it chose the "line of less resistance". The Fund compelled the countries to generate, no matter how, large trade surpluses in a very short lapse of time, to pay the interest due and avoid a major international financial crisis.

The government also believed the crisis was temporary and return to external credit was assured in the short run. Consequently it didn't adopt any kind of reform, either to compensate the external credit constraint or to repay the external debt in a non inflationary way. Quite the

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39. In 1987 there were about twelve countries not paying regularly their debt, although very few in open confront with banks.

opposite, the policies adopted just accommodated the crisis, generating and aggravating imbalances. When the perception about the nature of the crisis changed and the debt started to be viewed as a very serious problem, the economy was trapped in semi-hyper-inflationary stagnation. In this circumstances, the resistance to reforms that redistribute losses is very high and the government, oftenly, succumbed to them. The necessary trade liberalization met the resistance of an over-protected and subsidized domestic sector. The state reform, through privatization of state owned firms, met civil servants' unions resistance, private suppliers to the government etc. When there is recession and the economy is disorganized by high inflation rates and tax evasion, fiscal reform is resisted by all.

The second part of the paper discussed the consequences of this temporary uncertainty with respect to the nature of the debt problem on the behavior of firms, that face no geographical constraints to its investment decisions. The decision of the firm, to remain or leave the country, was analyzed considering the high costs of investment and disinvestment and temporary uncertainty to both: the nature of the problem and the reaction of the country to it. In this context the firm will not take any precipitous decision. This delayed reaction have several implications for the economy: if the problem was really temporary, the

retraction of investment was stronger than it should be if there was no uncertainty, but recovery will be fast; If the problem is serious, requiring active reforms to overcome the otherwise permanent crisis, the reaction of the firm depends on the reaction of the country. In the case the country reacts rapidly to the change of perception about the nature of the problem, the international firms will wait longer. This will help the economy to get out faster, from the crisis. On the other hand, if the country does not react to this change of perception, it is less likely that it will do it in the future. Since, persistence in the accommodating policies only aggravates the problems. In this circumstance international firms will tend to leave, aggravating the crisis and weakening the chances that reforms will be adopted.

The empirical estimation was realized to test if the overall reaction of foreign investment flows was as the "wait and see" argument predicted: new inflows should present the faster reaction to the crisis, since, is better to stay outside the country until the crisis is over; reinvestment should present a delayed reaction to avoid unnecessary depreciation of the capital, in the case the problem will be solved. Finally, outflows should present the slower reaction, since capital will leave the country only after the crisis is viewed as permanent.

The estimation was performed using a two-step error correction representation. The results confirmed that hypothesis: there was an almost sequential behavior in international investment, though there were two striking results: inflows presented a significant positive shift after 1988 at the height of the crisis and outflow reaction to the crisis was only borderline significant.

As debt conversion was the most likely explanation for the increase in inflows in this period, the equation was estimated discounting the gains obtained by the low prices in the loan's secondary market. After this correction, the positive shift vanished. As for the second result, there are some possible explanations: international firms still believe that government will do something serious with respect to the crisis orr they already made their decision and are just waiting for the best moment to leave.

The first possibility is not so unthinkable for the period of analysis that is strongly affected by the 1990 year, when the Collor administration took office with a firm commitment to reforms. On the other hand, the observed decline of outflows may be associated to the asset freeze enacted by the government that affected multinational firms. The low pace of those reforms under Collor administration and the more conservative position of the administration

that took office after Collor's impeachment, makes the second possibility more likely.

As the Brazilian experience was very close to the experience of several other debtors, the analysis was extended to a group of nineteen less developed countries. At first sight the data suggests that, after the beginning of the debt crisis, while some countries experienced an expansion of foreign investment flows, countries with debt payments problems experienced a contraction. The data suggests also a return of those flows for some of those countries some years later. The group of countries included eight countries that never had to renegotiate their debts, five countries that had to renegotiate but after a while reacted to the crisis and seven countries that renegotiated and accommodated to the crisis. Comparing the behavior of foreign investment in the different groups is possible to test alternative hypotheses: whether these foreign flows presented a distinct behaviour between debtors countries and other LDC after the debt crisis and whether they reacted positively to structural reforms pursued by part of the indebted countries.

Since the IMF programs were very alike and most countries, at least at the beginning, reacted in the same way to the crisis, foreign investment flows should present a similar, negative, reaction. For countries that, later,

engaged in structural reforms a positive reaction of those flows should be expected. Unfortunate, the data is aggregate, preventing the separate analysis of inflows and outflows. A panel data estimation for random effects estimators was realized for that group of nineteen countries, for the 1975 1989 period

The results of the analysis also confirmed the above hypothesis: there was an initial significant negative response of foreign investment for countries that rescheduled the debt as compared to the previous period and to the other nonproblematic countries. There was also a positive response for those countries that endured economic reforms, that remains significant even when gains from debt conversion are discounted from the flows of foreign investment. Mexico and Chile have become very dynamics economies and foreign investment contributed to those results. Chile also promotes the largest program in debt conversion and has managed to do it in a non inflationary way. This experience suggests that previous stabilization would be also a necessary condition for debt/equity conversion.

The initial Brazilian reaction to the debt crisis was not atypical. Most debtors countries generated their huge trade surplus at expense of domestic imbalances. What is atypical in Brazil is its resistance to change. It is

obvious that postponement of necessary reforms only makes them more difficult and more recessionary. Chile, which only interrupted the structural reforms with the debt crisis, presented the faster recovery. Mexico's adjustment was harder and longer than Chile's. Venezuela and Argentina, started only recently with structural reforms, and it is still not clear if governments will succeed or will succumb to pressures. On the other hand, even those countries have not solved completely their debt problem as low secondary market prices and high domestic interest rates indicate. And, there is already another specter haunting those economies: short term international capital. Trade liberalization, in most countries, was followed by capital liberalization. Those reforms were coincident with a long period of low international interest rates. The reaction of those short run flows was as strong as observed during the 1970s with bank lending. Some countries, like Argentina and Mexico, are again with overvalued exchange rates and trade deficits. In Brazil, which recently relaxed some rules with respect to foreign portfolio investment, also received those flows. The external sector didn't allow to overvalue the exchange rate. But again, the external reserves increase was sterilized at a high inflationary cost.

Although, the general evaluation of the debt episode is very negative, the long run perspectives for Brazil are

not so bad. The external financing was used in a productive way and the economy has a large industrial sector, though, massive investment is still necessary. Still, along those eight years the country trade surpluses added to one third of a year GDP while average output expansion was 2.5% (or 3.5 % if 1990 is excluded) a very low rate, but one of the highest among Latin Americans indebted countries. This resource transfer had a negative counterpart associated with the reduction of imports, but it is clear that the Brazilian problem is more of financing this transfer than to generate the resources to make the transfer. There is also a more realistic view of the problems and of the solutions to them. In the last eight years the economy was a lab for all kinds of economic experiments that did as much or more damage than the debt crisis itself. The success of stabilization and reforms in other Latin American countries has the spill-over beneficial effects on public opinion in Brazil, forcing the government to be more active.

All these cases suggest that foreign investment react with the revision of probabilities of domestic and external balances, that depend, themselves, on many things such as deficits, external debt and trade competitiveness. Without a long run solution to the external debt and active reforms the chances of foreign direct investment are meager.

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