

A Estrutura da Dívida Pública no Brasil

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THE STRUCTURE OF THE PUBLIC SECTOR DEBT IN BRAZIL

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I. INTRODUCTION

The literature on the end of the remarkable inflationary processes (Bresciani-Turroni [1937], Sargent [1986]) calls our attention to one of the favorable hyperinflation aspects: the fact that the high inflation destroys old debts. Because of the central role fiscal deficits play on chronic inflation, the alleviation of the burden of debt helps stabilization, and the fact that a large portion of government debt may disappear without the undesirable reputation costs of explicit debt repudiation is even better. In the Brazilian inflationary experience, most of this potentially favorable effect of high inflation on debt has been neutralized by indexation. In December 1994, officially recognized total federal domestic debt was 19.9% of GDP. The fast growth of public debt in the first three years of stabilization has offset the benefits of the inflation acceleration which occurred shortly before the onset of monetary reform of July, 1994. By December 1997, such figure was 37.3% of GDP.

Part of this debt growth process may be due to foreign reserves accumulation, but it has certainly been aggravated by the delays in fiscal reforms, the absorption of bad debts which had been carried by private and public banks, as well as the long process of political negotiation around the need to extend fiscal adjustment which has been taking place at the federal level to local and state governments.

As a result of this process, the public sector net debt has increased from 28.5 percent of GDP in December 1994 to 34.5 percent in December 1997. More than two thirds of that increase stemmed from the net debt of the federal government and the Central Bank. There was an increment of 17.4 percent of GDP in the gross domestic debt of the federal government and the Central Bank, partly compensated by a reduction in their foreign debt equivalent to 3.4 percent of GDP. The resulting federal gross debt increment of 14 percent of GDP led to a much smaller, though still impressive, increase in the federal net debt, largely because it was offset by an accumulation of 'other assets' amounting to 7.4 per cent of GDP. The recent evolution of federal net debt figures should be seen with a grain of salt. Though the federal net debt has really increased much less dramatically than the federal gross debt since 1994, the slower increase conceals a deterioration of the quality of the net debt that deserves close observation.

High interest rates have had a severe impact of state and municipal government accounts. Thus, the combination of high interest rates and the sudden end of the high-inflation regime precipitated the already expected going under of the most fragile part of the banking system, largely constituted by banks controlled by the states. In order to avoid a major banking crisis, the Central

Bank launched in late 1995 a program to bail out large banks which were facing problems. At least three big private institutions had been rescued by November 1997, roughly in the same way: the Central Bank assuming the bad part of the insolvent bank's balance sheet and forcing the sale of the remaining part to a sounder institution, properly persuaded to participate in the operation by the access to a low-interest credit line. Something similar is now being done with the insolvent state banks, after a long political battle with governors that insisted in keeping control over their banks after the bail out operation.

But, having lost that battle, state governors won a much more important one as they managed to extract from the federal government a generous restructuring of the states' sizable outstanding debt. As high-interest state bonds are being swapped for lower interest federal bonds, the states' debt is being largely converted into debt to the federal government and, therefore, being subtracted from the federal gross debt in the net debt figures. The total ongoing state debt swap operation is estimated to reach R\$ 103 billion or roughly 12 percent of GDP. Similarly, non-performing assets of the insolvent banks transferred to the Central Bank, as well as low-interest loans extended to the institutions that absorbed those banks, are also being deducted from the federal gross debt. As the importance of those various assets has been growing very rapidly there is every reason to believe that the quality of the federal net debt figures is being negatively affected.

It is highly likely that, in the future, part of the assets which are being subtracted from the federal gross public debt may prove to be partially or totally worthless. Some of the assets transferred to the Central Bank when failing banks were bailed out may prove to be worthless, or the states may not fully honor the service of their debts to the federal government. If and when that happens, the federal net debt figures will have to be adjusted upwards. The still unknown costs of the bailing out of the failing banks and the restructuring of the states' debt are bound to comprise an important determinant of the effective net debt burden.

Simultaneously to all these events that are affecting the supply side of the debt, the stabilization process is significantly shifting the debt demand curve outward and also in the direction of longer debt. Maturities of nominal securities, that prior to the stabilization reached, at most, a couple of months, increased up to three years prior to the Asian crisis of October, 1997. The spectacular growth of some financial services—e.g., insurance and private pension funds—creates a steady demand for public debt of longer maturity. Foreign funds also represent a growing demand for government securities denominated in foreign currency. However, this process has not been monotonic, since it has been partially reversed by the Mexican [1994] and Asian [1997] crises.

In Brazil, the demand for public debt has traditionally been associated with high liquidity. Banks or money-market funds managed by banks used to hold the public debt and provide depositors with a combination of highly liquid interest bearing account and a demand deposit account (see Carneiro and Garcia [1994] and Garcia[1996a]). This process increased the *moneyiness* of the debt, and provided the conditions for agents to bear the megainflation that ended with the Real Plan of July, 1994. The economic role of the public debt might now be changing, as pointed above, and it is very important to try to access if that is indeed the case, because this process will also affect the demand for different types of debt. The structure of the debt—denomination, indexation, and maturity—are, therefore, a point of utmost importance. At the same time, as recent research has demonstrated (see Calvo[1995]), the debt profile is in itself an important fundamental of the stabilization process. That is, the success of the stabilization process is a fundamental determinant of the public debt structure, as well as the structure of the public debt is a major factor for the success of the stabilization process.

Besides this introduction, this paper has four more sections. Section II—PUBLIC DEBT IN BRAZIL, 1970-97: CAUSES AND EVOLUTION—reviews the public debt growth process in the Brazilian economy, with special emphasis on the post 1990 period. We decompose the recent public debt growth into its main components, namely: the fiscal deficit, recognition of old debts, and debt issue related to sterilization of monetary effects of foreign reserves accumulation. In this Section it is also presented a detailed description of the structure—denomination, indexation and maturity—of the federal debt. We show how these characteristics evolved in accordance to domestic macroeconomic conditions—the rise in both the inflation level and volatility—, and to external conditions—the debt crisis, the agreements and the revival of capital inflows in the 90s.

Section III—RECENT DEVELOPMENTS IN DEBT MANAGEMENT IN BRAZIL—tackles the very important question of what determines the debt structure in Brazil. There has been many recent contributions in the literature regarding the question of what should determine the debt structure; among others Barro [1995], Blanchard and Missale [1991] and Goldfajn [1996]. In this paper, we challenge the so called “pedestrian” explanation of the debt structure, i.e., that the government tries to save on debt service by playing the yield curve and fiddling with composition and denomination. We study in detail the debt management in Brazil during the period June 1997-May 1998, using data on debt redemptions and placements, through the Treasury and Central Bank auctions. The study of the auctions’ data provide insights on the debt management not found on the more widely used data on total debt size and structure. This period is very rich concerning the debt structure, because it includes the Asian crisis and the policy response to it.

Section IV—THE PUBLIC SECTOR NET DEBT—carries on an in depth analysis of the net debt figures. After identifying its main shortcomings, an effort is made to improve such figures in three important aspects. The first involves the credit risk of the failed banks assets which were given as collateral to the loans made by the PROER, the banks' bail out program carried out by the federal government. The second involves mainly the treatment of the liabilities of state and municipal governments that are being rapidly converted from debts to the private sector into debts to the federal government. In an effort to analyze the risk that may be involved in low quality assets that are being subtracted from the federal gross debt—in order to have a clearer assessment of the real extension of the debt burden—part of Section IV will involve a risk analysis of those assets using Monte Carlo simulation methods. Finally, the section will address the improper treatment of public enterprises' debt in the official public sector net debt statistics.

Finally, in Section V—CONCLUSION—we summarize the main conclusions of the paper, offer a few scenarios of the evolution of the debt, and draw a few policy implications for the debt management in Brazil.

II. PUBLIC DEBT IN BRAZIL, 1970-97: CAUSES AND EVOLUTION

II.1 Public Debt in Brazil: 1970-1997 - An Overview

The introduction of a formal market for public securities in Brazil was an important outcome of the midsixties reforms. The lack of marketable public securities as a possible alternative to finance fiscal deficits was part of the diagnosis of the causes behind high inflation, as stated in the first military government's Economic Plan, the PAEG. Although the 1964 revolutionary regime had stern goals for fiscal improvement, the view that fiscal deficits would be the rule rather than exception in the following years led to the creation of a market for government debt based in the institutionalization of monetary correction, which was one of the three pillars of the financial reforms of 1964/65. The other two were the creation of the Central Bank and the adoption of a banking system based on a firm separation between commercial banks and non-bank institutions. For a historical analysis of the reforms in the context of Brazilian financial history, see Sochaczewski [1980].

The broad evolution of the total federal government debt in constant reais may be read in Figure 1, where Central Bank holdings of government debt, the vertical difference between the two lines, is distinguished from the outstanding debt held by the private sector. The years of high inflation, from the early eighties to the mid-nineties, witnessed a widening of the fraction of the public debt which remained in the Central Bank. Under high inflation, cash management activities tended to predominate in the banking sector and the Central Bank backing of such activities required the automatic provision of liquidity to banks' holdings of public debt.¹

This phenomenon is a far cry from the situation prevailing in the second half of the 1960's and the end of the 1970's. The objective of institutional development of a market for government debt which had been stated in the midsixties reforms was, thus, fully attained. Indexed bonds (the so-called ORTNs – *Obrigações Reajustáveis do Tesouro Nacional*) were seen as offering genuine protection against inflation erosion of financial wealth in spite of the fact that until 1974, monetary correction was arbitrarily defined each month by an act of the Ministry of Finance, without official commitment to any particular price index.

The existence of indexed public debt held by private savers on a voluntary basis defined a bedrock for the development of financial markets in Brazil in the following years, in spite of the increasing

¹ See Carneiro et alli. [1993].

annual rates of inflation from 1973 to 1994. In the earlier years (between 1966 and at least 1971), the demand for public debt was growing faster ahead of the government's financial needs. The existence of a broad stock of public securities was, however, seen as rather convenient for the purposes of regulating short run liquidity of the banking system by means of final sales and purchases of public debt in the open market. This "institution building" goal actually opened room for the creation, in the Central Bank, where public debt was managed, of a widespread range of credit programs designed to fund agricultural projects, regional development, and has fostered the establishment of regional development banks at the state level. The excess demand for public bonds led the Central Bank to assume the role of a financing agent.

Overfinancing of the federal government led, thus, to the institutionalization of mechanisms to help increase the spending capacity of local governments, a phenomenon taking years to revert. A potential contracting effect represented by the issuance of public debt in excess of the government financial needs led to the creation of mechanisms to increase deficit spending. In what became known as the years of the Economic Miracle, the annual GDP growth rates in excess of 10% led to the optimistic view that the Brazilian State had created a wholesome healthy mechanism to capture private savings and channel them to public investment, thereby compensating for the underdevelopment of long term financial markets. The idea of complementarity between public and private investments reinforced the view that public debt was a key element in channeling funds for more investment, either public or private. When the first oil crisis of 1973 challenged the continuation of the high growth path, the Brazilian government kept its long run strategy: Geisel years, 1974-79, to grow its way out of the first oil crisis, relying then on further deepening of public indebtedness supported by the growth of external liquidity.

The success of the strategy could be measured by the extent to which the accumulation of public debt was compatible with the maintenance of economic growth at high rates. Continuity of this process of growing indebtedness, however, relied on the factors behind demand, that is, growth of private wealth, on the wealth holders' confidence in the prospects of the public sector's ability to serve the debt and on the use that was ultimately being made of the savings captured by the government. The growth of private wealth lost steam in the second half of the 1970's, and ceased to be active in the stagnation of the 1980's. High and unstable inflation led to a considerable increase in the volatility of expected returns from government debt due both to a deterioration in the use of public savings and to the frequent change in monetary correction rules denouncing the growing importance of risk of default. Finally, the decade of high inflation in the 1980's was also a decade of economic stagnation, decline in public as well as private investment, witnessing a

visible deterioration in the use of resources. There seems to be, thus, no shortage of explanation for the end of the public debt accumulation. Both the reduction of public investment (as illustrated, for example by the decline of profitability of public enterprises) and the difficulties to accumulate further debt were part of a major crisis in which the shrinking of public savings played a dominant role. (See Carneiro and Werneck [1993]). This evolution will be analyzed in more detail in the following sub-sections. However, before we proceed to the analysis of the evolution of the debt during the last three decades, we should explain the idiosyncrasies of the Brazilian public bonds, which were issued with many different forms of indexation.

II.2 Characterization (Denomination, Indexation and Maturity)

Brazilian Federal Domestic Debt securities have been issued in many different forms. Only the external debt is denominated in foreign currency (mostly in US\$); clauses indexing the domestic debt to the US\$ have always prescribed the settlement in domestic currency. Besides the exchange-rate, several other indices have been used to index the debt: the price level index, the monetary correction, and the interest rates (both ex-ante and ex-post). Regarding the latter index, interest rates, Brazil has developed in the highly volatile inflation environment of the late 80s an idiosyncratic form of debt indexation, which we refer to as “ex-post short-term interest rate indexation.”

When inflation became very high and very volatile, since it would be silly for the Central Bank to take advantage of short run gains by risking to lose its customers, interest rates were managed by the central bank so that a real interest rate was provided on top of inflation, in a Fisher-effect-like way. Given the volatility of the latter, the former became also very volatile and risky. Therefore, when inflation rose unexpectedly, large losses were caused to bond holders, which were composed mainly by financial institutions which held interest bearing deposits against the government bonds. More than once, the Central Bank bailed out the financial institutions that would otherwise have failed in face of an interest rate raise. Therefore, the situation was very unfair, because the government had to pay a risk premium in its debt because of the high interest rate volatility, but when the interest rate was raised, the bond holders suffered only small losses, because of the bail-outs.

In order to provide a less expensive solution to this problem, the LBC was created in 1986 (after the second Collor Plan, in February 91; the LFT replaced it with the same kind of indexation). The LBC was a security sold at a discount which had its face-value corrected daily by the average daily interest rates during its term. It is a floating interest rate, adapted to the high frequency

required by high inflation and daily indexation. It would be equivalent to a bond whose nominal value is accrued every day by the daily accrual of the Libor. We call this form of indexation “ex-post short-term interest rate indexation”. This is the closest one can get to perfect indexation in fixed income markets. It corresponds to a bond of duration zero, since it does not suffer practically any loss in its value when interest rates go up. These bonds were widely used in times of high uncertainty, as the crossover to the Cruzado Plan in 1986. On the other hand, monetary policy has a very limited or nihil **wealth** effect, since rises in interest rates do not affect the value of the private financial wealth in these fixed income securities. Thus, the introduction of these bonds back in 1985 implies the recognition that monetary policy had already lost its power because of widespread indexation.

We will now provide a brief summary of the bonds and bills that existed in period 1970-1997 (or part of it). Nominal securities (discount bills) were the LTN (Letra do Tesouro Nacional) and the BBC (Bônus do Banco Central). The LTN, issued since August 1970 by the Treasury, has a minimum maturity of 28 days. The BBC, issued since January 1991 by the Central Bank, has also a minimum maturity of 28 days, being used chiefly for monetary policy purposes.

The first index used in Brazil was the so called “monetary correction”. Accordingly to Simonsen [1995], the new military government created in July 1964 indexed bonds, the ORTNs (Obrigações do Tesouro Nacional). The ORTNs were bonds whose nominal values were periodically adjusted upwards (initially, every quarter; later, every month) accordingly to coefficients computed by the Ministry of Finance, terms from one to twenty years, and (real) yearly interest rate of 6%. The coefficients were set in many different ways in the following two decades, but the overall result was a vast underestimation of the inflation, making the “monetary correction” a very poor inflation hedge. Figure 10 displays the evolution of the real value of the ORTN index, showing unequivocally that there has been a vast underestimation of the inflation by the official index.

Bonds indexed to the price level were the NTN-B, and the NTN-C, both indexed to the IGP-M (the market general price index), with a minimum term of 12 months. The OTN (Obrigações do Tesouro Nacional) and the BTN (Bônus do Tesouro Nacional) were also indexed to a price level—the INPC (national consumer price index)—, although this indexation was done indirectly, through an index set by the Ministry of Finance. In times of very quickly rising inflation, even this kind of indexation did not constitute a good inflation hedge (Garcia [1994]).

Bonds indexed to the US\$ were the ORTN *cambiais* (Obrigações Reajustáveis do Tesouro Nacional), the OTN *cambiais* (Obrigações do Tesouro Nacional), the NTN-D, NTN-I, NTN-L,

NTN-R1, and NTN-R2 (Nota do Tesouro Nacional) and the NBC-E (Nota do Banco Central). The former two bonds no longer exist. The NTN-D, issued since November 1991 by the Treasury, has a minimum maturity of three months, and is the most liquid Treasury bond indexed to the US\$. The NBC-E (Nota do Banco Central), issued since February 95 by the Central Bank, has also a minimum maturity of three months.

Floating interest bonds are the NTN-A, NTN-H, NTN-F, NTN-P, all indexed to the TR (Taxa Referencial, a daily average of monthly private CD interest rates calculated by the Central Bank). The NTN-T is indexed to a long term average of the Brazilian foreign debt yields, the TJLP (Taxa de Juros de Longo Prazo) and applies to BNDES² long term loans.

We now turn to the analysis of the federal bond debt evolution in each decade.

II.3 1970 to 79: The Hopeful Years

Table 1

<i>Year</i>	<i>Debt/GDP Ratio (%)</i>	<i>Real Debt growth (%)</i>	<i>Share of Private Holding of Public Debt (%)</i>	<i>Share of Fixed Interest Bonds in Private Holding of Public Debt (%)</i>	<i>Average Maturity of Total Public Debt (months)</i>
1971	4.5	13.0	95.5	14.9	14.2
1972	5.4	38.1	92.9	25.3	14.5
1973	5.9	42.0	89.4	41.3	15.2
1974	5.3	-0.5	90.5	32.6	20.1
1975	6.2	30.4	90.4	33.2	23.7
1976	7.2	25.9	92.0	39.7	22.8
1977	7.1	6.4	89.1	47.0	17.5
1978	7.4	8.3	89.2	52.7	14.8
1979	6.4	-8.1	89.5	49.5	13.5

* Source: Séries Históricas - Dívida Pública. Andima [1993].

The stock of government bonds was multiplied by a factor of five in the 1970's.³ As seen in Table 1 there is a clear break between the annual figures before and after the oil crisis. GDP growth

² Banco Nacional do Desenvolvimento Econômico e Social (BNDES) is the national development bank.

³ In constant reais of December 1997, the stock grows from 8.6 billion to 40.5 billion. The exchange rate in December, 31 was 1.1164 R\$/US\$.

declined sharply in the second half of the decade compared to the first half, as inflation doubled, and there were increasing difficulties to control the growth of the public sector financial needs.⁴ Average maturity reached its peak in 1975 but the share of fixed interest bonds kept growing until the end of the decade, as interest rates began to rise in 1976 following the abandonment of the adoption of interest rate ceilings which had prevailed until September 1976.

Figure 2 shows the evolution of federal bond debt and debt held by the private sector. Total bond debt went from 1.2% of GDP to 3.7% of GDP between 1970 and 1979. But in the second half of the seventies, as external debt was accumulated, part of the public deficit was financed by a gradual process of statization of private external debt. Instead of reducing their total foreign liabilities in face of higher exchange rate risk, private debtors were allowed to decrease their net liabilities by their excess foreign debt at the Central Bank. This process transferred available finance which had been previously used by the private sector to fulfill the increasing requirements associated with the wave of public investment associated with the II National Development Plan (PND). Dollar denominated deposits from the private sector at the Central Bank went from less than 0.1% of GDP in the first half of the seventies to 3.2% of GDP in 1979, becoming an important element of the growth of non monetized debt from 1.1 to 6.9% of GDP in the 1970's. The peak was attained in the last quarter of 1978, the last year of the Geisel government. The first year of General Figueiredo's term started with a reduction in the real value of public bond debt due to two effects: the decline in nominal interest rates promoted by Delfim Netto in an attempt to stimulate the level of economic activity and the increase in exchange rate uncertainty related to the second oil crisis. Both factors have reduced the attractiveness of the public debt in private portfolios.

Public debt denomination has changed in response to changes in demand. From 1971 onwards, fixed interest Treasury Bills (LTN's) were issued side by side with the old Indexed Treasury Bonds (ORTN's) as a result of the success of the reforms. In contrast with the ORTN's, which were held both by financial and non-financial institutions, LTN's are the typical assets that serve as reserves by the financial system institutions. They are auctioned at a discount only in large denominations, with maturity ranging from 30 to 720 days. Central Bank daily operations to regulate short-term liquidity were then conducted through the sales and purchases in LTN's market, whereas ORTN's were thought as adequate to provide steady finance for the Federal Government fiscal deficit. Central Bank portfolio therefore was concentrated by and large in

⁴ See Table 4 in Carneiro [1987].

LTN's. Figures 3A and 3B show the composition of bond debt held by the private sector in the two kinds of instruments. The real value of indexed debt reaches a plateau and stabilizes in the middle of the decade, so that further finance for the public deficit came from the steady increase in the stock of LTN's between January 1975 and October 1978. The share of ORTN's held by the private sector declines to one half at the end of the decade as the duration of the debt shrinks in face of higher inflation and unstable interest rates. Figure 8 shows the decline in the average maturity of public debt from 20 to 14 months between 1977 and 1979 when the widespread practice of repurchase agreements by the Central Bank makes it harder to ascertain the actual demand for longer term debt⁵.

II.4 1980 to 1989: High Inflation

The 1980's witnessed the rise of inflation plateau from the 30% annual rate to three digit rates and explosions which had two dominant effects on the accumulation of public debt. The first one was the loss of credibility of monetary correction rules. The second one was the growing fear that anti-inflationary policies would have to involve some sort of explicit default of the stock of public debt.

Table 2

<i>Year</i>	<i>Debt/GDP Ratio (%)</i>	<i>Real Debt growth (%)</i>	<i>Share of Private Holding of Public Debt (%)</i>	<i>Share of Fixed Interest Bonds in Private Holding of Public Debt (%)</i>	<i>Average Maturity of Total Public Debt (months)</i>
1980	4.2	-32.3	82.3	30.5	20.0
1981	5.6	23.1	76.3	31.0	24.9
1982	7.1	31.0	63.3	24.5	26.6
1983	6.6	-20.0	48.9	11.9	28.4
1984	7.4	11.7	46.0	2.9	22.8
1985	11.2	73.6	63.1	7.7	14.5
1986	9.9	1.9	46.7	4.0	8.8
1987	10.8	1.5	38.2	0.3	9.8
1988	13.9	13.2	34.3	0.0	7.7
1989	16.3	11.1	47.4	0.0	11.4

* Source: Séries Históricas - Dívida Pública, Andima [1993].

⁵ Data discriminating the average maturity of the indexed debt from that of the nominal debt are not available for the earlier period.

The stock of public debt was again multiplied by a factor of 4.8 in real terms between January 1980 and December 1989.⁶ But the pace of debt accumulation in the eighties exhibits the symptoms of an unhealthy process: the average maturity declines despite the fall in the share of nominal bonds, and the share of private holdings of public debt also decreases. We take this latter movement as an indication that the public debt was working more as “money” than as public debt.⁷ Figure 4 shows the evolution of the Federal bond debt in the 1980’s.

In 1980, a major blow in the institution of monetary correction as a basis for debt indexation was struck by the prefixation of monetary correction for the twelve months following the maxi-devaluation of December 1979, in an attempt at controlling inflation expectations. After the external debt crisis of 1982/83, the dynamics of the domestic debt growth came to experience different regimes, as a new source of uncertainty (moral hazard from the part of the government) was introduced, namely the possibility of partial changes in indexation rules as an instrument to default on debt. Following the failure of the Cruzado stabilization plan of 1986, a swarm of indices and rules for indexation were introduced in private contracts, as well as in public liabilities, as markets reacted to changes in the rules of the game by requiring extra-protection. Figure 10 shows the evolution of the real value of the ORTN index. That picture clearly explains agents’ mistrust in official indexation.

Figures 5A and 5B show the evolution of the federal public bond debt held by the private sector discriminated by type of index used for monetary correction. Minister Delfim Netto’s first effort to control inflation by means of manipulating expectations resulted in doubling the rate of inflation to a three digit annual pace, when another maxi-devaluation was followed. Figure 8 shows the decline in the average maturity of public debt, which fell from 31 months in May/83 to 4.5 months in August/89. With inflation rates going from 100 to 200% a month, debt management was mainly concentrated in the short run needs of the banking system, as indexed public debt became the essential backing for overnight indexed demand deposits offered by banks as a domestic money substitute.⁸

⁶ In constant reais of December 1997, the stock grows from 39.1 billion to 186.6 billion. The exchange rate in December, 31 was 1.1164 R\$/US\$.

⁷ For a discussion on the “moneyness” of the Brazilian public debt in the megainflation years, see Carneiro [1994], Carneiro and Garcia [1994] and Garcia [1996a].

⁸ The issue of the provision of a domestic currency substitute as a means to prevent the dollarization of the economy is studied in Carneiro [1994], Carneiro and Garcia [1994] and Garcia [1996a].

From the viewpoint of establishing a reputation to create the demand for public debt, indexation was seen at first as a guarantee. More inflation could not be used as a means to reduce debt. Discount bills were issued when inflation expectations were declining. The return of high inflation in the eighties revived old fears.

Debt management in high inflation required thus a good deal of creativity as revealed in denominations, maturities and forms of indexation. As emphasized before, in contrast with other inflationary economies, in Brazil, only the external debt is denominated in foreign currency (US\$); the domestic debt indexed to the US\$ is, and has always been, redeemable, in local currency. Several indices have been used to index the debt: the US\$ exchange rate, different price-level indices, different formulas for monetary correction, and interest rates (both ex-ante and ex-post). Regarding the interest-linking, in the high inflation environment of the late 80's an idiosyncratic form of debt indexation was introduced, referred to as "ex-post short-term interest rate indexation." This form of debt indexation withdraws almost all interest rate risk from bond holders, as well as shuts down one of the transmission channels of monetary policy, namely the wealth effect.

As Figures 5A and 5B make clear, the decade ended with almost 100% of the federal bond debt being rolled-over in the form of bonds with "ex-post short-term interest rate indexation". This state of affairs reflected not only the extremely high uncertainty regarding the inflation and interest rates, but also the fear of an explicit debt default by the incoming administration (President Collor de Mello). At the time, there was a widespread suspicion regarding the credit risk of the public securities, which were indeed validated by the new administration's actions, summarized in the next Section.

II.5 The Roaring 1990's

Table 3

<i>Year</i>	<i>Debt/GDP Ratio (%)</i>	<i>Real Debt growth (%)</i>	<i>Share of Private Holding of Public Debt (%)</i>	<i>Share of Fixed Interest Bonds in Private Holding of Public Debt (%)</i>	<i>Average Maturity of Total Public Debt (months)</i>
1990	13.5	-15.8	34.4	10.0	34.9
1991	8.5	-36.2	27.0	4.6	34.3
1992	10.7	21.4	30.0	43.6	30.1
1993	10.5	-3.2	33.2	43.7	17.5
1994	12.3	50.6	61.2	28.3	6.9
1995	12.6	21.4	76.7	34.8	5.9
1996	20.2	66.2	86.2	53.9	6.7
1997	23.2	22.3	91.9	51.5	

* Source: Séries Históricas - Dívida Pública, Andima [1993].

The successful replacement of demand deposits by indexed deposits at the banks (backed by government securities in the banks' portfolios) during the period of high inflation avoided dollarization but created an obstacle to any stabilization strategy that required a sudden fall in the rate of inflation. Two reasons may explain this difficulty: a) Since the demand for money was partially satisfied by the indirect holding of indexed public debt through overnight indexed deposits, the sudden fall in nominal interest rates which would result from a successful stabilization plan would, simultaneously, induce the monetization of government debt. This could be erroneously read as lack of monetary control, and thus jeopardize the continuity of low inflation; b) the change in fiscal regime that was needed to guarantee the survival of low inflation would take some time, so that in the transition to a fiscal regime compatible with low inflation extra finance for the deficit would be required.

Two ways out of this dilemma were proposed: one was to create a tax on financial assets in order to provide government finance for the transition. A political evaluation made at the eve of Collor's inauguration concluded that the Congress would not vote a law imposing an effective capital levy immediately, as needed in order to give the new government some time to work on the fundamentals. A second alternative was adopted in the Collor stabilization plan: a moratorium of virtually all public debt for a period of 18 months by denying to holders access to their financial assets, transforming them in deposits at the Central Bank, referred to as VOB's. The hijacked assets would be returned to owners with monetary correction plus 6% interest (the same interest

rate offered by popular savings accounts) in twelve installments beginning in September 1991, except when decided by the Central Bank in a case by case basis.

The 1990's begun thus with the most extraordinary of government interventions in the public debt market, which was announced at the inaugural day of the Collor Presidency (March 15, 1990). For the first time in Brazil since markets for public debt were overhauled in 1964, default risk was explicitly introduced in the market.

The long run response was extremely surprising. The stock of public debt was multiplied by a factor of 1.3 between January 1990 and December 1997 in real terms⁹. Figure 6 shows the evolution of the total federal bond debt between January 90 and December 97, in December 97 values. Table 3, which includes the VOB, and the table above show that the proportion of the debt held by the public has been increasing since 1992. This proportion was approximately 33% in 1993, reached 60% in 1994 and finally peaked 90% in 1997.

The effect of the moratorium may be seen in Figure 7B, which displays the evolution of the debt held by the private sector by type of indexation, for the period 1990/97. In Figure 7B, it is clear the fall of the real value of the total debt in March 90, when the liquidity of the existing debt was suspended.

The evolution of the composition of the bond debt considering the different types of securities may also be observed in Figure 7A which shows the evolution of the debt held by the private sector by type of indexation, in percent since 1990. The rich structure of the portfolio during the period reflects the larger diversity of available bonds, especially after February 1991.¹⁰ The ever-changing composition of the public debt was made possible also by the extremely short maturity of the debt. When the debt maturity is short, it is constantly being rolled-over. The constant replacement of maturing short-term bonds by new ones opens space to much faster changes in debt composition than observed in countries with longer maturity debt.

⁹ In constant reais of December 1997, the stock grows from 181.8 billion to 229 billion. The exchange rate in December, 97 was 1.1164 R\$/US\$.

¹⁰ Note that the total stock of debt presented in figures 7A and 7B does not include the so called VOBs (deposits at the Central Bank) representing claims against the Central Bank which were the outcome of the moratorium between March 90 and July 92. At the onset of the Collor Plan, it represented 68% of the debt held by the public in Mar/90.

Besides the LTN which had been issued since January 1971 by the Treasury, with a minimum 28 days maturity, the Central Bank, motivated by the difficulties which would arise when VOB deposits were freed, created a new bond, the BBC, with the same maturity as the LTN's, in order to issue an instrument directed specifically to the aim of avoiding an explosion of money supply. Other debt instruments introduced were the NBC's (Central Bank Notes, floating interest bonds issued since August 1991), the NTN's (Federal Treasury Notes, issued since November 1991) and the NBC-E (Central Bank floating interest notes based on a referential "real interest", the so called TR, defined as an average of banks' time deposit rates less expected inflation as defined by the Central Bank, issued since March 1995). The fixed interest bonds portion of the total debt corresponds to the share of LTN's and BBC's on the total debt stock.

At the time of the debt freeze in 1990, debt held by the public consisted of three different types of bonds: non-indexed securities sold at discount, indexed bonds linked to the overnight short-run interest rate ("ex-post short-term interest rate indexation"), and dollar-indexed bonds with a fixed coupon. Until April 1990, the stock of debt can be divided into bonds indexed to the short-run interest rate (over 95% of the total) and bonds indexed to the exchange rate. After April, the share of non-indexed debt grows for a short period, reflecting the short-lived success of the de-indexation. But it then decreases drastically with the strong acceleration of the inflation in the end of 1990. After March 1991, the proportion of non-indexed debt increases once again, remaining around 10% until the end of 1991 when it reaches the lowest average of the decade. The share of the dollar-linked debt increases in the period April-December compared to the previous period, reflecting the mounting uncertainty around the President's impeachment, but it remains around 7% of the total debt. The remainder of the bond debt held by the public corresponds to the bonds linked to the overnight interest rates.

Only at the beginning of 1992, when expectations of accelerated inflation did not materialize, did the effects of recovered investors' confidence start to show up in public debt markets. Such expectations had been based on the combination of price liberalization, public tariffs corrections and the devaluation which followed the floating of the exchange rate in October 1991, in face of the strong monetization of the hijacked assets during the first Collor Plan. The recovery of the stock of public debt in the portfolio of the private sector (Figure 6) was a clear demonstration that asset-holders were willing to return to business as usual in spite of the violence of repeated interventions which had been made in the rules of indexation and liquidity of public securities in the previous twelve years. One should bear in mind that the majority of economic analysts at the time were forecasting that never again would the government be able to place new debt. The

Brazilian experience, therefore, may have something to say about reputational models which withdraw the government's ability to place new debt after a capital levy on the public debt.

The return of investors' confidence is also confirmed by the recovery of foreign exchange reserves after 1992, which can be seen in Figure 9. Following the high political turbulence that characterized the months before the impeachment of President Collor de Mello, the beginning of the Itamar Franco's presidency was marked by high uncertainty concerning economic policy. New proposals of another moratorium and even repudiation of the public debt were daily in the press and it was only after the President nominated his fourth Minister of Finance in less than six months that the recovered confidence materialized in higher reserves.

Between April 1992 and July 1993, the non-indexed part of the debt grows, corresponding on average to more than 50% of the total. The part of the debt that is indexed to the overnight interest rate is reduced to less than 10%, and two new types of bonds appear: those indexed to IGP-M, a price-index calculated by Vargas Foundation, believed to be free of government's intervention, which accounted for more than 30% of the debt in July 93, and those indexed to the TR (Referential Rate, average of private CD's rates) which accounted for around 5% of the debt. Dollar indexed debt accounted for 5% of the total debt in July 93.

From July 93 to June 94, at the eve of the Real Plan, the share of the debt in dollar linked bonds and to the TR grows, each to around 10% of the total debt. The share of IGP-M indexed bonds remained initially around 35%, falling to 25% in June 94. The fraction held in non-indexed discount bonds fell gradually until May 94 (to 42%), and then abruptly to 7% in June 94. The debt was "rolled over" into the Real plan mainly in the form of bonds indexed to the overnight interest rate ("ex-post short-term interest rate indexation"), which were deemed the least risky bonds (46% of the total debt in June 94).

From April 1993 and July 1997, capital inflows resumed as Brazil's relations with the international financial community were back to its normal, putting an end of a long process of foreign debt rescheduling under the Brady scheme. The inflows were a main factor in expanding both the monetary base and interest-bearing public debt. Central Bank sales of debt to sterilize monetary expansion avoided the explosion of the monetary base.¹¹

¹¹ As analyzed elsewhere (Carneiro and Garcia [1995]), the process of capital inflows in Brazil was generated by the large spread between external and internal rate of returns. The financial instruments that paid such very high interest rates were government securities. Therefore, *strictu sensu*, capital inflows were not sterilized once they

In July 1994, the Real monetary reform promoted a general de-indexation of the economy by adopting real as the monetary unit, made equal to the value on the 30th of June 1997 of the URV, a unit of value equal to the official value of the dollar exchange rate, that had been an official index for monetary correction of nominal values and contracts since March 1994.

Both the dynamics and the composition of the process of debt accumulation experience important changes after the reform. The proportion of non-indexed debt remains around 30% between July 94 and November 95, when it starts to grow, reaching 50% after January 96. The share of bonds indexed to the IGP-M decreases continuously between July 94 and December 95. After March 96, this share does not exceed 3% of the total debt. Dollar-linked bonds remain around 10% between July 94 and August 95, falling then slightly to around 7% of the total debt between September 95 and February 96. With the aggravation of the economic situation in Asia, it increases once again to reach 15% at the end of 97. The share of bonds indexed to the short-run interest rate corresponds to around 25% of the total debt between July 94 and July 95, 35% between August 95 and February 96, falling to approximately 20% in the end of 97. The share of bonds indexed to the TR increased after July 94, reaching 22% in May 95. Between October 95 and July 96, this fraction is reduced to 10%, 8% in August 95/ August 97, and in the end of 97 corresponds to 11% of the total debt. Apart from short-run variations, demand for such bonds is determined essentially by the need of the banking system to avoid mismatches, since TR is the basic factor of correction for saving accounts and mortgages. Another type of bond appears between November 94 and July 95, the NTN-T indexed to the long-run interest rate applying to loans from the BNDES and corresponding to around 5% of the debt, but reducing its participation to 1% of the total debt between January 96 and December 97.

It can be observed again in Figure 8 the decline in the average maturity of the debt in the 90's. During the period between March 90 and July 92, the high average maturity reflects the existence of the well known VOBs. After the devolution of the hijacked assets, the average maturity of the debt falls from 33 months in August 92 to 6 months in December 96.

entered the country: they entered the country in order to purchase government securities and profit from the large spread. The government was purchasing foreign reserves in order to prevent oscillations in the economy's cashflow from jeopardizing the stabilization effort that was being designed. The word sterilization gives the wrong timing idea; it suggests that after the funds entered the country, and have been converted into domestic currency, government securities were sold to mop up liquidity and avoid the inflationary consequences of monetary expansion. That was not the case in Brazil. The word sterilization also suggests that the government has to raise interest rates in order to sell its securities. That is also false for the Brazilian case. Had the Central Bank not intervened by selling securities at low prices (high yields), the domestic interest rate would have fallen and the capital inflows would have been smaller.

As we have seen, doubts regarding the sustainability of the debt played already a major role during Collor de Mello's inauguration, determining the freezing of the majority of the financial domestic assets. The issue of debt sustainability, not addressed in this paper, should consider measures of the net total debt, not only the federal bond debt. This paper will deal more thoroughly with measures of the public-sector net debt on Section IV. Here, we will present an imperfect measure of the net debt that we claim to show that one finds currently an explosive behavior of the Brazilian debt, without any sign of levelling off. In Section IV, we will relate this pattern to the worsening of the fiscal situation after the Real plan, when the inflation control eroded both the *seignorage* revenue and the fiscal gain from postponing non-indexed government outlays.

Figure 9 shows the growth in the domestic net effective federal debt.¹² Until July 1995, all the growth in the debt since January 1991 could be fully explained by two factors: the unfreezing of the blocked bank accounts which occurred in the Collor administration,¹³ and the accumulation of foreign reserves. Note how this changes dramatically after July 1995. Until December, 1997, a gap of almost US\$70 billion opened up between the net federal debt and the sum of the other two series. This is the consequence of the deterioration of the fiscal accounts, although some outlays may not show up immediately in the fiscal accounts as loans to troubled financial institutions. The next Section will deal more thoroughly with these issues.

¹² This is the "Dívida Mobiliária Federal" minus the securities traded with the states and municipalities (LBC-Es).

¹³ That is, compulsory savings were transformed into voluntary savings.

III. RECENT DEVELOPMENTS IN DEBT MANAGEMENT IN BRAZIL

The recent literature on debt management is very rich. Several models have been developed trying to explain the debt structure, among others Barro [1995], Blanchard and Missale [1991] and Goldfajn [1997]. Here, we challenge the so called “pedestrian” explanation of the debt structure, i.e., that the government tries to save on debt service by playing the yield curve and fiddling with composition and denomination. We deem this to be an unavoidable first step in assessing possible explanations for the Brazilian debt structure.¹⁴

The relevant decisions concerning debt size and structure are how much and what kind (denomination, indexation and maturity) of bonds to place at the auctions, given, among other pieces of information, the amount of debt that is being redeemed. Those redemption² of old maturing debt and placement³ of new debt constitute the marginal changes in size and structure of the total debt. The size and structure of the total debt are, of course, the average that corresponds to those marginal changes. Therefore, to properly study debt management, besides analyzing the total debt size and structure, we must analyze what happens at the auctions. After all, if conditions change and it becomes optimal to issue only one type of debt that was not being issued before, the structure of the total debt can only be gradually changed. Here, we study in detail the debt management in Brazil during the period June 1997-May 1998, with special emphasis in the auctions. This period is very rich concerning the debt structure, because it includes the Asian crisis and the policy responses to it.

In June 1997, on the verge of the Taiwanese first difficulties, the debt market was following a process of increasing the maturity of the bonds, with the interest rate leveled at little over 20% annual rate. Figure 14 shows several interest rates. The TBC (Taxa do Banco Central) is the short term discount rate, at which banks may get bank reserves at the Central Bank. The other marks refer to average rates at non-indexed (nominal) bonds primary auctions conducted by the Treasury and/or the Central Bank (Andima[1997,1998]). Until late October 1997, when the Asian crisis erupted completely with the fall of the Hong-Kong market, we may observe a positively sloped yield curve built on top of the TBC, which were kept by the Central Bank at 20.70% a.a. for several months. Note that in the weeks previous to the crisis’ eruption, two auctions of two-year bonds were successfully conducted, the last one with an average rate close to 25% a.a.. In that week (week of 9/30/1997) auctions of bonds with maturities of six months, one and two

¹⁴ For econometric tests of the more sophisticated models using Brazilian data, see Goldfajn [1997], and the recent M.Sc. Thesis of one of this project participants (Pierotti [1998]).

years were held, and the auction average interest rates show a positively sloped yield curve, with a maturity premium of almost four percentage points for the two-year bonds.

When Brazil began to suffer the contagion effect of the Asian crisis, in the form of a speculative attack during the week of October 27, 1997, the Central Bank quickly reacted by increasing the basic interest rate, the TBC, from 20.70% to 43.41%. After two weeks without auctions, the rolling over continued with three-month-maturity bonds, at rates little below the TBC. The negative maturity premium, i.e., the fact that the three-month bonds' yield was lower than the TBC, implied a negatively sloped yield curve. That meant that the market was expecting the interest rates to fall (among them, the TBC) in the next three months.

In that environment, it is likely that the Treasury and the Central Bank did not want to place long maturity debt. An interest rate of 43% a.a. (with the inflation rate well below 5% a.a. and an exchange-rate devaluation of 7.5% a.a.) is clearly unsustainable in the long run, being admissible only during a short period to counteract an speculative attack. Therefore, if the Treasury and the Central Bank decided to place one or two year bonds at such high rate, they could conceivably spark a panic, because of the informational content of such move. Placing debt at 43% for a short while may be admissible, but paying such high rates for long periods puts the government budget in a clearly unsustainable path. That could then trigger expectations of default from the part of the government. In other words, in such a situation, it may not exist an equilibrium with that high an interest rate and longer maturities.¹⁵ The only equilibrium may be the one with very short maturity bonds. The alternative explanation is that the maturity premium asked by the market for longer maturity bonds was beyond the maximum premium implied by the auction managers' reservation prices.¹⁶

Until the end of 1997, only three-month maturity bonds were placed, all with negative maturity premia. Figure 13 shows the overall monthly balance of government auctions and debt redemptions, and its composition.¹⁷ Note that in the last quarter of 1997, the debt redemptions were much higher than the new placements through the auctions. In that environment, there may be excess liquidity in the market, in the sense that the banks have an undesired amount of excess

¹⁵ The argument here follows the lines of the credit rationing model of Stiglitz and Weiss [1981].

¹⁶ We asked the Central Bank staff member what had happened in those auctions. He answered that the Central Bank and the Treasury offered longer term bonds, but the bids were all refused, because they were deemed insufficient in quantity, and the yields asked were both too high and too volatile.

¹⁷ Figure 11 shows the size and composition of total redemptions, and Figure 12 shows the size and composition of total new placements at the auctions.

free reserves in their reserve accounts at the Central Bank. When that happens, the Central Bank is said to be undersold. In those situations, the Central Bank usually places bonds every day with repurchase agreements to avoid the fall in interest rates.¹⁸ However, given that the previous situation was of large oversold position from the part of the Central Bank, the net redemptions of the last quarter of 1997 only reduced the oversold position, without reversing it into an undersold position.¹⁹

Another aspect that should not be overlooked is the positive net placements of US dollar-linked debt during the last four months of 1997 (see Figure 13). That status continued in the first semester of 1998, and responded for the increase in the US\$-linked debt share in total debt (see Figure 7A), which, nevertheless, never reached the 20% level. We interpret such movement as a combination of the agents' desire to hedge the exchange-rate risk, and the government's double objective to provide such hedge without compromising foreign reserves²⁰ and to place higher priced (lower yield) debt.²¹

Figure 15 shows the auctions of non-indexed (nominal) bonds since the beginning of 1998. The pattern is extremely interesting. Note that the reduction in the basic short term rate set by the Central Bank (TBC) sets the pace for the reduction of the other interest rates at the auctions. The pattern is clearly one of a steady reduction of the TBC (set at six-week intervals). The auction rates tend to be lower than the TBC, signalling the market expectation of a future interest rate fall. At first, only one and three-month bonds are being placed. After the third reduction in the TBC since the Asian crisis, in February 1998, the market for six-month bonds reappeared. After

¹⁸ Note the apparent paradox of this situation. If the Central Bank has to act to avoid a fall in the interest rate, why does it not let the interest rate fall from such high level? The answer is that the market indeed required such high rate to bear the new level of Brazil risk after the Asian crisis. Nevertheless, the short term movements in the interbank market could let the short term interest rate temporarily fall much below such high rate. In order to avoid sending false signals as to its targeted rate, the Central Bank acted to prevent the temporary fall in the short term interbank interest rate.

¹⁹ The undersold or oversold position of the Central Bank is not a public datum. This qualitative piece of information was given to us by a Central Bank staff member.

²⁰ Remember that the US\$-linked bonds were redeemable in R\$. Under a fixed (or semi-fixed) exchange-rate regime, this detail is irrelevant. However, Brazil still keeps a dual exchange-rate system and, furthermore, the reintroduction of foreign exchange restrictions is always regarded as a possibility (see Garcia and Barcinski [1998]). This leads to the so-called "convertibility" risk, which is traded in international financial markets. That is, one may get a quote on how much would it cost in R\$ to have a certain amount of US\$ delivered in a US bank account at a certain future date. From the point of view of the government accounts, in the event of a devaluation, US\$-linked debt does not ~~compromise~~ the amount of foreign reserves, but only the fiscal situation.

²¹ Given the increased fear of a devaluation, the yields on US\$-linked debt were much lower than those on nominal bonds.

jeopardize

the fourth reduction in the TBC since the Asian crisis, in March 1998, the market for one-year bonds also reappeared.

The yield curve is inverted (downward sloped) for the one-month, three-month and six-month maturities, and normal (positively sloped) for the one-year maturity, when such market reappears. This is compatible with a market expectation of falling interest rates in the near future (up to six months), but with a large uncertainty of events “much further in the future”(one year, in this case). In late April 1998, after the fifth reduction in the TBC since the Asian crisis, the yield curve became normal (positively sloped), and, as the spreads opened up, much more steep, signalling increasing maturity premia. By mid-May, time of the Russian crisis eruption, the yield curve was very steep.

At that point, the government decided to double its bet on falling interest rates, undertaking a sixth successive reduction in the TBC. This time, however, market’s expectations did not agree with such move. To demonstrate that, we resort to other interest rates, those of interest rate swaps.²² The rates for those swaps are comparable to those of the public bonds.²³

Figures 16, 17 and 18 show the interest swap rates, together with the auction rates, and the TBC, for three-month, six-month and one-year maturities, respectively. What we want to demonstrate with these Figures is that the swap rates serve as **lower bounds** for the respective auction rates, and, as such, serve as (downwardly biased) measures of the bids offered at the auctions of government bonds. What we observe in Figures 16, 17 and 18, especially in the latter two, is that the swap rates were declining accordingly to the TBC until April, 1998. After that, the swap rates increased, while the TBC was once more reduced by the Central Bank. That is, a gap opened up between the interest rate the government was trying to signal and the interest rate the market was requiring under the new epidemic given the Russian contagion. Not surprisingly, the market for three-month, six month and one-year bonds vanished, and the only nominal bond placed in the auctions after mid-May were one-month BBC’s. In June and July, even that became too expensive, and the Central Bank resorted to its last resource, the LBC’s, short term (one month) bills indexed to the daily interest rate (bonds with ex-post short-term interest rate indexation).

This decision had an immediate impact on the amounts that were rolled over in each auction. When the debt maturity decreases, the debt must be rolled over more often. That is exactly what

²² These swaps are like forward contracts, with only one final payment.

²³ Strictly speaking, the rates differ for a minor dating convention, which has no importance for our purposes here.

we observe in the last months of Figures 11, 12 and 13. The amounts of monthly redeemed and issued debt tripled. This, of course, creates a new source of risk, that of not being able to roll over the debt in the event of a crisis, with possible impacts in the exchange-rate anchor of the current stabilization program.

This one-year period, therefore, is indeed very rich, because in it we were able to see markets opening up before the Asian crisis (two-year nominal bonds), then markets disappearing when the crisis erupted, markets reappearing as interest rates were reduced, and markets once more disappearing when a new crisis erupted and the Central Bank did not want to validate market's expectation of higher interest rates.

We conclude from all those observations that the "pedestrian" explanation is quite a good description of what has happened. The government has indeed tried on one hand to save on the interest rate expenditures, playing with different kind of indexes and the term structure, and on the other hand to lengthen the debt to avoid the "rolling over" risk. It also allowed the share of US\$-linked debt to increase, but not as much as to turn a possible devaluation in a "poison pill" as in the case of the Mexican Tesobonos in December 1994. However, this strategy has become a very risky one, as the fiscal results eroded since the start of the stabilization plan. We now turn to the issue of the net debt, which will allow us to tackle the fiscal side and its impact on the bond debt.

IV. NET DEBT

Three major stylized facts mark the evolution of the public-sector debt during the 1990s. The first is the substantial reduction in the importance of the foreign debt in the total public-sector debt.²⁴ The second important fact is that from January 1991 until mid-1995 domestic federal debt growth can be entirely explained by two elements: the conversion of compulsory savings to voluntary savings by the Collor administration, and the substantial accumulation of foreign reserves, as seen in the previous section. The third major stylized fact is that from 1995 on the growth in the domestic federal debt is in large part explained by fiscal developments.

With the sizable accumulation of foreign reserves after 1991, the net public-sector debt acquired an increasing importance as indicator of public indebtedness. As in many other countries, it became routine to refer to the gross indebtedness figures net of the value of major assets in the public sector balance-sheet. In addition to foreign exchange reserves, however, the net debt figures in Brazil include many other lower quality assets that have been growing very rapidly in the last few years. This section discusses the implications of this fact for the interpretation of the public-sector net debt statistics.

IV.1 Recent Evolution of the Public-Sector Net Debt

As Table 4.1 shows, the public-sector net debt has increased from 28.5% of GDP in December 1994 to 34.5% of GDP in 1997. This increase is totally explained by the very rapid growth in the domestic net debt, which increased from 20.3% of GDP in 1994 to 30.1% of GDP in 1997, and is more than compensated by the reduction in the foreign net debt from 8.2% of GDP to only 4.4% of GDP in 1997. Given that the domestic net debt of the public sector enterprises was substantially reduced during the period, the increase in the public-sector net debt during 1994-1997 can be entirely explained by the growth in the domestic net debt of the federal government and Central Bank, and state and municipal governments. In fact, the figures in Table 4.1 imply that more than two thirds of this growth can be attributed to the federal government and Central Bank.

²⁴ From almost 28% of GDP in 1991, the public-sector foreign gross debt was reduced to some 11% of GDP in 1997.

Table 4.1
Brazil, Non Financial Public-Sector Net Debt, 1994-1997
(in percent of GDP)

	<i>December</i> <i>1994</i> <i>(A)</i>	<i>December</i> <i>1995</i> <i>(B)</i>	<i>December</i> <i>1996</i> <i>(C)</i>	<i>December</i> <i>1997</i> <i>(D)</i>	<i>Change</i> <i>94-97</i> <i>(D) - (A)</i>
<i>(1) Federal Government & Central Bank Net Debt</i>	<i>12.3</i>	<i>13.0</i>	<i>16.4</i>	<i>18.2</i>	<i>5.9</i>
<i>Gross Debt</i>	<i>31.7</i>	<i>34.0</i>	<i>40.9</i>	<i>45.7</i>	<i>14.0</i>
<i>Domestic Debt</i>	<i>19.9</i>	<i>23.6</i>	<i>31.4</i>	<i>37.3</i>	<i>17.4</i>
<i>Foreign Debt</i>	<i>11.8</i>	<i>10.4</i>	<i>9.5</i>	<i>8.4</i>	<i>-3.4</i>
<i>(-) Foreign Reserves</i>	<i>5.8</i>	<i>7.0</i>	<i>7.8</i>	<i>6.4</i>	<i>0.6</i>
<i>(-) Other Assets</i>	<i>13.7</i>	<i>14.0</i>	<i>16.6</i>	<i>21.1</i>	<i>7.4</i>
<i>(2) State and Municipal Governments Net Debt</i>	<i>9.5</i>	<i>10.4</i>	<i>11.9</i>	<i>13.5</i>	<i>4.0</i>
<i>Domestic Net Debt</i>	<i>9.2</i>	<i>10.1</i>	<i>11.5</i>	<i>13.0</i>	<i>3.8</i>
<i>Foreign Net Debt</i>	<i>0.3</i>	<i>0.3</i>	<i>0.4</i>	<i>0.5</i>	<i>0.1</i>
<i>(3) Public Enterprises Net Debt</i>	<i>6.7</i>	<i>6.5</i>	<i>6.1</i>	<i>2.8</i>	<i>-4.0</i>
<i>Domestic Net Debt</i>	<i>4.9</i>	<i>4.8</i>	<i>4.0</i>	<i>0.9</i>	<i>-4.0</i>
<i>Foreign Net Debt</i>	<i>1.9</i>	<i>1.7</i>	<i>2.0</i>	<i>1.9</i>	<i>0.0</i>
<i>Public-Sector Net Debt [(1) + (2) + (3)]</i>	<i>28.5</i>	<i>29.9</i>	<i>34.4</i>	<i>34.5</i>	<i>6.0</i>

Source: Banco Central do Brasil

This evolution of the federal net-debt figures during 1994-1997 should be interpreted with caution. Though the federal net debt has increased much less dramatically than the federal gross debt, there are reasons to believe that the quality of the net debt has deteriorated substantially during the period.

IV.2 The Quality of the Federal Net Debt

There are two important sources of deterioration in the quality of the public-sector net debt after 1994. The first is the recent restructuring of the Brazilian financial system. The combination of high interest rates and the sudden end of the high inflation regime, following the launching of the stabilization plan in mid-1994, increased considerably the vulnerability of the banking system.

After the Central Bank intervention in *Banco Econômico* in August 1995, the financial health of important private banks became increasingly questioned and there was a growing concern that a major banking crisis could develop. In response to those concerns, the Central Bank decided to promote the restructuring of the private banking system introducing in early November 1995 a series of measures, including the creation of the Program to Promote the Restructuring of the Financial System (PROER). Three big private institutions have been rescued since then, following basically the same procedure: the Central Bank assuming the bad part of the insolvent bank's balance sheet and forcing the sale of the remaining part to a sounder institution, persuaded to participate in the transaction by the access to a low-interest credit line.

From its launching in November 1995 to March 1997, PROER operations amounted to R\$15.1 billion. With the acquisition of *Banco Bamerindus* by the Hong Kong & Shanghai Banking Corporation in May 1997, this amount increased to R\$20.8 billion. By November 1997, a total of R\$21.0 billion had been released.²⁵ Some R\$1.2 billion have already been paid off by the banks and R\$13.2 billion, corresponding to the resources used to finance the purchase of *Banco Econômico* and *Banco Nacional*, have been transferred to the Central Bank department in charge of liquidating financial institutions. Those resources will be paid back only when the Central Bank manages to sell assets of the former *Econômico* and *Nacional* or when it liquidates the guarantees of the PROER loans.

²⁵ See Mendonca de Barros et al. [1998].

A similar program was launched in mid-1996 to deal with the insolvent state-owned banks. So far, the most important transaction in the context of this program has been the R\$8 billion capitalization of *Banco do Brasil* by the Treasury in 1996.

A second important source of deterioration in the quality of the federal net debt has been the generous restructuring by the federal government of the states' sizable outstanding debt during 1997. In the seventh restructuring of this kind in a period of ten years, the federal government has issued bonds with high interest rates and relatively short maturities to extend credit to the states at low interest rates and maturities that in most cases reach 30 years. As of December 1997, some R\$54 billion of states' debt had been restructured. It is estimated that the final amount could be as high as R\$103 billion.

The non-performing assets of the insolvent banks transferred to the Central Bank, as well as low-interest loans extended to the institutions that absorbed those banks, have been deducted as assets from the federal gross debt. Analogously, as high-interest state bonds have been swapped for lower-interest federal bonds, the states' debt has been largely converted into debt to the federal government and, therefore, also been subtracted from the federal gross debt in the net-debt figures. As the importance of those various assets has been growing very rapidly, there is every reason to believe that the quality of the federal net-debt figures is being negatively affected.

In fact, the last column of Table 4.1 shows an increase of 17.4% of GDP in the gross domestic debt of the federal government and the Central Bank between 1994 and 1997, partly compensated by a reduction in their foreign debt equivalent to 3.4% of GDP. The resulting gross-debt increment of 14% of GDP led to a smaller, though still impressive, increase in the federal net debt largely because it was offset by an accumulation of "other assets" amounting to 7.4% of GDP. The evolution of those assets has been dominated by developments related to the restructuring of the financial system and the states' debt.

It is highly likely that, in the future, part of the assets which are being subtracted from the federal gross public debt may prove to be partially or totally worthless. Some of the assets transferred to the Central Bank when failing banks were bailed out may prove to be worthless, or the states may not fully honor the service of their debts to the federal government. If and when that happens, the federal net-debt figures will have to be adjusted upwards.

IV.3 Reassessing the Federal Net Debt: A Simple Model

The contingent liabilities that stemmed from the financial-system restructuring program, as well as the sizeable stock of states' debt included in the assets considered in the federal net-debt figures, may be properly taken into account in a simple model that allows a more careful assessment of the importance of the federal net debt. As the model is developed, the two problems will be dealt with separately at first and jointly afterwards.

The contingent liabilities beneath the financial-system restructuring program may be treated in a very straightforward way. Let Z be the non-performing assets of the bailed out banks that were absorbed by the Central Bank and let h be the proportion of those assets that the Central Bank will be able to recover after they are liquidated. As those assets are currently being entirely subtracted from the gross federal debt, the federal net-debt ND should be transformed into the corrected measure ND_z according to the following equation

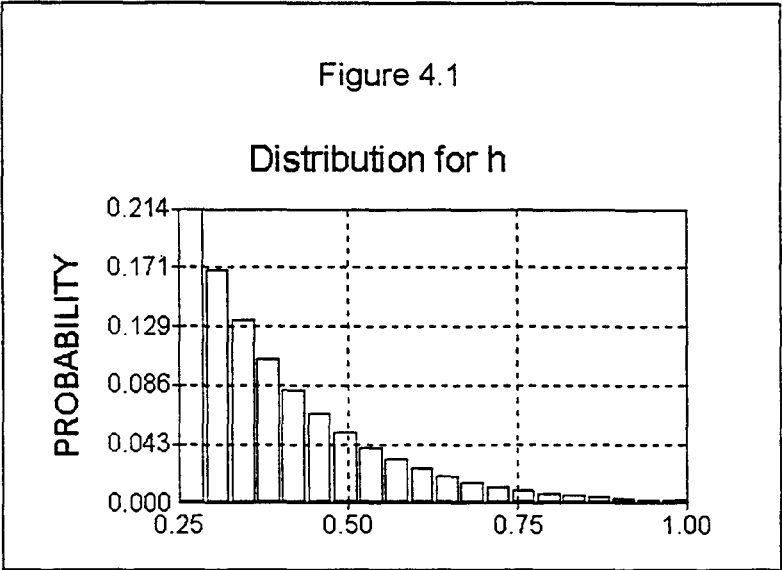
$$ND_z = ND + (1 - h) Z \quad [4.1]$$

Of course the value of h is not known yet. But one may deal with the pending uncertainty about its value assuming a plausible probability distribution for h . Preliminary data on the costs of the financial-system restructuring program show that in the case of *Banco Nacional*, one of the three big private institutions that have been bailed out, the Central Bank will be able to recover as much as 25 percent of the absorbed assets.²⁶ Just to illustrate the point, it was somewhat optimistically assumed that h has a truncated exponential distribution with mean equal to 0.4 and minimum and maximum values 0.25 and 1.0 respectively.

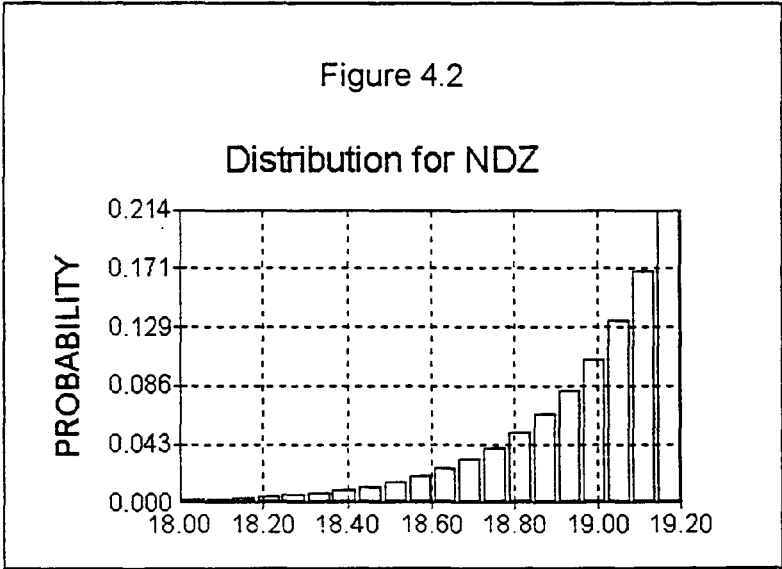
In 1997, the federal net debt ND corresponded to roughly 18 percent of the GDP. The total value of the assets of *private* bailed-out banks that were transferred to the Central Bank has been estimated at 1.6 percent of GDP. If nothing could be recovered ($h = 0$), the value of the corrected federal net debt stock ND_z would be equivalent to 19.6 percent of GDP. Such an extreme case was just assumed away when the distribution for h presupposed that its value would be at least 0.25. Figure 4.1 below shows the distribution for h generated by Monte Carlo simulations. Using the above mentioned values for ND and Z , simulations based on equation 4.1 generated the

²⁶ See "BC recupera só 1,1 bilhão do Nacional", *Gazeta Mercantil*, February 2, 1998.

distribution for ND_z presented in Figure 4.2.²⁷ According to this distribution, the mean value of the corrected federal net-debt measure ND_z would be around 19 percent of GDP.



Putting aside for a moment the problem stemming from the existence of contingent liabilities related to the financial-system restructuring program, one may now turn to the problem posed by the importance of the states' debts among the assets considered in the federal net-debt calculation.



²⁷ In fact the utilized sampling method was the Latin Hypercube, a variant of the Monte Carlo method.

Assuming that A , the total stock of states' debts to the Union, is the only relevant federal asset, the federal net debt may be written as

$$ND = D - A \quad [4.2]$$

where D is the gross debt, on which an average interest rate r is paid. The states are supposed to pay an interest rate ρ on their debt to the Union. The federal net interest payments therefore are

$$J = rD - \rho A$$

that may be re-written as

$$J = (r - \rho\alpha) D \quad [4.3]$$

where

$$\alpha = A/D \quad [4.4]$$

Dividing both sides of expression [4.3] by ND , and taking [4.2] and [4.4] into account, one may get

$$v = (r - \rho\alpha)/(1 - \alpha) \quad [4.5]$$

where $v = J/ND$ is the implicit interest rate paid on the federal net debt. Naturally, if $r > \rho$ and $\alpha < 1$, an increase in α leads to a higher v , as the derivative of v with respect to α may be written as

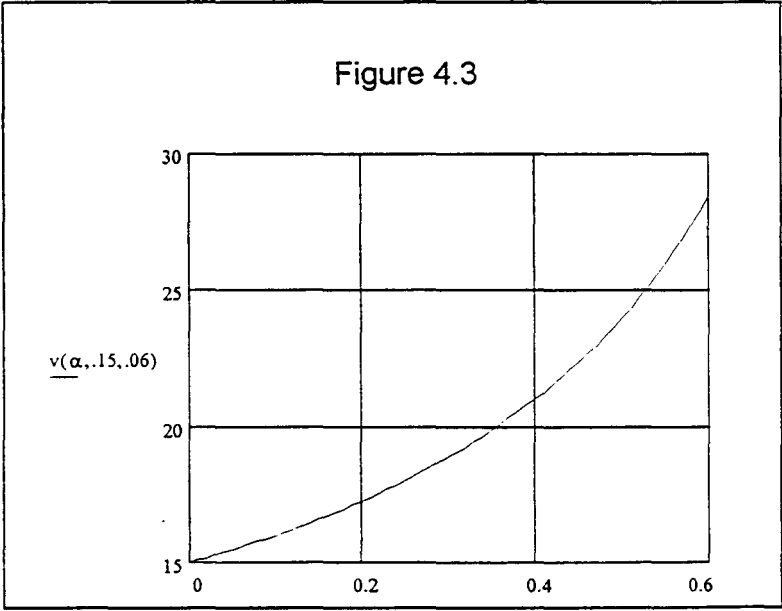
$$(r - \rho)/(1 - \alpha^2) \quad [4.6]$$

In other words, if the interest rate ρ on states' debt to the Union is lower than the interest rate paid by the federal government on its own debt, the implicit interest rate v paid on the federal net debt will be higher the higher, the importance of the state's debt to the Union vis-à-vis the gross federal debt.²⁸

²⁸ In fact, the second derivative of v with respect to α , which may be written as $2(r - \rho)/(1 - \alpha)^3$, is also positive if $r > \rho$ and $\alpha < 1$. The higher α , the higher the sensitivity of net interest paid on the federal net debt to an increase in α .

In Figure 4.3, which was drawn assuming plausible values for the interest rates in equation [4] ($r = 15$ percent and $\rho = 6$ percent), one may have a clearer idea of how an increase in α affects the implicit interest rate v . Since the current value of α is around 0.4, the implicit rate consistent with those values would be around 21 percent.

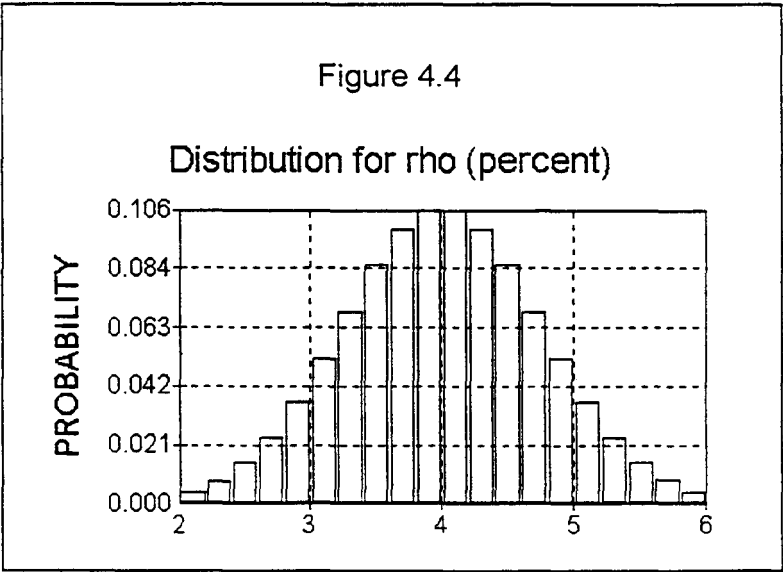
In fact, the implicit interest rate v on the federal net debt should depend not on the contractual interest rate ρ on the states' debt to the Union but upon the *effective* interest payments that the federal government is finally able to receive from the states. As past experience has shown that such debt service has been subjected to all kind of difficulties, one may take this fact into account in the model, treating ρ as a random variable, and running simulations in order to detect the effect of the uncertainty about ρ on the implicit interest rate on the federal net debt.



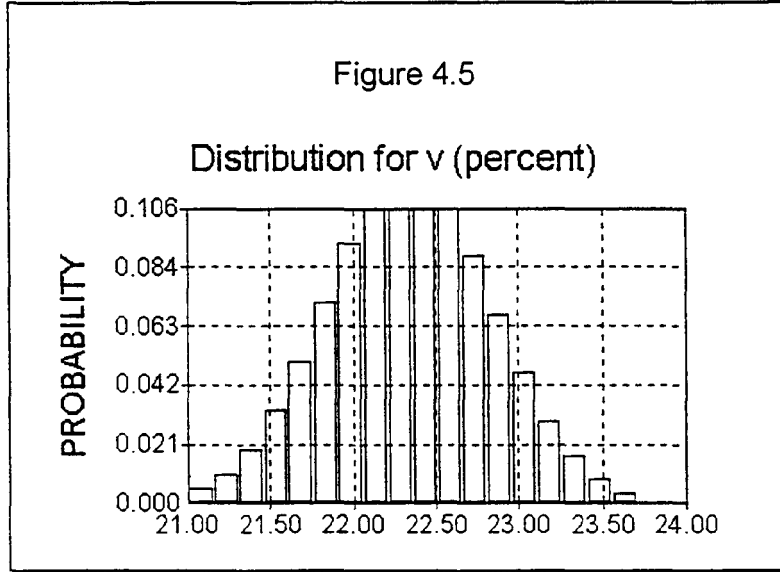
The maximum interest rate the Union may expect to receive from the states is, of course, the contractual rate, i.e. 6 percent. In the worst case the states could even stop paying interest on their debts to the federal government. It was assumed that ρ has a truncated normal distribution

with mean 4 percent, standard deviation 0.75 percent, maximum 6 percent and minimum 2 percent.²⁹ Figure 4.4 below shows the distribution for ρ generated by the simulations. Keeping $r = 15$ percent and assuming $\alpha = 0.4$, simulations run with the model generated the distribution for ν presented in Figure 4.5.

As may be seen in the figure, the implicit interest rate ν on the federal net debt may vary from 21 to 23.7 percent, as a result of the uncertainty about ρ . The average interest rate is around 22.3 percent.



²⁹ However, no credit risk was assumed. The optimistically underlying hypothesis is that the states will eventually pay their debts to the Union.



Looking from a different angle, one might notice that although taking federal assets into account may undoubtedly lead to what seems to be more comfortable federal debt figures, as long as $r > \rho$, the implicit interest rate on the net debt tend to be higher than the rate paid on the gross debt, what could be seen as an indicator of a less comfortable situation. The interest bill that stems from paying an annual implicit interest rate of v on a net federal debt $D - A$ is equivalent to the bill that would result from paying the lower interest rate r on a much higher debt stock, which would be a measure more appropriate for comparisons involving debt accumulated before the restructuring of the states' debt. Labeling such a virtual debt stock ND_A one may write

$$v(D - A) = r ND_A \quad [4.7]$$

and get

$$ND_A = (D - A) v/r \quad [4.8]$$

an expression that, when [4.2] and [4.5] are used, may be rewritten as

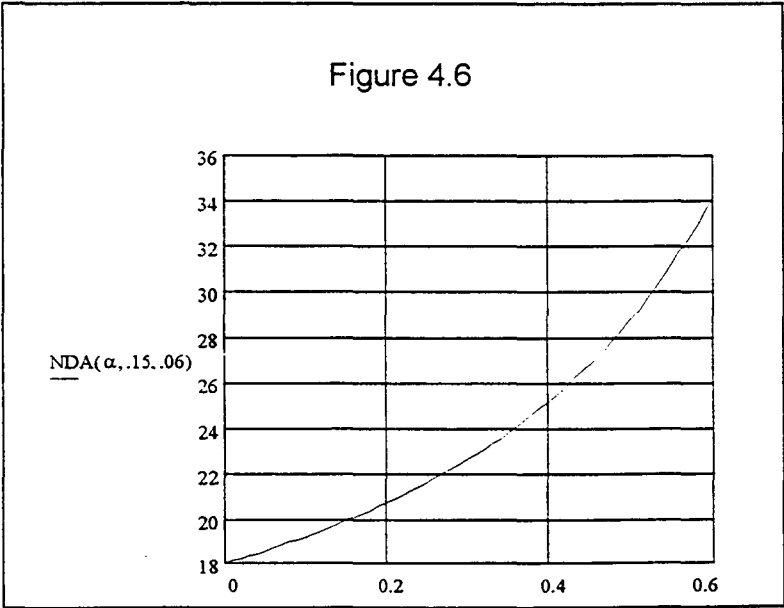
$$ND_A = [ND/r][(r - \rho\alpha)/(1 - \alpha)] \quad [4.9]$$

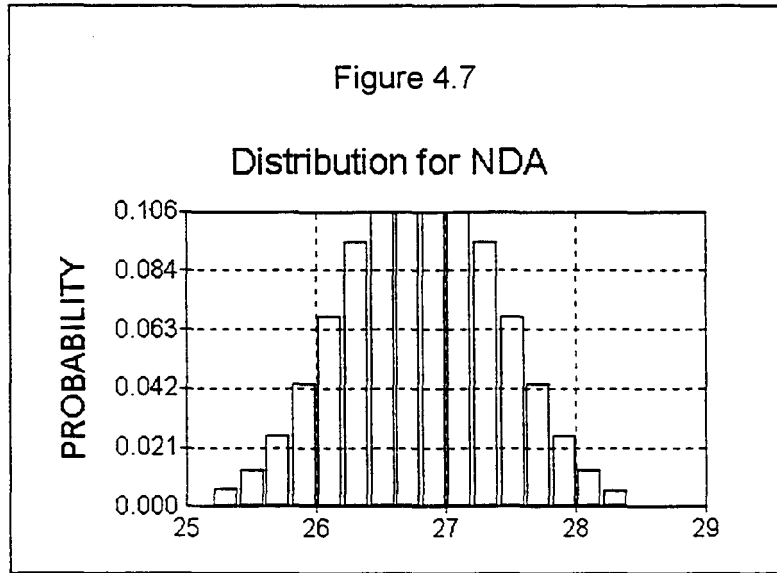
That expression provides a corrected measure of the federal net debt that takes into account the relatively low interest paid by the states on their debts to the Union. For a given level of ND , ND_A

will be higher the higher the value of α , as illustrated in Figure 4.6, for $r = 15$ percent and $\rho = 6$ percent

As the current value of α is 0.4, what Figure 4.6 shows is that even if the states duly pay the contractual 6 percent interest rate on their debt to the Union, the interest bill on the 18 percent of GDP federal net debt would be equivalent to the bill that would result from paying a 15 percent interest on a debt corresponding to more than 25 percent of GDP. Of course, ND_A could be much higher if the effective interest rate on the states' debt to the Union prove to be well below 6 percent. Again, simulations may be helpful at this point. Using the distribution for ρ from above, one may generate the distribution ND_A presented in Figure 4.7, which has a mean value of 26.8 percent

Up to now the problem posed by the existence of contingent liabilities related to the financial system restructuring program, on one side, and the problem stemming from the importance of the states debt to Union, on the other, were treated separately. It is now time to consider both problems together.





The first problem was dealt with above by equation [4.1]

$$ND_Z = ND + (1 - h) Z \quad [4.1]$$

which provided a correction of the federal net debt that allowed for the existence of the contingent liabilities. Using [4.2], that equation may be rewritten as

$$ND_Z = D - A + (1 - h) Z \quad [4.10]$$

Repeating the same reasoning above around equation [4.7], one may say that the interest bill brought about by paying an implicit interest rate v on $D - A + (1 - h) Z$ is equivalent to the bill that would result from paying the lower interest rate r on a higher debt stock. Labeling now such a debt stock ND_{AZ} one may write

$$v [D - A + (1 - h) Z] = r ND_{AZ} \quad [4.11]$$

and get

$$ND_{AZ} = [D - A + (1 - h) Z] v/r \quad [4.12]$$

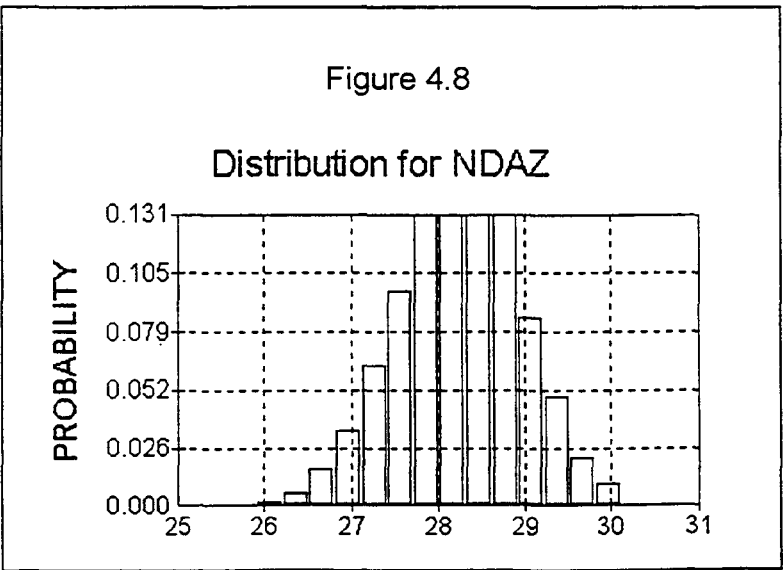
And, using [4.2] and [4.5], one may write

$$ND_{AZ} = [ND + (1 - h) Z] [(r - \rho\alpha)/(1 - \alpha)r] \quad [4.13]$$

that provides a corrected measure of the federal net debt that *jointly* takes into account the problem posed by the existence of contingent liabilities related to the financial system restructuring program and the problem stemming from the importance of the states debt to the Union.

The uncertainty about both h and ρ may now be jointly considered. Taking the distributions assumed for h and ρ above, one may use equation [4.13] to simulate the distribution for ND_{AZ} , as shown in Figure 4.8. The corrected measure ND_{AZ} could reach as much as 30 percent, with a mean value of roughly 28.2 percent.

Taking into account the combined uncertainty entailed in two of the main assets that have been deducted from the gross federal debt leads, therefore, to a corrected measure of the federal net debt that could easily involve adding 10 percent of GDP to the official net debt measure. So far this distortion is being somewhat offset by a counteracting distortion involved in the way public enterprises' account are treated in the net debt calculations, as will be seen in the next section. But, as the rapid advancement the of the privatization process in the country is bound to substantially reduce the magnitude of this offsetting effect, the net-debt measure problems discussed above will become increasingly important.



IV.4 The Net Debt and the Treatment of Public Enterprises

The official public-sector net debt figure in Brazil is calculated as the difference between the sum of the gross debts of the different segments of the public sector and the sum of various assets, which includes not only foreign reserves but also lower quality assets, as certain kinds of Central Bank loans and Treasury loans discussed in sections IV.2 and IV.3 above. However, other important (high-quality) assets, as those belonging to public enterprises, are not deducted, as should be expected, even though the enterprises' liabilities are included in the public sector debt. That leads not only to an incorrect public sector net-debt estimate but also to a very misleading overestimation of the impact of privatization on the public sector net debt.³⁰ Given the peculiarities of public debt accounting in Brazil, when a public enterprise is privatized its whole debt is reclassified and written off from the public sector net-debt statistics. Therefore, each billion of privatization proceeds, stemming from the sale of publicly held equity, seems to be reducing the net debt by much more than one billion. Nothing of that sort would happen if the treatment of the accounts of public enterprises in the net-debt estimation were duly improved.

As more and more public-sector assets are being considered, the net-debt figure in Brazil has been converted into a very raw measure of the public-sector net worth. In what concerns the way public enterprises are considered, that rawness could be significantly lessened. What should be included in the estimation of the net-debt, with a subtracting sign, is only the part of the public enterprises' equity held by the government, properly valued of course. That would be consistent with what Buiter [1983] proposes as a comprehensive consolidated public sector balance sheet, reproduced below as Table 4.2. It should be noted that in some countries, as New Zealand, for example, a comprehensive public sector balance sheet along those lines has been regularly published and used to monitor fiscal performance.³¹

³⁰ See Werneck [1997].

³¹ See New Zealand, Ministry of Finance [1997].

Table 4.2

Buiter's Comprehensive Consolidated Public Sector Balance Sheet

<i>Assets</i>	<i>Liabilities</i>
<i>Social overhead capital (non-marketable)</i>	<i>Net interest-bearing debt denominated in domestic currency, held by residents</i>
<i>Equity in public enterprises (partly potentially marketable)</i>	<i>Net interest-bearing debt denominated in domestic currency, held by non residents</i>
<i>Land and mineral assets (marketable)</i>	<i>Net interest-bearing debt denominated in foreign currency, held by residents</i>
<i>Net foreign exchange reserves</i>	<i>Net interest-bearing debt denominated in foreign currency, held by nonresidents</i>
<i>Present value of future tax program, including social security contributions, tariff revenue, etc. (implicit asset)</i>	<i>Net interest-bearing index-linked debt, held by residents</i>
<i>Imputed net value of government's cash monopoly</i>	<i>Net interest-bearing index-linked debt, held by nonresidents</i>
	<i>Stock of high-powered money</i>
	<i>Present value of social insurance and other entitlement programs</i>
	<i>Public sector net worth</i>

Reproduced from Buiter [1983].

The public enterprises' liabilities included in the calculation of the public sector net debt in Brazil supposedly comprise liabilities of public enterprises of all government levels: federal, state and municipal.³² According to the official public sector net debt figures, in December 1996, those liabilities were estimated at R\$ 47.4 billion (5.9 percent of GDP). The liabilities of the federal public enterprises corresponded to R\$ 20.4 billion (2.5 percent of GDP) and those of state and municipal enterprises to R\$ 27 billion (3.4 percent of GDP).

Table 4.3 below may help to give a rough idea of how big a difference it would make to change the way public enterprises are treated in the public-sector net debt calculation.³³ The December 1996 figures in the table refer only to the holding companies of the three largest remaining *federal* groups of public enterprises. The total book value of the shares held by the federal government in the three holding companies was R\$ 24.1 billion. The market value of those shares was RS 29.3 billion. Making a realistic assumption that the remaining federal public enterprises have a consolidated non-negative networth, one may safely say that deducting the value of the shares held by the government in federal public enterprises, instead of adding the debt of those enterprises, when computing the public-sector net debt, would make a difference of at least R\$ 44 billion in the net debt figure. In fact, if the book value of the shares held by the federal government in the three largest holding companies were used, the official public-sector net debt figure would be reduced by R\$ 44.5 billion. If the market value of the shares were used, the reduction would reach R\$ 49.7 billion, roughly 6 percent of GDP.

³² Public enterprises' liabilities are in fact calculated net of checkable account deposits and holdings of federal bonds.

³³ The authors are grateful to Marina Figueira de Mello for providing the data presented in that table.

Table 4.3
Federal State Enterprises, 1996
Main Holding Companies
(R\$ billion)

<i>Holding companies</i>	<i>Federal Government participation as percent of voting shares</i>	<i>Federal Government participation as percent of total shares</i>	<i>Net Worth</i>	<i>Total Stockholder capital</i>	<i>Book value of the shares held by the federal government</i>	<i>Market value the shares held by the federal government</i>
<i>Petrobrás</i>	86.0	65.3	20.0	13.0	8.5	9.3
<i>Eletróbrás</i>	85.2	75.0	59.6	18.0	13.5	14.9
<i>Telebrás</i>	50.0	21.4	27.7	10.0	2.1	5.1
<i>Total</i>			107.3	41.0	24.1	29.3

Source: SEST - Secretaria de Coordenação e Controle das Empresas Estatais and Rio Stock Exchange

V. CONCLUSION

Given Brazilian inflationary history, the domestic bond debt market was recreated in the mid-sixties with the introduction of indexed bonds (ORTNs), which were then conceived as an anti-inflationary tool. The idea was that only the money financing of the fiscal deficits was inflationary. In the period of more than thirty years since its creation, the Brazilian open market has evolved into a very sophisticated one. The gross bond debt held by the private sector is currently around one fourth of a trillion US dollars; the megainflation of the eighties and early nineties did **not** inflate away the Brazilian debt.

As shown in Section II, the Brazilian public debt and the inflation grew together since the second half of the seventies. This imposed a very peculiar structure on the debt. Except in very short periods, most of the debt has some form of inflation protection through indexation. Despite indexation, the debt maturity has been and still is quite short. After all, during the megainflation, monetary correction has traditionally been a very poor inflation hedge in Brazil. In more than one occasion, the government has tampered with the indexation clauses of the debt. Moreover, in 1990, the Collor administration started by hijacking most of the public debt to avoid a massive capital flight.

During the megainflation, most of the debt was placed with the banks (later, with mutual funds managed by the banks) which used the bonds as the asset counterpart of inflation protected deposits (the indexed money, or domestic currency substitute). With the Real Plan this situation is gradually changing. The debt maturity has been lengthened (with a few setbacks, as the recent Asian and Russian crises), and more agents interested in becoming final holders of long debt—as insurance companies and pension funds—are becoming more important in the financial arena.

As the currently very high short-term interest rates in Brazil converge to a lower level, we shall see these agents holding much longer debt. Until then, the high level of short-term debt, which is many times higher than the foreign reserves, will be menace to the stabilization program. This is even more concerning because the dismal fiscal performance since the Real Plan both negatively affects the investors' confidence in the macroeconomic stability, and adds to the already high level of debt.

The increase in public-sector net debt in recent years is totally explained by the very rapid growth in the domestic net debt, which increased from 20.3% of GDP in 1994 to 30.1% in 1997. More than two thirds of this growth can be attributed to the expansion of the domestic net debt of the federal government and Central Bank. Though the federal net debt has increased much less dramatically than the federal gross debt, there are reasons to believe that the quality of the net debt has deteriorated substantially during the period.

There are two important sources of deterioration in the quality of the public-sector net debt after 1994. The first is the recent restructuring of the Brazilian financial system, which led the Central Bank to assume the bad part of the balance sheet of insolvent institutions. The second important source of deterioration in the quality of the federal net debt has been the restructuring by the federal government of the states' sizable outstanding debt during 1997, which led to the conversion of states' debt into debt to the federal government.

The non-performing assets of the insolvent banks transferred to the Central Bank have been deducted as assets from the federal gross debt. Similarly, as states' debt has been largely converted into debt to the federal government, it has also been subtracted from the federal gross debt in the net-debt figures. As the importance of those various assets has been growing very rapidly, there is every reason to believe that the quality of the federal net-debt figures is being negatively affected.

It is highly likely that, in the future, part of the assets which are being subtracted from the federal gross public debt may prove to be partially or totally worthless. Some of the assets transferred to the Central Bank when failing banks were bailed out may prove to be worthless, or the states may not fully honor the service of their debts to the federal government. If that happens, the federal net-debt figures will have to be adjusted upwards, with possible budgetary impacts which will probably increase the size of the bond debt.

The contingent liabilities that stemmed from the financial-system restructuring program, as well as the sizable stock of states' debt included in the assets considered in the federal net-debt figures, may be properly taken into account in a simple model that allows a more careful assessment of the importance of the federal net debt.

When the proportion of those assets that the Central Bank will be able to recover after the bailed out banks are liquidated is treated as a random variable, with a plausible probability distribution, one finds that the federal net debt figures should be corrected upwards. This is also the case when it is taken into consideration that the interest rate on states' debt to the Union not only is lower than the interest rate paid by the federal government on its own debt, but uncertain.

Taking into account the combined uncertainty entailed in these two assets that have been deducted from the gross federal debt leads to a corrected measure of the federal net debt that could easily involve adding 10 percent of GDP to the official net debt measure. So far this distortion is being somewhat offset by a counteracting distortion involved in the way public enterprises' account are treated in the net debt calculations. But, as the rapid advancement of the privatization in the country is bound to substantially reduce the magnitude of this offsetting effect, the net-debt measure problems will become increasingly important.

As shown in Section III, the strategy to roll over the old debt and issue new debt as required by the fiscal deficits has been quite conformable to the "pedestrian" explanation. That is, the government has indeed tried on one hand to save on the interest rate expenditures, playing with different kind of indexes and the term structure, and on the other hand to lengthen the debt to avoid the "rolling over" risk. It also allowed the share of US\$-linked debt to increase, but not as much as to turn a possible devaluation in a "poison pill" as in the case of the Mexican Tesobonos in December 1994. However, this strategy has become a very risky one, as the fiscal results eroded since the start of the stabilization plan.

Therefore, unless a major improvement in the fiscal accounts is undertaken by the new administration in 1999, we foresee difficult problems in debt management. Interest rates will have to remain at high levels, with deleterious impacts on the budget, on economic growth, and on social welfare. Furthermore, the short average maturity and large size of the bond debt will represent a constant threat to the exchange-rate anchor that is fundamental to the stabilization process.

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Figure 1
Total Federal Debt and Debt held by the Private Sector - 1970/97

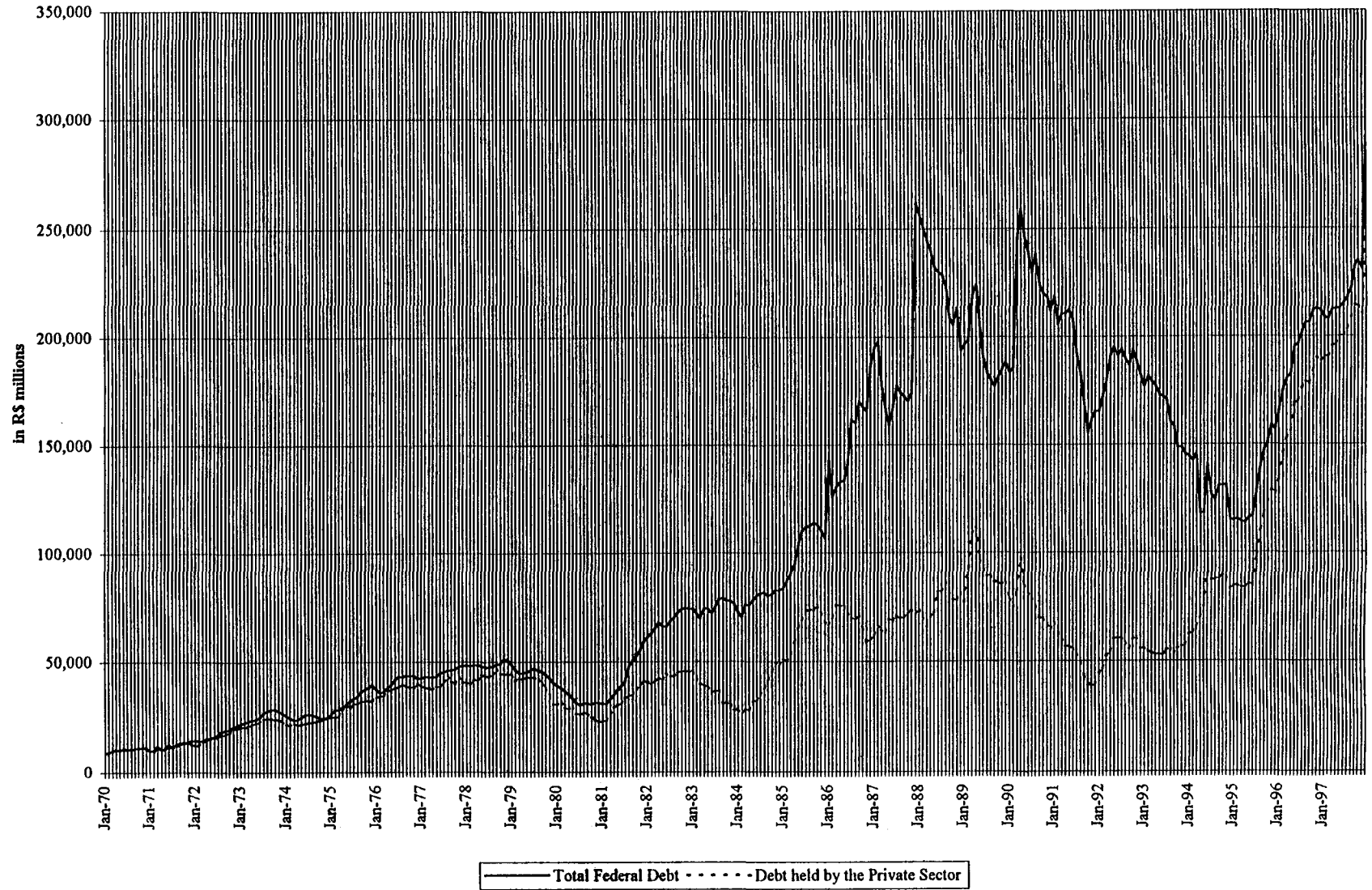


Figure 2
Total Federal Debt and Debt held by the Private Sector - 1970/79

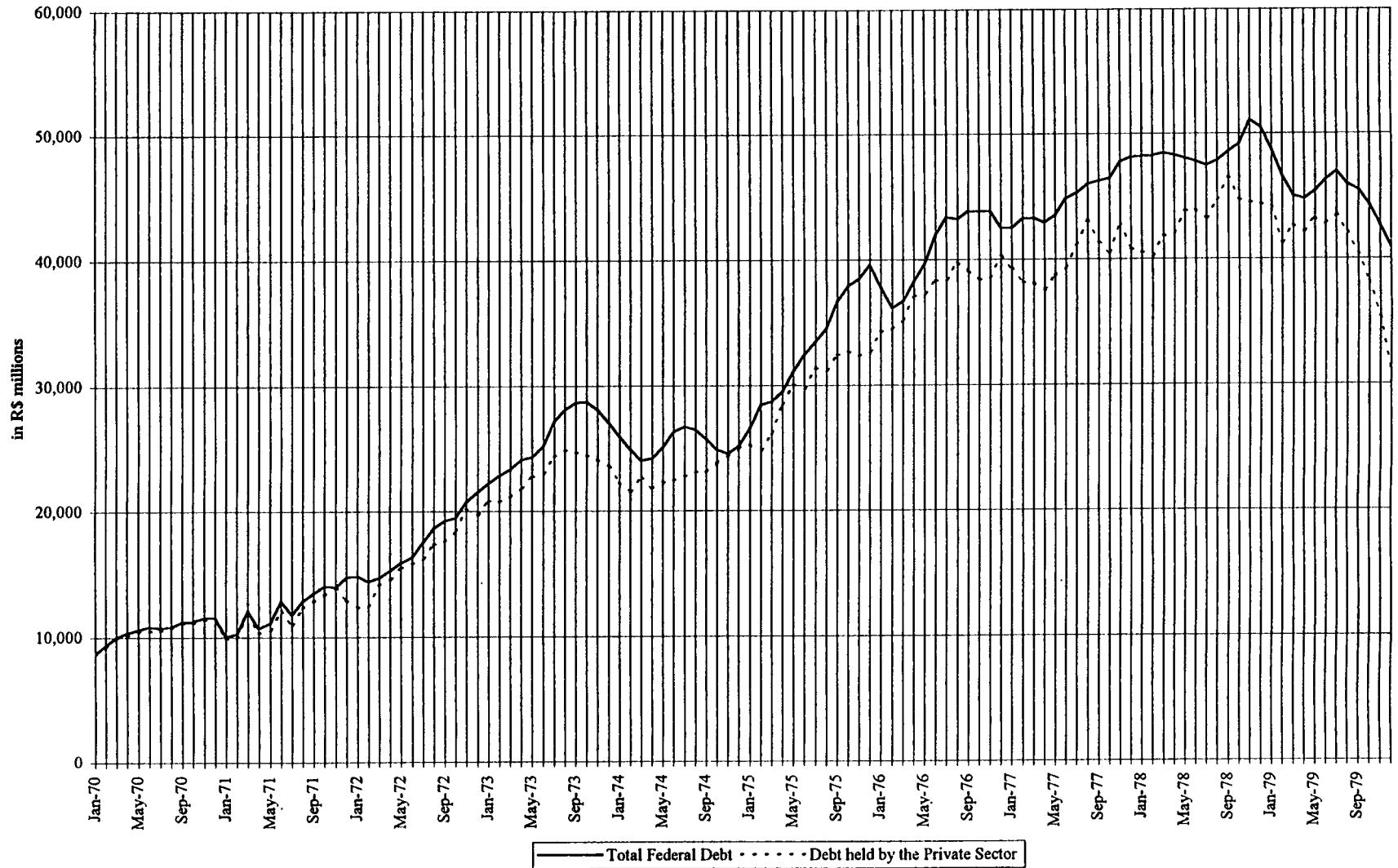


Figure 3 A
Federal Securities - Composition 1970/79

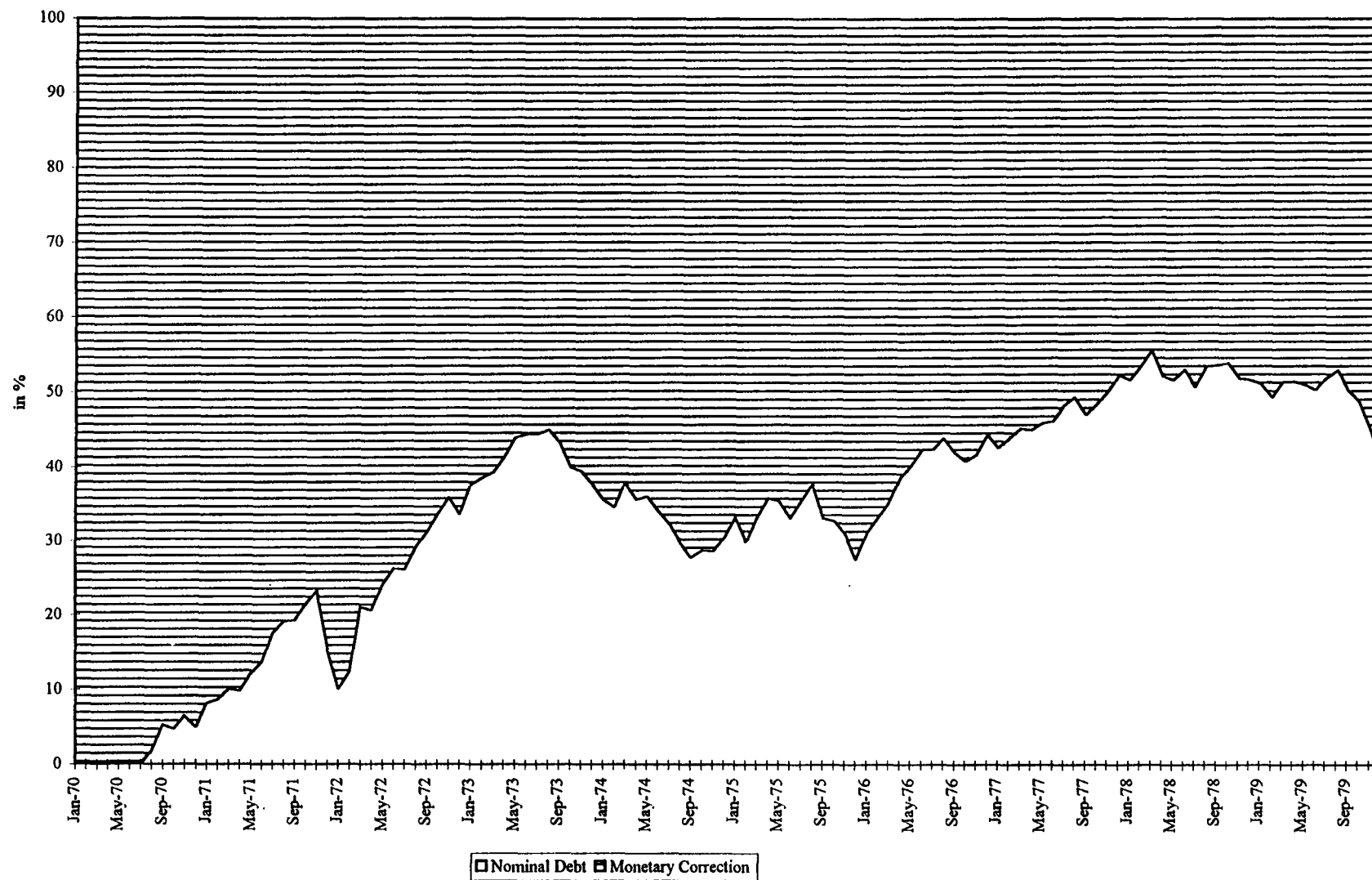


Figure 3 B
Federal Securities - Composition 1970/79

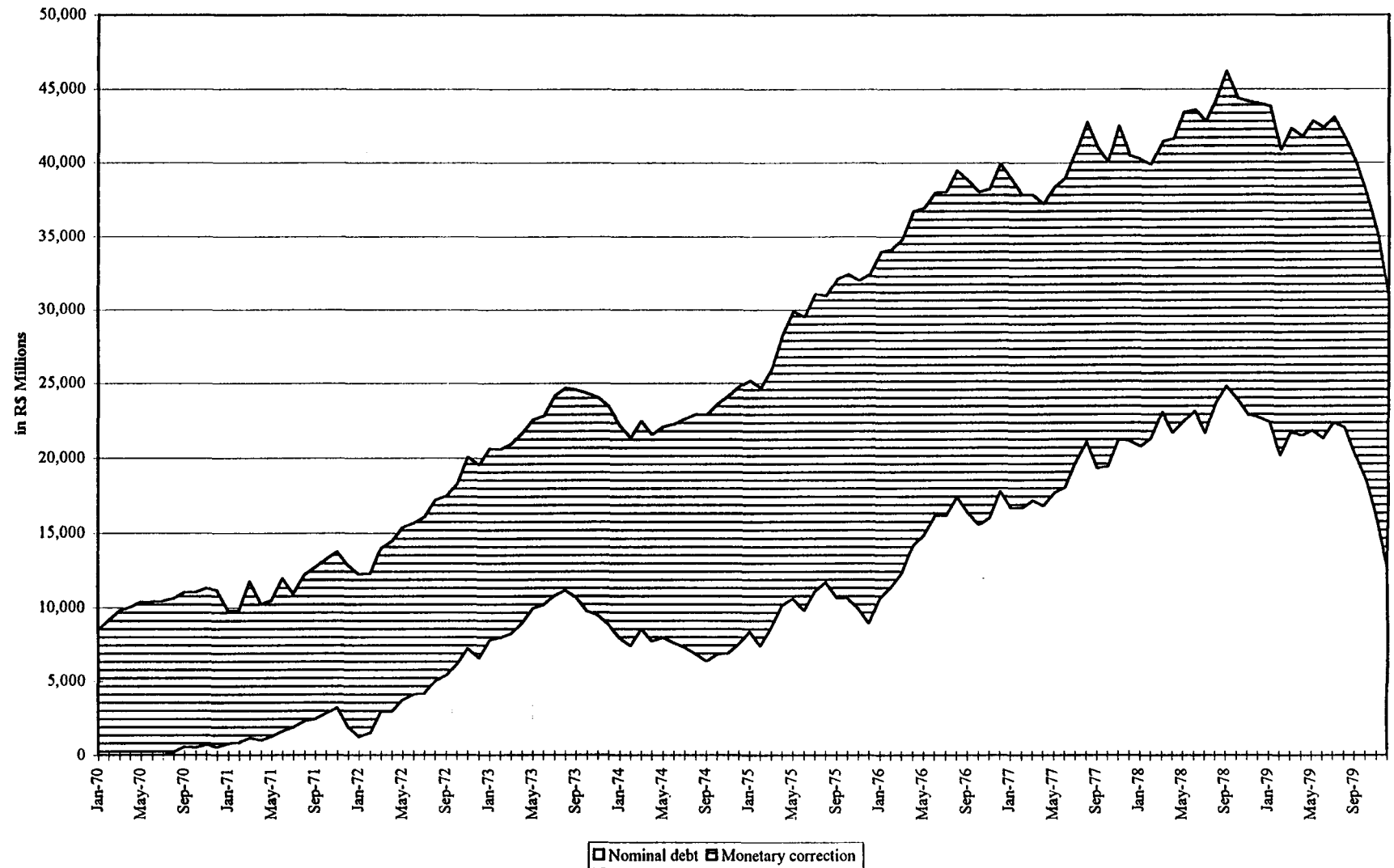


Figure 4
Total Federal Debt and Debt held by the Private Sector - 1980/89

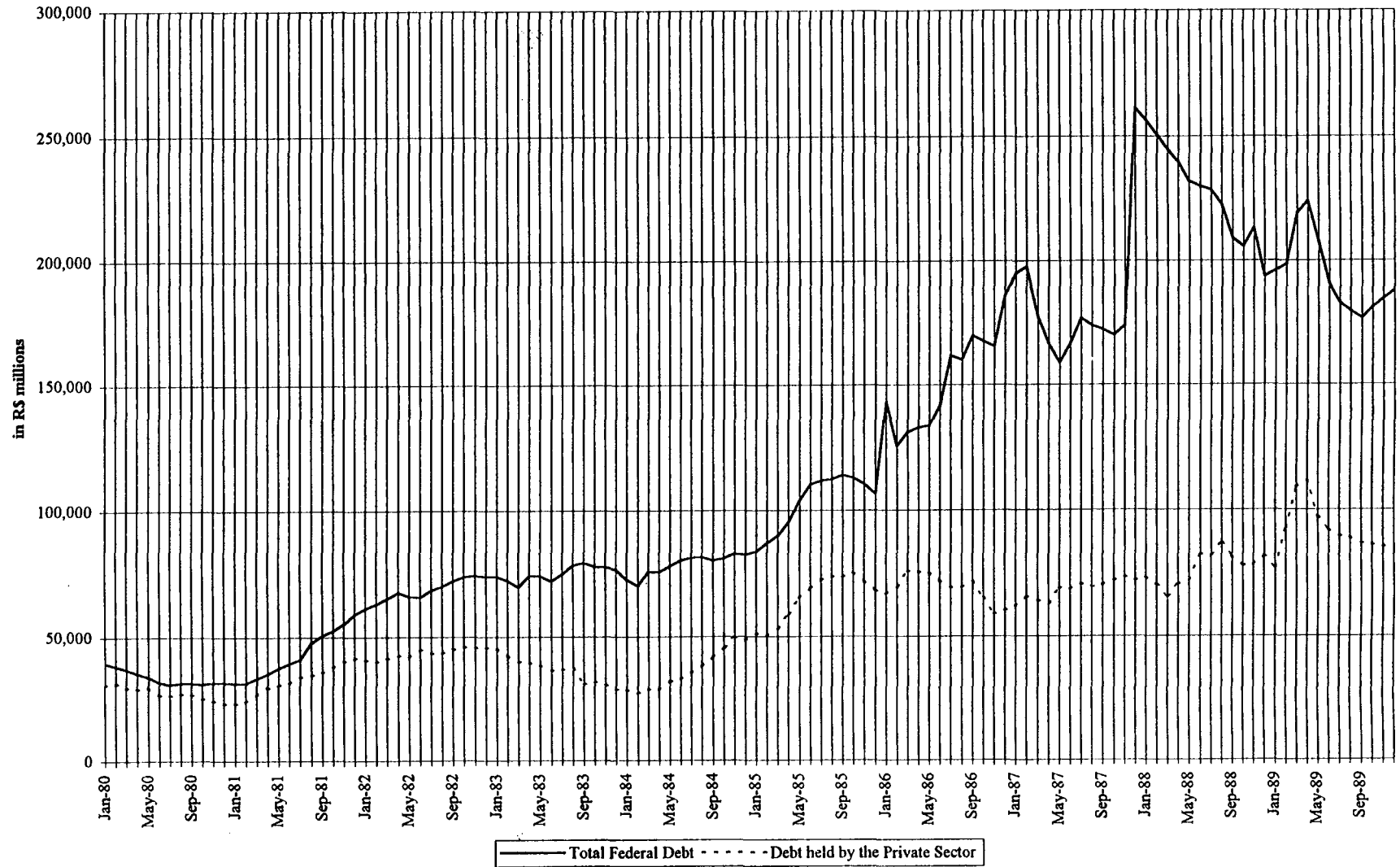


Figure 5 A
Federal Securities - Composition 1980/89

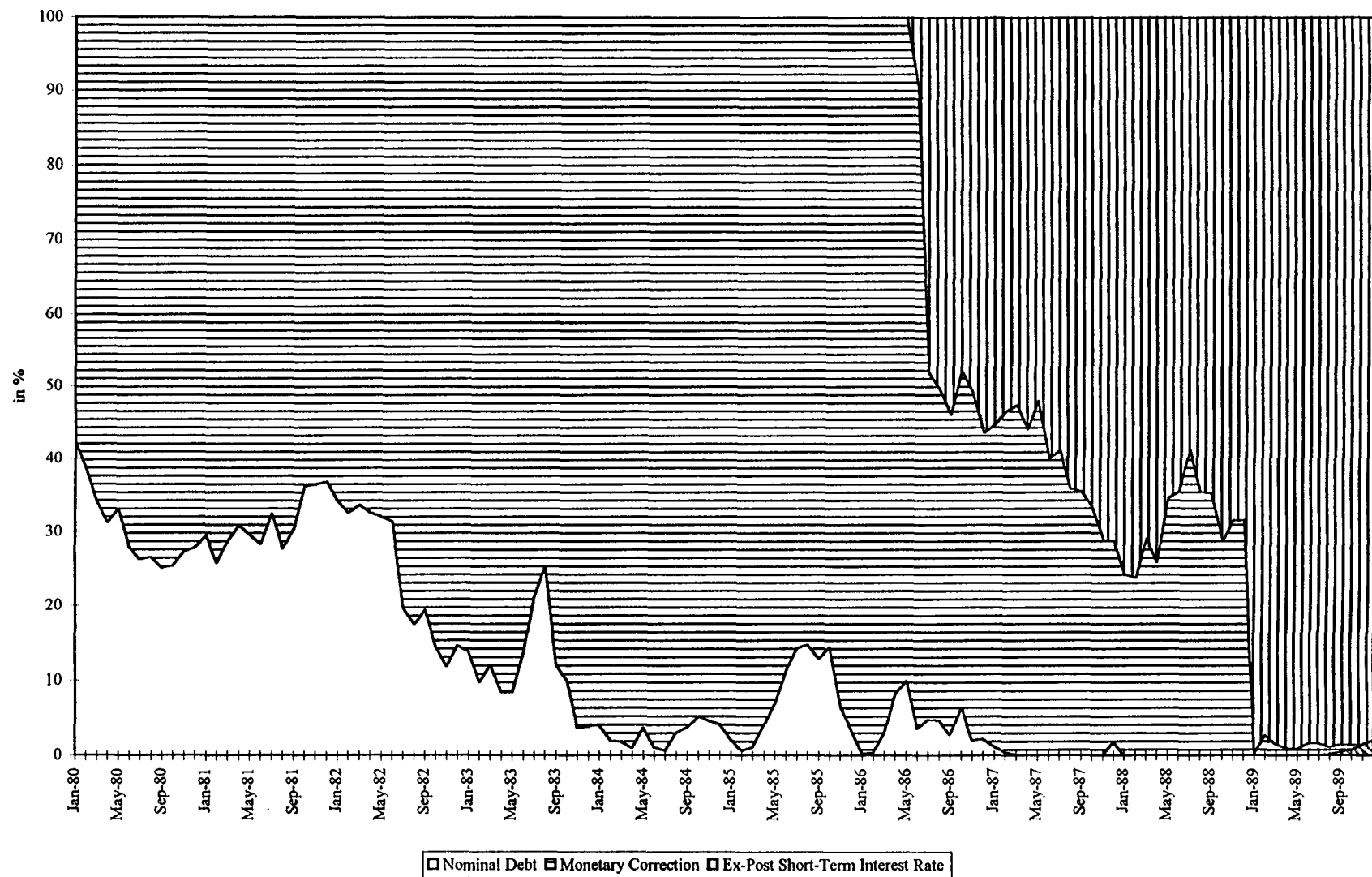


Figure 5 B
Federal Securities - Composition 1980/89

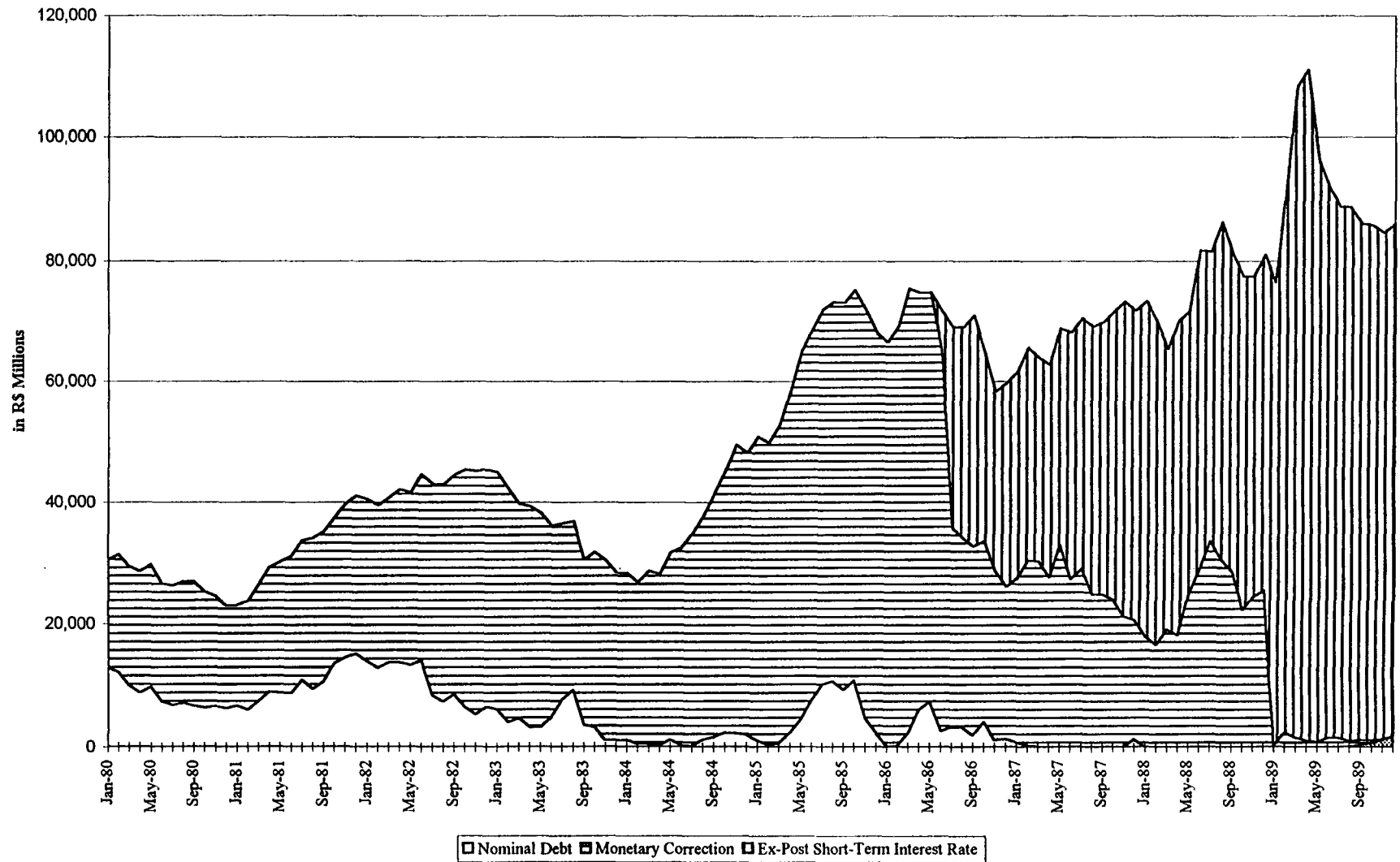


Figure 6
Total Federal Debt and Debt held by the Private Sector - 1990/97

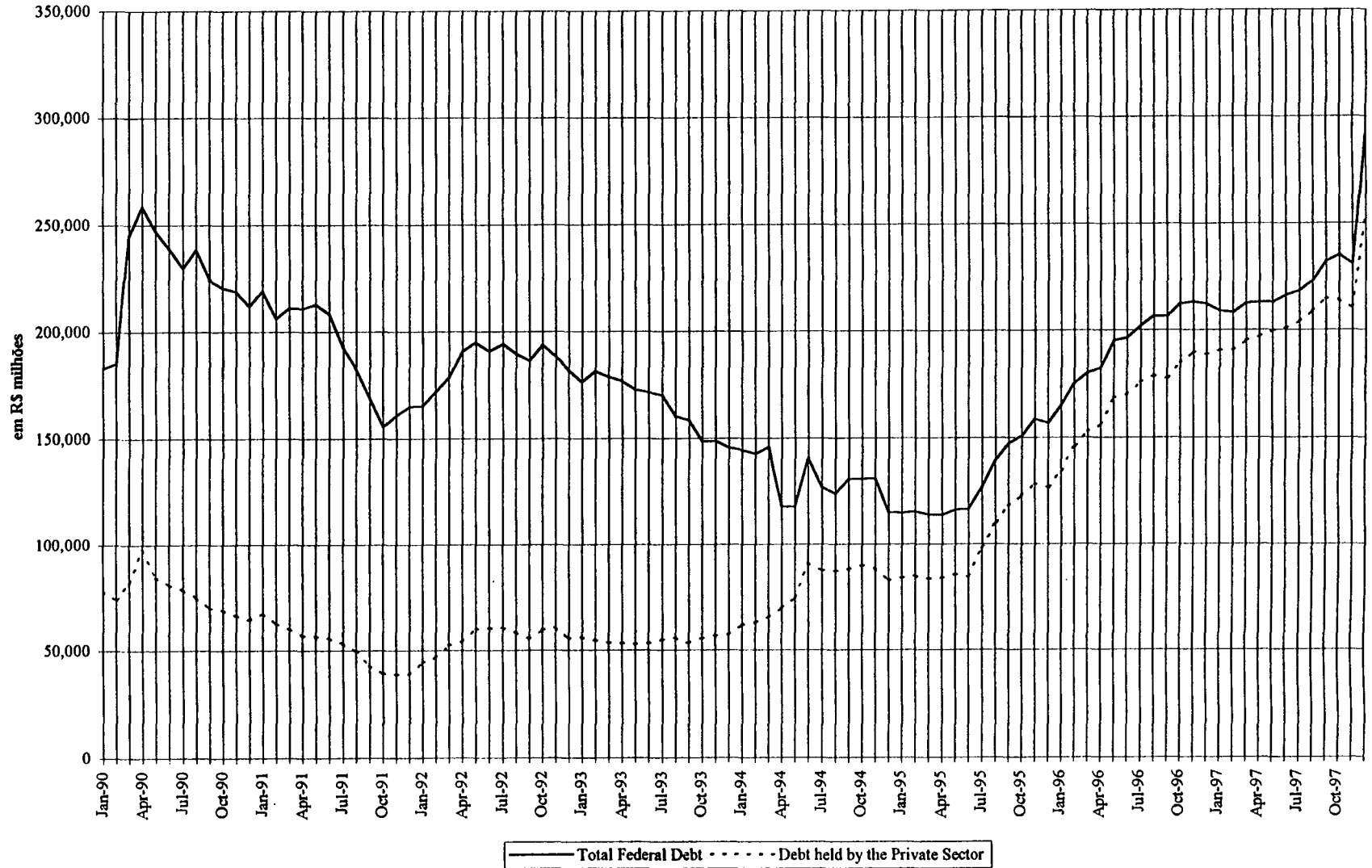


Figure 7 A
Federal Securities - Composition 1990/97

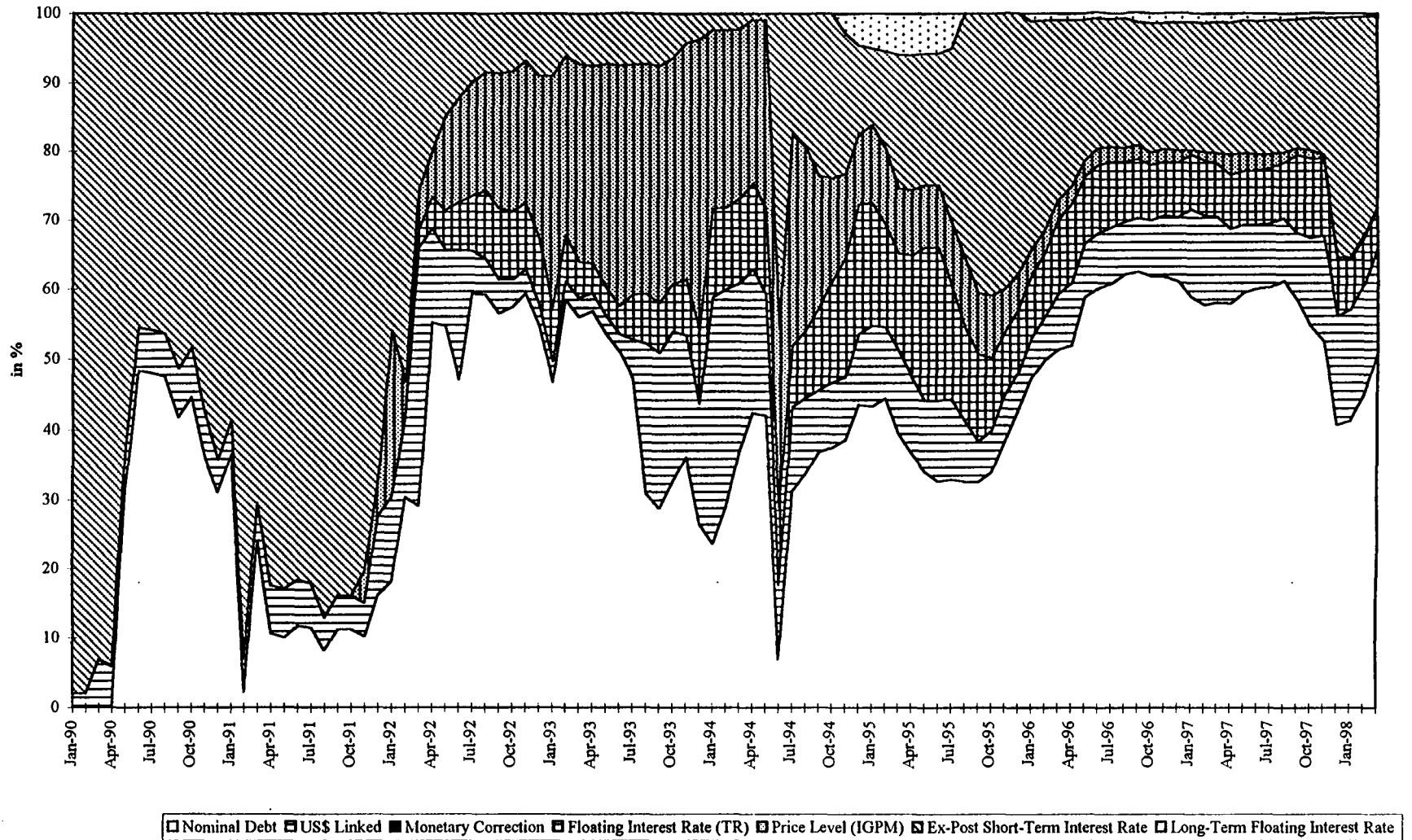


Figure 7 B
Federal Securities - Composition 1990/97

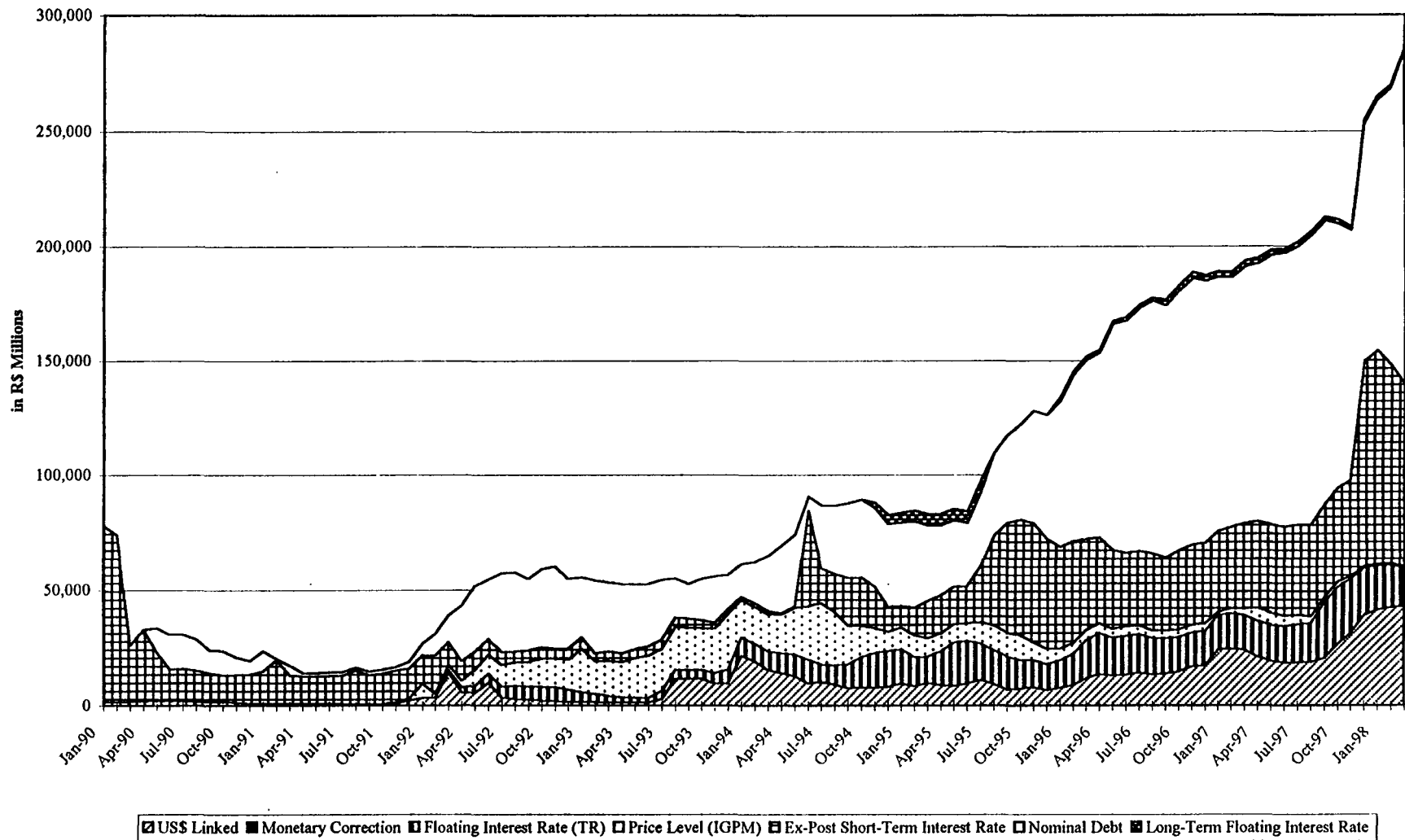


Figure 8
Average Maturity & Inflation 1977/96

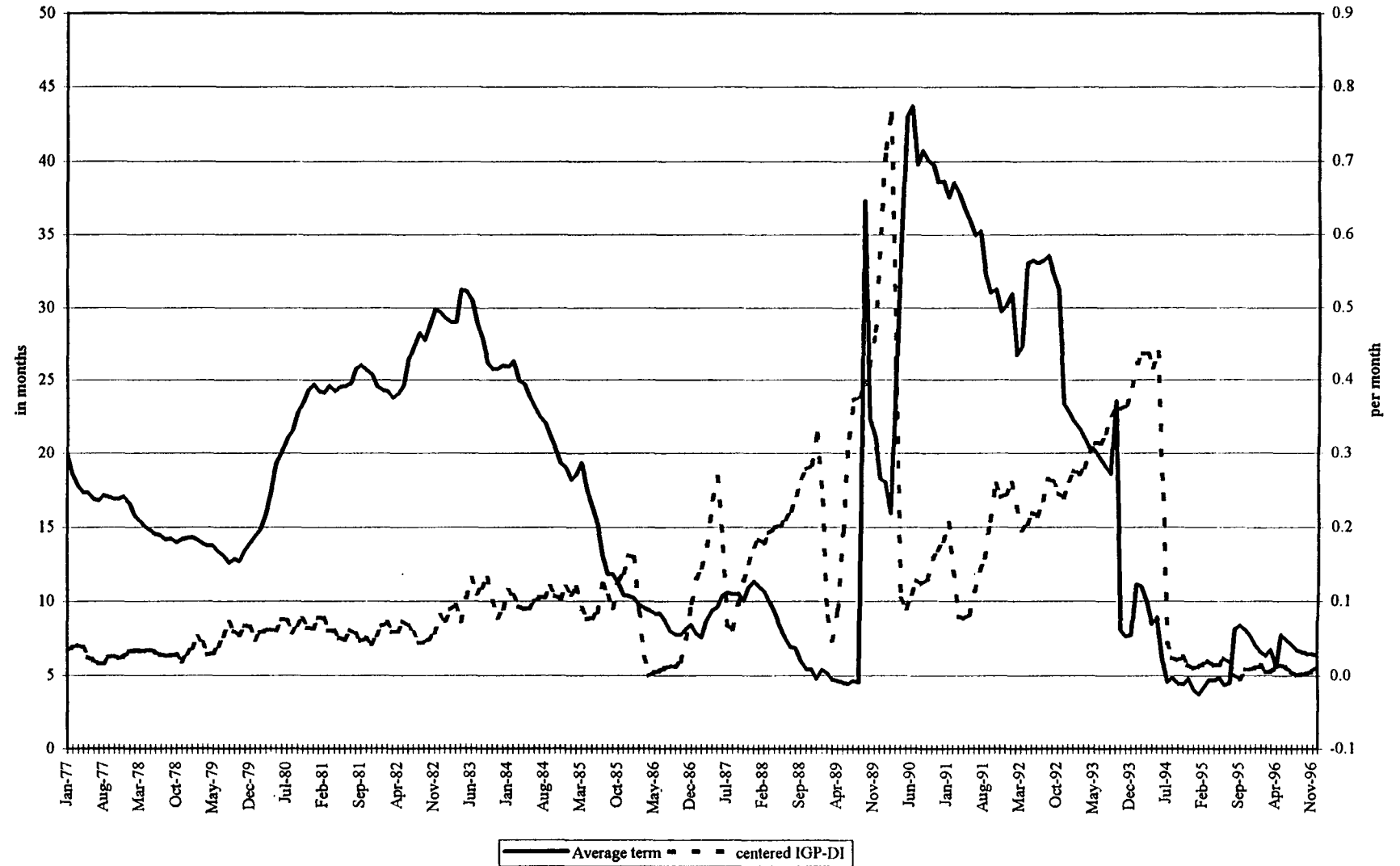


Figure 9
Domestic net effective federal debt and foreign reserves accumulation

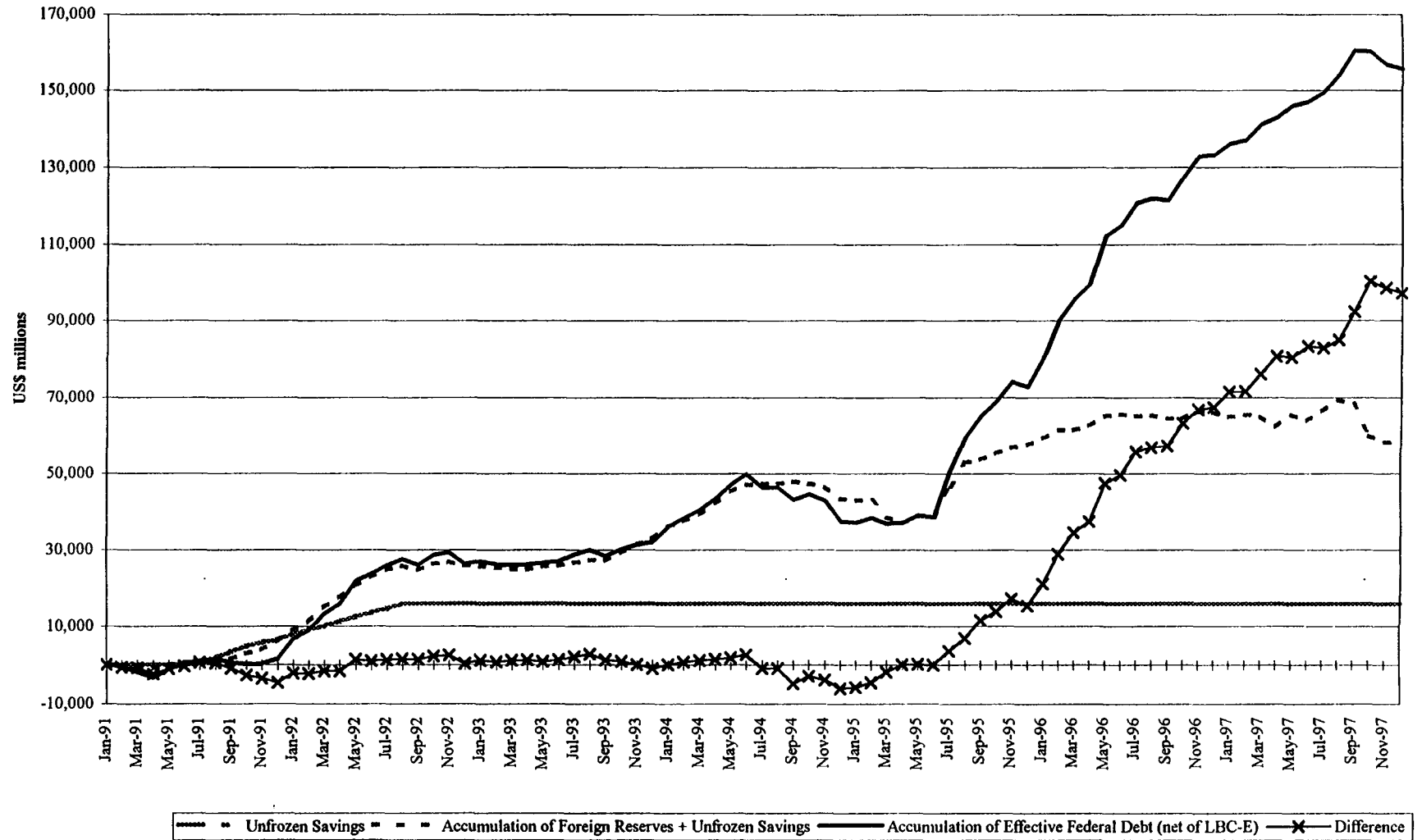


Figure 10
Evolution of the ratio OTN / Price (official inflation)

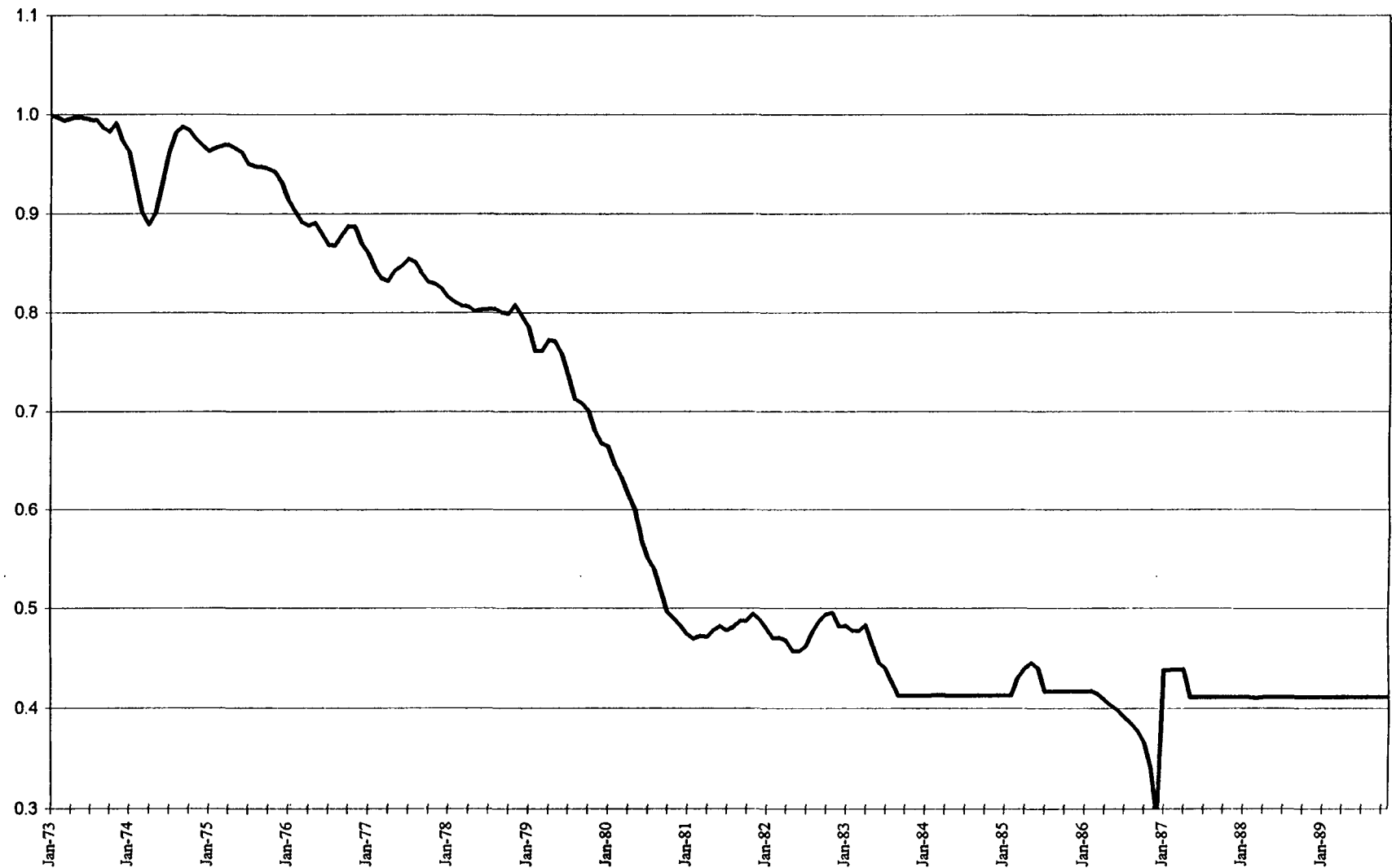


Figure 11
Public Debt Redemption

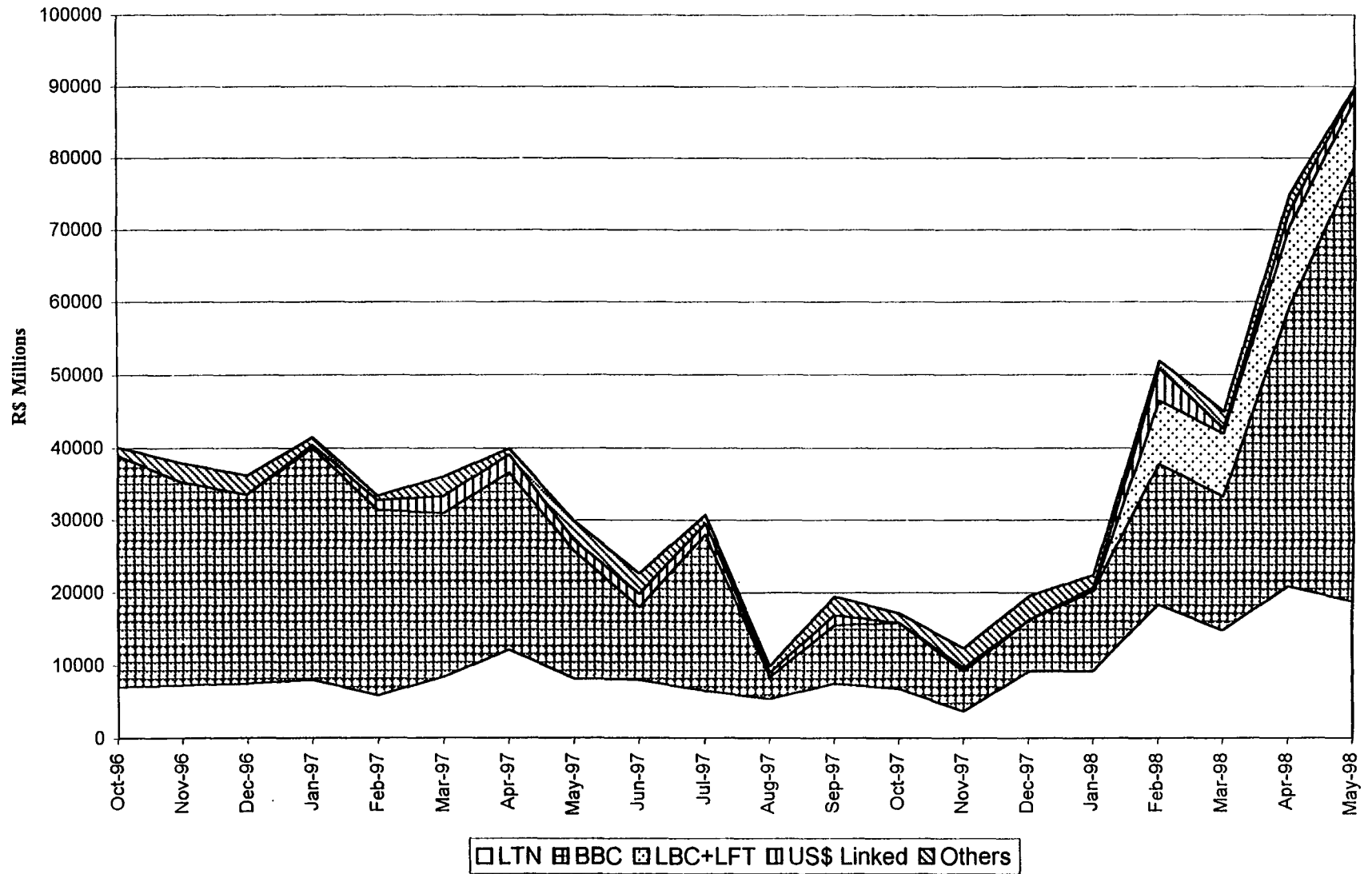


Figure 12
Public Debt Placement

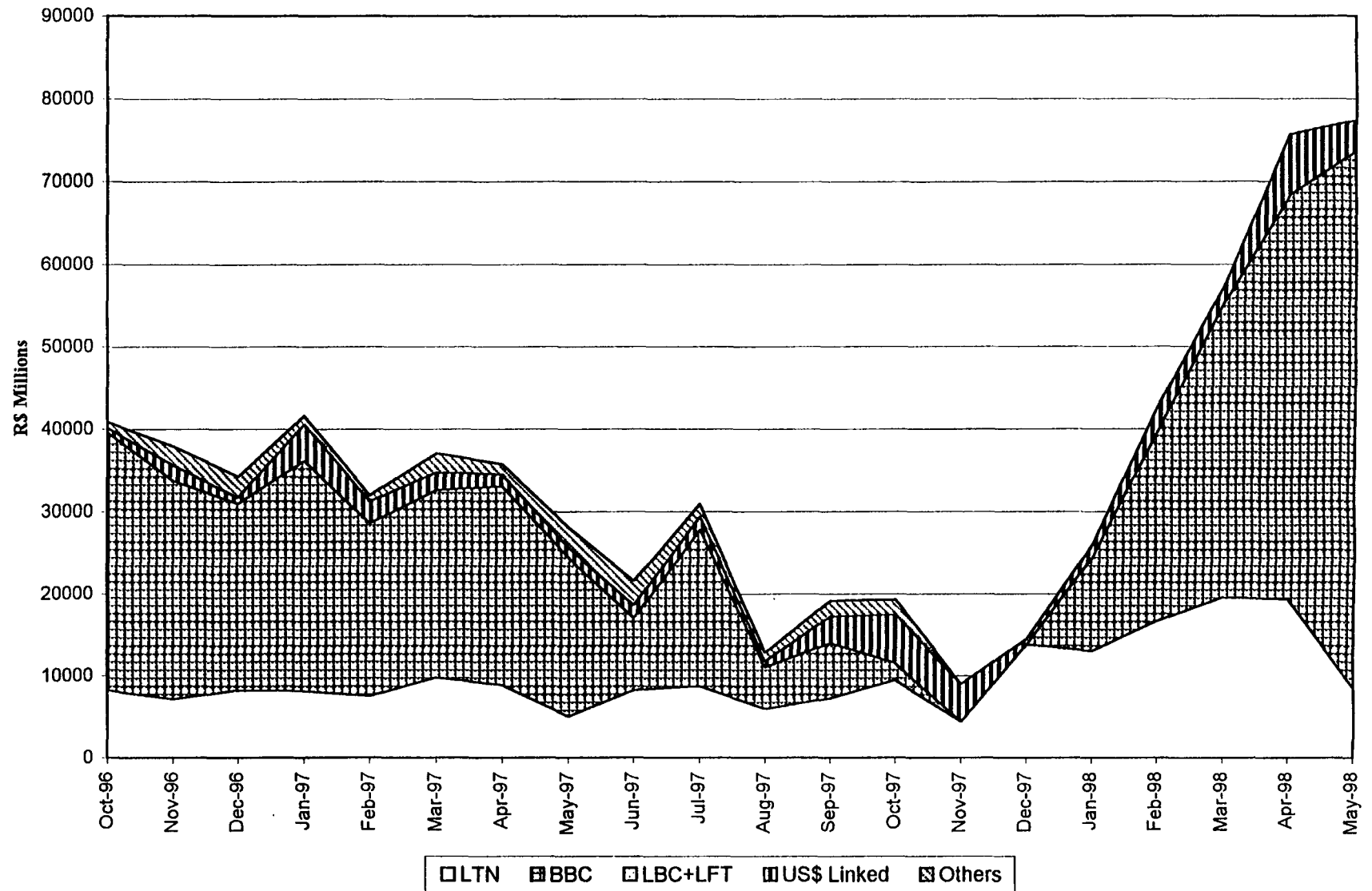
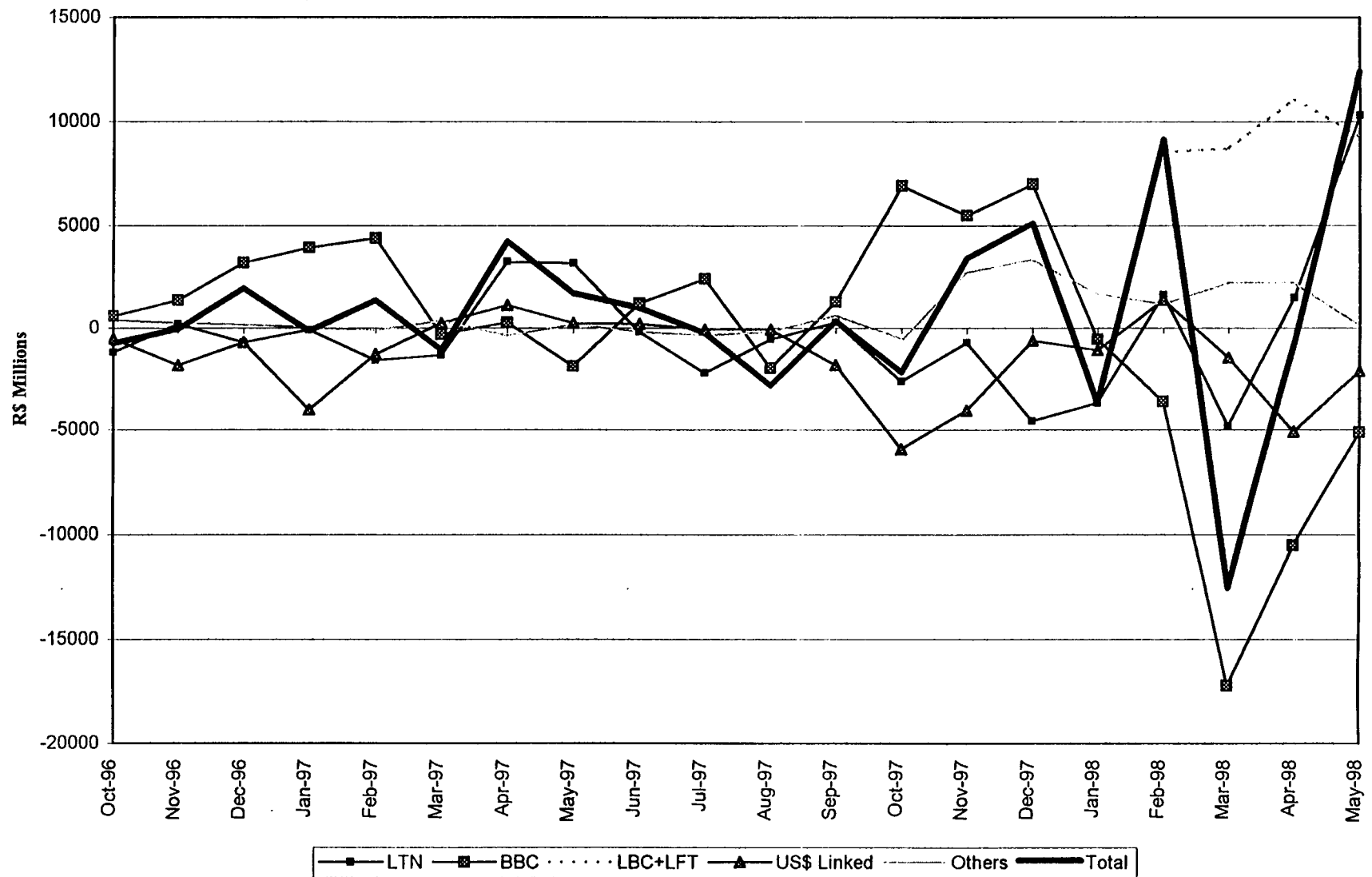


Figure 13
Public Debt Balance (Redemption - Placement)



Public Debt Auctions: LTN and BBC- 1997.2

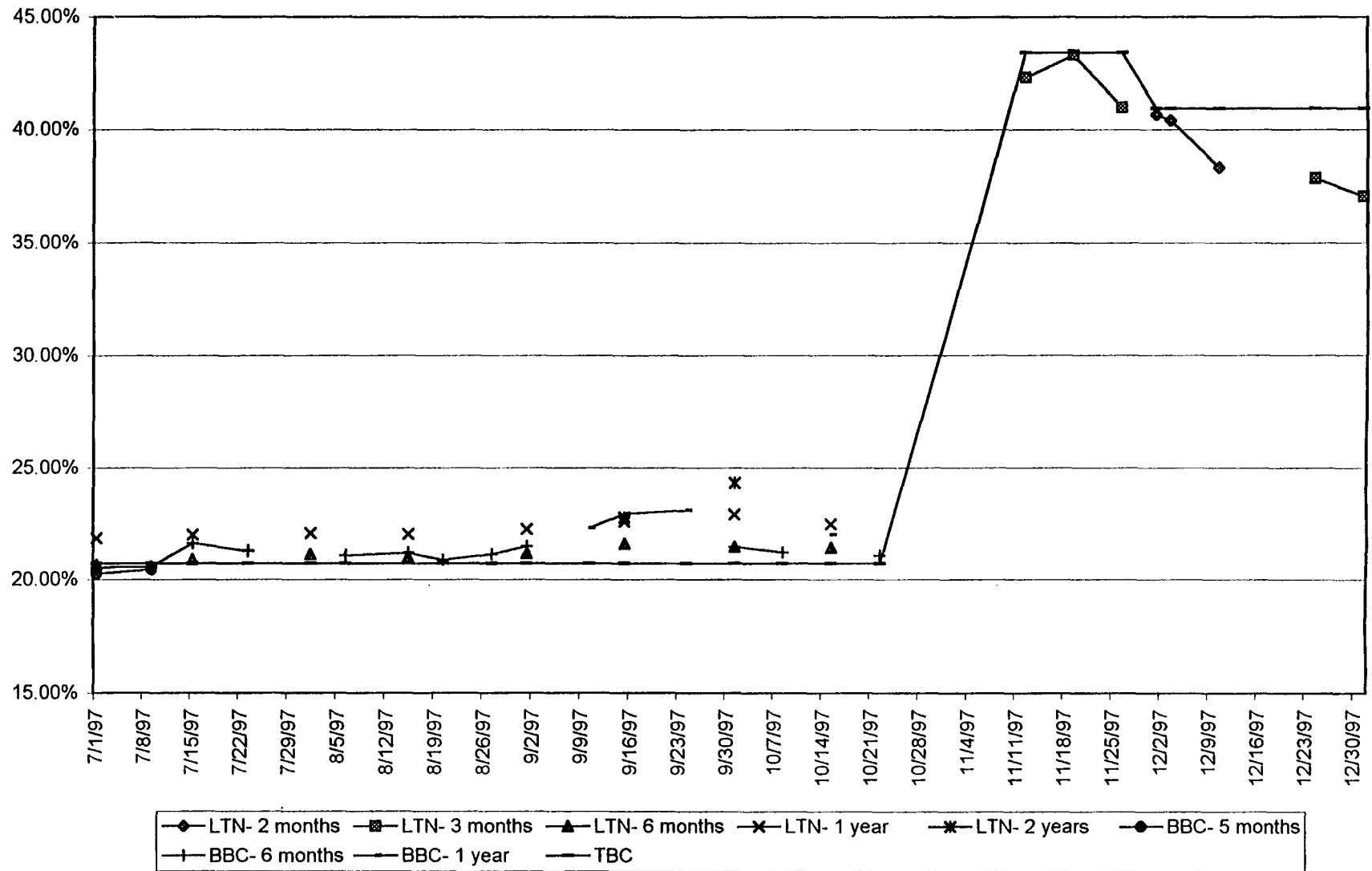
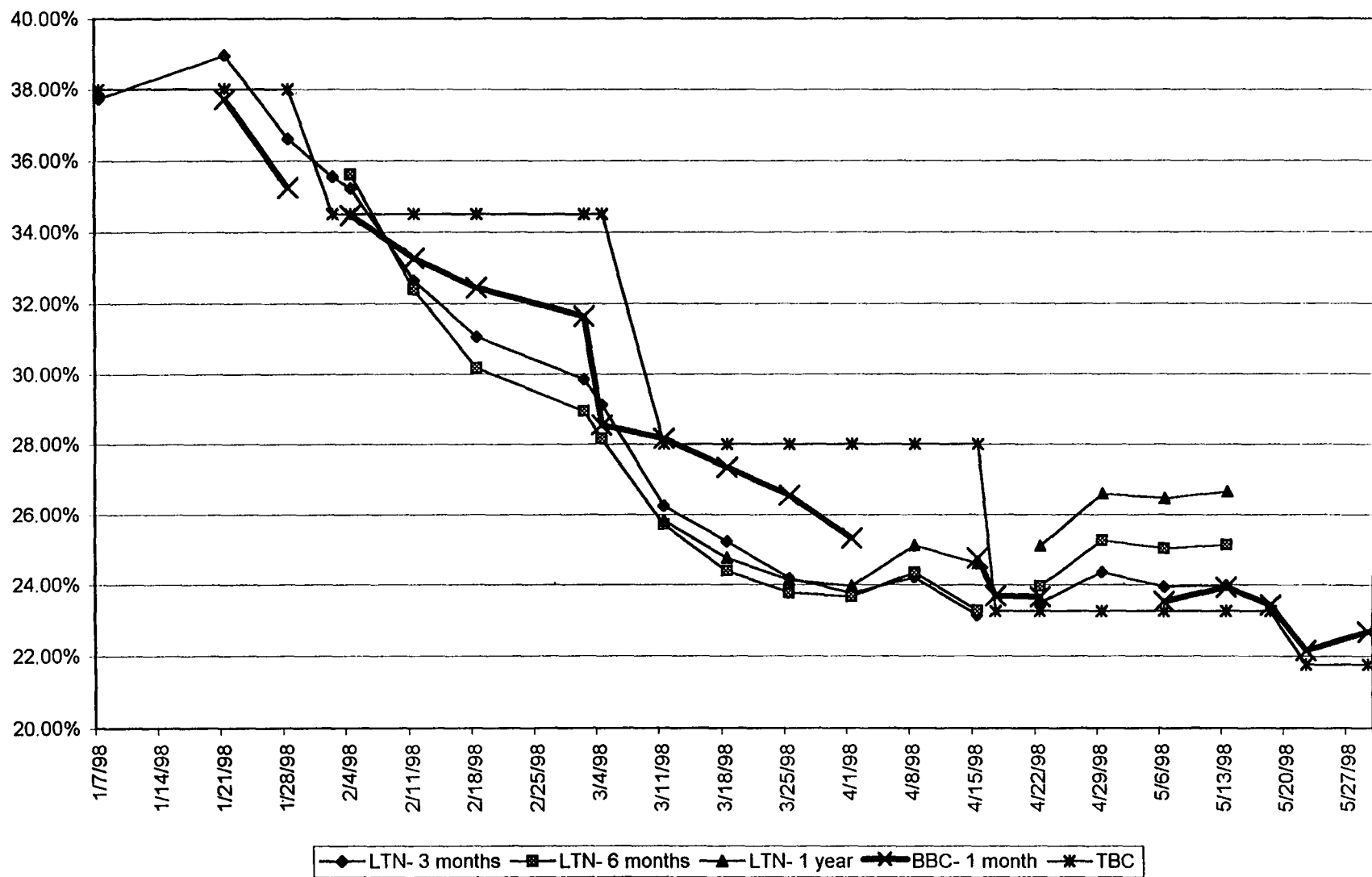


Figure 15
Public Debt Auctions: LTN and BBC- 1998.1



The swap rates are from monday

Figure 16
3 Months

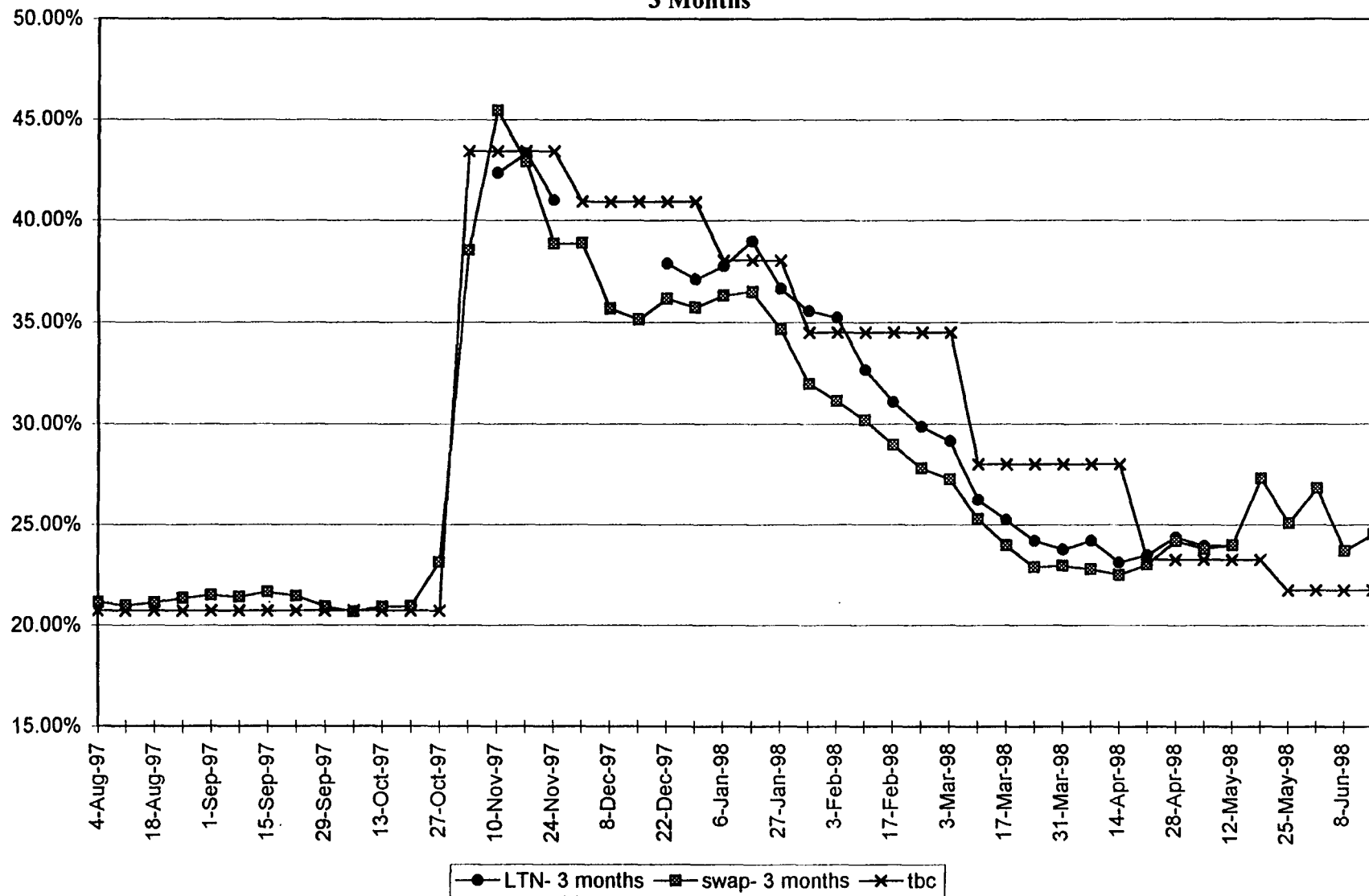


Figure 17
6 Months

The swap rates are from monday

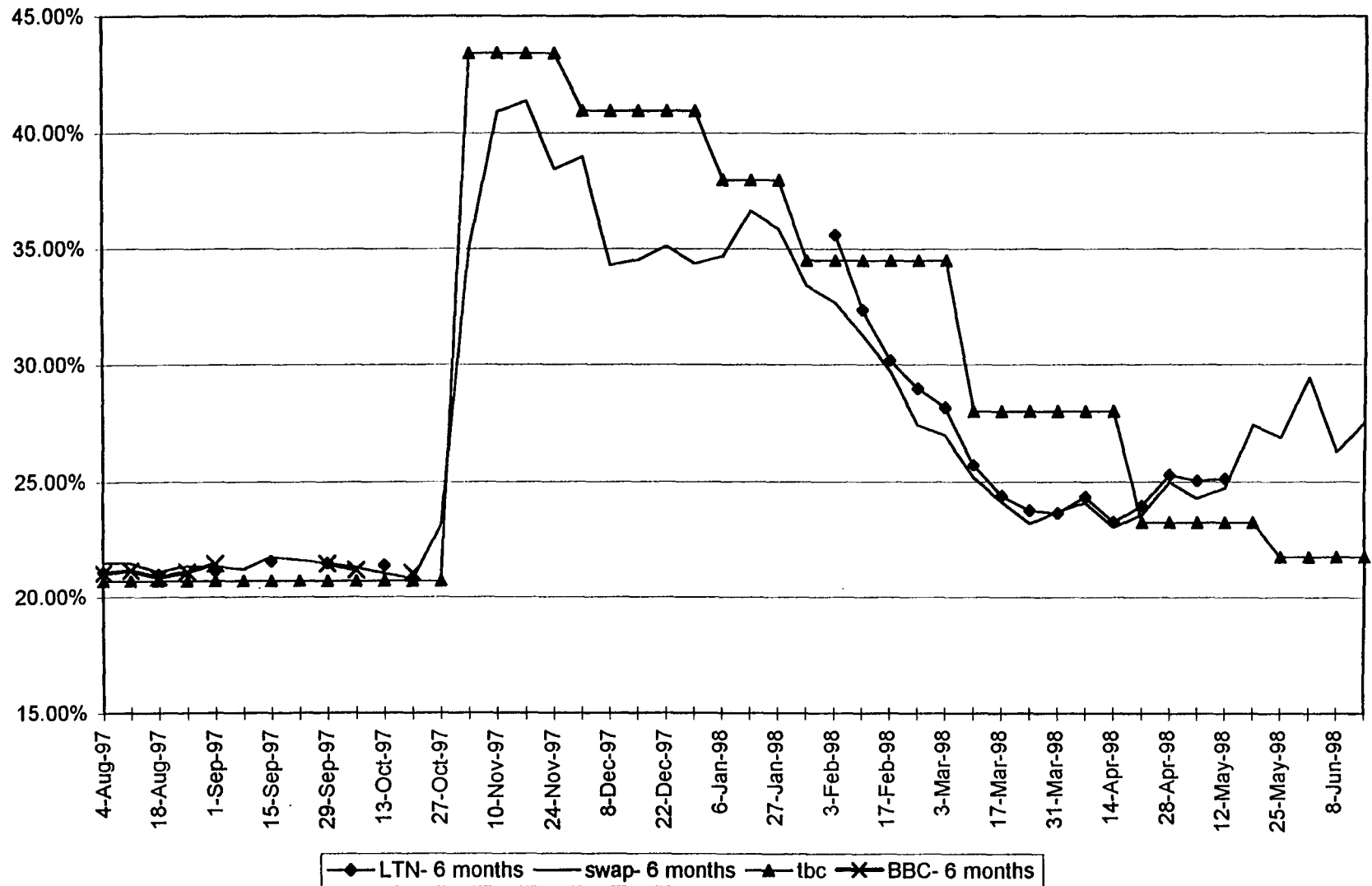


Figure 18
1 year

The swap rates are from monday

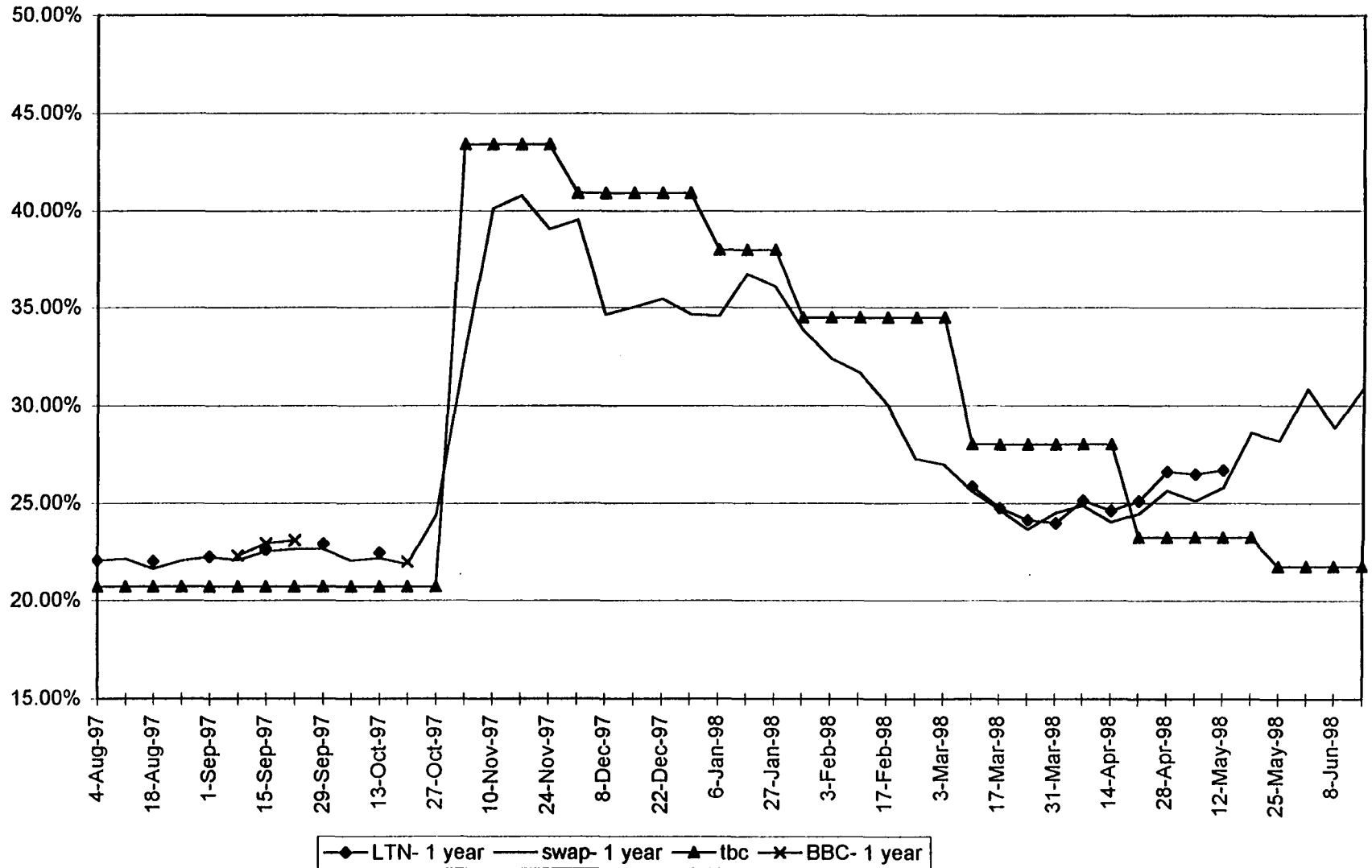
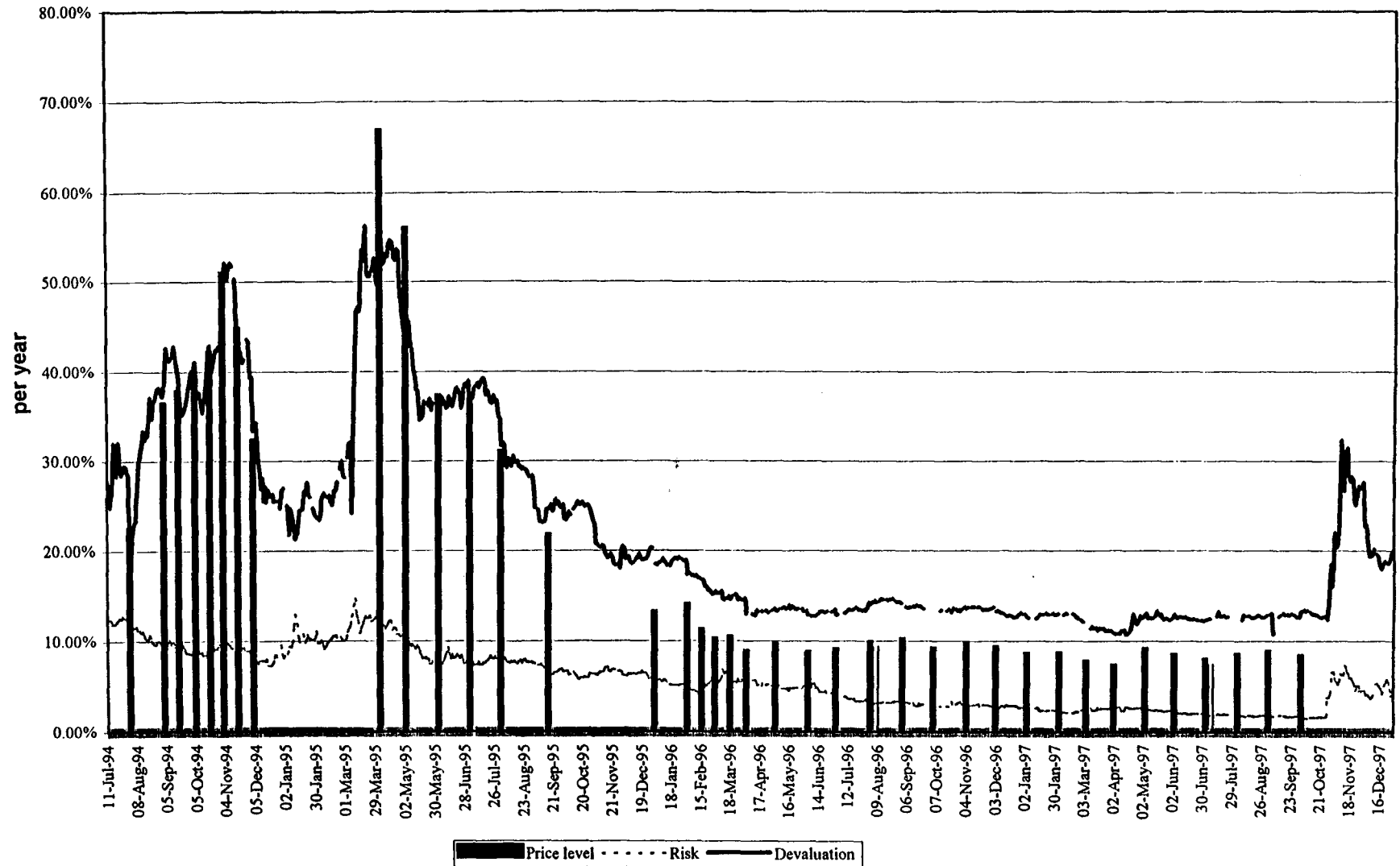


Figure A
Price Level, Risk & Devaluation





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