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CAPITAL FLOWS AND BRAZILIAN ECONOMIC PERFORMANCE

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Capital Flows and Brazilian Economic Performance[1]

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Abstract

Foreign capital flows found their way back into Brazil in the 1990's as part of the general process of resumption of foreign capital to developing countries, well before inflation was controlled. Brazil is latecomer to the increasing number of poor countries which after decades of macroeconomic mismanagement promoted stabilization, liberalizing trade reforms and removal of state controls over the private economy and benefited from foreign debt rescheduling under the Brady rules. Privatization and trade reforms began in 1990 but successful inflation stabilization started only in 1994. This paper examines the role played by capital flows in the recent performance of the Brazilian economy and the interplay between domestic policy uncertainty and the volatility as well as the abundance of the different types of capital flows in the 1990's. The three main conclusions of the Brazilian experience are that the high level of foreign exchange reserves strengthened the chances of stabilization, that there was no significant difference in the volatility between direct investment and purely financial flows at the peak of uncertainty and that the taxation of excessive flows seemed to be sufficient to regulate the rapid swings in foreign capital flows in the aftermath of the Mexican turmoil of 1994/95. As uncertainty derived from domestic policy diminishes and stabilization results seem more likely to last, the proportion of direct investment in the financing of the current account deficit increases, but this should be seen as no excuse either for postergating fiscal reforms or for accepting a permanent overvaluation of the exchange rate.

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Introduction

There was a significant increase in capital inflows to Brazil in the nineties, transforming a capital account deficit of 1.55% of GDP observed in 1983/89 into a surplus of 2.5% of GDP in 1990/95. Were asset-holders only after a quick gain because of interest rates differentials far beyond perceptions of country risk or are there signals that the new volume of inflows may be relied upon as an extra source of savings that will contribute to an increase in the country's growth prospects? A convincing answer to this question depends on judgements about the elements behind these movements, acting on the supply and the demand-side of the recent flows as well as about the effects the latter may have on growth constraints: on investment, on savings, and on the foreign exchange constraints which are likely to bind Brazilian economic growth in the next years.

This paper examines some characteristics of the recent inflows against the background of past experience and focuses on the elements pertaining to domestic policy uncertainty which has pervaded the Brazilian experience and which in the recent years competes with the external-based volatility of capital as the main reason behind the wild swings in the level of economic activity.

One striking feature behind the country's poor economic performance in the 1980's was the fall in the ratio of investment to GDP when measured at 1980 prices, from a peak of 25.8% in 1975 to an average of less than 15% in the first half of the 1990's[3]. Recovery of the investment/GDP ratio has been slow since 1992, from 14% to 16,6% in 1995 and an estimated 17% in 1996, thus we can hardly expect to find an overwhelming aggregate impact of recent flows on investment. On the other hand, two facts deserve attention in the interpretation of the nature and the long run consequences of the recent inflows. First, since Brazil has come late both in external

[3] See Carneiro and Werneck (1993) and section 2 ahead.

debt rescheduling (the final Brady agreement was completed only in 1994) and stabilization (first successful attempt is now only two-and-a-half years old), there has not been enough time for a noticeable structural change in the quality of flows. Secondly, the evidence of a significant change in the amount of foreign direct investment (US$ 9.5 billion net inflows in 1996 compared with US$ 3,6 billion net inflows in 1995 and US$ 1,7 billion in 1994), are still too recent to allow a convincing evaluation of its effect on aggregate investment and saving.

Section 1 describes the sources and composition of the capital flows in the 1990-95 period, in the context of the historical experience. Section 2 examines the determinants of the inflows and their composition; it is argued that in spite of the short run nature of the capital flows in the first years, with the dominance of bonds and notes issued by financial institutions, the balance of pros and cons tends to be favorable since the accumulation of foreign reserves was essential to build a cushion of foreign exchange which has been helpful to Brazilian economic stabilization policy. Brazilian policy makers provoked a credit crunch through record high reserve requirements and credit ceilings for the banking system and managed to resist the turbulence that followed the Mexican devaluation of December 1994. The loss of foreign reserves was reverted after April 1995. This victory over pessimistic expectations about the fate of the stabilization attempt opened room for a significant change in the pattern of capital flows since then, with a shift in favor of foreign direct investment. In principle, this change is expected to be favorable since direct investment flows are expected to be less volatile than purely financial flows. Section 3 examines the volatilities of different forms of capital flows to the Brazilian economy in the period, and evaluates the differences which may be detected among investment flows (portfolio versus direct investment and total investment versus loans). The data suggest that the volatility of the flows measured by the coefficient of variation of monthly changes has not behaved too differently during the early 1995 turbulence. The Brazilian government opted for

not imposing restrictions other than a tax on short term capital, which was directed essentially to purchase fixed income securities and benefit from the extremely high interest rates that resulted from the credit crunch. Changes in this tax rate were the most important instrument to discriminate against hot money favoring capital flows of better quality. Section 4 describes the utilization of the recent flows in the different phases of the present stabilization effort: government reserves, credit expansion and investment, high interest rates and exchange rate appreciation, a sequence which has resulted from the interplay between the events in the international economy and incentives derived from governmental policies. In section 5, an attempt is made at drawing policy lessons from the Brazilian experience, taking account of the policy uncertainties derived from exchange rate overvaluation, little progress in the reduction of the consolidated public sector deficit and low aggregate investment that prevail after two and a half years of successful monetary reform and deindexation.

1. Foreign Capital and the Performance of the Economy

Since the first oil shock brought to a halt the high economic growth of the early seventies, the availability of foreign finance has been playing a major role in the overall performance as well as on the choices available to economic policy in the Brazilian economy. Table 1.1 shows that the decrease in real GDP growth rate between 1975/79 and 1980/88 from an annual average of 5.9% to 2.9% coincided with an increase in net factor payments abroad from 1.9% to 4.8% of GDP. By the end of the 1980's unfavorable external economic relations had entailed a reduction of both consumption, domestic savings and gross fixed investment as a proportion of current prices GDP.

The economic consequences of the failure of the two Collor stabilization plans of March 1990 and February 1991 set the background scene of crisis of 1990/93. There was 4-digit annual inflation except during the short-lived interregna between the

price explosions which followed the general price freezes and de-indexation attempts, as well as an accumulated loss of 4.7% in real GDP.[4] The level of real output of 1989 was only recovered at the first quarter of 1994, causing an even more dramatic loss in domestic consumption as high inflation promoted the regressive income transfers which were necessary to promote trade surpluses high enough to close the Balance of Payments gap and recover the level of reserves.[5]

Details of the Brazilian Balance of Payments for the 1975/95 period are presented in Table 1.2. Between the Mexican debt crisis of 1982 and the end of the 1980's, current account deficits had to be reduced from an annual average of US$ 9.4 billion in 1975/82 to an average of US$ 1.2 billion in 1983/89. Between 1983 and 1989, an average annual trade surplus of US$ 12.4 billion was produced as a response to the need of adjusting the domestic economy to the overall foreign exchange constraint.

From the 70's to the 80's there was also a dramatic change in the domestic investment pattern of the Brazilian economy. Data on current and constant prices gross fixed investment as a GDP ratio are presented in Table 1.3. Gross fixed investment in current prices shows a decrease from an average of 22% of GDP in the last five years of the 70's to 16.9% of GDP in 1984. From this year onwards, the data show an upward trend of the investment ratio to a peak of 26.9% in 1989, a surprising result in view of high uncertainty brought about by high inflation and the three unsuccessful stabilization attempts starting with the Cruzado plan.

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[4]Because of the slowdown in investment in the preceding decade and output growth rate well below the trend of the previous forty-years, GDP gap estimates differ too much according to assumptions on what happened to investment productivity, but output was well below capacity even before the fall in GDP in the 1990-93 crisis. See Abreu, Carneiro and Werneck (1996) for a long run discussion of the constraints to Brazilian economic growth .

[5]See Carneiro and Garcia (1995) for details.

This recovery in investment, however, is only apparent as revealed by the constant prices ratio series. Behind the contrast of the two series there is a sharp relative price increase of capital goods and construction. The high uncertainty concerning the legal value of contractual indexation following the Cruzado experiments, and the increase in the relative price of imported capital goods account for this shift. The latter reflects not only the devalued currency after 1983 but the scarcity of credit from suppliers as well as from official and multilateral sources, which traditionally provided financial support to long run investment projects.

The picture is not brighter on the savings side, mainly because public savings have not recovered from their slump in the eighties, as there was no fiscal adjustment. The deficit was reduced thanks to severe cuts in public investment. Public savings averaged in the 70's 7.6% of GDP and fell during the 80's to -1.31% in 1989. In contrast to what happened in the 70's, when abundant foreign capital financed the rise of domestic investment, both public and private, in the 80's the contribution of foreign flows was very small and even negative at the end of the decade. As foreign savings fell during the 80's, investment was to be financed by the private sector, whereas there was no available foreign capital during the long period of the external debt crisis and high inflation.

At the end of the 1980's and at the beginning of the 1990's, the capital account deficit required current account surpluses. Restrictive demand policies aimed at controling domestic absorption reduced economic growth. Investment was bound by (lower) savings and by negative foreign transfers as Brazil did not qualify for new Balance of Payments finance. Because of the suspension of debt-related payments under the official moratorium declared in early 1987, financial as well as real resource transfers became negative. Without virtually any foreign exchange reserves, interest payments to private debtors were made throughout the period as allowed by the trade

surplus. In 1988, a one-shot recovery in foreign direct investment produced a surplus in the capital account, essentially because of external debt conversions of almost US$ 3 billion. Actually, profit remittances, which show a record high level in the moratorium years, were supposed to encourage direct investment.

Table 1.4 presents a breakdown of the Brazilian Balance of Payments Capital Account since 1989. From 1989 to 1991 net foreign investment (including reinvestment) averaged less than 500 million per year. It was only after the enactment (31 May 1991) of a regulation known as the Annex IV of resolution 1289/87 permitting foreign investors to buy fixed income assets (opening thus wider room for portfolio investment) that foreign investment showed its first significant increase in almost ten years.[6] The attractiveness of high interest rates prompted a recovery in foreign exchange reserves after the real devaluation of September 1991, which was followed by a sharp increase in domestic interest rates. Since August 1993 (Res. 2013), money entering the country as portfolio investment can purchase stocks and bonds, Depositary Receipts or go to Fixed Income Funds and Privatization Funds, which are special funds constituted by privatization monies, that is, public debt which qualifies for the liquidation of purchases of state companies in privatization auctions.

Foreign investment recovered at first with portfolio investment which had been boosted by the enactment of Annex IV. Only institutional investors are allowed to invest in Annex IV funds: financial institutions, insurance companies and foreign investment funds. Through those funds institutional investors can acquire Brazilian stocks and derivatives assets. Starting February 1996, foreigners were forbidden to buy privatization securities bonds directly through Annex IV operations, but such securities

[6]See Carneiro and Garcia (1995).

can still be purchased through privatization funds and pay from this year onwards a 5% tax.[7]

After an initial period when the inflow of capital was instrumental to the recovery of foreign reserves in 1991 and 1992, the Central Bank, in the second half of 1993, imposed restrictions on capital entries. At first, only fixed income investments were taxed. Since August 1995 the tax rose from 5 to 7% and loans not related to trade pay 5% transaction tax upon entrance (stock-market investments are still not taxed). However, with a very active market for derivatives, it is hard to prevent foreign investors from flooding the country to make a quick gain from the very high real interest rates. In order to circumvent taxes on fixed income assets, one of the most widely used operations to transform an investment in stocks in an investment in fixed income is the so-called box operation in the options market, that consists of a simultaneous trade of four options—two calls and two puts—that produces a return that is known in advance, just like a bond. By an arbitrage argument, this return must equal the interest rate. After August 1995, foreign capital was banned from box operations, as Annex IV funds were prohibited from operating in futures markets.

Both the role and the composition of loans in foreign currency have also shown a significant change in the recent years. Bonds and Notes (both fixed and floating rates) corresponded to 2/3 of the inflows in 1995 in sharp contrast with the beginning of the nineties, when the dominance of commercial papers and intercompanies categories meant that foreign borrowing were by and large restricted to foreign companies, because of the unsolved problems related to the Brady negotiations. Figure 3.2 exhibits the behavior of inflows according with these categories and other

[7] Such securities have long maturities compared with ordinary Central Bank Bonds or Treasury Notes and since they are sold at high (and volatile) discounts, and offer excelent prospects of returns for those investors either willing to hold them to maturity or interested in participating in privatization auctions. Restrictions applying to them in times of abundant supply of funds are an example of the government's difficulties to deal with the fungibility of foreign flows when it tries to discriminate between "long" and "short" term capital.

according to Central Bank records. Bank intermediated loans (operations under Resolution 63), which had been the main instruments of the previous debt cycle, lost its importance. More recently, both export related securities, operations to finance agricultural activities (Resolution 2148, which have a minimum maturity of 180 days) and funds to finance housing and other construction projects are gaining more weight as the economy heads towards recovery. They correspond at the end of 1996, to around 17.3% of total inflows.

As to the agents intermediating the flows, Annex IV portfolios are administered by Brazilian as well as by local subsidiaries of foreign banks, such as Citibank (US$ 6.693 billion) and Chase Mannhattan (US$ 4.315 billion), accordingly to December 1996 data. At the end of 1995, a total of 518 portfolios were registered, 45% administered by Brazilian banking firms. Non banks intermediaries such as brokers and special purpose funds are responsible for a share of 21% while pension funds cover only 1% of the total.

2. Determinants, Timing and the Composition of Capital Inflows

The change in the composition of foreign capital flows to Brazil reflected the drastic changes in macroeconomic environment that characterized the Brazilian economy in the nineties.

It is impossible to ignore the consequences of the low policy-credibility in the aftermath of the failure of the stabilization attempts during the Collor government. After the second price freeze in less than one year, the economic team had three hard tasks to accomplish in order to restore confidence in the economic policy: liberalize prices, unfreeze the assets that had been taken from asset-holders and recover external credibility. In order to face the hyperinflation menace which was expected to follow

from the increase in liquidity, macroeconomic policy required high interest rates and exchange rate devaluation. The response of foreign investors (including Brazilian holders of foreign assets) was highly positive as foreign reserves recovered the prospects for economic governance.

This suggests that both the quantity and the quality of foreign finance responded to prospects of better quality in the conduction of macroeconomic policy well **before** actual results showed up.[8] Furthermore, the increase in portfolio investment led the way to an increasing share of direct investment in total inflows.

It is difficult to separate the positive effect of the reversal of domestic outlook from the obvious improvements on the supply of funds. Since the late seventies, there has been a growing mobility of international capital. The share of Brazil had decreased significantly in the eighties as failure to reschedule the external debt prevented Brazil from benefiting from the increase of flows to developing countries, which happened in the second half of the eighties and in the early nineties. By the end of the 1980's, Brazil received less than 0,6% of FDI in the world (14.6% of the flows to LA), compared with 6.2% in the end of the seventies (30.5% to LA)[9].

Following a brief albeit serious reversion in the positive trend at the time of the international debt crisis, the first half of the nineties witnessed a substantial growth in capital flows across the borders, as dominant risks were perceived to be increasingly country-specific and no longer systemic. Three additional reasons may help to explain the higher volume of migrating capital: the decrease in costs of portfolio movements permitted by the generalization of globalized trading, the ability of fund managers to

[8]Garcia and Barcinski (1996) find that statistically significant coefficients of the interest rate differentials are sufficient reason to attribute to this differentials the main explanation for the net inflows. Since there is no obvious measure of expected change in macro policy stance, however, this would imply, for example, that reluctance to raise domestic interest rates was the main reason behind the capital flight of the late eighties.
[9]Jaspensen (1995).

persuade investors of their timely evaluation of expected gains and associated risks, and a trend to liberalize exchange markets almost everywhere.

As a result, flows have become larger and more volatile, posing problems to monetary authorities in Brazil as well as in other countries, given the disparities between the size of foreign exchange reserves in the vaults of Central Banks as compared with the potential volume of capital that is available to cross foreign exchange markets. A good portion of the liberalization wave may in its turn be attributed to the recognition by local authorities of their limited powers to deal with massive runs on their foreign exchange reserves. More liberal exchange policies usually mean a greater reliance on market-determined exchange rates and a larger scope for domestically oriented monetary policy. Price movements of foreign exchange in this context, however, can absorb a good deal of the energy, which otherwise has to be faced by direct interventions in order to prevent the development of short-run bubbles generated by self-fulfilling prophecies, that are common in foreign exchange markets. In Brazil, the existence of a formal dual exchange market in spite of the fact that the "floating market rate" spread over the "commercial rate", which applies to practically all transactions except the gold market, has been virtually zero for a long time. Smaller exchange controls have made the country more attractive to foreign capital and at the same time there was a continuous display, from the part of the Brazilian government, of belief that hospitality and steady rules breed confidence. This has contributed to further enlargement of capital flows. But the existence of the dual market means that, in case of a massive run against the Real, the Brazilian authorities may still allow the spread between the two rates go up, thereby creating a market-determined tax on capital flight.

Resumption of growth prospects is essential to enhance expected profitability of new projects. High inflation meant a permanent instability concerning basic rules

and exchange rate prospects beyond indexation rules (examples: in spite of daily exchange rate indexation, real exchange rate was usually overvalued following inflationary upsurges). Timing and the propensity of foreign investors to wait and see seems to be essential in the case of Brazilian recent experience - share of FDI in capital flows after 1991 tend to corroborate this opinion.

Finally, Brazil was very late to promote stabilization compared with Chile, Argentina and Mexico. Therefore other reforms were delayed. A good example was the protraction of privatization following the failure of the Collor stabilization attempt in 1990. But it was widely believed that as soon as the hyperinflation menace was left behind, and the state reformed, a new phase of economic growth was to be expected. Basic reasoning was that the high uncertainty generated by macroeconomic instability and the hyperinflation menace posed a high risk premium on the decision to invest, especially in long maturities projects.

Uncertainty and the Cost of Waiting

Recent approaches to the theory of investment[10] emphasize the role of the cost of waiting for a better opportunity as a determinant of investment outlays. This may help to throw some light into the determinants of FDI-related inflows, compared to other form of capital movements. The basic idea is to make use of the option pricing approach: if the potential investor postpones his time of entry he pays for it, because he still retains the option to enter later. By then, a less uncertain evaluation of the prospects for implementation of succesfull macroeconomic policies can be made.

[10]Pindyck, 1994

In this section we make use of a simple model which has been previously used by Dornbusch (1990) to explain the risk premium for the Mexican economy following the stabilization reforms. The basic idea is to make a simple model of the relationship between an investor's beliefs concerning the future evolution of the rates of return in a risky economy and the premium he demands to invest immediately, instead of waiting and acquiring more information.

The investor's beliefs may be taken as the probability distribution describing the possible future events of the uncertain economy. Since this is usually an unobservable characteristic of the investor, it is useful to make use of simplifying assumptions to allow an explicit calculation of the relation between these beliefs and the risk premium.

The first assumption limits the range of possibilities for the evolution of the rates of return during the maturity of the investment. In the present case, it suffices to assume that there are two alternative scenarios: (i) a good state, where policy reforms are successfully implemented and the expected rate of return is high (labeled r_g) and (ii) a bad state, where reforms are but a promise and the expected rate of return is low (labeled r_b).

The investor can decide either to wait and apply his wealth abroad affording to a known rate of return **r**, or realize a direct (irreversible) investment in this risky environment with two states of nature. At the moment of decision those who are brave enough to enter the country at early stages do so because they believe that they will reap good profits soon since the good state is just around the corner.

In order to determine the possible paths to be followed by the rates of return, it is assumed that the investor's evaluation of states follows a Markov process. In a bad state there is a probability **q** of persistence and a probability **(1-q)** of a shift to a favorable state. Thus, **q** can be interpreted as the probability of bad news and **(1-q)** as

the probability that succesfull macroeconomic policies will be implemented and change the prospects of the economy. A further simplification made is that once this favorable state is achieved, it is expected to last forever[11].

The relationship between the required premium and the investor's belief starts with the definition of this premium[12]. Starting at the bad state of the economy, the required premium for an investor that has a belief of persistence of the present state q to go ahead and invest, instead of taking a "wait and see" position which mantains the option of entering once the favorable state is verified is given by:

$$\phi = [q / (1+r-q)] (r-r_b)$$

This result above confirms the so-called Bernanke's Bad News Principle that the option value of waiting depends only on the rate of return in the bad scenario, not on the good news. The size of the required premium depends thus only on the difference between the certain rate abroad (r) and the low rate of return of the uncertain economy, not on the difference between the certain rate and the high rate. The reason is that investors can always benefit from the good state situation if they wait for it to invest.

Also, accordingly to the equation above, the size of the required premium for an immediate commitment grows with the probability of persistence of the bad state.

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[11]A more difficult assumption needed in the present interpretation is that this process repeats itself at each point of decision. Each investor is understood to have his own belief towards the future evolution of the rates of return, differences between economic agents reflecting their private sources of information and particular ideas about the environment, and their decisions are made separately. Finally, that investors are assumed to be risk-neutral, so that they differ only with respect to their assessment of the most convenient time of entry.

[12]The required premium is defined as the difference in return between the expected present value of the two possible investment opportunities (waiting versus commitment). A simplifying assumption behind the implicit probabilities is of a time invariant r_b so that the same game is repeated with the same payoffs, what is patently inadequate for a long period, when some opportunities are lost.

Protracted stabilization and covered interest differential

Figure 2.1 shows an estimate of the covered interest differential CID and its components for the period 02/1991 to 12/1996. This estimate was obtained using US T-bills interest rate, a riskless overnight monthly interest rate applied to Brazilian Federal bonds backed assets and the expected rate of exchange devaluation, measured in the first date of each month in the BM&F exchange futures market. The CID, calculated as $\{(1+RN)/[(1+E)(1+TB)] -1\}$, where RN is the domestic interest rate, E the expected devaluation in futures market and TB the external interest rate, may be seen as a pure risk premium which depends on the probability of the different states of the economy.

Assembling the data on the risk premium and fixing r_g, r_b and r, the specified model above may be used to estimate an implicit degree of belief concerning the future evolution of the rates of return. This belief reflects essentially an aggregate behavior, the outcome of independent decisions. In a preliminary exercise, the certain rate of return chosen was the US T-bills interest rate and the low rate of return was first taken to be zero, then -40%. These are just two base line assumptions in order to analyze the evolution of the probability of persistency of the bad scenario. The results of this computation are shown on Table A.1.[13]

Quality of the capital flows

It is not trivial to find an explanation for the timing of direct investment inflows in the implicit probabilities of bad scenarios as suggested by the evolution of risk premia. The result of the repeated frustration with the stabilization attempts is that expected policy reforms which would be forthcoming following successful stabilization

[13] Some examples of these results are shown in Appendix Table A3.

had to be postponed in each episode. Confidence in the improvement of the domestic scenario has thus been eluded several times leading to a premium on the correct timing, but it is a hard task to obtain a reasonable estimate of the rate of return in the "bad state".

Quality of flows should improve with the decrease in the probability of bad scenarios. This means that higher confidence in the progress of economic reforms should increase the share of FDI in total capital inflows.

The comparison between the time path of economic policy and the behavior of the quality of inflows should help to assess the responsiveness of the flows to expectations on economic policy "fundamentals". Unfortunately, a homogeneous monthly series for the quality of flows starts only in 1992 and stops in April 1996, when the vigourous recovery in direct investment was but starting as may be seen on Appendix Table A3. Regressions of different measures of the quality of flows on a rough estimate for the probability of the bad scenario were run obtaining correct negative signs but non-significant coefficients with the data until April 1996.

3. Volatility and the Response to Short Run Incentives

During and following the 1995 Mexican turmoil, Brazilian authorities have not shied away from adopting frequent changes in the legislation, especially those items concerning the taxation and other incentives to short term capital[14]. This section addresses the issue of to what extent have aggregate flows reponded to overall changes in environment, to short run incentives, and change of rules.

[14] See Garcia and Barcinski (1996) for an updated description of the legislation version. 1994 and 1995 changes in legislation in Annex 1.

In July 1994, the monetary reform was implemented. The sudden lowering of expected inflation boosted the demand for credit and the government announced a very restrictive monetary policy. The strategy was based on high primary interest rates and high reserve requirements imposed on banks in order to prevent a too rapid increase in the money supply from rising expected inflation. In October 1994, two months before the Mexican peso was floated, the Brazilian government took several measures in order to control the excess of capital inflows motivated by the increase in domestic interest rates. There was an import boom and abundant external funds to finance it but Central Bank foreign exchange reserves remained practically constant between June and November, in spite of the increasing domestic interest rates, thanks to the restrictions on foreign capital. The tax on financial operations applying to currency loans was raised from 3 to 7% and the minimum maturity of foreign loans was raised from 90 to 540 days, and, for the first time, a tax of 1% on portfolio capital was charged. A reserve requirement of 15% was imposed on credit to exporters, and 30% on credit to imports.

Following the turmoil caused by the devaluation of the Mexican peso after 19 December, the outflow of foreign capital became dominant in all categories and reserves started to deteriorate. The Brazilian government decided to revert the overvaluation trend of the Real, which had been utilized as an instrument for de-indexation in the second half of 1994. At the same time, several of the restrictions to foreign capital which had been imposed were removed in face of the new international environment. The tax on portfolio capital was extinguished, and the tax on foreign currency loans was reduced from 7% to zero, whereas the minimum maturities applying to loans were reduced back to 36 months for new loans and 6 months for renewals.

In the first quarter of 1995, these policy measures, coupled to another round of restrictive policies on domestic credit creation, which were based on higher reserve requirements applying to sight as well as to time deposits and even to bank loans,[15] led to higher interest rates and a gain in foreign reserves from around US$30 billion in April to more than US$ 46 billion by the end of the third quarter of 1995. From August onwards, the tax on fixed income investments were raised back to 7%, and loans were taxed at 5%, with a declining scale according to maturity, being zero for loans of 6 years or more. All other financial instruments used to intermediate capital inflows are subjected to a 5% flat entrance tax, starting February 1996.

This experience with the use of different domestic incentives in order to control capital flows is rich. In order to assess what happenned to the volatility of the different types of capital flows we examine figure 3.1, which contains 5 panels with different graphs. The first panel summarizes the behavior of net foreign investment in Brazil in the period 1987-95, shown in net terms and separated into inflows and outflows. The four smaller panels show the decomposition of foreign investment into respectively foreign direct investment (including merchandise flows and foreign debt conversion which do not require foreign exchange transactions), portfolio investment, financing operations and currency loans. All four components are presented in net terms, as well as separated into inflows and outflows for the same period.

Figure 3.1 shows that the upsurge of foreign capital in the first half of the nineties is dominated, in annual data, by the large movements of porfolio investment following de-regulation. Secondly, that foreign direct investment increased after 1993 with a similar pattern in annual data. Finally, that financing operations have been by and large dominated by external-debt related amortizations in the period, whereas

[15] For more details, see Carneiro and Garcia (1995) and Carneiro (1995).

currrency loans have been revived after 1991, in a clear response to higher domestic interest rates.

The decomposition of currency loans into banks, intercompany loans, commercial papers bonds and notes (fixed and floating) and securitization of export financing operations are shown in figure 3.2. The upper part of the figure shows the decomposition of disbursements and the lower panel shows the decomposition of amortizations. Currency loans intermediated by banks, which had been dominant in the previous debt cycle, have been replaced by securities-backed operations in the nineties, with an increasing role played by fixed notes and bonds, whereas the pattern of amortizations clearly show the scars of the previous cycle.

Short Run Volatiliy

In order to address the issue of volatility in the short run, data describing the behavior of monthly changes in the net flows are presented in figure 3.3, for the period between 02/92 and 12/95. The data is divided into three types of net flows: direct investment, portfolio investment and funds (fixed income and privatization). Simple inspection of the graph suggests that first, volatility of all three categories have increased in the period of high uncertainty related both to domestic policy changes and to changes in the external environment. The former was the case in the end of 1993 when portfolio investment reacted wildly to expected changes in rules, and in the beginning of 1994, when foreign direct investment inflows exhibited a similar behavior in the presence of the uncertainties related to the multi-stage stabilization program, which was being enacted by the Brazilian government. Fixed income funds are included as a separate category because after 1994 most of the portfolio investment has been confined in these funds, as explained earlier. The behavior of the three

categories at the time of the high uncertainty between the Mexican devaluation of December 1994 and the second half of 1995 is also very similar.

Tables 3.1 and 3.2 presents volatility estimates for foreign investment and currency loans, calculated as coefficient of variation of monthly flows. Separate measures are reported for inflows, outflows and net inflows, so that the potential differences in the behavior of entries and exits may be checked. Foreign investment is classified in portfolio (fixed-income funds and privatization funds included) and direct (separated into merchandise inflows and reinvestments).[16] The standard deviations and the coefficients of variation are calculated for the whole period (01/92 to 05/96) as well as for each of the complete years from 1990 to 1995.

When we examine monthly inflows in each year, the main conclusions are that, for the period as a whole, portfolio inflows presents the smallest coefficient of variation (0,97%) among the various forms of inflows of foreign investment. When we consider net inflows, direct investment turns out to be less volatile.

If we consider the variability of changes of monthly inflows (not reported in the tables) the volatility of direct investment net inflows is the smallest in the period (12.7%), compared with portfolio investment (270.6%), and this is true for almost every year of the sample. One surprise is the relatively high volatility of merchandise inflows and reinvestment, two forms of direct investment which do not involve cash flows, and therefore do not have a **direct** impact on foreign exchange markets.

[16] The Central Bank does not publish separate data for merchandise and monetary flows but for the 1990's, it was possible to have a series in the hope to check whether merchandise flows and reinvestment exhibited a different volatility, since most restrictions aiming at reducing volatility of capital flows apply only to financial flows.

When we consider data for inflows corresponding to loans, shown in table 3.2, however, we see that these show a coefficient of variation of 0,63% for the period as a whole, which indicates a volatility smaller than that observed for direct investment.

Another interesting feature is the relatively high volatility of export-related securities throughout the period, as well as the rather moderate increase in the volatility of bonds and notes signaling that after all, the differences between changes in regulations and tax rates applying to the different types of capital flows entries appear to have contributed to smooth the differences in volatility.

The comparative data on volatility of the different flows suggest that the differences in behavior (and eventual macroeconomic effects) between "purely financial" investment and direct investment more committed with the long run determinants of the economy is, at least in the case of the Brazilian economy in the nineties, less pronounced and more subtle than it is expected at first sight.

4. Consequences: short and long run effects

The traditional argument for the desirability of foreign investment is, of course, its expected ultimate effect boosting growth without increasing domestic savings requirements. Two important characteristics of the recent experience of higher capital flows to third world countries are first, its supply-determined character[17] derived from the lower interest rate in industrialized countries, and second, that financial motives dominated the scene on the demand side. Thus, it may be interesting to inquire whether the smaller importance of direct investment relatively to monetary inflows in the Brazilian case is sufficient to lead to the conclusion that their unwelcome monetary-

[17]See G.Calvo et al (1996).

expansionist and exchange-rate appreciation impacts overshadowed their expected impact on real investment.

There are elements in the recent Brazilian experience suggesting that, first of all, domestic conditions have played an important role in the level as well as in the composition of capital flows. Secondly, that without the benefit of previous foreign reserves accumulation, the stabilization program would have small chance to overcome the shockwave set off by the Mexican devaluation crisis. And finally, that a certain degree of similarity of behavior between the two types of flows may be detected from the time-series evidence.

In Table 4.1, direct investment and other forms of foreign capital (the latter classified into short-term and long term in the Brazilian Balance of Payments criterion) are presented as a proportion of GDP for the period 1989/1995, and the corresponding annual averages for 1964/70 and 1971/80. Taking a long run perspective, both periods of high turbulence, namely the mid-sixties and the eighties have also been periods of low foreign capital. Between 1964 and 1970, short term capital was only 0.2% of GDP whereas other forms of long term capital corresponded to 2% of GDP, these figures increased to 0,6% and 5.4% in the seventies and declined to -0.1% and 2.7% in the eighties, respectively. In the period 1992/95, the two categories present values of 0.6% and 4.4% of GDP respectively, with foreign direct investment reaching a very high average in historical terms. The annual data tends to confirm these observations when the recovery of more favorable prospects[18] opened the way to more foreign capital in the recent years.

[18] See section 2 above.

Long Term Capital and the Real Exchange Rate

Two undesirable effects of the excessive capital flows are the expansionist monetary effects of the reserve accumulation and the overvaluating pressure over the exchange rate. The monetary effects of the recent capital flows have been more extensively described by the author elsewhere, with two main conclusions. The first one relates to the advantages of a "security" effect of the Central Bank reserves. The second one relates to the fact that actually in the Brazilian case there was scarcely any mopping up of excessive monetary base in a traditional "sterilization" operation. In the Brazilian high inflation monetary regime with daily indexation, foreign capital in excess of current account needs entered the country to take advantage of the high interest paid by government securities, while domestic nominal interest rates were at first determined by the need to offer asset holders an alternative to foreign assets in order to set a limit to currency substitution .[19] After the monetary reform, they were used to punish speculation against the new currency.

The second aspect has to do with the overvaluation pressures, which may have been very important in short-lived episodes. Estimates of overvaluation following the monetary reform based on peak-to-trough measures (general price index relatively to US Consumer Prices) reached 24% in the first six months of the program, leading prominent analysts to predict that a colapse of the exchange rate would be inevitable in the first half of 1995. Because of wild changes in relative prices following stabilization, the overvaluation measured by wholesale non agricultural prices, for the same period, was practically nihil. Most calculations, however, tend to overlook the fact that under high inflation, small lags in daily indexation may produce large differences between the real value of the exchange rate at the end of the month and its average monthly value.

[19] Carneiro and Garcia (1995, op. cit), pp. 18 ff.

This leads to an overestimate of the real exchange rate prevailing before the program, and thus to a correspondingly exagerated estimate of the overvaluation.

When we look at longer series, however, the picture exhibits a different aspect, since some degree of appreciation is associated with higher long term capital inflows, both being perhaps a signal of "good times". In Table 4.2 a series for the real exchange rate for the Brazilian economy is presented side by side with a measure of long-term capital as defined in the Balance of Payments statistics, expressed as a percentage of GDP. The data are drawn in Figure 4.1. The long run association between the level of the real exchange rate and the amount of long term capital shown in the graph would argue more in favor of a jointly determined phenomena than the idea of causality.[20] Recent research results conducted under the author's supervision are reported on Table 4.3, in which a co-integration regression is estimated for the Real Exchange Rate under three different deflators, with a consistently negative sign for the effect of long-run capital flows on the real exchange rate. To be sure, this conclusion does not imply one should not worry about overvaluation effects of excessive and short-lived capital inflows, but underscores the importance of analysing the quality of flows when one assesses the convenience of restricting capital inflows.

Capital Flows and Consumption versus Investment

Only in the past two years one may have more concrete reasons to believe in a favorable change in the growth prospect for the Brazilian economy capable of justifying an improvement in the investors' view of the expected profitability and the degree of riskiness. Thus, any assessment of the consequences for investment, savings and growth is bound to be precarious and premature. In the first months of the Real monetary reform, the consumptiom boom was actually enhanced by the availabity of

[20] Actually, both series were found to be I(1), Granger-causality tests applied to the two variables can't reject the absence of Granger-causality.

foreign sources of finance for consumers' credit, but the effects of foreign capital abundance were believed to be more positive than the effects of a possible round of capital flight.[21] Figure 4.2 presents the behavior of aggregate domestic savings, investment and the supply of credit to households by the banking system. The first result is that the growth of consumption, credit and foreign investment has followed the same direction from 1990 to 1994. Furthermore, during the 1995 recession, the graph suggests that the increase in aggregate investment proceeded in spite of the slowdown of consumption and savings. The 1996 recovery in consumption and GDP was accompanied by a significant improvement in the quality of capital inflows together with an increase in capital goods imports of 12.1% over 1995 figures, but data on overall investment are still not available.[22]

Sectoral destination

A brief look into broad sector destination show that the share of manufacturing industry as a destination of direct investment has fallen from the late eighties (71%) to mid nineties (55.4%). Services seems to attract an increasingly higher share of foreign capital, reflecting a number of phenomena. One is the internationalization of a traditional "nontradeable sector" through the widespreading of franchising operations, for example. Another is the opening up of the contracting, building, technical consulting and computer-related businesses, and more recently, insurance which have been a traditionally protected area up to the late eighties. Finally, the further effects of privatization and structural changes within the subsectors of manufacturing industry, reflecting both the consequences of more liberal trade policies (end of prohibitions,

[21] In the six months of the program (the second half of 1994), there was no attempt at avoiding the exchange rate overvaluation, since the government feared that a speculative attack against the Real leading to a devaluation would put an end to the deindexation efforts. Thus, the costs associated with an overdose of foreign capital were very small compared with the expectations of a sharp devaluation and the explosion of domestic consumption.

[22] Although official figures are still not available, non-official estimates point to an investment to GDP ratio of 17.1% at 1980 prices.

lowering of import tariffs) and deep changes in industrial policies (such as the end of the nationalization requirements in value added and overall discrimination against foreign firms which was banned from the Brazilian constitution only in 1995). In the upsurge of direct investment of the last three years, there has been a noticeable increase in Transport Equipment and a decrease in Tobacco, but as the privatization program reaches electric power generation, telecommunications and state banks, a new wave of foreign capital is expected to materialize in the 1997/98 period.

5. Conclusions and Policy Issues

Brazilian experience is rich and varied. In the past, nationalism, control of capital flight and dirigist industrial policy was the rule. The more recent stance is somewhere in between Mexican liberalization of capital account coupled with the uncertainties derived from flexible exchange rates and Argentina's fixed exchange rate with full convertibility. In both cases, and Brazil is no exception, fiscal discipline seems essential to signal more favorable scenarios, and yet this is the hardest result to accomplish.

Are there policy lessons to be drawn on how to prevent capital from flooding the country in good times and fleeing the country in bad times? Capital flight was low before 1986, even at the worst of the early eighties, but it was much milder in 1995 than in 1982, notwithstanding the liquidity of the more recent investment. At the time of the first Mexican crisis external debt was public, and foreigners' money was tied to long run investment projects. However, this does not mean that industrial policies make flows more stable, as evidenced by the behavior of the different types of flows examined in section 4. In the late eighties, external moratorium plus domestic uncertainty with high inflation increased capital flight. Frustrated stabilization attempts plus delay in external debt restructuring are the main reasons behind radical changes in

attitudes in the early nineties. Financial openness of neighbors did make a difference and so did the abundance and composition of supply. At the peak of high uncertainty, after President Collor's hijacking of domestic financial assets, liberalization of rules together with high interest rates were essential elements for the reconstruction of economic policy credibility and stabilization. But abundance of external liquidity makes quite a difference, and the existence of private capital ready to respond to inconsistent macropolicies should not be seen as a bad thing.

Another difficulty faced by regulators today derives from the interplay between supply-side determinants and the availability of financial innovations. In the presence of today's facilities to move money to financially open neighbor economies (Paraguay and Uruguay), the inefficiency of old fashioned controls are clear. The issue of what kind of controls to adopt will inevitably be marred by conflicting objectives, such as "to control the volatility while minimizing the obstacles to capital mobility", since these obstacles may have negative effects on the long term flows.

On the issue of overvaluation effects, following the Mexican crisis of 1994/95, a more pragmatic exchange-rate policy has been adopted by the Brazilian government, with an eye on the need to discourage volatile short term capital and another on the trade balance prospects. At the beginning the adoption of a more flexible exchange rate policy raised fears of catastrophic scenarios for the stabilization which did not materialize. In the present regime, the Central Bank adopts a floating band which has been upwardly adjusted twice in the past two years[23], and makes frequent interventions so as to keep the exchange rate within a narrower "informal crawling band" which has roughly been sliding at a rate which implies a moderate but steady real devaluation. This is believed to exorcise the fears of a maxi devaluation at the same time it has prevented systematic appreciation. Thus far this exchange policy has been seen as

[23] As of February 1997, the managed float is between a minimum of 1.05 and a ceiling of 1.14 reals per US dollar.

sensible by long term investors, although exports have been growing at a slow pace. This attitude was adopted after the Mexican crisis suggesting that there is some advantage in being a latecomer. Improvement of quality of flows on a permanent basis seems to require more than sensible macropolicies, but also a more permanent and consistent stance concerning the role of private sector in the investment process as a whole.

As to the dilemma between taxation of high volatile capital movements versus prohibition or a quarantine system, the Brazilian experience seems also to be of some interest. In the early seventies, Brazilian authorities have made use of a quarantine system by requiring a deposit at the Central Bank during six months, with no interest paid, for all foreign loans from private banks, and even so there was excessive money creation in 1972 and inflationary pressures in 1973 and 1974. In the recent years there has been a clear preference for taxation, as briefly described above, and the results are still not unfavorable: as long as high interest rates are the main reason for excessive flows, taxation of extra gains may be enough to control excessive entries, as it has happened, for example, in the second half of 1995 and first half of 1996. There are no signs that such policies resulted in unwanted reserves in the vaults of the Central Bank.

Investment performance is hard to assess since the recovery began. Aggregate investment responds in the long run to foreign capital, but by and large, they have both been affected by overall economic incentives in the past four decades. There are signs that investment recovery has been adversely affected by the uncertainties of 1995 and preliminary estimates point to a slow increase in the investment to GDP ratio in 1996, so that the increase in capital inflows can hardly associated in the first two years of the Brazilian stabilization with investment recovery, but may have helped to sustain a high level of consumption expenditure and a higher fiscal deficit than is sustainable in a scenario of continuous low inflation. The high level of the fiscal deficit, around 6% of

GDP under present circumstances, does not provide an adequate environment for sterilized intervention as recommended in other circumstances.[24] Finally, policy discussions on the degree of government intervention which should be applied to boost foreign capital inflows to preferred sectors are frequent now, as the current account deficit is expected to worsen in the coming years, while the quality of flows has been improving. Resorting to more restrictive policies in the acceptance of capital flows, besides being no substitute for sound fiscal policies, may open the way for the restoration an unfortunate respectability of capital controls. A return of capital controls have often involved arguments about the discrimination of controls "by type" of capital, or "by sector of destination", with increasing pressures for an official industrial policy, which will certainly appear in more respectable clothes whenever Balance of Payments difficulties arise.

[24] See Reisen (1995) for an overview of the recommendations concerning sterilized interventions, which includes a generalized form of sterilization through the use of excessive public savings. In the Brazilian case, the government has managed to make use of compulsory holding of public bonds by official pension funds and imposed reserve requirements on investment funds which have similar effects, but this is obviously not feasible when the Treasury's growing financial needs crowds out the Central Bank, leaving scarcely any room for sterilized intervention through the use of long term savings.

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Table 1.1
Brazilian national accounts
(as % of current prices GDP)

	average 75-79	*average 80-82*	*average 83-89*	*average 90-95*	*1990*	*1991*	*1992*	*1993*	*1994*	*1995*
GDP (const. prices growth rate)	5.9	1.7	3.4	1.6	(4.2)	0.3	(0.8)	4.2	6.0	4.2
Net factor income/payments abroad	1.9	4.2	4.6	2.4	2.8	2.8	2.5	2.8	1.9	1.7
Net unequited transfers	0.0	0.0	0.0	0.4	0.2	0.4	0.6	0.4	0.5	0.6
Gross national disposable income	98.1	95.8	95.4	98.0	97.4	97.6	98.1	97.6	98.6	98.9
Domestic Consumption	78.6	78.5	75.8	78.9	76.6	79.2	77.6	78.5	79.2	82.1
Domestic Savings	19.5	17.4	19.6	19.1	20.7	18.4	20.5	19.1	19.3	16.8
Gross fixed investment	22.5	23.5	21.6	20.7	22.9	19.2	19.5	20.0	20.8	21.6
Current account deficit	3.9	5.3	0.6	0.4	0.8	0.4	(1.6)	0.2	0.3	2.5
Gross fixed investment financing	23.4	22.6	20.2	19.6	21.6	18.8	18.9	19.2	19.6	19.2

Sources: Banco Central do Brasil, IBGE and Carneiro & Werneck (1993)

Table 1.2
Brazil: Balance of payments 1975 - 1996
(US$ Billion)

	average 75-79	**average 80-82**	**average 83-89**	**average 90-96**	**1990**	**1991**	**1992**	**1993**	**1994**	**1995**	**1996***
Trade Balance	(1.9)	(0.3)	12.4	7.4	10.8	10.6	15.2	13.3	10.5	(3.4)	*(5.5)*
Financial Services(1)	(2.5)	(8.9)	(9.6)	(8.3)	(9.7)	(8.6)	(7.3)	(8.3)	(6.3)	(8.2)	*(9.8)*
Services (others)	(2.5)	(4.5)	(4.1)	(7.5)	(5.6)	(5.0)	(4.1)	(7.3)	(8.4)	(10.4)	*(11.9)*
Current Account	(6.9)	(13.6)	(1.2)	(6.2)	(3.8)	(1.4)	6.1	(0.6)	(1.7)	(18.0)	*(24.3)*
Capital Account	7.5	10.1	(5.1)	14.7	(4.7)	(4.1)	25.3	10.1	14.3	29.4	*32.4*
Errors and Omissions	(0.2)	(0.4)	(0.4)	0.2	(0.3)	0.9	(1.4)	(1.1)	0.3	2.1	*1.0*
Reserves (changes)(2)	0.4	(3.9)	(6.7)	8.6	(8.8)	(4.6)	30.0	8.4	12.9	13.5	*9.0*
Capital Account (as % of nominal GDP)	4.5	4.6	(1.3)	2.6	(1.1)	(1.1)	6.8	2.4	2.5	4.1	*4.3*

Source: Banco Central do Brasil - atualizado a partir do Boletim do Banco Central de Março de 1997.

(1) Interests

(2) Current Account + Capital Account + Errors and Omissions

*preliminary

Table 1.3
Brazil: Gross fixed investment 1975-1995

	Gross Fixed Investment Curr.Prices (as % GDP)	Gross Fixed Investment Const.Prices (as % GDP)	Gross Fixed Investment Const.Prices (1990=100)	Capital goods Imports (1990=100)
1975	23.3	25.8	103.4	66.3
1976	22.4	25.0	110.6	61.0
1977	21.3	23.6	109.3	52.3
1978	22.3	23.5	114.5	59.9
1979	23.4	22.9	119.0	63.6
1980	23.6	23.6	129.9	73.9
1981	24.0	21.6	114.1	67.8
1982	23.0	20.0	106.3	55.2
1983	19.9	17.2	89.0	42.2
1984	18.9	16.3	88.8	36.3
1985	18.0	16.4	96.6	41.8
1986	20.0	18.8	118.4	58.4
1987	23.2	17.9	116.8	66.7
1988	24.3	17.0	111.0	70.7
1989	26.9	16.7	112.3	82.1
1990	22.9	15.5	100.0	100.0
1991	19.2	14.6	94.2	100.7
1992	19.5	13.6	87.7	107.7
1993	20.0	14.0	90.3	145.5
1994	20.8	15.0	96.7	212.9
1995	21.6	15.4	99.3	298.1

Sources: IBGE - National Accounts Department ,Banco Central do Brasil, IPEA and

Carneiro & Werneck - "*Obstacles to investment resumption in Brazil*" in "Savings and investment requirements for the resumption of growth in Latin America"- IDB,1993

Table 1.4
Brazil: Balance of payments - Capital account 1989-1996
(US$ Million)

	1989	*1990*	*1991*	*1992*	*1993*	*1994*	*1995*	*1996*
Capital account	(3,648)	(4,715)	(4,148)	25,271	10,115	14,294	29,359	32,391
Investment (net)	125	-	170	2,972	6,170	8,131	4,663	15,558
Reinvestment	531	273	365	175	100	83	384	447
Financing	3,640	3,424	2,026	13,258	2,380	1,939	2,834	4,302
Foreign	3,788	3,474	2,125	13,191	2,625	2,389	3,513	4,405
New inflows	2,257	2,662	2,125	1,608	1,435	2,389	3,513	4,405
Refinancing	1,531	812	-	11,583	1,190	-	-	-
Brazilian	(148)	(540)	(99)	67	(245)	(450)	(679)	(103)
Amortizations	(33,985)	(8,665)	(7,830)	(8,572)	(9,978)	(50,411)	(11,023)	(14,423)
Paid	(5,889)	(8,053)	(7,830)	(7,147)	(9,268)	(11,001)	(11,023)	(14,423)
Refinancing	(28,096)	(612)	-	(1,425)	(710)	(39,410)	-	-
Currency loans	25,972	(297)	964	17,577	11,659	53,802	33,570	26,797
Short-term	(1,664)	(1,208)	(3,033)	2,602	869	909	18,834	3,995
Long-term	27,636	911	3,997	14,975	10,790	52,893	14,736	22,802
Brazilian Banks	1,465	-	-	294	-	5,752	-	-
New inflows	-	-	-	294	-	-	-	-
Refinancing	1,465	-	-	-	-	5,752	-	-
Foreign commercial banks	26,065	-	-	7,703	834	38,758	1,737	811
New inflows	600	-	-	603	834	2,034	1,426	562
Refinancing	25,465	-	-	7,100	-	36,724	311	249
Intercompany	106	258	308	871	1,064	632	1,133	1,578
Other [1]	-	653	3,689	6,107	8,892	7,751	11,866	20,413
Other capital	69	550	157	(139)	(216)	750	(1,068)	(290)

Updated from the Boletim do Banco Central do Brasil of March/1997

(1) including bonds, "commercial paper" and "fixed/floating rate notes"

Table 3.1

*Brazil: Volatility of foreign investment**

Monthly flows - Coeficient of variation

	Portfolio			Direct			Merchandise	Reinvestment
	inflow	outflow	net inflow	inflow	outflow	net inflow	inflow	
90	0.88	1.68	2.25	0.98	1.52	2.60	0.40	0.81
91	0.71	1.42	0.62	0.66	0.87	0.93	0.41	0.92
92	0.33	0.65	1.13	0.88	1.07	1.07	0.63	1.28
93	0.58	0.64	1.06	0.60	1.20	1.19	1.79	0.59
94	0.28	0.43	0.89	0.39	0.69	0.52	1.14	0.97
95	0.40	0.38	6.02	0.50	0.69	0.52	0.82	1.32
96**	0.23	0.17	1.22	0.70	0.75	0.72	0.85	1.47
90/96	0.97	1.09	2.18	1.34	1.26	1.60	1.05	1.46

Source: Banco Central do Brasil

*: includes transactions that were not realized through the foreign exchange markets

**:Jan/1996 - Jun/1996

Table 3.2

Brazil: Volatility of Currency Loans

Monthly Flows - Coeficient of Variation

	Total	Com Firce # 10	RES #30	Fin Rural Res 2148	Fin Imobil Res 2170	Comercial Papers	Bônus e Notes	Securitiz.	Renov.
92	0.366	0.350	1.027	-	-	0.801	0.589	2.486	1.257
93	0.506	0.425	1.200	-	-	0.706	0.649	1.282	0.851
94	0.549	0.840	1.698	-	-	0.540	0.710	1.257	0.678
95	0.682	0.675	1.057	1.467	-	1.234	0.979	1.741	0.858
92/96	0.629	0.806	1.219	2.567	7.211	1.216	0.809	1.758	1.008

Source: Banco Central do Brasil

Table 4.1
Foreign Investment in Brazil (short-term, long-term and direct)

	Foreign Direct Investment (as % GDP)	Short-Term Foreign Capital (as % GDP)	Long-Term Foreign Capital (as % GDP)
1991	0.1%	-0.8%	1.0%
1992	0.3%	0.7%	4.0%
1993	0.1%	0.2%	2.5%
1994	0.3%	0.2%	9.4%
1995	0.5%	2.6%	2.1%
1996	1.2%	0.5%	3.0%
Average 64/70	*0.3%*	*0.2%*	*2.0%*
Average 71/80	*0.7%*	*0.6%*	*5.4%*
Average 81/91	*0.5%*	*-0.1%*	*2.7%*
Average 92/96	*0.5%*	*0.8%*	*4.2%*

Source: Banco Central do Brasil

Table 4.2
Real exchange rate and long-term foreign capital

	Real Exchange Rate R$/US$*		Long-Term
	Wholesale Price Index (IPA -DI)	General Price Index (IGP - DI)	Foreign Capital (as % GDP)
1964	1.870	2.102	1.1%
1965	1.843	2.027	1.6%
1966	1.579	1.763	1.8%
1967	1.486	1.635	1.7%
1968	1.578	1.720	1.7%
1969	1.659	1.792	2.8%
1970	1.622	1.752	3.4%
1971	1.588	1.730	4.2%
1972	1.580	1.728	7.4%
1973	1.600	1.756	5.4%
1974	1.633	1.798	6.3%
1975	1.671	1.839	4.6%
1976	1.637	1.791	5.1%
1977	1.634	1.763	4.8%
1978	1.625	1.754	6.9%
1979	1.741	1.896	5.1%
1980	1.913	2.177	4.5%
1981	1.680	1.943	6.0%
1982	1.705	1.958	4.6%
1983	2.094	2.487	3.5%
1984	2.060	2.562	5.5%
1985	2.122	2.630	3.4%
1986	1.899	2.309	1.2%
1987	1.812	2.120	1.4%
1988	1.607	1.905	0.9%
1989	1.385	1.615	0.5%
1990	1.090	1.279	1.1%
1991	1.308	1.503	1.0%
1992	1.400	1.582	4.0%
1993	1.289	1.436	2.5%
1994	1.119	1.194	9.4%
1995	1.000	1.000	2.1%
1996	1.054	1.008	3.0%

* US prices deflated by PPI (1995=1)

Source: Banco Central do Brasil, FGV and FED St. Louis

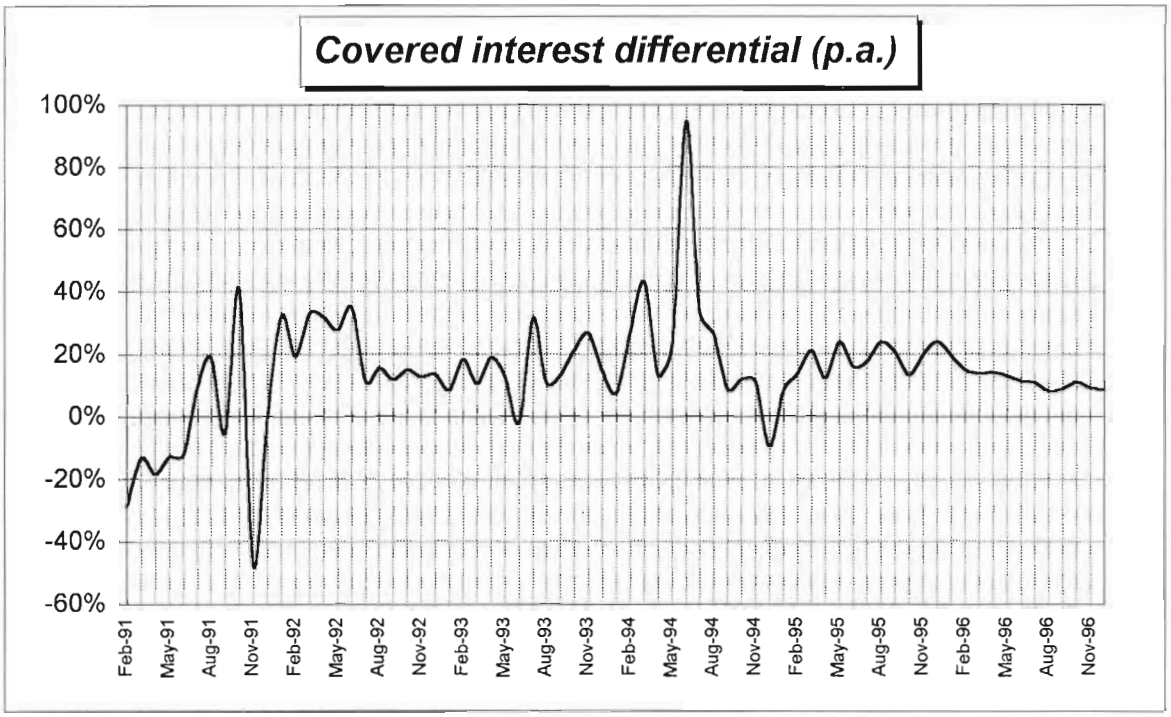
Table 4.3
Real exchange rate cointegration regressions
Annual data 1964-1995

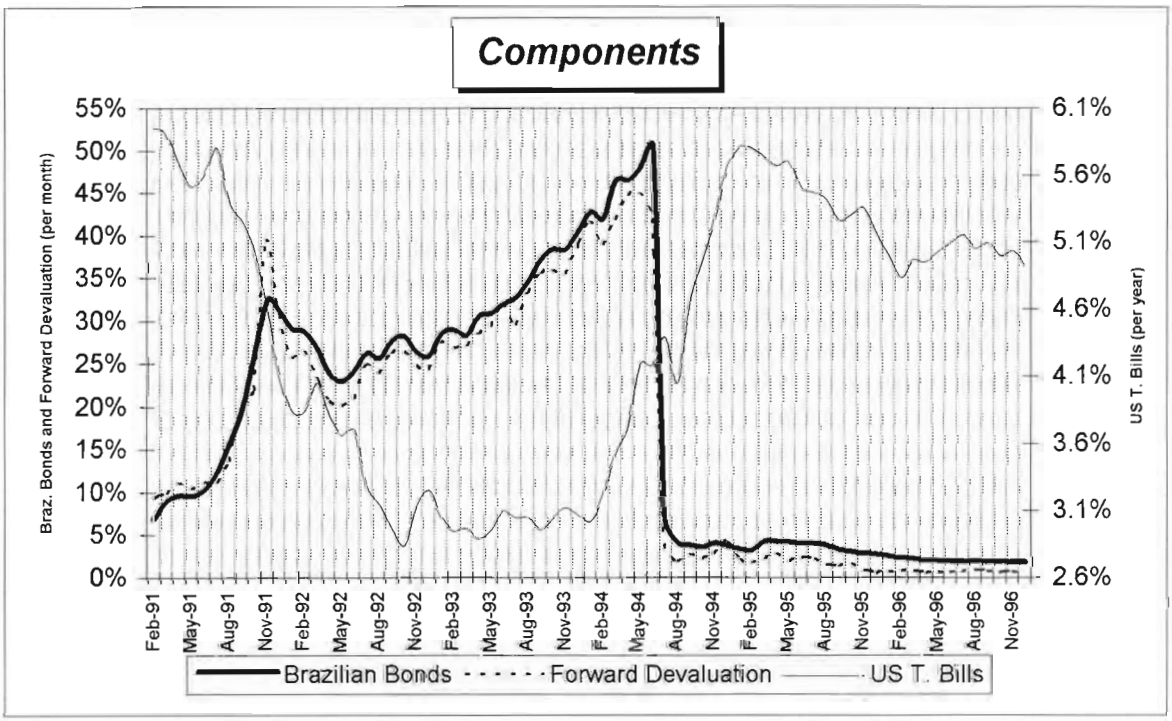
		Wholesale Prices	General Prices	Consumer Prices
Intercept		6.63	6.78	8.09
	(SE)	(1.23)	(1.85)	(2.23)
Government Expenditures (% GDP)		-0.80	-0.88	-0.77
	(SE)	(0.18)	(0.30)	(0.33)
Long-Term Foreign Capital (% GDP)		-0.02	-0.04	-0.05
	(SE)	(0.01)	(0.01)	(0.02)
Openess (Degree of)		0.23	0.33	0.34
	(SE)	(0.16)	(0.24)	(0.30)
Terms of Trade		-0.06	-0.07	-0.43
	(SE)	(0.09)	(0.13)	(0.17)
Adjusted R^2		0.75	0.62	0.59
Durbin-Watson		1.85	1.78	1.72
Lyung-Box Q		6.53	3.00	6.85
ADF on residuals		-4.11	-4.38	-4.09

Note: The Mackinnon critic values (at 5% and 10% of significance) are 4.46 and -4.08

Source: M. Baumgarten- "Modelos de Taxa de Câmbio Real de Equilíbrio: Uma Aplicação para o Brasil" Unpub. MA Thesis, Dept. of Economics, PUC-Rio, August 1996

Figure 2.1
Covered interest differential (CID)

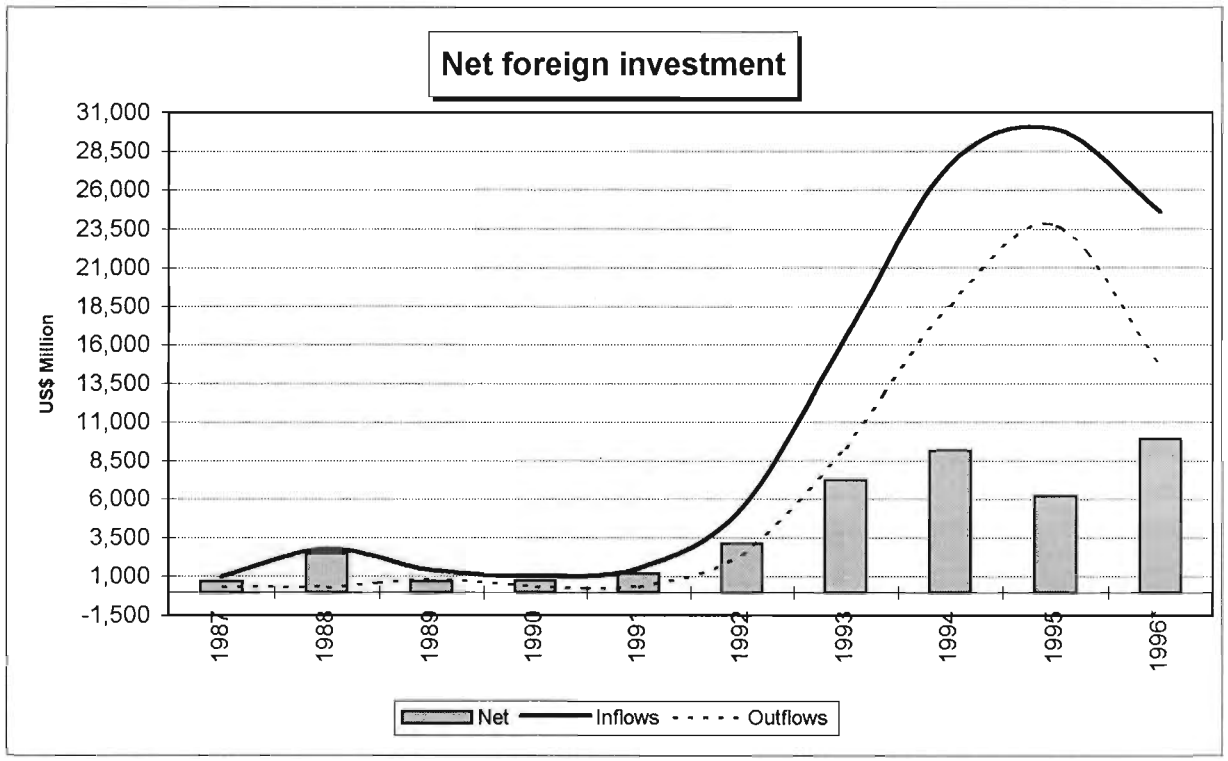


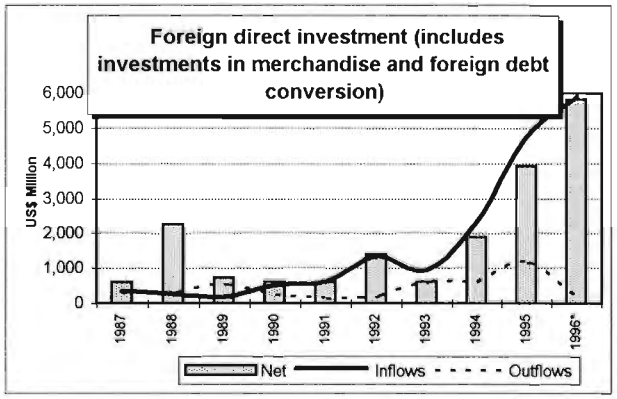


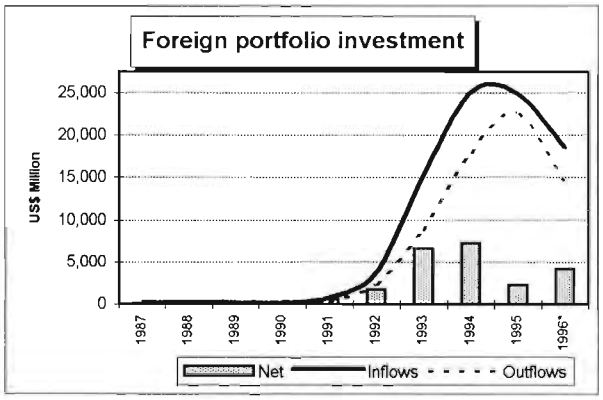
Source: Banco Central do Brasil, Bolsa de Mercadorias Futuros and FED (St. Louis)

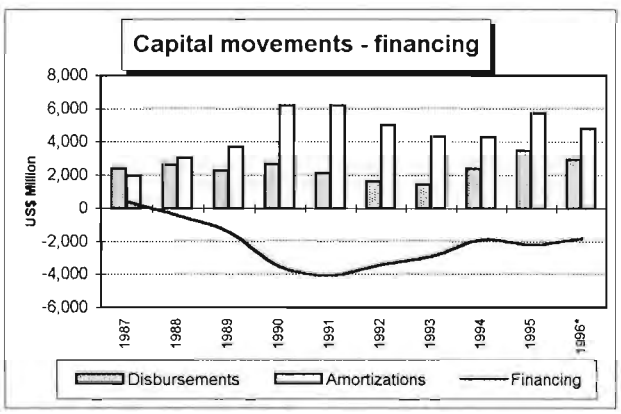
Figure 3.1

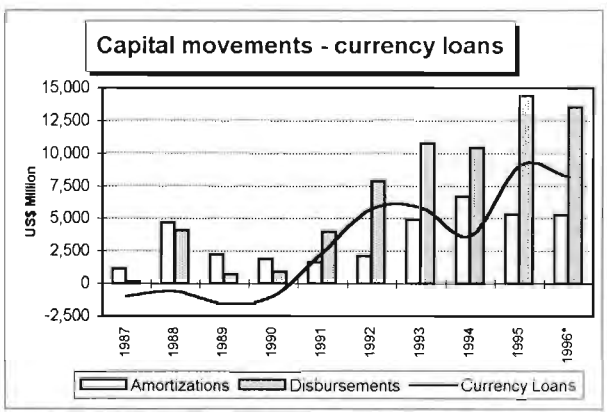
Net foreign investment *(includes decomposition of inflows and outflows)*







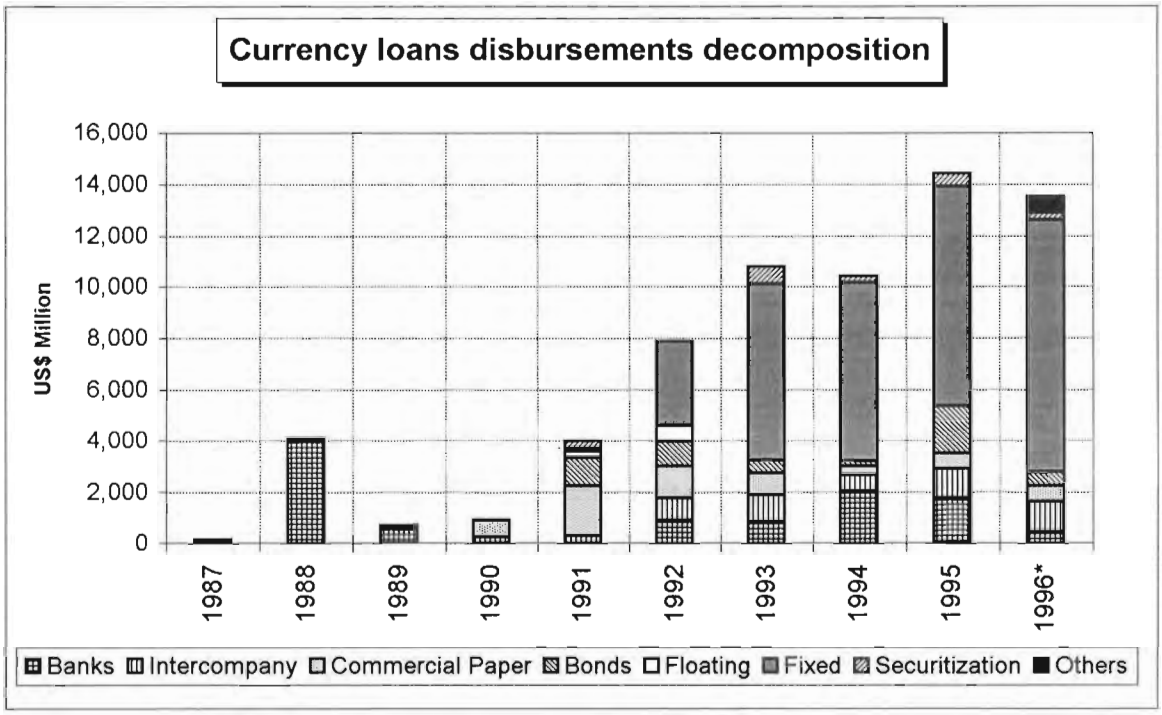


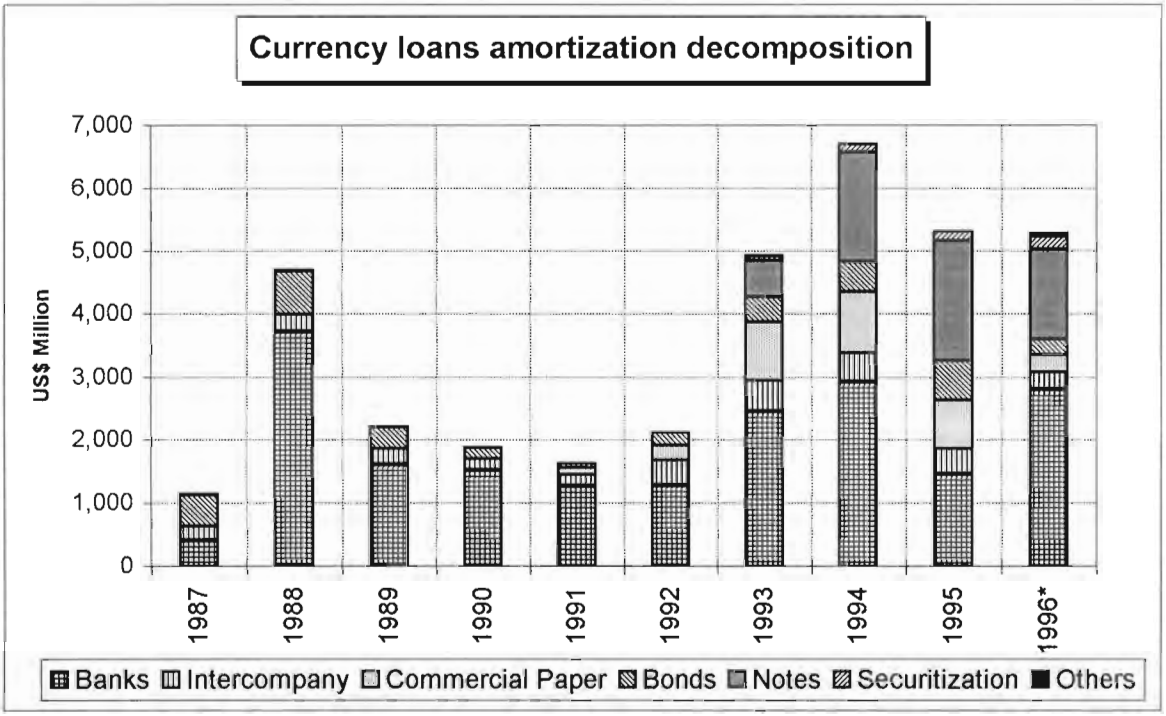


* includes the flows until September

Source: Banco Central do Brasil

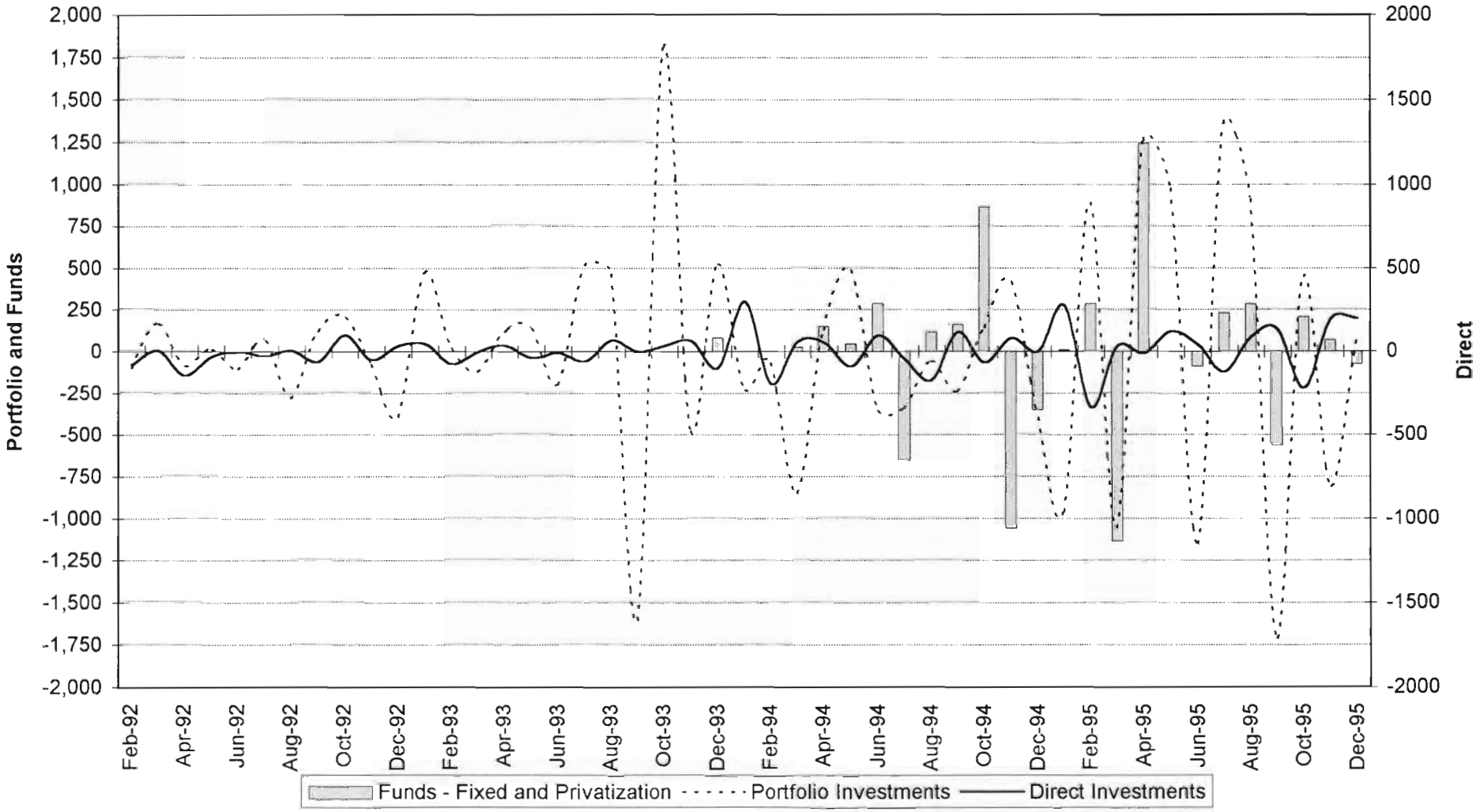
Figure 3.2
Currency loans disbursements and amortizations decompositions





* includes the flows until September
Source: Banco Central do Brasil

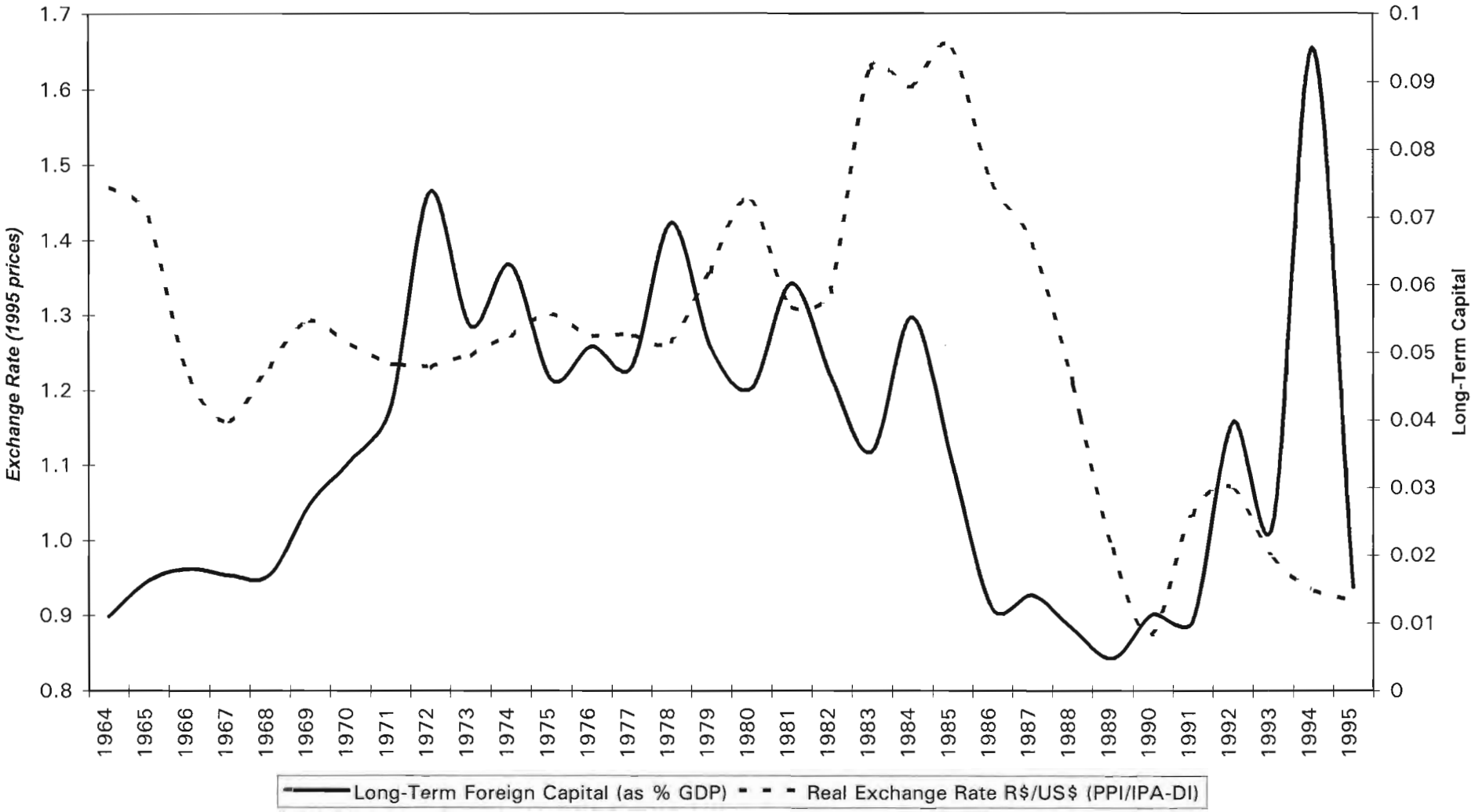
Figure 3.3
Volatility
First differences (net inflows)



Source: ANBID

Figure 4.1

Real exchange rate and long-term foreign capital



Source: Banco Central do Brasil

Figure 4.2

Domestic savings, Gross fixed investment, Domestic credit to individuals and Foreign investment

(US$ million)

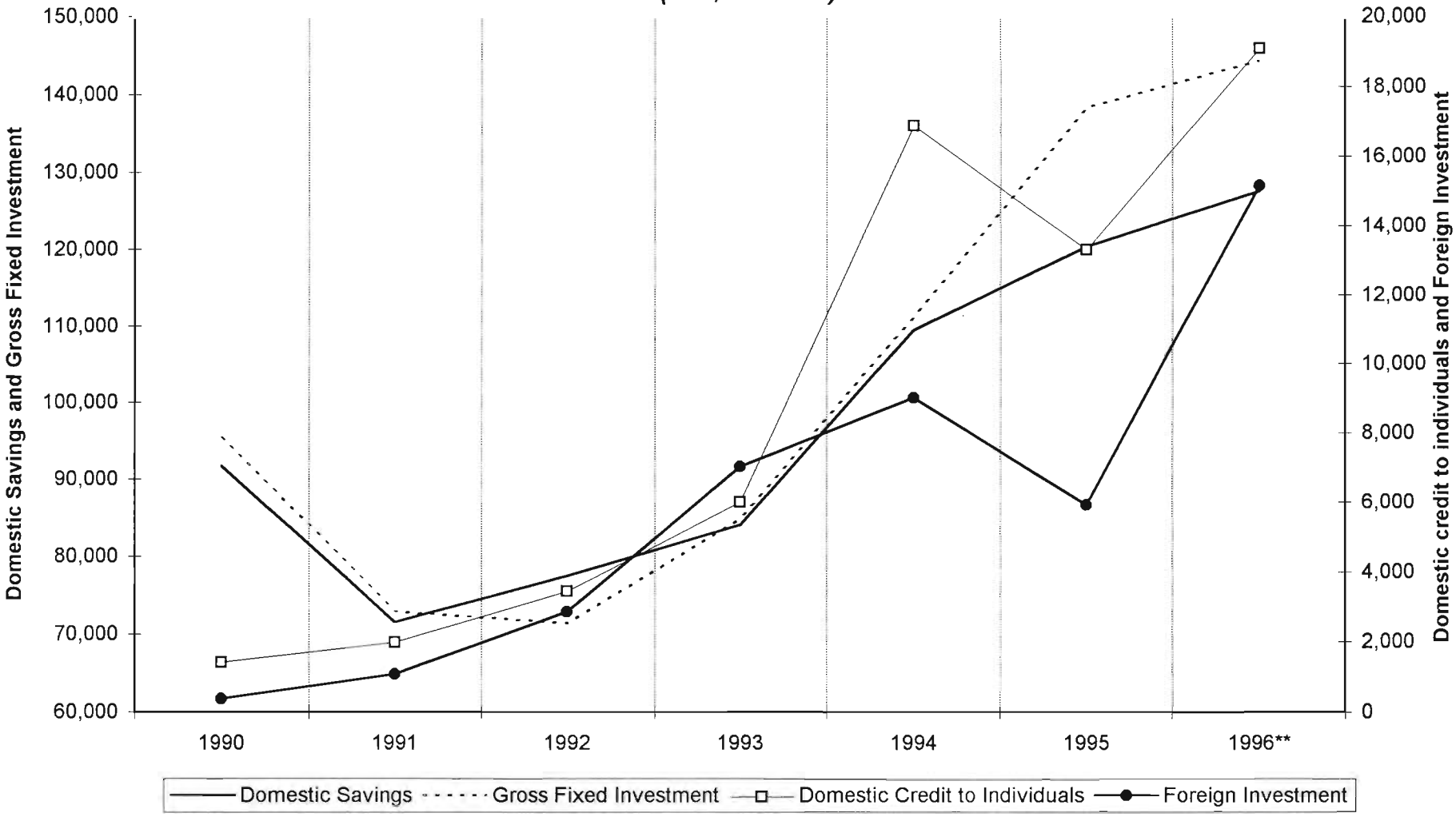


Table A.1
Covered interest differential (CID)
and the probability of the persistency of bad scenario

	US T.bills*	Braz. bonds**	Devaluation***	CID	Q(0)****	Q(-40%)
Jan-92	0.31%	29.06%	25.72%	31.94%	92.69%	43.76%
Feb-92	0.31%	28.76%	26.50%	19.15%	86.50%	31.57%
Mar-92	0.33%	26.86%	23.49%	32.81%	92.62%	44.42%
Apr-92	0.31%	23.92%	20.75%	31.51%	92.61%	43.43%
May-92	0.30%	22.99%	20.17%	27.44%	91.46%	40.00%
Jun-92	0.30%	24.28%	20.87%	34.61%	93.68%	45.83%
Jul-92	0.27%	26.22%	24.80%	10.88%	79.36%	20.75%
Aug-92	0.26%	25.64%	23.83%	15.39%	85.66%	27.12%
Sep-92	0.24%	27.66%	26.18%	11.69%	82.11%	22.02%
Oct-92	0.23%	28.17%	26.41%	14.76%	86.25%	26.35%
Nov-92	0.26%	26.40%	24.84%	12.50%	82.44%	23.18%
Dec-92	0.27%	25.91%	24.27%	13.40%	83.09%	24.42%
Jan-93	0.25%	28.51%	27.34%	8.26%	75.19%	16.58%
Feb-93	0.24%	28.91%	26.83%	18.11%	88.53%	30.54%
Mar-93	0.24%	28.36%	27.01%	10.29%	79.91%	19.90%
Apr-93	0.24%	30.54%	28.38%	18.76%	89.16%	31.31%
May-93	0.24%	30.90%	29,31%	12.45%	83.18%	23.13%
Jun-93	0.25%	31.91%	31.81%	-2.13%	-226.73%	-5.36%
Jul-93	0.25%	32.73%	29.44%	31.12%	93.85%	43.24%
Aug-93	0.25%	34.64%	33.18%	10.63%	80.07%	20.40%
Sep-93	0.24%	37.23%	35.49%	13.23%	84.14%	24.24%
Oct-93	0.25%	38.40%	35.87%	21.06%	90.04%	33.86%
Nov-93	0.26%	38.38%	35.36%	26.39%	92.22%	39.15%
Dec-93	0.25%	40.41%	38.49%	14.44%	84.96%	25.88%
Jan-94	0.25%	42.76%	41.57%	7.35%	73.01%	15.03%
Feb-94	0.26%	41.99%	38.82%	27.05%	92.26%	39.74%
Mar-94	0.29%	46.43%	41.74%	42.74%	95.64%	51.29%
Apr-94	0.31%	46.50%	44.60%	12.73%	80.18%	23.38%
May-94	0.34%	47.94%	44.93%	22.82%	88.03%	35.48%
Jun-94	0.34%	50.60%	42.00%	94.41%	99.76%	70.97%
Jul-94	0.36%	6.88%	3.98%	33.28%	92.22%	44.73%
Aug-94	0.33%	4.16%	1.80%	26.46%	90.24%	39.05%
Sep-94	0.38%	3.81%	2.70%	8.70%	68.23%	17.06%
Oct-94	0.40%	3.61%	2.25%	11.67%	73.65%	21.62%
Nov-94	0.43%	4.06%	2.72%	11.06%	71.37%	20.67%
Dec-94	0.46%	3.78%	4.20%	-9.78%	100.00%	-28.81%
Jan-95	0.47%	3.36%	2.21%	8.04%	61.44%	15.81%
Feb-95	0.47%	3.25%	1.69%	13.49%	73.99%	24.08%
Mar-95	0.47%	4.25%	2.14%	20.90%	82.98%	33.16%
Apr-95	0.46%	4.25%	2.79%	12.04%	71.84%	22.05%
May-95	0.46%	4.24%	1.95%	23.54%	85.10%	35.94%
Jun-95	0.45%	4.04%	2.33%	15.71%	78.14%	27.07%
Jul-95	0.44%	4.02%	2.18%	17.44%	80.29%	29.24%
Aug-95	0.44%	3.83%	1.57%	23.55%	85.72%	36.00%
Sep-95	0.43%	3.31%	1.28%	20.48%	83.75%	32.79%
Oct-95	0.43%	3.08%	1.59%	13.11%	74.98%	23.63%
Nov-95	0.44%	2.87%	0.92%	19.47%	82.64%	31.64%
Dec-95	0.42%	2.77%	0.54%	23.72%	86.37%	36.21%
Jan-96	0.41%	2.57%	0.67%	19.23%	83.26%	31.43%
Feb-96	0.39%	2.34%	0.78%	14.68%	78.69%	25.87%
Mar-96	0.40%	2.22%	0.73%	13.64%	76.67%	24.43%
Apr-96	0.40%	2.03%	0.52%	13.91%	77.41%	24.81%
May-96	0.41%	2.00%	0.57%	12.81%	75.45%	23.26%
Jun-96	0.41%	1.94%	0.64%	11.06%	71.96%	20.69%
Jul-96	0.42%	1.91%	0.62%	10.76%	71.11%	20.23%
Aug-96	0.41%	1.95%	0.89%	7.93%	64.19%	15.73%
Sep-96	0.41%	1.88%	0.76%	8.64%	66.14%	16.90%
Oct-96	0.41%	1.86%	0.58%	10.90%	72.02%	20.48%
Nov-96	0.41%	1.79%	0.65%	9.02%	67.42%	17.52%
Dec-96	0.40%	1.79%	0.70%	8.40%	66.22%	16.54%

Source: Banco Central do Brasil, Bolsa de Mercadorias & Futuros and FED (St. Louis)

*T bills interest rates - monthly rates

**Overnight monthly interest rate

*** Expected Rate, measured in the first date of the month

**** Q (r) is the implicit probability of persistency of the bad state given a low rate of return r

Table A.2
Foreign investments
Net inflow of resources
(US$ million)

	Portfolio Investments	Direct Investments	Funds Fixed and Privatization
Jan-92	266	309	-
Feb/92	162	229	-
Mar-92	326	234	-
Apr/92	235	90	-
May/92	245	57	-
Jun-92	134	53	-
Jul-92	203	27	-
Aug/92	-80	34	-
Sep/92	36	-26	-
Oct/92	241	73	-
Nov-92	167	21	-
Dec/92	-232	55	-
Jan-93	237	101	-
Feb/93	262	27	-
Mar-93	137	23	-
Apr/93	252	59	-
May/93	394	20	-
Jun-93	192	11	-
Jul-93	702	-49	-
Aug/93	1168	18	-
Sep/93	-439	14	-
Oct/93	1373	48	-
Nov-93	899	112	-
Dec/93	1417	13	80
Jan-94	1191	313	82
Feb/94	1124	119	78
Mar-94	269	176	106
Apr/94	396	229	256
May/94	887	138	300
Jun-94	535	235	586
Jul-94	185	189	-70
Aug/94	122	16	46
Sep/94	-123	134	208
Oct/94	15	67	1072
Nov-94	436	148	10
Dec/94	42	148	-343
Jan-95	-924	424	-334
Feb/95	-34	90	-46
Mar-95	-1094	119	-1185
Apr/95	161	106	59
May/95	1138	226	56
Jun-95	-18	265	-37
Jul-95	1339	142	194
Aug/95	2255	227	478
Sep/95	539	362	-86
Oct/95	982	141	120
Nov-95	170	336	189
Dec/95	239	532	111
Jan-96	1084	455	329
Feb-96	607	235	74
Mar-96	-43	479	-19
Apr/96	574	478	1
May/96	723	1623	-73
Jun-96	-218	1103	-2
Jul-96	-68	585	9
Aug/96	727	429	-40
Sep/96	631	348	1
Oct/96	701	824	14
Nov-96	718	899	-106
Dec/96	682	1737	-18

Source: BACEN

Table A.3
Quality of foreign investment and the probability of bad scenarios
(Some regression results)

Dep. Variable	Constant	Q	Ln(Q)	AR(1)	MA(1)	R-squared	Durbin-Watson stat
Period	T-statistic	T-statistic	T-statistic	T-statistic	T-statistic	Adjusted R-squared	F-statistic
DITIE	0.155604	-0.009240				0.000087	0.479073
92.01 - 96.12	3.934418	-0.071116				-0.017153	0.005057
DITIE	0.149340	-0.023293		0.698182		0.535899	2.116281
92.01 - 96.12	3.777619	-0.279169		8.011298		0.519324	32.331700
DITIE	0.149477	-0.038047		0.748983	-0.165037	0.543903	1.906550
92.01 - 96.12	3.711107	-0.439115		7.893010	-0.968802	0.519025	21.862760
DITIE	0.139519			0.750051	-0.154007	0.542334	1.903434
92.01 - 96.12	4.170893			7.867496	-0.912925	0.525989	33.180010
Ln(DITIE)	-2.438914		-0.237032			0.011443	0.747461
92.01 - 96.12	-6.178615		-0.805135			-0.006210	0.648242
Ln(DITIE)	-2.360222		-0.117522	0.605973		0.372820	2.289201
92.01 - 96.12	-5.887221		-0.457544	5.488192		0.348697	15.455380
DITIN	0.525025	-0.212252				0.000376	2.210357
93.01 - 96.12	1.104208	-0.131492				-0.021355	0.017290
DITIN	0.379111	-0.096089		0.312811	-0.370010	0.003866	1.974903
92.01 - 96.12	0.891375	-0.067011		0.170317	-0.205803	-0.050468	0.071153
DITIN	0.861369	-0.913229		0.826133	-1.090851	0.220222	2.180185
93.01 - 96.12	3.560327	-0.755792		8.524485	-8.442434	0.167055	0.011377
Ln(DITIN)	-2.386313		-0.724931			0.038737	1.099845
93.01 - 96.12	-3.032841		-1.269613			0.014705	1.611917
Ln(DITIN)	-2.341565		-0.717650	0.190724		0.091989	2.150555
93.01 - 96.12	-3.196901		-1.351394	1.126474		0.038577	1.722242

Source: Banco Central do Brasil, Bolsa de Mercadorias & Futuros, FED (St. Louis) and ANBID

* DITIE = Foreign Direct Investment (entry) / Total Foreign Investment (entry)

DITIN = Foreign Direct Investment (net entry) / Total Foreign Investment (net entry)