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Debt Management in Brazil

Evaluation of the *Real* Plan and Challenges Ahead

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In 1994–98, Brazil's domestic debt grew very rapidly while remaining short in maturity. The main policy recommendations for managing this domestic debt situation: maintain a tighter fiscal stance and consider the use of inflation-linked bonds.

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Summary findings

Brazil's domestic debt has posed two challenges to policymakers: it has grown very fast and, despite progress, remains extremely short in maturity.

Bevilaqua and Garcia analyze Brazil's experience with domestic public debt management, searching for policy prescriptions for the next few years.

After briefly reviewing the recent history of the country's domestic debt, they decompose the large rise in federal bonded debt in 1995–98, searching for its macroeconomic causes. The main explanations: extremely high interest payments (caused by Brazil's weak fiscal stance and quasi-fixed exchange rate regime) and the accumulation of assets (especially obligations of Brazil's states).

Simulations of the net debt path for the near future underscore the importance of a tighter fiscal stance to prevent the debt-to-GDP ratio from growing further.

The authors' main policy advice is to foster and rely more on inflation-linked bonds—the least harmful way to lengthen debt maturity.

This paper—a product of the Brazil Country Office, Latin America and the Caribbean Region—is part of a larger effort in the region to assist in better management of Brazil's domestic debt. Copies of the paper are available free from the World Bank, 1818 H Street NW, Washington, DC 20433. Please contact Suman Bery, room I4-173, telephone 202-458-5178, fax 202-522-3130, email address sbery@worldbank.org. Policy Research Working Papers are also posted on the Web at www.worldbank.org/research/workingpapers. July 2000. (49 pages)

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Debt Management in Brazil:

Evaluation of the Real Plan and Challenges Ahead

by

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Executive Summary

During the 1995 to 1998 period, the net public debt of the consolidated public sector in Brazil increased from 28.5 percent to 42.6 percent of GDP. This dramatic growth has raised many doubts about the sustainability of the current economic policy in the country. These concerns have been further increased by the exchange rate devaluation of January of 1999, which raised even more the stock of the domestic public debt--due to the existence of dollar-linked indexation clauses on part of the debt--, as well as the stock (in R$) of the foreign debt. The concerns about sustainability have been compounded by those related to the very short maturity of the domestic public debt, which increased the vulnerability of the country

In this paper we assess the experience with public debt management in Brazil in recent years, attempting to evaluate its main lessons and derive policy guidelines for the next few years, with emphasis on the issues pertaining to the structure of the debt (denomination, indexation and maturity). We review in Section II the genesis of the modern domestic public debt market in Brazil. After being conceived in the second-half of the sixties as a non-inflationary instrument of public finance, and based, initially, entirely on inflation-linked bonds, the public debt market expanded substantially in its early years, generating for a while a seemingly costless way to fund public expenditures. During the 1980s, with the rise in inflation, cash management activities became predominant in the debt market. Since then, the maturity of the public debt has been remarkably short. With inflation stabilization, the debt has been gradually lengthened while nominal bonds became more prevalent, even when total debt was growing fast due to fiscal deficits. The international financial crises since 1997 changed that trend in the debt structure. As of October, 1999, the share of nominal bonds is only 11.55%, while the average remaining life of the debt is still very short.

Section III decomposes the large rise in federal bonded debt during 1995-1998, searching for its macroeconomic causes. It attempts to quantify the contraction and expansion sources of the rapid increase in the stock of federal bonded debt occurred during the period. The main culprits are the weak fiscal stance, and the very high interest rates and associate payments. In Section IV we perform simulation exercises of the public net debt path until 2002, the final year of the current presidential term. We show that even under favorable macroeconomic conditions the evolution of the public net debt to GDP ratio will remain a policy concern in coming years. Policy conclusions are summarized in Section V, where we discuss the role of public debt management in Brazil in the near future. Our main policy advice is that the rollover of the domestic public debt should be made with inflation-indexed bonds, in order to lengthen the maturity without creating time consistency problems. We add a few suggestions on how this shift could be accomplished.

I. Introduction[1]

From 1995 through 1998, the net public debt of the consolidated public sector in Brazil increased from 28.5 percent to 42.6 percent of GDP. This dramatic growth has raised many doubts about the sustainability of the current economic policy in the country. These concerns have been further increased by the exchange rate devaluation of January of 1999, which raised even more the stock of the domestic public debt, due to the existence of dollar-linked indexation clauses on part of the debt, as well as the stock of the foreign debt (in Reais). The concerns about sustainability have been compounded by those related to the very short maturity of the domestic public debt.

In this paper we assess the experience with public debt management in Brazil in recent years, attempting to evaluate its main lessons and derive policy guidelines for the next few years, emphasizing the issues related to the structure of the debt. Section II discusses the evolution of the domestic bonded public debt since 1970, with an emphasis on volume and composition (indexation and maturity) during the Real Plan. Section III decomposes the large growth observed in the federal bonded debt during 1995-1998, searching for its macroeconomic causes. It attempts to quantify the contraction and expansion sources of the rapid increase in the stock of federal bonded debt that occurred during the period. In Section IV, we simulate paths of the net public debt until 2002, the final year of the current presidential term. We show that even under favorable macroeconomic conditions the evolution of the public net debt to GDP ratio will remain a policy concern in coming years.

[1] We acknowledge the World Bank's initiative in commissioning and financially supporting this study. All views in the paper are those of the authors. We thank Suman Bery, Clemente del Valle, Xin Zhang, and Eriko Togo for comments and Áureo de Paula, Debora Masullo, Marcelo Rezende, Roberto Cohen and Tatiana Didier for superb research assistance. All errors are ours.

With the previous sections as background, Section V concludes the paper with a policy analysis of public debt management in Brazil in the near future. Our main policy advice is that the rollover of the domestic public debt should employ inflation-indexed bonds, in order to lengthen the maturity without creating time consistency problems.

II. Domestic Bonded Debt[2]

II.1. Historical background (1970-1994)

The beginning of the existing market for domestic public debt in Brazil was the financial reforms introduced by the military government in the second half of the 1960s. Those reforms envisaged three big measures to solve the inflationary problem of the previous ten years (inflation rose from 15% to 80% a year between 1955 and 1964): the creation of marketable public securities to finance fiscal deficits; the creation of the Central Bank; and the adoption of a banking system with a clear-cut separation between commercial banks and non-bank institutions.

Figure II.1—Federal Bonds: 1970-1999—displays the evolution of the total federal government debt, separating the Central Bank holdings of government debt from the outstanding debt held by the private sector. During the high inflation years--from the early eighties to the mid-nineties--there had been a widening of the fraction of the public debt held by 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

[2] This Section draws heavily on Bevilaqua, Carneiro, Garcia, and Werneck (1999).

the automatic provision of liquidity to banks' holdings of public debt. This situation stood in marked contrast with the stated objectives of the reforms. Nevertheless, the objective of institutional development of a market for government debt, which had been stated in the financial reforms of 1964-5, had been attained.

The domestic public debt market in Brazil started with indexed bonds in the late sixties. Only in August, 1970, nominal bonds unindexed were placed (for the stated purpose of conducting monetary policy).[3] Indexed bonds (ORTNs – Obrigações Reajustáveis do Tesouro Nacional) were seen by asset holders as a hedge against inflation-induced erosion of financial wealth despite 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.

Without indexed bonds, the financial markets would not have developed as they did in the face of the accelerating annual inflation from 1973 to 1994. Figure II.2—Federal Bonded Debt Structure: 1970-1999—displays the remarkably mobile structure of the Brazilian domestic public debt.

During the infancy of the public domestic debt market (1966-1971), the demand for public debt grew ahead of the government's immediate financing needs. A large stock of public domestic debt was deemed convenient for regulating short-run liquidity of the banking system, by means of final sales and purchases of public debt in the open market. As in "Say's law", however, the possibility of creating a large debt supply opened room for the creation, in the Central Bank, of a wide range of credit programs designed to fund

[3] Simonsen (1995).

agricultural projects and regional development, and has fostered the establishment of regional development banks at the state level. The excess demand for public bonds in the early years of the market led the Central Bank to assume the role of a financing agent,[4] an aberration that lasted for years. The development strategy of the 1970s was based in great measure on the public sector's ability to issue debt to fund development projects.

By the late 1970s and early 1980s, it became clear that this growth engine had stalled. The decade witnessed high and unstable inflation, which led to a considerable increase in the volatility of the expected returns on government debt due both to a decline in the use of public savings and to frequent changes in monetary correction rules (i.e., partial disguised defaults). The 1980s were called the lost decade, due to the economic stagnation, the megainflation, and the decline in public, as well as private, investment. As a consequence, the accumulation of public debt seemed to be approaching the end, and, by the turn of the decade, a default on domestic public debt was seen by many as an unavoidable outcome.

In fact, the new government that took office in 1990 decreed the blocking of 80% of all financial assets. The terms of the decree were actually complied with, and the government was able to unblock all the financial assets beginning 17 months later, in 12 monthly installments. During 1993-4, capital inflows added to the demand for high-yield public debt, creating a more stable environment that made the Real Plan possible.

[4] For many years the Brazilian Central Bank had a director in charge of Agricultural Development (sic).

II.2. Recent Evolution: The Real Plan

In July 1994, a new currency, the Real, was introduced, as the last part of the de-indexation program. Both the debt structure and size changed in important ways after the monetary reform, as the annual inflation rate fell from a four-digit figure to a one-digit figure. Until the Asian crisis (October, 1997), foreign capital kept flowing in steadily, and the domestic public debt market experienced a period of gradual maturity lengthening due to decreasing yield volatilities. Since the last quarter of 1997, a series of ups and downs has characterized the international finance scene for the emerging markets,[5] also affecting the domestic public debt market. After a semester when more than US$45 billion of foreign reserves vanished, the Brazilian government decided to float the Real in January, 1999, thereby inaugurating a new phase of the Plan. We analyze below the debt accumulation process since the introduction of the new currency, the Real, emphasizing debt size and structure (indexation and maturity).

II.2.1. Size

The extremely fast increase of the federal bonded debt during the Real Plan was one of the more ominous macroeconomic indicators. Figure II.3 displays the evolution of the federal bonded debt in constant R$ of April, 1999, and as percent of GDP. It is quite clear that, after remaining stable during the first year of the new currency (July-94 to June-95), both measures of debt accumulation started trending upward. As a percent of GDP, the federal bonded debt almost quadrupled in less than four years! Section III identifies the factors responsible for this enormous growth.

II.2.2. Composition

This section analyzes the structure of the domestic debt, i.e., its composition: denomination of the debt (domestic currency vs. foreign currency), indexation (to domestic price levels, to the exchange rate, to short-term interest rates, etc.), and maturity structure. We also explore new measures of risk exposure, as the V@R (Value-at-Risk).

II.2.2.1. Denomination and Indexation

All domestic federal bonded debt is redeemable only in R$. Only the external debt is redeemable in foreign currency. Figure II.4 displays the federal debt composition after the Real Plan. It is clear that when the debt started trending upwards in mid-1995, it was the nominal (non-indexed) part that was mainly responsible for the growth. Notwithstanding the increasing share of nominal in total debt, average maturity kept lengthening. Barcinski [1997] computed a measure of risk usually applied to financial institutions portfolios the V@R (Value-at-Risk) for the nominal federal debt. The V@R measures the amount of market risk of a given portfolio, i.e., the maximum expected loss of that portfolio in a given time span.[6] He showed that, notwithstanding the increase in the nominal debt and its maturity lengthening, the V@R of the nominal debt actually decreased for the first years of the Real Plan (he analyzed 1994-1996). That reflected the fact that interest rate volatility was decreasing substantially, except for the first semester of 1995, when it increased momentarily as a consequence of the Mexican crisis. This fall in interest rate volatility is displayed in Figure II.5.[7]

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[5] Since 1997, all first semesters have been good ones, and all second semesters have been bad ones for the emerging markets. It is a general hope that the spell will be broken this year.
[6] For a detailed description of the V@R methodology, see Jorion [1997].
[7] Adapted from Barcinski [1997].

The share of nominal to total debt remained around 30%- 40% between July 94 and November 95, when it started to grow, reaching 60% around mid-96. That share was maintained until the Asian crisis, in September, 1997, when it started to drop. Until the Russian crisis, in May, 1998, the nominal debt share was still above 50%, despite the precipitous fall in average maturity. With the Russian crisis, the Treasury and the Central Bank started to issue only indexed debt (for reasons that will be analyzed later), and the nominal debt share fell to 3.5% in December 1998.[8] After the nomination of the new Central Bank governor, in March 1999, this share has been increasing again.

The share of bonds indexed to the IGP-M (a widely used price index) decreased continuously during the whole period. According to Central Bank sources, this reflected a policy decision to stop issuing inflation-linked bonds, which were deemed inflationary.[9] Dollar-linked bonds remained at around 10% of the total debt between July 94 and August 95, falling then slightly to around 7% of the total between September 95 and February 96. With the deterioration of the economic situation in Asia, these increased once again to reach 15% at the end of 1997. That share rose throughout 1998 to around 21% at year-end, showing that agents were (correctly) hedging against the predicted devaluation. The devaluation of January 13, 1999, and the continuous depreciation after the currency was floated two days later, increased the value of the dollar-linked debt *vis-à-vis* the other

[8] When commenting on the changes in composition, we will often refer to what we think caused those changes (supply-driven or demand-driven changes). Of course, we are aware that we only observe equilibria data, i.e., the intersection between a supply and a demand curve. Therefore, statements such as the ones we offer would actually need careful studies of econometric identification conditions in order to be verified. Nevertheless, we will often take a stab on what caused the composition changes: a change in demand, a change in supply, or both.

[9] See previous footnote. In the beginning of the Real Plan the government was fighting several forms of mandatory indexation. It is quite natural to think that courts would be more likely to uphold previous mandatory indexation clauses for wages or other sources of income if the government itself had kept inflation indexation for some of its debt instruments. Apart from this indirect effect, we see no relation between the existence of inflation-linked bonds and inflation, (see the policy discussion.)

bonds. The share jumped to 30% after the devaluation, but has fallen, since, as the demand for new issues of dollar-linked bond has diminished considerably and the currency appreciated after March, 1999. With the new round of depreciation that started in May, 1999, the demand for dollar-linked debt (or any hedge against the depreciation) has been increasing again, forcing the Central Bank to supply more of this kind of debt[10].

The share of bonds indexed to the short-run interest rate (or zero-duration bonds)[11] was around 25% of the total debt between July 94 and July 95, 35% between August 95 and February 96, falling to approximately 20% in November, 1997. In December, 1997, a large issue of this kind of bonds distorted all debt-statistics. Around R$ 50 billion of bonds were issued as part of a renegotiation deal with the Brazilian state of São Paulo,[12] making the share of zero-duration bonds jump to 35%. After that, as those bonds were swapped with the Central Bank for shorter-maturity ones, their share fell gradually to 21% in May, 1998, when the beginning of the Russian crisis made the Central Bank and the Treasury change strategies regarding the issuance of nominal bonds. As mentioned before, the issuance of nominal bonds stopped, and only zero-duration bonds started being issued. That move made the share of the latter jump from 21% in May to 42% in June. By December, 1998,

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[10] A current important policy issue is how much dollar-linked debt (or other kinds of exchange-rate-risk hedges, as future contracts) should the government provide in the current floating exchange rate regime.

[11] The bond indexed to the short-run interest rate is 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 the high inflation and daily indexation conditions prevalent when it was created (1985). It would be equivalent to a bond whose nominal value is accrued every day by the daily accrual of the Libor. This is the closest one can get to perfect indexation in fixed income markets. It corresponds to a bond of duration zero (that being the reason why we call this type of bond **zero-duration bond**), since it does not suffers practically no loss in its value when interest rates go up. These bonds were widely used in times of high uncertainty, as, for example, the crossover to the Cruzado Plan in 1986. On the other hand, monetary policy has a very limited **wealth** effect, since rises in interest rates do not affect the value of the private financial wealth in these fixed income securities (see Pastore, 1996).

[12] These bonds were also of a much longer maturity than the average prevailing at the time, fact which will also distort the average-maturity statistic for December, 1997, as we will analyze in the next Section.

the zero-duration bond share was almost 70%. It fell in January due to the increase in value of the dollar-linked bonds, and it kept falling later as the issuance of nominal bonds resumed after March, 1999. As of September, 1999, its share was hovering around 60%.

II.2.3. Maturity Structure

Figure II.4 shows the average maturity of the debt during the Real plan. The average maturity of the total debt has substantially increased in relative terms although it remains quite low in absolute terms.[13] As already commented above, it is nonetheless interesting that until the Asian crisis (September, 1997), maturity kept increasing despite the increasing share (and total value) of the nominal debt.[14] As noted before, until 1996, Barcinski [1997] showed that, the V@R (value-at-risk) of the nominal debt decreased despite the size increase and the maturity lengthening. In other words, investors in public debt were not incurring more price risk, despite the increase in the portfolio size and in the nominal debt maturity.

With the international financial crises, this virtuous circle came to an end. 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% (see Figure II.6). After two weeks without public debt auctions, the rolling over continued with three-month-maturity bonds, at rates little below the TBC.

[13] When talking about debt maturity with foreign economists, we, Brazilian economists, sometimes cause some confusion because of different measures. We use "months" as the measure, while the former use "years". The same used to happen with inflation measures before the Real Plan. We used "% per month", while everyone else was used to "% per year". One hopes that soon we will able to follow the world convention!

In that environment, the Treasury and the Central Bank probably did not want to issue long maturity debt. An interest rate of 43% per year (with the inflation rate well below 5% per year and an exchange-rate devaluation of 7.5% per year) is clearly unsupportable in the long run, being sustainable only briefly to counteract a speculative attack. Therefore, had the Treasury and the Central Bank decided to place one or two year bonds at such a high rate, they could conceivably have sparked a panic, because of the informational content of such move. Placing debt at 43% for short periods might be desirable, but paying such high rates for long periods puts the government budget on a clearly unsustainable path. That could then trigger expectations of a government default. In other words, in such a situation, there may be no equilibrium with such a high interest rate and long maturity.[15] The only equilibrium may be the one with very short maturity bonds. An 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] That rollover strategy had the effect of decreasing the maturity of the stock of debt. Figure II.6 shows that interest rate volatilities increased tenfold during this turbulent period. As a consequence, so did the V@R measures.

Until the end of 1997, only three-month maturity bonds were placed, all with negative maturity *premia*. During the first five months of 1998, the Treasury and the Central Bank were able to place nominal debt with increasing maturity. However, when the Russian crisis first hit in May 1998, even short-term bonds (three or six months) became extremely

[14] The jump in average maturity that occurred in September, 1997, is a mistake. The Central Bank is trying to correct that statistic. We will replace the Chart when the correct data are ready.

[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.

costly for the issuers, as yields rose substantially. As a consequence, 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 (a nominal bond issued by the Central Bank). In June and July, even that became too expensive, and the Central Bank resorted to its last resource, the zero-duration bond.

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 was happening until May 1998. The amounts of monthly redeemed and issued debt tripled! This, of course, created a new source of risk, that of not being able to roll over the debt in the event of a crisis, with possible impact on the exchange-rate anchor that was in place at the time. After May, due to the strategy of placing only indexed bonds (mostly zero-duration and dollar-linked), average maturity resumed its upward trend, and the rollover risk decreased. However, this happened at a cost: if interest rates had to be lifted in the future, the fiscal budget would be badly hit. The same was valid regarding a devaluation. With the benefit of hindsight, we know now that both strategies caused massive losses to the federal budget.

Even with zero-duration debt, average maturity fell again in the last quarter of 1998, due to the contagion effect of the Russian default. After the devaluation, maturity has been increasing (see Figure II.4). However, if the government were now to decide to quickly change the current debt structure in favor of nominal debt, either a fall in maturity or a substantial cost increase in debt service would be likely, as we will discuss in Section V.

III. Evolution of the Gross Domestic Bonded Debt during the Real Plan: a Decomposition Exercise

During the four years of President Fernando Henrique Cardoso's first term, the federal bonded debt increased to more than five times its original value; from R$ 60 billion to R$ 323 billion.[17] This spectacular debt growth raises many questions about the sustainability of economic policy, especially if one considers the effects of the exchange-rate devaluation in January of 1999, which increased even more the service costs of federal bonded debt, due to the existence of dollar-linked indexation clauses on part of the debt.

This Section decomposes the federal bonded debt growth, searching for the macroeconomic causes of the huge growth that occurred in 1995-1998. We attempt to quantify the contraction and expansion sources of the federal bonded debt.

Consider the federal government and Central Bank aggregate balance sheets in 12/31/94 and 12/31/98, respectively. One of the accounts on the liability side is the federal bonded debt. The value we are interested in explaining is the difference between this account's balances on these two dates. Due to accounting identities, this value is the sum (with opposite sign) of the differences during the period of all the other accounts' balances. Consequently, by aggregating these other accounts' balances in a way amenable to our macroeconomic analysis, we measure the factors responsible for the growth of the federal bonded debt in this four-year period. The idea of this decomposition exercise can be better understood with the accounting framework provided in Table III.1. The table starts from

[17] These numbers obtained great repercussion in the press. The headline of the 2/13/1999 edition of the São Paulo's daily newspaper *O Estado de São Paulo* was **The public debt increased 424% in FHC term**.

the government budget constraint, and works to develop an accounting identity (equation (6)) that is amenable to identifying the sources of the growth of federal bonded debt.

TABLE III.1. DEBT USES: A DECOMPOSITION

(1) NET DEBT = LIABILITIES - ASSETS

(2) Δ (NET DEBT) = Δ (LIABILITIES) - Δ (ASSETS)

(3) Δ (NET DEBT) = PRIMARY DEFICIT + INTEREST PAYMENTS + ADJUSTMENTS

(4) Δ (LIABILITIES) = Δ (DOMESTIC BONDS) + Δ (OTHER DOMESTIC DEBT) + Δ (FOREIGN DEBT)

(5) Δ (ASSETS) = Δ (DOMESTIC ASSETS) + Δ (FOREIGN ASSETS)

(3), (4), (5) ⇒ (2), and solving for Δ (DOMESTIC BONDS)

SOURCE OF FUNDS = USES OF FUNDS

(6) Δ DOMESTIC BONDS = PRIMARY DEFICIT + INTEREST PAYMENTS + ADJUSTMENTS + Δ (DOMESTIC ASSETS) + Δ (FOREIGN ASSETS) - Δ (OTHER DOMESTIC DEBT) - Δ (FOREIGN DEBT)

Thus, we search for an explanation for the R$262,369 million variation, as shown on Table III.2, of the federal bonded debt (federal government + Central Bank).

TABLE III.2. FEDERAL BONDED DEBT GROWTH: 1995-1998

	December 1994	December 1998	Variation	Percent Variation
Federal Bonded Debt (R$ Millions)	60,255	322,624	**262,369**	435.7%
GDP (R$ Millions)	537,555	912,456	374,901	69.7%
Federal Bonded Debt (% GDP)	11.2	35.4	24.1	216.1%

Initially, we will aggregate the other accounts in the federal government and Central Bank aggregate balance sheet in three groups, each one of them standing for one of the following reasons to issue federal bonded debt[18], as laid out in Table III.1.

1) To finance the federal government's (+ Central Bank's) deficit;

2) To accumulate foreign and domestic assets; and

3) To repay other previous debts (non-bonded debt).

Item #1 represents the difference in the two net worth figures (a fiscal deficit is a loss, and a fiscal surplus is a profit); item #2, the asset accumulation during the period; and item #3, the decrease in the aggregate of all other liability accounts. Thus, considering the federal bonded debt as the "sources", and the other accounts as the "uses" we can observe these uses on Table III.3 and III.4, expressed in R$ and percentage of GDP, respectively.[19]

[18] Here, we are not determining whether the debt movements resulted from the fiscal, monetary, or exchange rate policy.

[19] The total of the uses (in bold in Table III.2A) is equal to the source variation (in bold in Table III.1), both equal to R$262,369. Since this value results from a sum of nominal values in R$ during four years with significant and variable inflation, it should be used only as an accounting reference.

TABLE III.3. FEDERAL BONDED DEBT USES: 1995-1998

In R$ (Millions)	December 1994	December 1998	Variation	Percentage Variation
Net Debt (increase=deficit)	65,836	231,258	165,422	251.3%
Asset Accumulation	106,308	270,187	163,879	154.2%
Other Debts' Repayments (-)	111,889	178,822	66,933	59.8%
TOTAL			**262,369**	

In percent of GDP, the data above are:

TABLE III.4. FEDERAL BONDED DEBT USES IN percent OF GDP: 1995-1998

In percent GDP	December 1994	December 1998	Variation
Net Debt (increase=deficit)	12.25%	25.34%	13.10%
Asset Accumulation	19.78%	29.61%	9.83%
Other Debts' Repayments (-)	20.81%	19.60%	1.22%
			24.15%

Table III.3 shows the federal bonded debt variation. The greatest share of the increases in federal bonded debt was due to the federal deficit (which would be equal to the net debt variation, if it were not for accounting details discussed above). The accumulation of assets was responsible for a little bit less, 62.5% of the federal bonded debt growth. The increase in other debts was responsible for the (negative) residual factor (-25.5%), which means that if the other debts had not grown by R$ 66,933, the federal bonded debt would have increased even more. Measured as a share percent of GDP, the federal deficit was responsible for 54.2% of federal bonded debt growth of 24.15% of GDP (Table III.4). The accumulation of assets was responsible for 40.7% of the federal bonded debt growth, while

the other debts actually decreased as a percent of GDP, being responsible for the remaining 5.0% of the federal bonded debt growth.[20]

We now turn to the decomposition of each of these three factors: the federal deficit, the assets accumulation, and the repayment of other debts.

III.1 Financing of the federal government (+ Central Bank) deficit

In order to make the net debt variation of the period (R$165,422 or 13.1% of the GDP) compatible with the nominal deficits registered during the same period, it is necessary to make three adjustments. The first is to add the states', municipalities' and state-owned enterprises' net debt variation.

The second adjustment recognizes the privatization revenues. Since privatization revenues occur only once, they are not included as current revenue in the public deficit computation. Nevertheless, they are financial inflows public revenues which, *ceteris paribus*, would lower the net debt (the state-owned enterprises that were sold were not previously included in the public sector assets). Under the hypothesis that everything else stayed constant, and assuming that all the privatization revenues were used for public debt redemption, the gross debt would diminish by the exact amount of these privatization revenues. Therefore, we have to add these revenues to the variation of the total net debt in order to obtain the debt variation concept that best conforms to the public deficit statistics.[21]

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[20] In Table III.3, all figures are in R$, while in Table III.4, the figures are in percent of GDP. Therefore, given that nominal GDP grew during the four-year period, the fact that "Other Debts" increased in nominal terms, while they decreased as percent of GDP is an indication that the increases occurred more to the end of the period relatively to the decreases.

[21] In reality, the relation between privatization and public debt is much more complex for at least two reasons. The first is that when a state-owned enterprise is sold, its debts are transferred to the private sector, diminishing the net debt by a value greater than the revenue of the privatization. The second reason is that

The third adjustment is related to the "Balance Sheet adjustment".[22] The idea of this adjustment is that the macroeconomic impacts of the "skeletons" (old debts that were eventually repaid) occurred in the past. For example, the public debt issue for Banco do Brasil's recapitalization — whose accumulated losses were threatening its solvency — recognized losses derived from bad credit expansions in the past. Indeed, the debt issue was not related to deficits *during* the recapitalization period, but to *old* deficits, that had never been recognized until then. Thus, it is necessary to subtract the Balance Sheet adjustment's variation from the total net debt to obtain the debt variation concept comparable to the public deficit, namely, the "Net Fiscal Debt without Privatization".

Therefore, the following accounting identity should hold: for the fiscal statistics published by the Brazilian Central Bank.

Increase in Net Fiscal Debt without Privatization = Nominal Deficit.

Making the adjustments, we obtain:

some state-owned enterprises held public debt as part of their assets. This debt, apparently was part of the gross debt, but, since it belonged to a state owned enterprise, was not part of the net debt. After the privatization, it also became part of the net debt. Therefore the study of the relation between privatization and the public debt is still a work in progress.

[22] Footnote n^{0} 1 of Table XXI of *Nota para Imprensa* (Monetary) of *Banco Central do Brasil* defines the "Balance Sheet Adjustment"as the following:
"(basis: Dec/95) Computes the bond issues relative to the Banco do Brasil's recapitalization, the reduction of the investment on the monetary reserve fund due to the court ruling involving the liquidation of the banks Comind and Auxiliar, securitization of debts, the use of "privatization money" in the PND, renegotiation of the Itaipu and Eletronorte debts with the SFN, the inclusion of constitution funds, besides the foreign debt difference, due to balance conversions, end of period exchange rates and the flows by the monthly average rate."

TABLE III.5. MAKING COMPATIBLE THE NET FEDERAL DEBT STATISTICS AND THE NOMINAL DEBT STATISTICS IN R$: 1995-1998

In R$ (millions)	Dec/94	Dec/98	Variation	Percentage Variation
Net Federal Debt (+ Central Bank)	65,836	231,258	165,422	251.3%
+ State's and Municipalities' Net Debt	51,091	130,905	79,814	156.2%
+ State Owned Enterprises' Net Debt	36,236	26,504	-9,732	-26.9%
= Total Net Debt	153,163	388,667	235,504	153.8%
- Balance Sheet Adjustment	0	39,516	39,516	
+ Privatization Adjustment	0	30,656	30,656	
= Net Fiscal Debt without Privatization	153,163	379,808	226,645	148.0%

TABLE III.6. MAKING COMPATIBLE THE NET FEDERAL DEBT STATISTICS AND THE NOMINAL DEBT STATISTICS IN percent OF GDP: 1995-1998

In percent of GDP	Dec/94	Dec/98	Variation
Net Federal Debt (+ Central Bank)	12.25%	25.34%	13.10%
+ State's and Municipalities' Net Debt	9.50%	14.35%	4.84%
+ State Owned Enterprises' Net Debt	6.74%	2.90%	-3.84%
= Total Net Debt	28.49%	42.60%	14.10%
- Balance Sheet Adjustment	0.00%	4.33%	4.33%
+ Privatization Adjustment	0.00%	3.36%	3.36%
= Net Fiscal Debt without Privatization	28.49%	41.62%	13.13%

Table III.7 shows the evolution and the composition of the public deficit during 1995-8. The net federal debt variation is slightly higher than the nominal deficits accumulated in the same period (226,645 - 219,999 = R$6,646). This difference occurred during 1995, when the Balance Sheet adjustments' methodology was not yet implemented. Therefore, an extra

item will be included: "Adjustment not computed by the CB", amounting to R$6,646 millions

TABLE III.7. PUBLIC SECTOR BORROWING REQUIREMENTS:1995-1998

In R$	1995	1996	1997	1998	Accumulated
Nominal	48,650	45,741	53,232	72,375	219,999
Federal Government and CB	15,632	19,946	22,912	49,351	107,841
States and Municipalities	24,141	21,076	26,377	18,416	90,010
State Owned Enterprises	8,877	4,720	3,943	4,608	22,148
Nominal Interest	51,065	45,001	44,923	72,492	21,3481
Federal Government and CB	19,554	22,854	20,537	54,485	117,430
States and Municipalities	22,992	16,840	19,941	16,570	76,343
State Owned Enterprises	8,519	5,309	4,444	1,437	19,709
Primary	-2,415	740	8,309	-116	6,518
Federal Government and CB	-3,922	-2,908	2,375	-5,134	-9,589
States and Municipalities	1,149	4,236	6,436	1,846	13,667
State Owned Enterprises	358	-589	-501	3,172	2,440

After all these adjustments, the equation which links the federal debt variation (+ Central Bank) with the federal nominal deficit is expressed on Table III.8. It shows that the largest share of item #1, which can be identified with the financing of the federal public debt (+ CB), was due to interest payments (71.0%). Item #1's second biggest expansion source was

the Balance Sheet adjustment. Note that this expansion effect from the Balance Sheet adjustment (23.9%) was substantially weakened by the privatization's contractionary effect (-18.5%). As we have already discussed, none of these items constitutes exactly the public deficit. According to the definition of the federal deficit, neither of the other items — related to states and municipalities (6.2% of item #1's growth) and the state owned enterprises (19.3%) — should be included, since this item (#1) refers only to the federal level.[23] The federal government and Central Bank's primary deficit had a contractionist impact during this period (-5.8%).

TABLE III.8. MAKING THE FEDERAL NET DEBT STATISTICS AND THE FEDERAL NOMINAL DEFICIT COMPATIBLE: 1995-1998

	R$ (millions)	Percentage Share
= Federal Net Debt Variation (+ CB)	165,422	
+ Nominal Interest (Federal Government + CB)	117,430	71.0%
+ Primary Deficit (Federal Government + CB)	-9,589	-5.8%
+ Nominal Deficit minus Net Debt Variation of the States and Municipalities	10,196	6.2%
+ Nominal Deficit minus Net Debt Variation of the State Owned Enterprises	31,894	19.3%
+ Patrimonial Adjustment Variation	39,516	23.9%
- Privatization Adjustment Variation	-30,656	-18.5%
+ Adjustment not Computed by the Central Bank	6,646	4.0%
= TOTAL	165,437	100.0%

III.2 Accumulation of assets

Table III.9 decomposes the accumulation of assets during this period. Note that domestic assets growth (194.42%) was substantially greater than the foreign assets' growth (64.04%).

[23] Thus, it would be expected that the nominal deficit were equal to the net debt variation, for both the states and municipalities as for the state-owned enterprises. Therefore, elucidating these items is still another work

The growth rates are unequal among the domestic assets also. The states' debts renegotiation, which appears on items 1.3 and 1.4, is responsible for slightly more than half of this increase (55.20%). The Central Bank's credits to financial institutions, which include the Proer (the private banks' bailout program), also played a significant role: 17.04%

TABLE III.9. ASSETS ACCUMULATION IN R$: 1995-1998

	Dec/94	Dec/98	Variation	Percent Variation
1. Domestic	73,478.00	216,332.39	142,854.39	194.42%
1.1. FAT	10,125.00	27,878.83	17,753.83	175.35%
1.2. CB's credits to financial institutions	20,561.00	48,490.18	27,929.18	135.84%
1.3. Federal Government's credits (Law 8727 / 93)	0.00	3,849.51	3,849.51	
1.4. Debt Renegotiations with the states	0.00	86,612.46	86,612.46	
1.5. Others	42,792.00	49,501.41	6,709.41	15.68%
2. Foreign Reserves	32,829.88	53,854.84	21,024.96	64.04%
TOTAL	106,307.88	270,187.23	163,879.35	154.16%

III.3 Repayment of other kinds of federal public debt

As shown on Table III.3, the other debts suffered, in nominal terms, a net increase. Therefore, if the other debts had remained the same, the federal public debt would have increased even more in nominal terms. Table III.10 shows the other kinds of debt variation in this period. Once more, the domestic components growth is faster than the foreign one

in progress.

(84.83% versus 41.96%). Among the domestic net debt components, the greatest share is due to the Monetary Base, responsible for 32.18% of the total net debt variation.

TABLE III.10. OTHER DEBTS VARIATION : 1995-1998
R$ Millions

	Dec/94	Dec/98	Variation	Variation Percentage
1. Other Domestic Debt	46,618.00	86,164.38	39,546.38	84.83%
1.1. Monetary Base	17,685.00	39,223.00	21,538.00	121.79%
1.2. Others	28,933.00	46,941.38	18,008.38	62.24%
2. Foreign Debt	65,270.88	92,657.42	27,386.54	41.96%
TOTAL	111,888.88	178,821.80	66,932.92	59.82%

Table III.11 summarizes the discussion about the factors of expansion and contraction of the federal public debt (in **nominal** terms). One must keep in mind that, since we are working with nominal values over a period of four years, those values presented on this table can be misleading.[24] It is observed that the most important individual factor for debt growth was interest payments (44.8%), followed by the accumulation of the state's debt (33.0%). If we add these interest payments to the accumulation of domestic assets, the quality of which is uncertain, we can "explain" more than 99% of the debt growth in this

[24] We preferred to present first the nominal values so that the total value to be explained was equal to that published by the Central Bank.

period.[25] Therefore, it is quite reasonable to identify the public debt growth with the deterioration of the fiscal position.

Table III.12 summarizes the discussion about the factors of expansion and contraction of the federal public debt (in **real** terms). The analysis in real terms generates a few discrepancies from the previous analysis, and, of course, is the most relevant to the current economic situation The interest rate share increased even more in real terms: interest payments, percent at 13.76% of GDP, alone exceeded the full variation of the federal net debt (13.09%). A similar figure (13.95% of GDP) is obtained by adding the items [Nominal Deficit minus Net Debt Variation of the States and Municipalities], [Nominal Deficit minus Net Debt Variation of the State Owned Enterprises], and [Balance Sheet Adjustment Variation]. Foreign Reserves actually fell as % of GDP (-0.21%), thereby making the whole Asset Accumulation much less attractive as an indicator of solvency.

A word of caution is necessary. One should not infer from the previous analysis that the bulk of the explosive growth in domestic bonded debt was due exclusively to the policy of extremely high interest rates, and that had the interest rates been lower, the bonded debt would not have exploded. Interest rates were high not only because of the Central Bank's policy decisions, but mainly because the fiscal stance became increasingly lax as the first successes of the Real Plan appeared on the inflation front[26]. Bevilaqua and Werneck (1998)

[25] See Bevilaqua and Werneck (1998)

[26] One can decompose the high domestic interest rate along the lines of the covered interest parity condition, to get: domestic interest rate = foreign interest rate + forward exchange-rate premium + covered interest parity differential (country risk).

While the crawling-peg-exchange-rate policy adopted in Brazil after April, 1995 created a wedge (the forward exchange-rate premium) that hovered around 10 percentage points, the country risk part had also been substantial. The country risk component was mainly determined by the perception of an unsustainable fiscal policy. Therefore, it is incorrect to say that, had the government abandoned earlier the crawling-peg policy to float the currency, interest rates would have fallen to international levels and the debt problem would have never existed. To make this counterfactual scenario plausible, a much stronger fiscal stance would have been

show that the primary balance of the consolidated public sector deteriorated substantially during 1994-8.

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required. And, if that were the case, interest rates would have been much lower even under the crawling-peg regime.

TABLE III.11. FEDERAL DEBT USES : 1995- 1998 (R$ Millions)

	Dec-94	Dec-98	Variation	Percentage Share
Federal Net Debt (+ CB)	**65836**	**231258**	**165422**	**63.05%**
Nominal Interests (Federal Government + CB)			117430	44.76%
Primary Deficit (Federal Government + CB)			-9589	-3.65%
Nominal Deficit minus Net Debt Variation of the States and Municipalities			10196	3.89%
Nominal Deficit minus Net Debt Variation of the State Owned Enterprises			31894	12.16%
Balance Sheet Adjustment Variation			39516	15.06%
Privatization Adjustment Variation (-)			-30656	-11.68%
Adjustment not Computed by the Central Bank			6646	2.53%
Assets	**106308**	**270187**	**163879**	**62.46%**
1. Domestic	73478	216332	142854	54.45%
1.1. FAT	10125	27879	17754	6.77%
1.2. CB's credits to the financial institutions	20561	48490	27929	10.65%
1.3. Federal Government's credits (Law 8727 / 93)	0	3850	3850	1.47%
1.4. Debt Renegotiations with the states	0	86612	86612	33.01%
1.5. Others	42792	49501	6709	2.56%
2. Foreign Reserves	32830	53855	21025	8.01%
Other Debts (-)	**111889**	**178822**	**-66933**	**-25.51%**
1. Domestic	46618	86164	-39546	-15.07%
1.1. Monetary Base	17685	39223	-21538	-8.21%
1.2. Others	28933	46941	-18008	-6.86%
2. Foreign	65271	92657	-27387	-10.44%
TOTAL			**262,368**	**100.00%**

TABLE III.12. FEDERAL DEBT USES IN percent OF GDP: 1995- 1998

	Dec-94	Dec-98	Variation
Federal Net Debt (+ CB)	**12.25%**	**25.34%**	**13.09%**
Nominal Interests (Federal Government + CB)			13.76%
Primary Deficit (Federal Government + CB)			-1.19%
Nominal Deficit minus Net Debt Variation of the States and Municipalities			4.17%
Nominal Deficit minus Net Debt Variation of the State Owned Enterprises			5.22%
Balance Sheet Adjustment Variation			4.56%
Privatization Adjustment Variation (-)			-3.44%
Adjustment not Computed by the Central Bank			0.87%
Total			**23.95%**
Assets	**19.78%**	**29.61%**	**9.83%**
1. Domestic	13.67%	23.71%	10.04%
1.1. FAT	1.88%	3.06%	1.17%
1.2. CB's credits to the financial institutions	3.82%	5.31%	1.49%
1.3. Federal Government's credits (Law 8727 / 93)	0.00%	0.42%	0.42%
1.4. Debt Renegotiations with the states	0.00%	9.49%	9.49%
1.5. Others	7.96%	5.43%	-2.54%
2. Foreign Reserves	6.11%	5.90%	-0.21%
Other Debts (-)	**20.81%**	**19.60%**	**-1.22%**
1. Domestic	8.67%	9.44%	0.77%
1.1. Monetary Base	3.29%	4.30%	1.01%
1.2. Others	5.38%	5.14%	-0.24%
2. Foreign	12.14%	10.15%	-1.99%

IV. Challenges Ahead: Debt Evolution in the Post-Devaluation Period

In this section we perform simulations of the public net debt path to 2002, the final year of the current presidential term. The starting point for the derivation of the model used for the debt-dynamics simulations is the standard budget constraint of the consolidated public sector, which in the case of Brazil includes the central government, states and municipalities and public enterprises:

$$\frac{M_t - M_{t-1}}{P_t} + \frac{B_t - B_{t-1}}{P_t} + \frac{E_t\left(B_t^* - B_{t-1}^*\right)}{P_t} \equiv \frac{D_t}{P_t} + i_t \frac{B_{t-1}}{P_t} + i_t^* \frac{E_t}{P_t} B_{t-1}^* - \frac{A_t}{P_t} + \frac{H_t}{P_t} \tag{1}$$

where M is the monetary base, B is the net domestic debt, B^* is the foreign debt net of international reserves, E is the nominal exchange rate in reais per dollar, D is the primary balance, i_t is the domestic interest rate, r is the foreign interest rate, A are privatization revenues and H represents hidden and contingent liabilities.

It is useful to rewrite equation (1) in terms of flows and stocks per unit of domestic product:

$$\frac{M_t - M_{t-1}}{P_t Y_t} + \frac{B_t - B_{t-1}}{P_t Y_t} + \frac{E_t\left(B_t^* - B_{t-1}^*\right)}{P_t Y_t} \equiv$$

$$\equiv \frac{D_t}{P_t Y_t} + i_t \frac{B_{t-1}}{P_t Y_t} + i_t^* \frac{E_t}{P_t Y_t} B_{t-1}^* - \frac{A_t}{P_t Y_t} + \frac{H_t}{P_t Y_t} \tag{2}$$

or

$$\frac{B_t}{P_tY_t}+\frac{E_tB_t^*}{P_tY_t}=\frac{B_{t-1}}{P_tY_t}\left(1+i_t\right)+\frac{E_t}{P_tY_t}B_{t-1}^*\left(1+i_t^*\right)-\sigma_t+d_t-a_t+h_t \qquad (3)$$

where σ, d, a and h are, respectively, seignorage, primary balance, privatization revenues and hidden and contingent liabilities in terms of GDP.

Equation (3) can be further rearranged as:

$$b_t + b_t^* = \frac{B_{t-1}}{P_{t-1}Y_{t-1}}\cdot\frac{\left(1+i_t\right)}{\frac{P_tY_t}{P_{t-1}Y_{t-1}}}+\frac{E_{t-1}}{P_{t-1}Y_{t-1}}\cdot b_{t-1}^*\cdot\frac{E_t}{E_{t-1}}\frac{\left(1+i_t^*\right)}{\frac{P_tY_t}{P_{t-1}Y_{t-1}}}-\sigma_t+d_t-a_t+h_t \qquad (4)$$

or

$$b_t + b_t^* = b_{t-1}\frac{\left(1+i_t\right)}{\left(1+\pi_t\right)\left(1+n_t\right)}+b_{t-1}^*\frac{\left(1+i_t^*\right)\left(1+\varepsilon_t\right)}{\left(1+\pi_t\right)\left(1+n_t\right)}-\sigma_t+d_t-a_t+h_t \qquad (5)$$

where b and b^* are, respectively, net domestic debt and net foreign debt in terms of GDP, π is the inflation rate, n is the rate of growth of real GDP and ε is the rate of devaluation of the nominal exchange rate.

Equation (5) may be used to simulate the path of the net domestic debt in Brazil over the medium term taking into account specific assumptions about the primary balance, inflation rate, rate of growth of real GDP, nominal exchange rate devaluation, domestic and foreign interest rates, and seignorage revenues. In addition, since the government intends to

continue its privatization program, one needs to make assumptions about how that program will be implemented. Finally, it is necessary to take into account the fact that the government has hidden and contingent liabilities which will be recognized in coming years.[27]

The main assumptions for the baseline scenario (Scenario 1) are shown in Table IV.1. The primary balance path corresponds to the full implementation of the IMF supported program over the period 1999-2001. According to the agreed targets, the consolidated public sector will generate primary surpluses of at least 3.1 percent of GDP in 1999, 3.3 percent of GDP in 2000, and 3.4 percent of GDP in 2001. For 2002, the final year of the current presidential term and end of the simulation period, it is assumed that the improved fiscal stance is sustained, with the primary surplus remaining at 3.4 percent of GDP.

TABLE IV.1. SCENARIO 1 - BASIC ASSUMPTIONS

Variables	1998	1999	2000	2001	2002
Primary balance	0.0%	3.1%	3.3%	3.4%	3.4%
Real GDP growth	0.2%	0.0%	3.0%	3.5%	4.0%
Domestic inflation rate	1.4%	10.0%	6.0%	6.0%	4.0%
Nominal depreciation (R$/US$)	8.2%	65.0%	-5.0%	5.0%	4.0%
Nominal Domestic interest rate	29.5%	26.0%	16.0%	13.0%	11.0%
Foreign interest rate	8.5%	8.8%	9.0%	8.8%	8.5%
Seignorage	0.8%	0.3%	0.2%	0.2%	0.2%
Privatization	1.4%	1.0%	1.0%	1.0%	1.0%
Hidden liabilities	2.3%	2.5%	2.5%	2.5%	2.5%

[27] The social security burden, which is the biggest contingent liability for the public sector, is incorporated in the primary balance.

Total revenues from privatization are projected at about 1.0 percent of GDP in 1999, and 1.0 percent of GDP thereafter. The bulk of the resources should come from the completion of the privatization of federal electricity generation companies in 1999, the privatization of the electricity transmission network from 2000, sales of remaining shares of previously privatized companies, such as CVRD and Light, and sales of the noncontrolling share of Petrobrás. The amount for 1999 was assumed to be less than the original figure of 2.8 percent of GDP contemplated in the IMF supported program, and less than the 1.3 percent assumed in the July 1999 revision of the program, because of the privatization results as of October 1999. In addition, it is assumed that the government will recognize about 2.5 percent of GDP in hidden and contingent liabilities every year during 1999-2002.[28]

The tightening in the fiscal stance will help to reduce the burden on monetary policy and will allow for a decline in the domestic real interest rate from about 15 percent in 1999 to 9 percent in 2000, and 7 percent in 2001 and thereafter. The reduction in the domestic real interest rate in response to the improved fiscal stance should be a natural consequence of the improvement in the risk assessment of the country as the fiscal adjustment is sustained over the years. The drop in the real interest rate will induce a recovery in economic activity, with the rate of growth of real GDP increasing to 3 percent in 2000, 3.5 percent in 2001, and settling at about 4 percent. Finally, the change in the policy mix brings about a steady decline in the inflation rate from 10 percent in 1999 to 4 percent in 2002. It also

[28] This amount of hidden and contingent liabilities is higher than what is assumed in the IMF program.

results in a substantial devaluation in the real exchange rate in 1999, which is partially reversed in 2000 by a nominal exchange rate appreciation.[29]

Results for the simulation of the consolidated public sector debt path during 1999-2002 are presented in Table IV.2. The model simulates the values of total net debt in the last line of the table and then distributes it according to the relative shares of net domestic and net foreign debt observed in the preceding year. Under the assumptions of Scenario 1, the ratio of net public debt to GDP rises to 50.1 percent in 1999 and then declines slightly to about 49.1 percent in 2002. This scenario highlights the key role played by the sustained improvement in the fiscal stance in stabilizing the net debt to GDP ratio in the medium term, even as the federal government recognizes a substantial amount of hidden and contingent liabilities every year.

TABLE IV.2. SCENARIO 1 - NET DEBT PATH, 1998/2002

Variables	1998	1999	2000	2001	2002
Net Domestic Debt	36.0%	39.3%	39.3%	38.9%	38.5%
Net Foreign Debt	6.6%	10.8%	10.8%	10.7%	10.6%
Total Net Debt	42.6%	50.1%	50.0%	49.6%	49.1%

In order to stress further the importance of the programmed primary surpluses for the stabilization of the net debt to GDP ratio over the medium term, a second scenario is considered in which there is a milder adjustment in the fiscal position of the consolidated public sector, perhaps because of delays in the implementation of fiscal reforms. Table

[29] The inflation rate in the debt simulation exercises should be a proxy for the GDP deflator. Here it is measured by the average IGP-DI.

IV.3 presents the basic assumptions of this alternative scenario (Scenario 2). After increasing to 3.1 percent of GDP in 1999, the primary balance is assumed to decrease to 2 percent of GDP in 2000 and remain at this level thereafter. To put this number in perspective, a 2 percent of GDP surplus represents a much tighter fiscal stance for the consolidated public sector than what was observed during any year in the 1995-1998 period.

TABLE IV.3. SCENARIO 2 - BASIC ASSUMPTIONS

Variables	1998	1999	2000	2001	2002
Primary balance	0.0%	3.1%	2.0%	2.0%	2.0%
Real GDP growth	0.2%	0.0%	2.5%	3.0%	3.5%
Domestic inflation rate	1.4%	10.0%	8.0%	6.0%	4.0%
Nominal depreciation (R$/US$)	8.2%	65.0%	6.0%	5.0%	4.0%
Nominal domestic interest rate	29.5%	26.0%	18.0%	16.0%	13.0%
Foreign interest rate	8.5%	8.8%	9.0%	8.8%	8.5%
Seignorage	0.8%	0.3%	0.2%	0.2%	0.2%
Privatization	1.4%	1.0%	1.0%	1.0%	1.0%
Hidden liabilities	2.3%	2.5%	2.5%	2.5%	2.5%

With the weaker adjustment in the fiscal position, monetary policy is supposed to carry a larger share of the burden for keeping inflation low. It is assumed that the real interest rate will drop to 11 percent in 2000 and will remain at 9 percent after 2001. Real GDP growth will rise to 2.5 in 2000, 3 percent in 2001 and 3.5 percent in 2002. In this alternative scenario the inflation rate is reduced to 8 rather than 6 percent in 2000 and the currency has a further nominal depreciation in the same year. The assumptions about the other

macroeconomic variables remain the same in order to facilitate the comparison with Scenario 1.[30]

As Table IV.4 indicates, this scenario for the primary balance implies a significantly different path for the net-debt to GDP ratio. The total net debt ratio increases steadily from 50.1 percent of GDP in 1999 to 57.3 percent of GDP in 2002.

TABLE IV.4. SCENARIO 2 - NET DEBT PATH, 1998/2002

Variables	1998	1999	2000	2001	2002
Net Domestic Debt	36.0%	39.3%	41.2%	43.0%	44.9%
Net Foreign Debt	6.6%	10.8%	11.3%	11.8%	12.3%
Total Net Debt	42.6%	50.1%	52.5%	54.9%	57.3%

V. Policy discussion

As the simulation results from the previous section indicate, even under very favorable macroeconomic conditions the evolution of the net debt to GDP ratio will remain a policy concern in coming years. Under these circumstances, what role should be played by public debt management in the near future?

We see public debt management as constrained by a fundamental policy consideration in the short-run. Although perceptions about the likelihood of a debt rollover crisis in Brazil

[30] Though some of them, such as the paths for the inflation and nominal interest rates after 2000, are at odds with the weaker fiscal stance and the nominal devaluation. We do that to stress the importance of a tougher fiscal instance.

have improved considerably since the January 1999 devaluation, the large stock of short-term debt remains an important source of anxiety, especially on the part of foreign investors. Even if there are reasons to believe that such a concern is somewhat misplaced[31], a practical implication of this fact is that the risk premium on Brazilian securities remains higher than what it would likely be if the same public sector borrowing requirements were financed with longer maturity debt. A central priority of debt management in the short and medium-run, therefore, should be to intensify efforts to lengthen the average maturity of the public debt. Furthermore, given the need to reduce the interest burden of the debt and increase the sustainability of the current fiscal stance, such maturity lengthening should naturally be implemented at the lowest possible cost.

What kind of debt instruments will be more appropriate under these conditions? It is expected that under the current IMF supported program the share of external and foreign exchange-indexed debt in the total public debt will be reduced gradually. Therefore, the process of debt maturity lengthening must be conducted through the issuance of domestic debt, either nominal or indexed.

What should be the relative shares of these instruments in debt placements? For the sake of clarity of the exposition, we partition the question of how much of each kind of debt should be issued in two layers. First, one should determine how much nominal against indexed debt should be issued. Second, among the several kinds of indexed debt, how much of each kind should be issued (zero-duration and inflation-linked). Although the determination of

[31] See Bevilaqua and Garcia (1999).

the debt structure is a multiple-choice allocation problem, the two-layered scheme is adequate for the Brazilian case, as we now explain.

To lengthen the average maturity of the debt requires the issuance of indexed debt, since long nominal debt (above two or three years) can only be issued at an abnormally high-risk premium. Therefore, the basic policy recommendation concerning the public debt structure for the Brazilian economy in coming months is to issue nominal debt with the highest possible maturity without creating an extremely upward sloping yield curve at the end. For the time nodes previously "conquered", issue the highest possible amounts that do not create "price-pressure" effects. For the bulk of the rollover and for the new additions to the debt stock, indexed debt should be issued, to lengthen the maturity structure as much as possible.

In terms of placement procedures, the authorities should announce the auctions as far in advance as possible[32] and avoid placing unexpected amounts of short-term securities in order to profit from the low maturity premia of the shorter maturities. Placing short-term debt because it is cheaper in an environment of lack of confidence jeopardizes the situation of the previous long-debt holders, because the short-debt holders have a liquidation option over those, and harms the debt market in the long run. It is akin to the issue of debt seniority: the short-term debt holders hold debt that is senior *vis-à-vis* the long-term debt holders, since the former will mature before the latter. Information regarding the process of

[32] This measure was included in the debt management strategy package recently announced by the Brazilian authorities. According to the newspaper *The Economist* (11/11/1999), ... *among the main features of the central bank's planned reforms are: to hold fewer, bigger auctions of debt, with dates announced further in advance; to reduce drastically the types of bonds on the market (there are currently more than 200, many of them small, illiquid issues relating to former state firms); to allow banks to have "short" positions on the bond market (ie, to sell bonds they do not own), plus other rule-changes to promote liquidity and to be more open in publishing details of the debt.*

debt lengthening must be well conveyed to the market, so that debt holders know in advance that they will be purchasing liquid instruments, and that the government will not "cheat" on them by placing shorter instruments in the future.

An important question remains on how much of each kind of indexed debt (zero-duration, inflation-linked, exchange-rate-linked, or another form as discussed below) should be issued. The exchange-rate-linked debt share, as already mentioned, must conform to the guidelines of the current IMF supported program. Given the current inflation targeting framework the use of zero-duration debt poses a version of the well-known time consistency problem. The over reliance on zero-duration debt, as in the current situation with almost 60% of total debt in this form, may reduce monetary policy credibility and commitment, because policy makers may become more exposed to choices and trade-offs between tight money policies to contain inflation and the budgetary impact of higher short-term rates. Therefore, it is advisable to reduce the share of this kind of indexed debt in the total public sector debt.

Therefore, the remaining instrument to be used in the process of maturity lengthening is inflation-linked debt. The main objection to this kind of debt indexation is that it may have inflationary effects. Nevertheless, as Price (1997) emphasizes (...) *the academic literature suggests no necessary connection between indexed bonds (or indexation in general) and inflation. The emergence of inflation depends on other circumstances and policies that are independent of indexation. Recent government issuers of indexed bonds in fact point to credibility enhancements that may result from issuing indexed bonds, by neutralizing the*

inflation tax.[33] Price's advice is that *(...) in newly developing or transition markets, they* [indexed bonds] *could be envisaged as part of a concomitant package of fiscal and monetary reforms to foster longer-term capital formation, along with strong commitments to price stability.*[34]

The current share of inflation-linked debt is negligible. This was a result of a policy decision after the Real Plan, when debt managers—convinced that inflation-linked debt was inflationary by conveying to the market a lack of anti-inflationary commitment of the government—decided to phase it out. Our policy advice is to reverse that decision. It is reasonable to assume that there is a natural demand for such long-term-inflation-linked bonds from pension funds, insurance companies, and other market participants whose liabilities are both long-term and display high correlation to the price level. For these market participants, long-term-inflation-linked bonds constitute a hedge, and, therefore, may be sold at a lower yield (higher price).[35]

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[33] Page 53.

[34] Page 55.

[35] In order to encourage discussion about the best transition strategy toward a higher share of long-term-inflation-linked bonds, we list here a few ideas of financial engineering that were collected among market participants and add a few ideas of our own. One possible instrument is a bond that would pay the higher of two indices: the inflation index plus a real rate (defined ex-ante), or a percentage of the accrual of the daily interest rates (Selic) during the bond's life. In the auction, market participants would bid for the percentage of the accrual of the daily interest rates (the lower the percentage, the more likely to win). This "mongrel" bond could provide a natural transition between the current zero-duration bonds and the inflation-linked bonds. While the holders of the "mongrel" bonds would guarantee the natural hedge provided by inflation protection (plus the real rate), they would also retrieve an option to profit from the high interest rates. The gain for the government would be the decrease of the harm in the fiscal accounts posed by an increase in short-term interest rates, thereby alleviating the time consistency problem discussed before. Another similar "mongrel" bond could be constructed by adding options to a standard inflation-linked-bond (plus an ex-ante real rate) with maturity of several years. These options, to be exercised at the beginning of each year of the bond's maturity, would change the yield from inflation plus the real rate to a percentage of the accrual of the daily interest rates during the following year. I.e., every year the debt holder would decide *ex ante* which index would be used to compute the bond's return. As before, the percentage of the accrual of the daily interest rates would be defined in the auction. The expectation is that with the success of the plan, market participants would not exercise the options, thereby in fact migrating to inflation-linked bonds, and alleviating the fiscal, and the derived monetary policy, time consistency problems. Again, the possible benefit of these "mongrel" bonds would be to allow the maturity lengthening of the debt with the minimum possible fiscal cost and without generating time consistency problems for the inflation targeting framework.

Of course, as the Real Plan achieves its long-term goals of promoting growth in a low-inflation environment, the debt structure should naturally shift towards nominal debt, including long-term securities. However, since it would be infeasible to try to engineer this shift at present, we see the indexation to inflation as the least harmful way to lengthen the debt maturity.

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APPENDIX 1

Bond	Function/Issuing Agent	Term and Interest Rates	Sort and Placement	Nominal Value Updating	Interest Payment	Principal Redemption	Selic Code
Description of the Public Bonds							
Issuing Agent – Tesouro Nacional							
CFT	- Certificates whose functions to support operations with specifics necessities defined in the law, possibly being issued in distinct series. These Bonds are divided in:						
	CFT-A	Term: up to 30 years. Interest Rates: up to 6% p.y.	- Nominative and negotiable. - Direct to the interested one.	Monthly by the IGP-DI	On the redemption date	On the date	-
	CFT-B	Term: up to 30 years. Interest Rate: up to 6% p.y.	- Nominative and negotiable. - Direct to the interested one	TR	On the redemption date	On the date	-
	CFT-D	Term: up to 30 years. Interest Rate: up to 6% p.y.	- Nominative and negotiable. - Direct to the interested one	Commercial dollar, considering the average selling rates of the week days immediately before the issuance and redemption dates of the bond.	On the redemption date	On the date	-
NTN-A	- Replacement of bonds issued in the foreign debt restructuring process.	Up to 30 years, respecting the original chronogram of the dates Interest Rates: Variable up to 12% p.y., depending on the bond.	- Book entry, nominate and negotiable - Direct to the interested one	Commercial dollar, considering the average selling rates of the week days immediately before the issuance and redemption dates of the bond.	Semiannually, observing the interest payment dates of the foreign debt bond which generated the replacement operation, with adjustment in the first period of fluency.	Respecting the chronogram of the bond which generated the replacement operation.	71/72
NTN-B	- Placed in The Central Bank's portfolio, substituting shorter term bonds, specially LFT. -Capitalization of totally or partially state owned enterprises.	At least 12 months Interest Rate: 6% p.y.	- Book entry, nominate and negotiable - Direct to the interested one	IGP-M	On the redemption date	On the due date	76
NTN-C	-Bond issued by the Tesouro Nacional to cover budget deficits, as well as operations for receipts antecipation.	At least 12 months. Interest rates: 6% p.y.	-Book entry, nominative and negotiable - Public Offering	IGP-M	Semiannually, with adjustment in the first period of fluency when necessary.	On due date	77
NTN-D	-Bond issued by the Tesouro Nacional to cover budget deficits, as well as operations for receipts antecipation .	At least 3 months. Interest rates: 6% p.y.	-Book entry, nominative and negotiable - Public Offering	Commercial dollar, considering the average selling rates of the week days immediately before the issuance and redemption dates of the bond	Semiannually, with adjustment in the first period of fluency when necessary	On due date	78
							73

Source: Banco Central do Brasil, Tesouro Nacional and Andima.

Description of the Public Bonds							
Bond	Function/Issuing Agent	Term and Interest Rates	Sort and Placement	Nominal Value Updating	Interest Payment	Principal Redemption	Selic Code
Issuing Agent – Tesouro Nacional							
NTN-E	-Bond issued by the Tesouro Nacional to cover budget deficits, as well as operations for receipts antecipation	Up to 30 years. Interest Rates: TBF, with monthly renegotiation of interest.	- Book entry, nominate and negotiable	--	Semiannually	On the due date	90
NTN-F	- Warranty to the the Banco do Brasil in operations contracted by Inanps with the FAT.	Up to 30 years, Interest Rates: up to 5% p.y.	- Book entry, nominate and negotiable - Direct to the interested one	TR	On the redemption date	On the due date	75
NTN-H	-Bond issued by the Tesouro Nacional to cover budget deficits, as well as operations for receipts antecipation	At least 3 months	- Book entry, nominate and negotiable - Public Offering	TR	--	On the due date	79
NTN-I	- To obtain resources for the payment of interest rates equalization of the financing of exports of Brazilian goods and services suported by the Proex.	Up to 25 years.	-Book entry, nominative and negotiable - Direct to the interested one	Commercial dollar, considering the average selling rates of the week days immediately before the issuance and redemption dates of the bond	--	Up to the due date of the respective parcel of interest of the exports financing.	88 89
NTN-J	- Capitalization of Banco de Brasil.	Up to 15 years. Interest rates: average return of LTN or average Selic.	-Book entry, nominative and negotiable - Direct to the interested one	--	Only after 3 years. Interests until the end of these 3 years are incorporated to principal.	On the due date	--
NTN-L	- Are issued to be exchanged for Tesouro Nacional bonds which belong to the Banco Central portfolio, they must be undertaken by the Tesouro Nacional, according to the Plano Brasileiro de Refinanciamento and Clube de Paris.	Up to 2 years. Interest Rates: 5% p.y.	-Book entry, nominative and negotiable	Commercial dollar, considering the average selling rates of the week days immediately before the issuance and redemption dates of the bond	On the redemption date	On the due date, possibly redeemed before as a consequence of the assumption, by the Tesouro Nacional, of the foreign debt, which is a currently a Central Bank's responsabilty.	80
NTN-M	- Obtained with resources of capitalizations for the support of the Plano Brasileiro de Dinheiro Novo e de Conversão de Dívida, in 11/29/93.	-15 years. Interest Rates: Libor semiannual plus a spread of 0,875% p.y., up to 12% p.y.	-Book entry, nominative and negotiable - Direct to the interested one	Commercial dollar.	Semiannually, with adjustment in the first period of fluency when necessary.	17 semiannual and consecutive parcels, beginning in 4/15/2001.	85/86
NTN-P	- To be exchanged for the product in money of transfers of goods and claims in the ambit of the PND.	At least 15 years. Interest Rates: 6% p.y.	-Book entry, nominative and negotiable - Direct to the interested one	TR	On the redemption date	On the due date	74/81

			Description of [illegible]				
Bond	Function/Issuing Agent	Term and Interest Rates	Sort and Placement	[illegible]	Interest Payment	Principal Redemption	[illegible]
			Issuing Agent – Tesouro Nacional				
NTN-R	- To be purchased by social security private *institutions* which have, as sponsors, exclusive or not, stated owned enterprises, mixed economy societies, from the federal or state government, including the ones of special nature and foundations created by the government. It is facultative the purchase of NTN-R by other private owned social security institutions, insurance and capitalization companies. The bond is divided in :						
	NTN-R1	2 years Interest Rates: 8 % p.y.	- Nominative and Negotiable. -Direct the interested one	-Commercial dollar, considering the average selling rates. -Commercial dollar, considering the average selling rates.	On the redemption date.	On the due date.	83
		10 years Interest Rates: 12% p.y.	- Nominative and negotiable. - Direct to the interest one		Monthly.	In 10 annual, equal and successive parcels.	84
NTN-S	- Bond issued by the Tesouro Nacional to cover budged deficits, as credit operations for receipts antecipation.	First period of at least 7 days, prefixed. Second period of at least 21 days, postfixed.	- Nominative and Negotiable. -Public Offering	Average adjusted rate of financing, according to the Selic, for federal bonds, accumulated from the beginning of the second period.	--	On the due rate.	87/97
NTN-T	- Warranty to Banco do Brasil in operations with the Ministério da Saúde with the FAT.	Up to 15 years. Interest Rates: 5 % p.y.	- Nominative and Negotiable. - Direct to the interest one	Based on an index generated from the TJPL, publicized by Bacen from the issuance date on the due date.	On the redemption date	On the due date	82
NTN-U	-Warranty to Banco do Brasil in operations contracted by the Ministério do Planejamento e orçamento with the FAT	Up to 15 yers. Interest rates: 6,53% p.y. calculated over the update nominal value.	- nominative and negotiable. - direct to the interested one	Based on an index generated from the TJPL, publicized by Bacen form the issuance date to the due date.	Monthly	Monthly, each parcel corresponds to the result obtained dividing the remaining balance, updated and captalized, on the due date, by the number of remaining parcels, including one which is due.	91
LFT	-To provide the necessary resources to cover the budget deficit, as well as credit operation for budget receipts antecipation.	Maturity: determined by the STN	- Book entry, nominative and negotiable -Direct to the interested one or public offering.	Average adjusted rate of the financing, according to the selic, for federal bonds.		On the due date.	21
A	- Bonds which are used by the Federal Government to undertake debts which are responsibility of the states and the Federal District.	15 years interest rates: average Selic plus 0.0245% p.m.	-Book entry, nominative and negotiable. -Direct to the interested one		On the due date of each of the 180 monthly parcels.	In 180 monthly and consecutive parcels, selling the first in the first month after the issuance .Each parcel corresponds to the result obtained through the division of the remaining debt verified on the due date of each parcel by the number of remaining parcels, including the one which as due.	23
B	-Bonds which are used by the federal government to undertake debts which are responsibility of the states and the Federal District.	15 years Interest Rate: average Selic	-Book entry, nominative and negotiable. - Direct to the interested one	--	On the redemption date	On the due date	24

Description of the Public Bonds							
Bond	**Function /Issuing Agent**	**Term and Interest Rates**	**Sort and Placement**	**Nominal Value Updating**	**Interest Payment**	**Principal Redemption**	**Selic Code**
Issuing Agent – Tesouro Nacional							
LTN	-Bond issued by the Tesouro Nacional to cover budget deficits, as well as credit operations for receipts antecipation.	t least 28 days. nterest Rates:	Book entry, ominative and egotiable Public Offering.	-	-	On the due date.	10
Issuing Agent – Banco Central							
NBC-E	- Monetary Policy instrument, so s to serve as an exchange rate edge to the institutions.	t leats 3 months. nterest Rates: 6% p.y.	Book entry, ominative and egotiable Public Offering.	ommercial dollar, onsidering the average elling rates of the week ays immediately before he issuance and edemption dates of the onds.	p to 6 months: on the edemption. ore than 6 months: emianualy, according o the redemption onth, with adjustment n the fluency period, hen necessary.	On the due date.	13/18
NBC-F	- Monetary Policy instrument, so s to serve as an exchange rate edge to the institutions.	t leats 3 months. nterest Rates: 6% p.y.	Book entry, ominative and egotiable Public Offering.	loating dollar, onsidering the average elling rates of the week ays immediately before he issuance and edemption dates of the onds.	p to 6 months: on the edemption. ore than 6 months: emianualy, according o the redemption onth, with adjustment n the fluency period, hen necessary.	On the due date.	14
BBC	Monetary Policy instrument.	At least 28 days. nterest rates: --	Book entry, ominative and egotiable Public Offering.	--	--	- Nominal Value n the due date.	11
BBC-A	Monetary Policy instrument.	FirstPeriod of at least 7 ays, prefixed. econd period of at east 21 days, ostfixed.	Book entry, ominative and egotiable Public Offering.	verage adjusted rate of he financing, according o the Selic, for federal onds, accumulatedfrom he beginning of the econd period.	--	n the due date.	15/17
LBC (3)	Monetary Policy instrument.	p to 30 months. nterest Rates: --	Book entry, ominative and egotiable Public Offering.	verage adjusted rate of he financing, according o the Selic, for federal onds.	--	n the due date.	20/22
NBC-A	Monetary Policy instrument.	irst period with at east 1 month and % p.y. interest rates econd period with at east 2 months.	Book entry, ominative and egotiable Public Offering.	ommercial dollar, onsidering the average elling rates of the week ays immediately before he issuance and edemption dates of the onds. verage adjusted rate of he financing, according o the Selic, for federal onds, accumulatedfrom he beginning of the econd period.	p to 6 months: on the edemption. ore than 6 months: emianualy, according o the redemption onth, with adjustment n the fluency period, hen necessary.	n the due date.	16
Issuing Agent– States and Municipalities							
LFTE/M	- States and Municipalities'Treasury bonds used to support credit operations for receipts antecipation, roll over public debt and financing of plans.	t least 6 months. nterest Rates: 0 %	Book entry, ominative and egotiable	verage adjusted rate of he financing, according o the Selic, for federal onds.	n the redemption ate.	n the due date.	

Figure II.1
Federal Bonds: 1970 - 1999

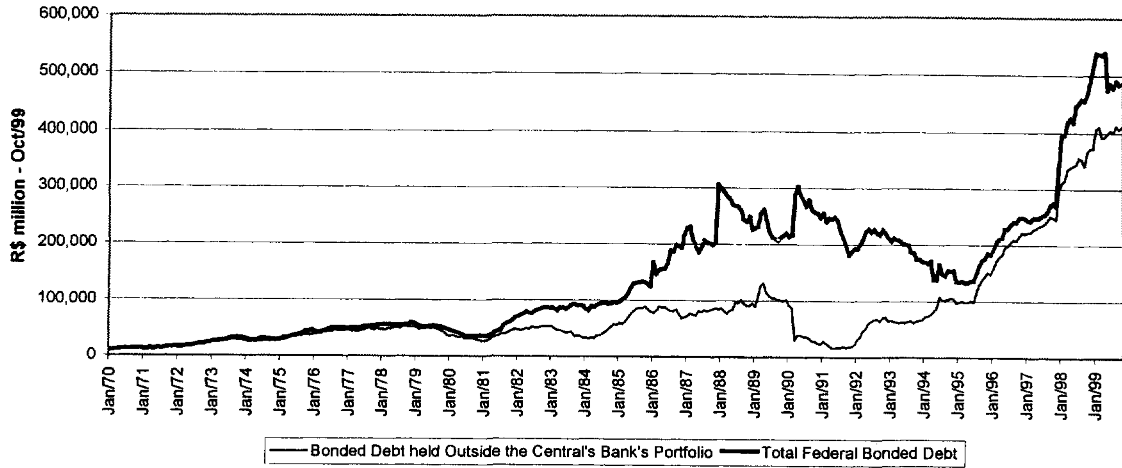


Figure II.2
Federal Bonded Debt Structure: 1970 - 1999

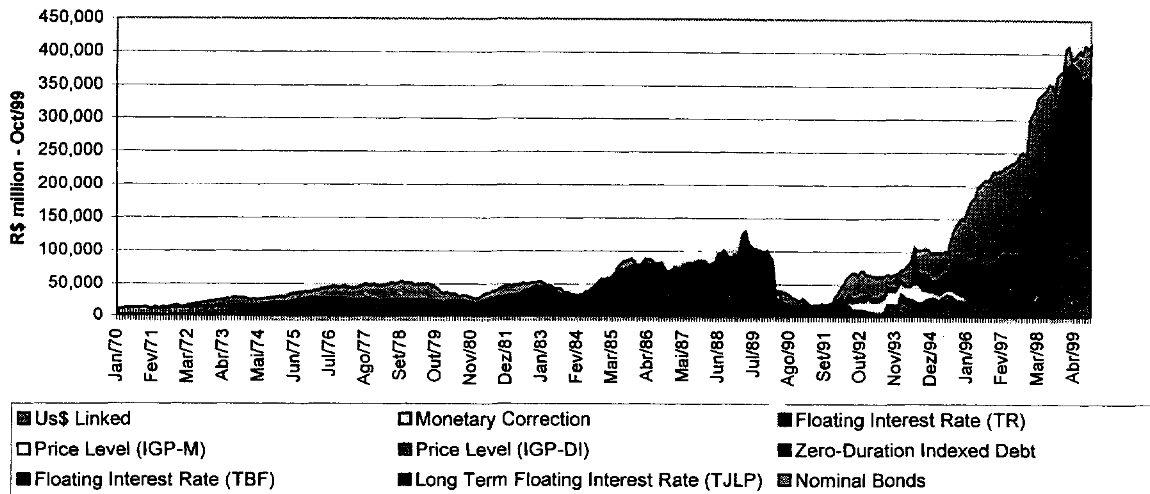


Figure II.3
Federal Bonded Debt held Outside the CB's Portfolio:
The Real Plan

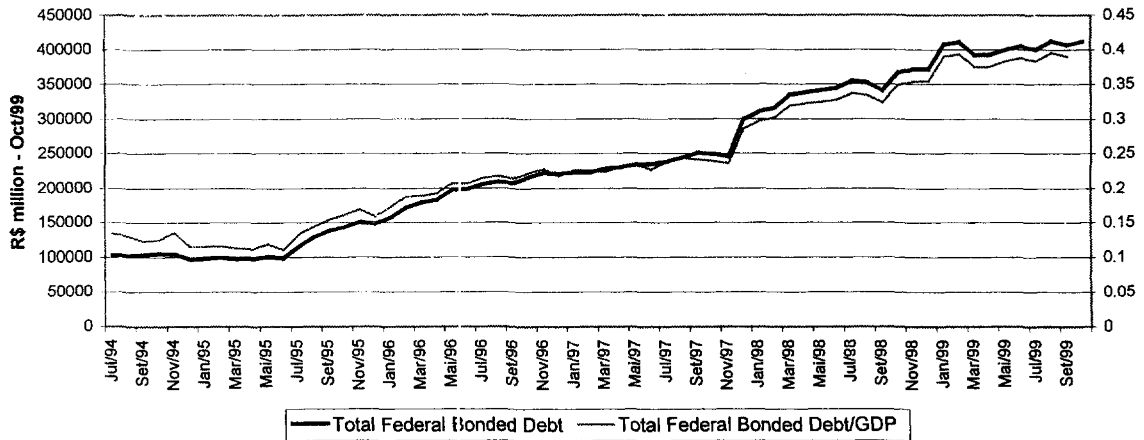


Figure II.4
Federal Bonded Debt : Composition and Average Maturity

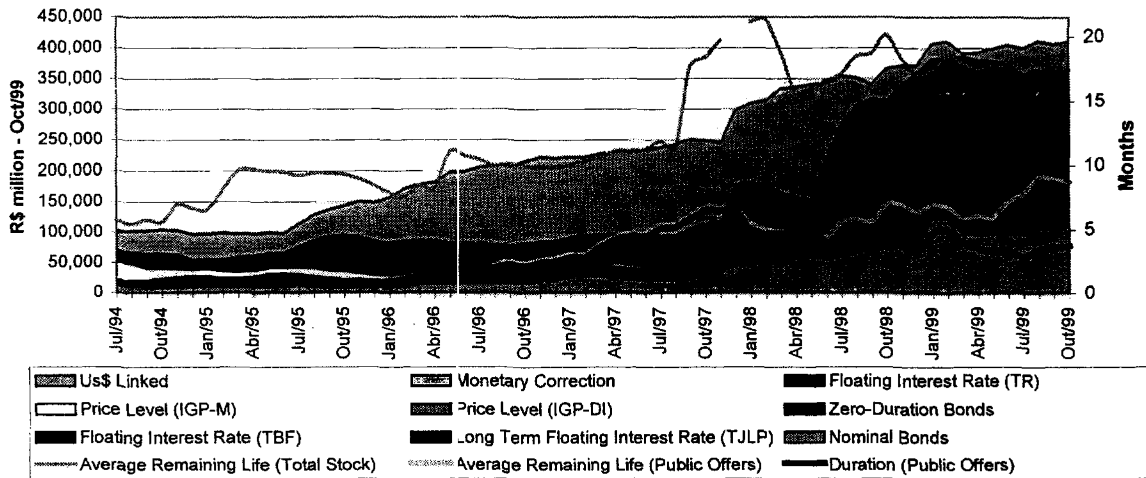


FIGURE II.5

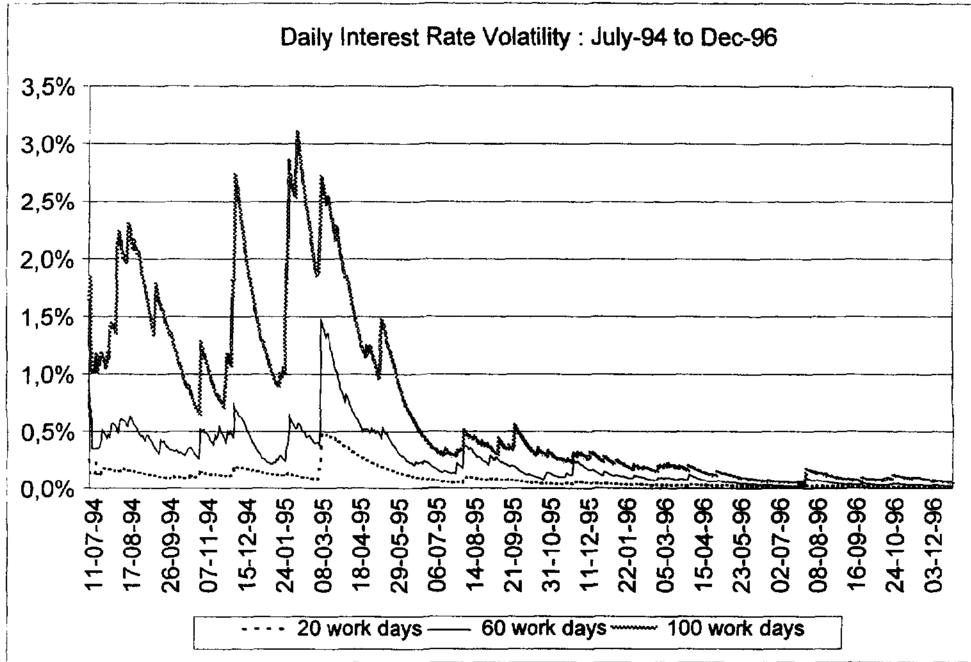
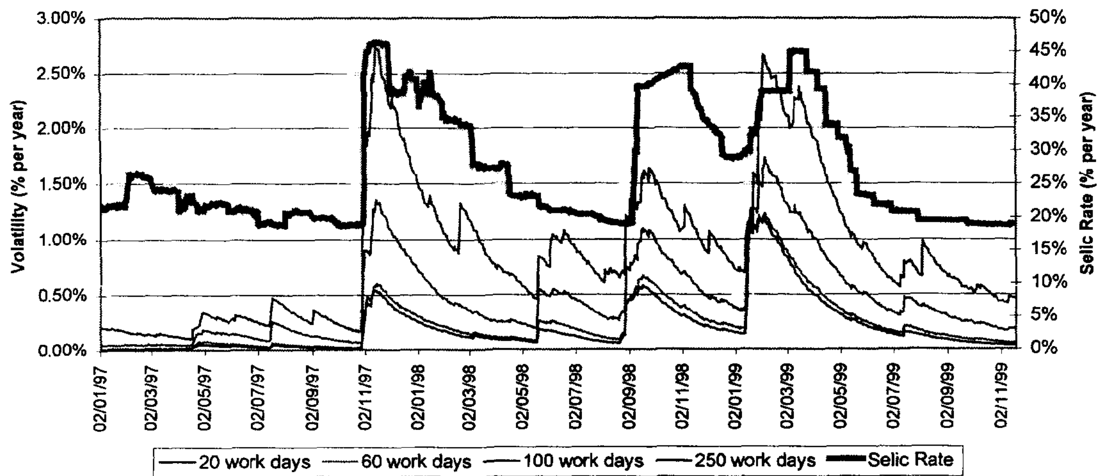


FIGURE II.6
Level and Volatility of Interest Rate: The Crises Period



Data Appendix:

Appendix 1: special request to Brazilian Central Bank.

Figure II.1: Brazilian Central Bank's home page: *www.bcb.gov.br*
Economic Data, Press Release, Fiscal Policies, Table XVIII (nominal data). We use centered IGP-DI to calculate real data.

Figure II.2: Brazilian Central Bank's home page: *www.bcb.gov.br*
Economic Data, Press Release, Fiscal Policies, Table XX and real data as calculated above.

Figure II.3: Brazilian Central Bank's home page: *www.bcb.gov.br*
Economic Data, Press Release, Fiscal Policies, Table XVIII and GDP from Central Bank Bulletin, Table IV.13

Figure II.4: Brazilian Central Bank's home page: *www.bcb.gov.br*
Economic Data, Press Release, Fiscal Policies, Table XX; the same real data; Average Remaining Life (total stock) data are directly sent from Central Bank; Duration (public offers) and Average Remaining Life (public offers) data come from Economic Data, Press Release, Fiscal Policies, Table XVII

Figure II.5: Extracted from Barcinski [1997].

Figure II.6: Selic Rate data come from Bloomberg. Volatilities are computed from interest rate futures market data, available from The Commodities and Futures Exchange (www.bmf.com.br).

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