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**Are There Reasons to Doubt Fiscal Sustainability in Brazil?**

**Ilan Goldfajn**

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# Banco Central do Brasil Technical Notes

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- ... Data unknown.
- Null data or an indication that the corresponding item does not exist.
- 0 ou 0,0** figure smaller than half the value of the last digit to the right.
- \* preliminary data.

An hyphen (-) between years (1970-1975) indicates the total of years, including the first and the last. A slash (/) between years indicates the yearly average of such years, including the first and the last, or harvest-year or agreement-year, according to the text.

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## **Foreword**

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The institutionalization of the Banco Central do Brasil Technical Notes, conducted by the Department of Economics, promotes the dissemination of works featuring economic content, attracting both theoretical and methodological interest, giving a view of the short-term developments of the economy and reflecting the work of the Bank's employees in all areas of action. Besides, other works, though external to the Banco Central, may be included in this series provided the Bank has afforded institutional support to their preparation.

# Are there Reasons to Doubt Fiscal Sustainability in Brazil?

ILAN GOLDFAJN

**Abstract:** this note analyzes fiscal sustainability in Brazil. It looks closely at the likely outcome of different assumptions. Based on alternative exercises, it argues that in all probable scenarios, debt to GDP ratio should at least stabilize, with good chances of declining over the years. It also argues that if an adverse scenario materializes in the future, further corrections in the balance of revenues and expenditures are feasible, given the nature of the fiscal framework.

## Summary

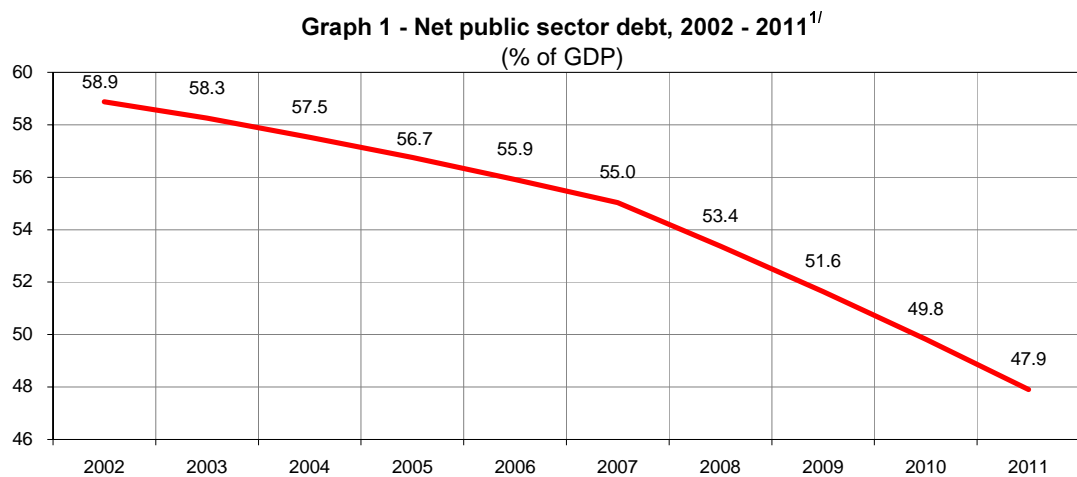
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# Are there Reasons to Doubt Fiscal Sustainability in Brazil?

ILAN GOLDFAJN<sup>1</sup>

## 1. Introduction

In principle, a simple and basic calculation should provide the answer to the question raised above. The current primary surplus of 3.75% of GDP would be more than a half percentage point higher than the required surplus to stabilize the debt-to-GDP ratio, assuming a modest 3.5% GDP growth and real interest rate as high as 9%.<sup>2</sup> Projecting these numbers over the next decade leads to a steeply declining ratio of the debt-to-GDP over the years (see Graph 1)<sup>3</sup>.



1/ The public sector debt-to-GDP ratio presented refers to the position at the end of the year.

However, this simple calculation seems to be insufficient to persuade the skeptics. There is a considerable degree of subjectivity when assessing fiscal sustainability in a real economy. One can always choose sufficiently adverse paths for the relevant variables in the future – GDP growth, real interest rates, and real exchange rates – that may lead to different assessments. Debt sustainability exercises should focus on medium and long run scenarios, but it is not uncommon to see biased assessments resulting from assumptions that are largely influenced by transitory adverse market swings. In general, neutral assessments are more common in tranquil times.

1/ I would like to thank Arminio Fraga for suggesting the topic of this note and for valuable comments; Katherine Hennings, Helio Mori, and the Economic Department at the Central Bank for substantial input in this note; and Amaury Bier, Joaquim Levy, and Pedro Malan for important suggestions. All remaining errors are the author's responsibility.

2/ The required surplus is  $s = (r-g)*d/(1+g) = (0.09 - 0.035)*0.58/(1.035) = 3.1\%$  of GDP, where  $r$  is real interest rate,  $g$  is real GDP growth rate and  $d$  is the debt-to-GDP ratio at the end of this year.

3/ The faster decline in the debt ratio after 2006 arises because there are no more hidden liabilities to recognize.

It is important to discuss fiscal sustainability based on the probability of certain assumptions occurring. What would be the probability of observing further real depreciation of exchange rate in Brazil over the next 5-10 years? What would be the chances that equilibrium real interest rates remain as high as the current ones? Both questions are relevant given the sensitivity of the Brazilian public debt to these variables. I will argue in this note that both probabilities are small when a 5-10-year time frame is considered. The current real exchange rate is probably undervalued, and real interest rates are very high and on a declining trend.

Some analysts tend to extrapolate the past behavior of the debt-to-GDP ratio in Brazil into the future. I argue in this note that this is incorrect since the factors that contributed to the increase in the debt-to-GDP ratio are non-recurrent. These factors are: (i) recognition of around 10% of GDP of already existing hidden liabilities (the so-called “skeletons”); (ii) weaker public sector primary results until 1998; (iii) significant real depreciation since 1999; and (iv) high real interest rates. All of the factors above should be excluded in a forward-looking analysis of the fiscal sustainability in Brazil. The fiscal stance improved considerably and there are reasons to expect that this policy will continue to be followed; real exchange rate adjustment under the new floating exchange regime has occurred; and most of the hidden liabilities have already been identified and are factored into our analysis.

Assessing fiscal sustainability requires also analyzing the current institutional framework. This analysis provides the basis to see whether current primary surpluses are sustainable and whether there is scope for further adjustments, if the conditions so require. In this respect, a few important points are worth emphasizing. First, although a tax reform is desirable for efficiency reasons, there are no structural difficulties in generating revenues in Brazil; on the contrary, the overall government tax revenue amounts to around 35% of GDP. Second, fiscal discipline has been achieved at all levels of government due to successful agreements between the federal government, state and local governments that are currently generating structural primary surpluses. Third, the Fiscal Responsibility Law ensures a sound and more permanent fiscal regime. There are borrowing limits and no government can spend beyond its means, and the capacity of state and local governments of borrowing was significantly constrained in view of the closing of most of state banks. Fourth, there is a constitutional ban on any law that modifies existing financial contracts or that can be interpreted as forced restructuring. The Constitution established that “the law shall not injure the vested right, the perfect juridical act and the *res judicata*”<sup>4</sup>. Nonetheless, there is recognition that further reforms are still needed to increase flexibility in spending and reduce social security deficit.

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4/ Article 5, item XXXVI, Constitution of the Federative Republic of Brazil. Additionally, article 1 of the Constitutional Amendment 32, of September 11, 2001, that changes the art. 62 of the Constitution, establishes that the issuance of Provisory Measures by the President of the Republic is forbidden when it targets the arrestment of goods, of private savings or any other financial assets.



In what follows, this note analyzes fiscal sustainability in Brazil. It looks closely at the likely outcome of different assumptions. Based on alternative exercises, it argues that in all probable scenarios, debt to GDP ratio should at least stabilize, with good chances of declining over the years. It also argues that if an adverse scenario materializes in the future, further corrections in the balance of revenues and expenditures are feasible, given the nature of the fiscal framework.

The structure of the note is as follows. I first describe the fiscal accounts in Brazil, covering both the recent data and the institutions. Second I present a basic scenario for the debt dynamics exercise in Brazil and carry on a sensitivity analysis of the debt-to-GDP ratio based on different assumptions. Third, I analyze the effect and the probability of a sufficiently adverse path occurring in the future. Finally, I summarize the main arguments in the conclusion.

## 2. The fiscal accounts in Brazil – facts and institutions

### 2.1 – Nominal deficit and primary surplus

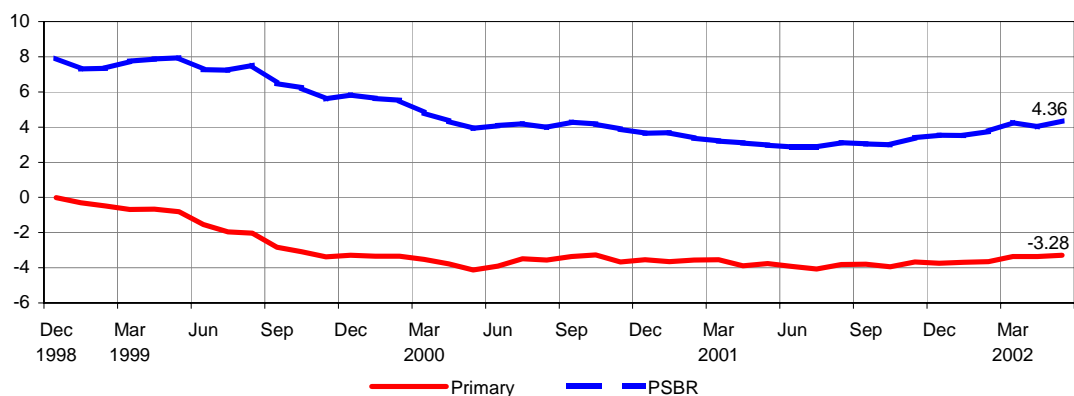
The fiscal results in Brazil have improved significantly in the recent past. The nominal deficit or the Public Sector Borrowing Requirements (PSBR), that had reached around 7% of GDP in the twelve months up to the end of 1995, improved to 4.36% of GDP in May 2002, as can be seen in Graph 2.

Regarding the primary fiscal results, which consider total revenues and expenditures excluding interest payments, the development is also positive, with the surplus increasing from 0.36% in December 1995 to 3.28% in May 2002. The operational fiscal results – defined as the primary surplus minus real interest rate payments – evolved from a deficit of 4.89% in 1995 to a deficit of 1.98% in May 2002.

**Graph 2 - Public Sector - PSBR and Primary Results**

(% of GDP) - Accumulated 12 months - valorized

(-) surplus; (+) deficit



## 2.2 – Public debt

The Net Federal Government Debt, which includes the National Treasury and the Social Security System, amounted to R\$455 billion in May 2002, or 36% of GDP. Adding the Central Bank's net debt, the resulting Net Central Government Debt reaches R\$447.1 billion, or 35.4% of GDP, because the Central Bank has more assets than liabilities.

If one considers the three levels of government, namely the Federal, State and Local Governments, the Net General Government Debt added to R\$689.7 billion in May 2002 (54.5% of GDP). Adding this amount to the net debt of the Central Bank and the public enterprises, the Net Public Sector Debt reaches R\$708.5 billion, or 56% of GDP, as can be seen in the Table 1.

Itemization	R\$ million			
	Domestic	External	Total	% of the GDP
Net Consolidated Public Debt (A + B + C + D)	567 917	140 537	708 454	56.0
Net General Government Debt (A + B)	492 124	197 587	689 711	54.5
Federal Government ( A )	271 374	183 662	455 036	36.0
States and Local Government Debt ( B )	220 750	13 925	234 675	18.6
Central Bank ( C )	62 907	-70 851	-7 944	-0.6
Net Public Enterprises Debt ( D )	12 886	13 801	26 687	2.1

Note: Net Central Government Debt = Federal Government debt + Central Bank.

While the net general government debt stood at 54% of GDP, the general government debt in gross terms reached R\$956 billion in May 2002, or 75.6% of GDP. This figure includes the total external debt of R\$201.6 billion, and domestic debt of R\$754.5 billion, for the federal, state and local governments.

## 2.3 – Gross x Net debt

I argue that while the concept of federal gross debt is more frequently used for exercises of debt dynamics because the figures on regional government are difficult to be collected and the quality of the assets of the government difficult to measure, in the case of Brazil, the net debt concept is quite appropriate. The concept of net public sector debt includes the three levels of government, the Central Bank and the public enterprises. The consolidation of intragovernment debt has been established on a sound footing and the nature of the government assets is quite clear.

An important consideration is that the net debt concept takes into account that assets can be used to redeem gross debt. One could always finance deficits by running out assets without affecting the gross debt level. In this respect, the net public debt concept is closer to the true measure of a public sector's net worth that considers total liabilities deducted by all assets. Incidentally, this is the direction taken by the new

IMF's Government Financial Statistics that proposes a set of statistics that attempt to reflect the true net worth of the public sector<sup>5</sup>.

Liquid assets are particularly suitable for redeeming debt at short notice. But, on a medium-term perspective, less liquid assets clearly ought to be taken in consideration (in symmetry to the accounting of less liquid liabilities, i.e, government debt that does not mature on the short term). In the case of Brazil, the assets owed to the government included in the net government debt are effectively available for payment of fiscal expenses (Table 2). In particular, the deposits of the Social Security System, the tax collected by all government levels, but not yet transferred to the treasuries, the demand deposits of all levels of government – including the Treasury deposits at the Central Bank – total more than 10% of GDP and are very liquid. Of course, the investments of several constitutional public funds, the resources of the Labor Assistance Fund (FAT), other government credits and credit to public enterprises are less liquid, but not necessarily of lower quality.

Itemization	R\$ million	% of GDP
Net Consolidated Public Debt	708 454	56.0
Net General Government Debt	689 711	54.5
Gross General Government Debt	956 106	75.6
General Government Credits (assets)	266 395	21.1
Deposits of the Social Security System	879	0.1
Tax collected (not transferred - float -, all government levels)	4 001	0.3
Deposits (all government levels)	122 101	9.7
Investment of Constitutional Funds	34 676	2.7
Labor Assistance Fund (FAT)	54 673	4.3
Other government credit's	15 174	1.2
Credit with public enterprises	30 892	2.4
Federal government external credits (collateral)	3 999	0.3

## 2.4 – Is the recent increase in debt to GDP ratio a trend?

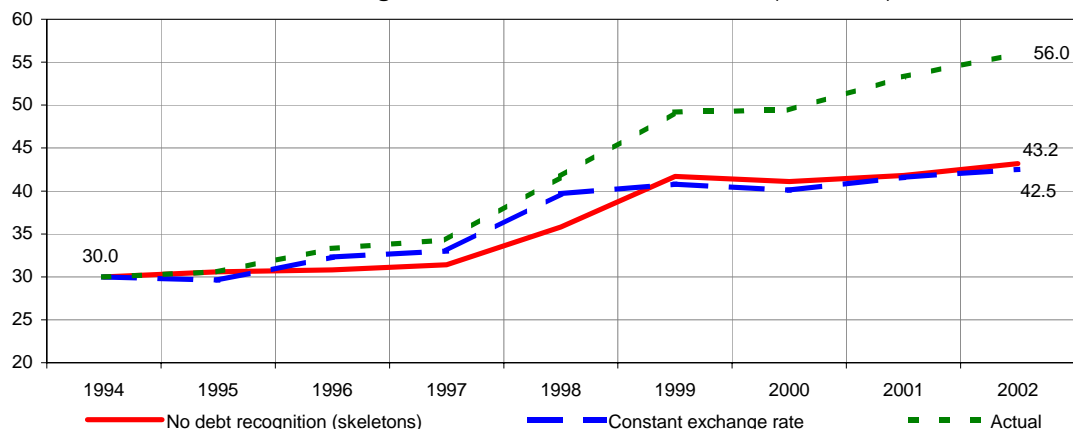
The debt-to-GDP ratio increased 26 percentage points from 1994 to 2002. During this period substantial reforms were implemented, leading to inflation stabilization, increased transparency and debt recognition, and, in the last three years, adjustments in the real exchange rate to improve external accounts. These factors influenced significantly the rise in the debt ratio. For example, the exchange rate depreciation was responsible for an increase equivalent to about 15% of GDP and the recognition of hidden liabilities (“skeletons”) to another 10% of GDP rise. The key point is that these factors are non-recurrent since the adjustment in the real exchange rate has occurred (the RER is now probably undervalued) and a large share of “skeletons” has been recognized (the rest is factored in our basic scenario).

5/ See IMF's "Government Financial Statistics (2001)". Although the concept of net debt is closer to the definition of net worth than gross debt, by no means it substitutes the need for the development of a more appropriate net worth concept.

Some counter-factual exercises are illustrative of the impact of these factors on the debt-to-GDP path. Assuming the exchange rate was kept stable since the end of 1994, and maintaining others factors as actually observed, the debt ratio would have reached 42.5% in 2002, instead of 56% (see Graph 3). Since the effect of the depreciation is calculated on accrual basis, part of this effect may actually reverse itself if the exchange rate appreciates back to less depreciated levels.

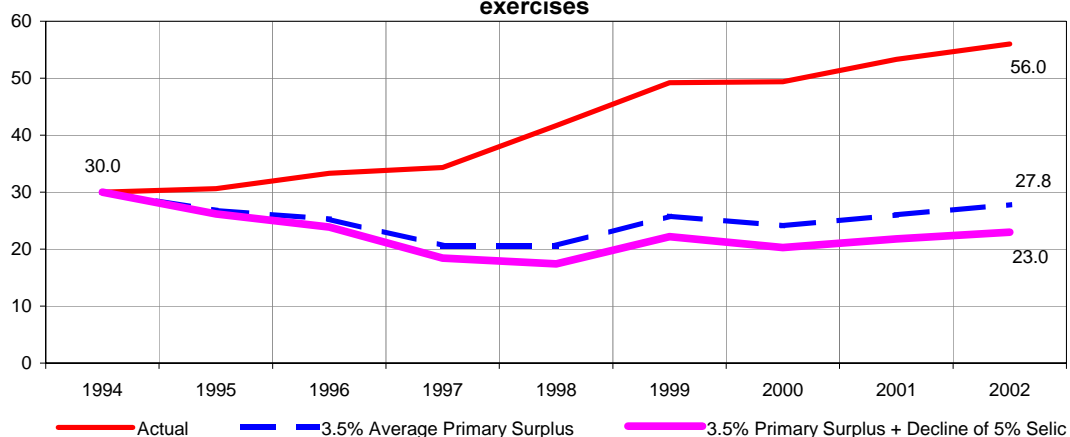
Similarly, Graph 3 shows the evolution of debt ratio in the case of not having to recognize the “skeletons”. With no skeletons debt-to-GDP would have reached 43.2% of GDP.

**Graph 3 - Actual evolution of net public sector debt and counter-factual constant exchange rate and no-skeletons exercise (% of GDP)**



Since 1999, Brazil has produced significant and consistent primary surpluses. One could ask whether the current policy would have been enough to prevent the recent increase in the debt ratio. A positive answer would provide greater comfort that current fiscal policy can stabilize the debt, even under adverse conditions, as the period 1994-2002 was characterized. Under a policy of generating primary surpluses of 3.5% of the GDP (a bit lower than today’s 3.75%) since 1995 and maintaining other factors as observed, the debt-to-GDP ratio would have shown a declining path, reaching 27.8% of GDP in 2002 (see Graph 4). In fact, in such a virtuous context, one would expect lower interest rates. Under the same fiscal policy and a reduction of 5% in the basic interest rates in the period 1995-98, the outcome would be a steeper decline of the

**Graph 4 - Actual evolution of the net public debt and counter-factual fiscal exercises**



debt ratio. The debt-to-GDP ratio would have reached 23% in May 2002, a reduction of 7% of GDP compared to the 1995 level. This path reflects the incidence of a lower interest rate on lower stock of outstanding debt.

It is important to point out the significant change in the debt-to-GDP curve due to the persistence of an appropriate sequence of primary surpluses. The primary surplus produces an initial reduction in the debt amount, and then this reduction becomes steeper with smaller payments of interest and the sequencing of new surpluses. This favorable dynamics allows a considerable decline in the debt ratio over the period.

If the past is a reference for the future, these exercises suggest that in the absence of major adjustments in the real exchange rate, or the need to recognize almost 10% of GDP of hidden liabilities, and with the current policy of generating a sizable fiscal surplus, the debt-to-GDP is likely to decline in the future.

## **2.5 – Institutions**

Important institutional reforms were implemented in the last few years so as to ensure the maintenance of the primary fiscal surpluses at appropriate levels and the sustainability of the debt.

First, since 1997 the debt restructuring agreements reached by the federal government with states and municipalities contributed to the reorganization of the finances of these sub-national governments. The state governments agreed with the commitment of 13% of their income to the service of their debts generating surpluses and improving the dynamics of the overall public debt. In this context, the sub-national governments improved their average primary deficit from 0.13% of GDP in 1994-1998 to a surplus of 0.62% of GDP in the period 1999-2001.

Second, a significant step forward is the Fiscal Stabilization Program implemented since 1998. This Program established targets for primary surpluses for the consolidated public sector of 2.6% of GDP in 1999, 2.8% in 2000 and 3% in 2001. The actual outcome was better than envisaged. The public sector primary surplus reached 3.1%, 3.55% and 3.75% in those years.

Third, and most importantly, the Fiscal Responsibility Law (Complementary Law 101) was enacted by Congress in 2000. This Law sets forth an institutional framework that forces the administrators of public resources to manage revenues, expenditures, assets and liabilities, following a set of transparent and precise rules. The main regulations are focused on establishing: (a) limits for expenditure on personnel and the public debt; (b) annual fiscal targets; (c) rules to compensate the creation of permanent expenses or reduction of tax revenues; and (d) rules to control the public finances in electoral years. The observation of this Law allows a permanent fiscal discipline at all levels of government, ensuring medium-term fiscal sustainability and transparency.

Finally, fiscal statistics have improved significantly, providing greater transparency and accuracy. The efforts made by the Brazilian Government were recognized by the International Monetary Fund Report on the Observance of Standards and Codes (ROSC) – Fiscal Transparency Module<sup>6</sup>: “Brazil attained high standards with respect to main indicators of fiscal management and transparency. (...) The coverage of fiscal targets and fiscal statistics is commendably broad. Recent reforms in the budget and planning process have substantially improved the realism and transparency of the federal budget, and its consistency with macroeconomic constraints, as well as its effectiveness in resource allocation. Mechanisms of internal and external control are generally well developed, and increasingly aim to access not only formal compliance with legal requirement, but also the quality and cost-effectiveness of public spending. Fiscal statistics at the federal level are of high quality, timeliness, and detail. Brazil is at the forefront of countries at comparable level of development in the use of electronic means for the dissemination of fiscal statistics, legislation, and administrative regulation on tax and budgetary matters, and for delivery of government services, as well as to facilitate civil society’s scrutiny of government activities and programs”.

This analysis provides the basis to argue that current primary surpluses are sustainable and that there is scope for further adjustments, if the conditions so require. These adjustments are feasible not only in terms of flows of revenues and expenses, but there is also room for further privatizations. In contrast to other emerging markets, recent privatization program in Brazil has left a larger proportion of assets and public enterprises in the hands of the government, leaving scope for further privatization, if such program is desirable or needed.

### 3. Basic scenario and sensitivity analysis

#### 3.1 – Solvency versus sustainability

The government is considered to be solvent if the present discounted value (PDV) of its current and future primary expenditure is no greater than the PDV of its current and future path of revenue, net of any initial indebtedness. A government’s debt position is considered to be sustainable if it satisfies the present value budget constraint (i.e., it is solvent) without a major correction in the future, one that could be unfeasible or undesirable for economic or political reasons<sup>7</sup>.

A solvency condition may be formalized as follows:

$$\sum_{i=0}^{\infty} \frac{E_{t+i}}{\prod_{j=1}^i (1+r_{t+j})} \leq \sum_{i=0}^{\infty} \frac{I_{t+i}}{\prod_{j=1}^i (1+r_{t+j})} - (1+r_t) * D_{t-1}$$

6/ IMF (2001), “Brazil: Report on Observance of Standards and Codes (ROSC) – Fiscal Transparency”. IMF Country Report no. 1/217.

7/ See IMF (2002) “Assessing Sustainability”.

expenditure:  $E_{t+i}$

revenue:  $I_{t+i}$

debt:  $D_t$

If the primary surplus is:

$$S_{t+i} = I_{t+i} - E_{t+i},$$

then:

$$\sum_{i=0}^{\infty} \frac{S_{t+i}}{\prod_{j=1}^i (1+r_{t+j})} \geq (1+r_t) * D_{t-1} \quad (1)$$

If the real interest rate ( $r_{t+j}$ ) and real GDP growth rate ( $g_{t+j}$ ) are maintained constant, and interest rate is higher than GDP growth rate:

$$r_{t+j} = r_t$$

$$g_{t+j} = g_t$$

$$r_t \geq g_t$$

then equation (1) as percentage of GDP could be simplified as:

$$(1+r_t) * \frac{D_{t-1}}{Y_t} \leq \sum_{i=0}^{\infty} \frac{S_{t+i}}{Y_t * (1+r)^i} = s_t * \sum_{i=0}^{\infty} \frac{(1+g_t)^i}{(1+r_t)^i} = s_t * \frac{1+r_t}{r_t - g_t} \quad (2)$$

For a given (constant) path of primary surpluses as percentage of GDP ( $s_t$ ):

$$s_t = s_{t+i} = \frac{S_{t+i}}{Y_t * (1+g_t)^i}$$

Therefore, from equation (2), the primary surplus for solvency would be given by:

$$s \geq (r - g) * d / (1+g)$$

It is important to realize that the solvency condition derived under constant values for growth, interest rates and primary surplus is also a condition for sustainability since, by construction, it does not require a major change in future variables to satisfy the intertemporal public sector budget constraint.

The institutional framework implemented in the recent years has reinforced the objective of preserving the solvency of the public sector. Indeed the framework currently in place makes excesses at any level of government more difficult to occur as

it contemplates instruments to preserve fiscal discipline. Additionally, the Fiscal Responsibility Law created a set of constraints – borrowing limits and ceilings for expenses with personnel – preventing fiscal irresponsibility.

Another consideration is that, as shown in the analysis of the net public debt an ample amount of liquid assets can be used in emergency situations. Finally, it is also important to bear in mind that the Brazilian economy has been able to collect a relatively high level of fiscal revenue corresponding to around 35% of GDP.

### 3.2 – Hypotheses of the basic scenario

The hypotheses in our basic scenario are conservative: (i) annual growth rate of 3.5%, less than potential output growth for Brazil, estimated at around 4.5% with recent data on productivity and labor force growth; (ii) high and conservative real interest rate of 9%; (iii) nominal (but not real) currency depreciation; (iv) stable primary surplus of 3.75% of GDP; and (v) the recognition of skeletons is estimated at 0.65% of GDP in 2003 and 0.75% of GDP between 2004 and 2007. This assumption includes the recognition of all FCVS accounts. With these hypotheses the evolution of the net debt is shown in Table 3.

The nominal and real interest rates are defined for the implicit internal public debt interest rate. This implies that the assumption of a 9% real interest rate implicitly assumes an even higher value – at about 10% – for the real interest rate based on a Selic rate. This is a very conservative assumption since a lower rate is warranted by the current fundamentals – healthy banking system, floating exchange regime, and fiscal framework.

The assumption regarding the skeletons – recognition of 0.75% of GDP until 2006 – provides a faster decline in the debt ratio after 2006.

Discrimination	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
Inflation GDP deflator (average)	7.59	4.94	3.87	3.63	3.50	3.50	3.50	3.50	3.50	3.50
Inflation GDP deflator (dec/dec)	5.89	4.00	3.75	3.50	3.50	3.50	3.50	3.50	3.50	3.50
GDP real growth	2.00	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50
Interest rate <sup>1/</sup>	17.59	13.36	13.09	12.82	12.82	12.82	12.82	12.82	12.82	12.82
Real interest rate	11.05	9.00	9.00	9.00	9.00	9.00	9.00	9.00	9.00	9.00
Nominal currency depreciation	22.87	2.46	2.22	1.97	1.97	1.97	1.97	1.97	1.97	1.97
Primary (% of GDP)	-3.75	-3.75	-3.75	-3.75	-3.75	-3.75	-3.75	-3.75	-3.75	-3.75
"Skeletons" <sup>2/</sup>	1.61	0.65	0.75	0.75	0.75	0.75	0.00	0.00	0.00	0.00
Net debt (% of GDP)	58.88	58.27	57.54	56.77	55.94	55.07	53.42	51.69	49.86	47.95

1/ Implicit internal net debt interest rate.

2/ Net of the privatization proceeds (% of GDP).



### 3.3 – Sensitivity analysis

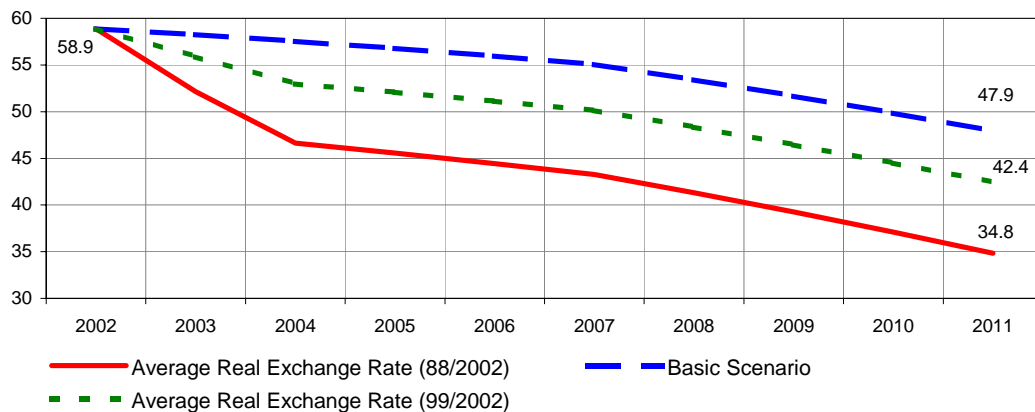
The graphs below show different paths followed by the net public sector debt under alternative assumptions for the exchange rate, real interest rate, GDP growth, and primary surplus. Higher real interest rates generally cause the debt to decline at a slower pace. Higher real GDP growth and larger primary surpluses produce an initial step reduction of debt, and, if maintained, a downward path. The effect of larger primary surpluses on the reduction of the debt is important.

#### 3.3.1 – Real exchange rate

It is important to realize that a nominal exchange rate depreciation only affects the debt-to-GDP ratio insofar it exceeds inflation (measured by the GDP deflator), i.e., it leads to a real exchange rate depreciation. A real exchange rate depreciation initially shifts upwards the level of the debt, as its effect is calculated on an accrual basis. As a result of the accrual methodology, a reversal in the movement of the exchange rate would immediately bring the debt down. A permanent impact on the debt stock would occur only if the debt matures and is redeemed at an unfavorable exchange rate (the debt is not rolled over or is refinanced with non dollar-linked-debt instruments). Otherwise, the fiscal loss is partially or totally reversed whenever the currency appreciates.

The effect of a gradual return of the effective real exchange rate to its 15-year average, compared to the basic scenario, is shown in Graph 5. The effect is substantial: the debt-to-GDP ratio falls by more than 25 percentage points in 10 years.

**Graph 5 - Net public sector debt, 2002-2011 - exchange rate exercise**  
(% of GDP)

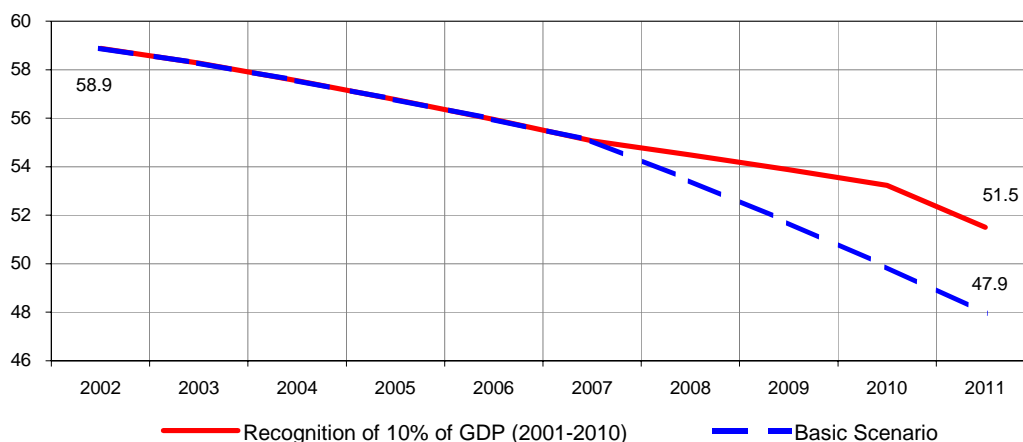


#### 3.3.2 – Skeletons

Debt recognition (“skeletons”) adds directly to the stock of the debt and thus impacts the debt level. The slope of the debt path is also affected, but to a smaller extent, due to the accrued interest on the newly recognized debt. The recognition of debt that had not been recorded as such by previous governments has responded for approximately 10% of GDP. As shown in the previous section, without such recognition

the debt dynamics would appear differently. Nonetheless, recognizing past debt is in line with the policy of improving transparency in the government accounts.

**Graph 6 - Net public sector debt, 2002-2011 - skeletons exercise (% of GDP)**

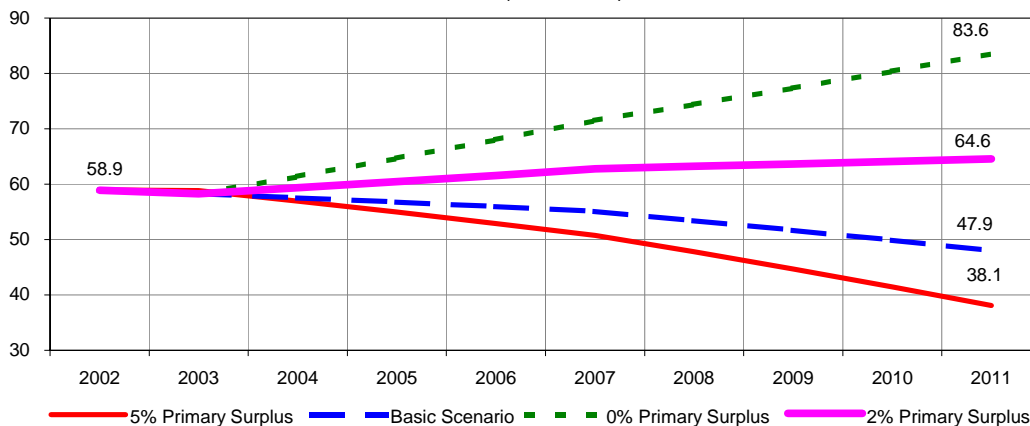


For the sensitivity analysis, a debt ratio path is simulated with higher debt recognition numbers in the future – accumulated 10% of GDP in the period 2002-2011. The results show that the dynamics are favorable, even under this assumption (Graph 6).

### 3.3.3 – Primary surplus

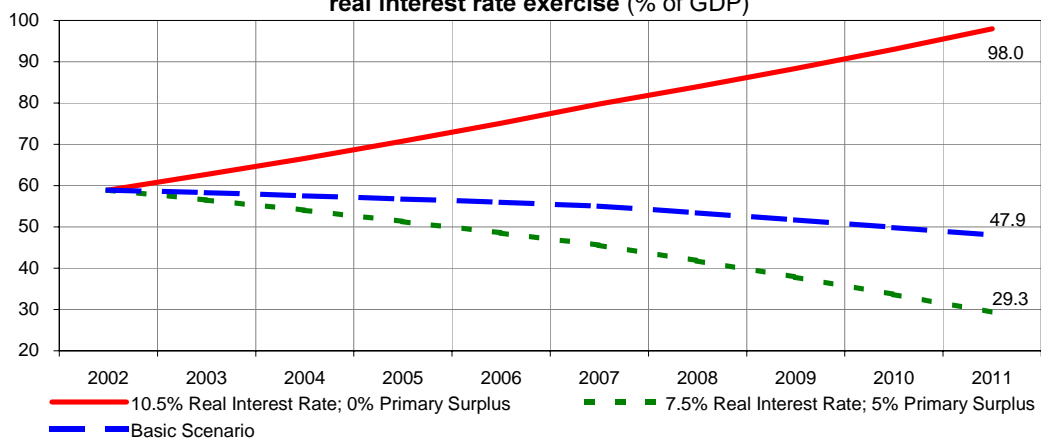
Changing the primary surpluses produces not only different levels of debt, but also different slopes for the debt path (Graph 7). Under the basic scenario – GDP growth of 3.5% from 2003 onwards and a real average interest rate of 9% p.a., primary surplus of 3.75% of GDP – net public sector reaches below 50% of GDP in 2010. Increasing the primary surplus to 5% of GDP would lead to a net debt of 40% of GDP in 2010, a decline of almost 20% of GDP from the current levels. Primary surpluses around 0-2%, however, would not be able to stabilize the net debt.

**Graph 7 - Net public sector debt, 2002-2011 - primary surplus exercise (% of GDP)**



Another possible exercise is to assume that different primary surpluses may lead to different paths for the real interest rate. This will be the case if current domestic real interest rates factor a premium on uncertain debt dynamics and if this premium is sensitive to the size of the primary surplus. The compounding of the two effects, has powerful consequences to the debt dynamics. Combining primary surpluses (0% or 5%) with real interest rates (10.5% or 7.5%) provides a stark picture (Graph 8). Over the horizon of the analysis, a 1.5 percentage point reduction in interest rates translates in debt to GDP ratios 10 percentage points lower than in a scenario where a higher primary does not induces lower interest rate.

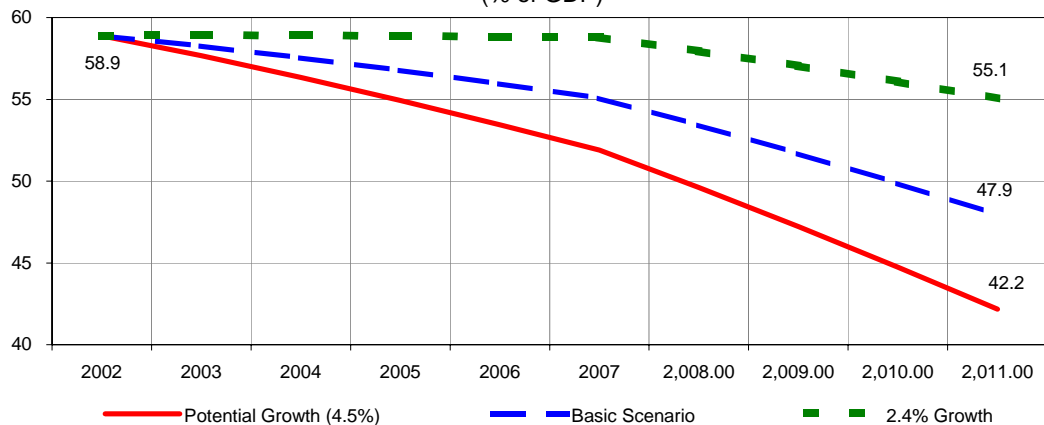
**Graph 8 - Net public sector debt, 2002-2011 - combining primary surplus with real interest rate exercise (% of GDP)**



### 3.3.4 – GDP growth

Assuming a lower GDP growth rate of 2.4% in 2003 onwards the debt would stabilize and decline subsequently. A higher growth of 4.5% would make the debt to GDP ratio fall considerably. Assuming a lower GDP growth rate of 2.4% in 2003 would not cause the debt-to-GDP ratio to increase over time. Actually, even this low level of growth would be consistent with a declining ratio after a few years (Graph 9).

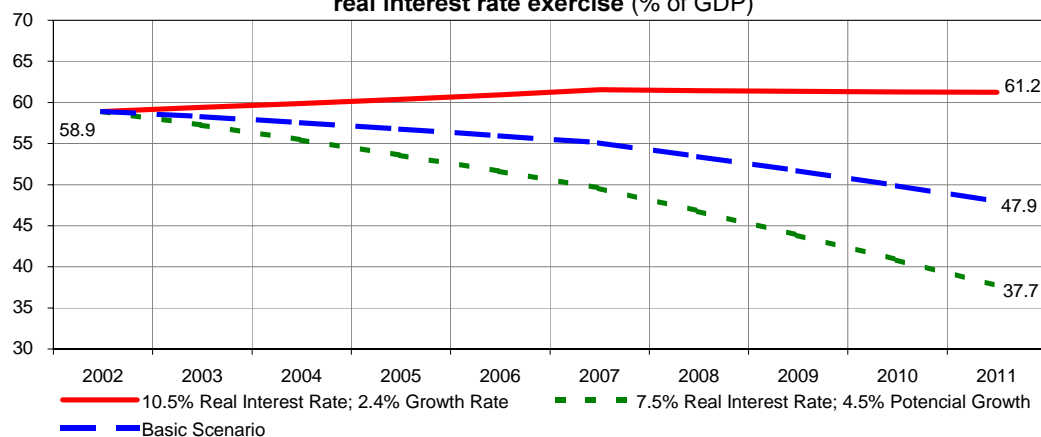
**Graph 9 - Net public sector debt, 2002-2011 - growth rate exercise (% of GDP)**



If higher growth is obtained in a scenario of lower real interest rates the decline in the debt-to-GDP ratio would be larger (Graph 10). Alternatively, if one

assumes a lower growth and higher real interest rate, the debt-to-GDP ratio remains relatively stable (remember that this real interest rate is the implicit rate on the debt – Selic rates would be even higher).

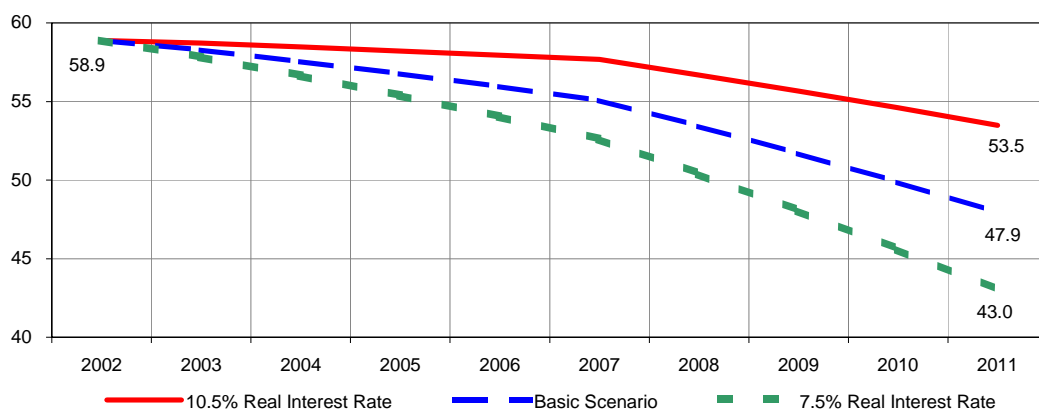
**Graph 10 - Net public sector debt, 2002-2011 - combining growth rate with real interest rate exercise (% of GDP)**



### 3.3.5 – Real interest rates

It is noteworthy that with the current levels of primary surpluses (3.75% of GDP), even if implicit real interest rates are maintained at 10.5% p.a. from 2003 onwards, the debt to GDP ratio remains stable until 2007, before moving to a downward trend to reach 54% in 2010. A real interest rate of 7.5% p.a. would help accelerate the debt reduction (Graph 11).

**Graph 11 - Net public sector debt, 2002-2011 - real interest rate exercise (% of GDP)**



## 4. Negative scenario and the likelihood of the assumptions

The sensitivity analysis shows that some unfavorable scenarios are not unstable. This is the case, for instance, of economic growth. Even if growth stays around 2-2.5%, the debt shows a declining path. Similarly, a once-and-for-all real

devaluation would not trigger an explosive growth of the debt ratio. Fiscal relaxation would have to be quite significant to set the debt into an unstable path, i.e., only if the surplus is reduced below 2% of GDP would the debt dynamics become unstable. Finally, interest rates would have to remain in quite a high level to bring the public debt to an unsustainable path.

True, it would be possible to design a negative scenario by assuming a set of sufficiently unfavorable outcomes for the main variables. It is important to point out, however, that for such a scenario to occur it would require the persistence of unfavorable numbers over a 10-year period.

For instance, if one takes into consideration a set of assumptions for the relevant variables for the period 2003-2011 where the GDP growth rate remains at a low level of 1.5% and real interest rate is set above 11%, the Net Public Sector Debt-to-GDP would follow a rapidly increasing path from 60% in 2002 to 80% of GDP in 2011. A primary surplus of 3.75% of GDP would not, in this case, be sufficient to ensure the sustainability of debt-to-GDP ratio (Table 4). But, what is the probability that such a sequence of unfavorable contingencies will persist for a whole decade?

Discrimination	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
Inflation GDP deflator (average)	7.59	4.94	3.87	3.63	3.50	3.50	3.50	3.50	3.50	3.50
Inflation GDP deflator (Dec/Dec)	5.89	4.00	3.75	3.50	3.50	3.50	3.50	3.50	3.50	3.50
GDP real growth	2.00	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50
Interest rate <sup>1/</sup>	17.45	15.90	15.38	15.24	15.34	15.41	15.48	15.53	15.59	15.64
Real interest rate	10.92	11.44	11.21	11.34	11.44	11.51	11.57	11.63	11.68	11.72
Nominal currency depreciation	29.33	4.00	3.75	3.50	1.97	1.97	1.97	1.97	1.97	1.97
Primary deficit (% of GDP)	-3.75	-3.75	-3.75	-3.75	-3.75	-3.75	-3.75	-3.75	-3.75	-3.75
"Skeletons" <sup>2/</sup>	1.61	0.66	0.78	0.80	0.81	0.82	1.09	1.09	1.09	0.00
<b>Net debt</b>	<b>60.26</b>	<b>62.08</b>	<b>63.95</b>	<b>66.00</b>	<b>67.84</b>	<b>69.90</b>	<b>72.44</b>	<b>75.28</b>	<b>78.43</b>	<b>80.87</b>
<b>Net debt (baseline)</b>	<b>58.88</b>	<b>58.27</b>	<b>57.54</b>	<b>56.77</b>	<b>55.94</b>	<b>55.07</b>	<b>53.42</b>	<b>51.69</b>	<b>49.86</b>	<b>47.95</b>

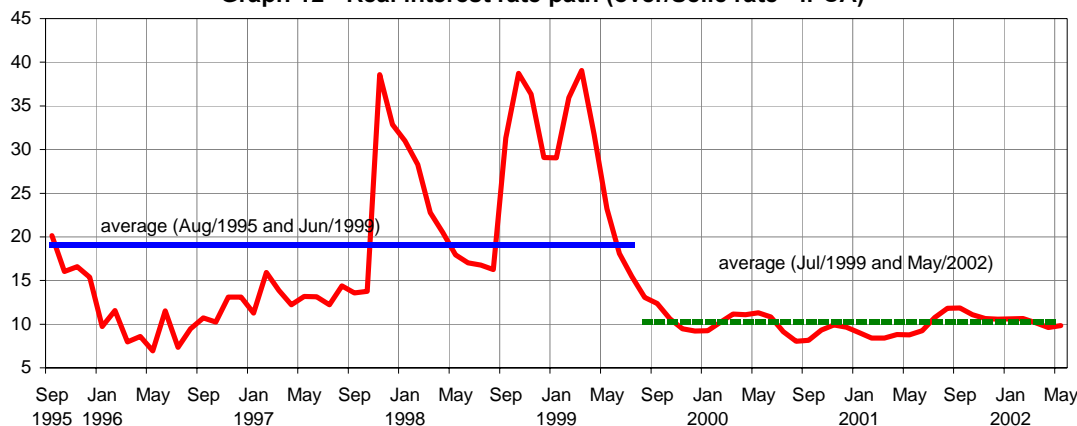
1/ Implicit interest rate of internal net debt.

2/ Net past debts, net of the privatization proceeds.

Let take the possibilities by turn. First, the interest rates. The balance of risks indicates the likelihood for a gradual reduction of interest rates from their current levels. Indeed, Graph 12 shows that the average real interest rate has been declining after the change to a floating exchange rate regime. Even in the recent event of adverse external shocks, the rise in interest rate has been less severe than in the past, as part of the shock has been absorbed by the exchange rate. Of course, one would not expect that the unfavorable domestic and external environment would persist for a decade, thus reducing the reasons for a more tight monetary policy stance. At such a time as a

more normal condition is reestablished, with a lower frequency of negative supply shocks, the real interest rate would continue in its downward trend, converging to the levels (well below 10%) observed in other emerging market economies.

**Graph 12 - Real interest rate path (over/Selic rate - IPCA)<sup>1/</sup>**

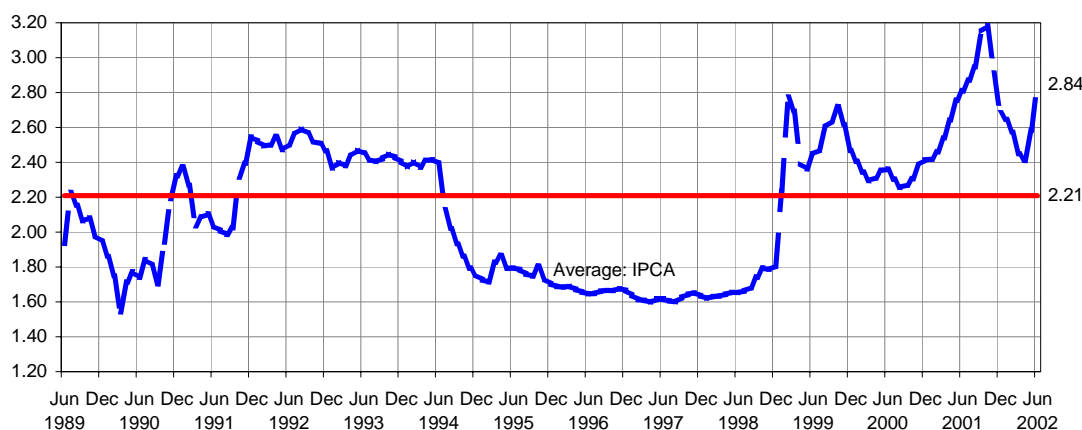


1/ Purged of seasonal factors by the 12 month IPCA.

A second question is whether it is likely that the real exchange rate will continue to depreciate. I argue that the probability of the real exchange rate appreciation from current levels in the coming years is high. It is important to take into consideration that the Brazilian economy has been through a sequence of adverse shocks with direct impact on the foreign exchange market in the recent past. Currently, domestic uncertainties are overlapping with turbulent international capital markets, and have translated into an overshooting of the exchange rate. Indeed, Graph 13 shows that the real exchange rate is well above the average level recorded over the last 15 years<sup>8</sup>.

Furthermore, it should be borne in mind that it is the real exchange rate that matters on our calculations. The path of the nominal exchange rate depreciation only affects the debt-to-GDP ratio insofar it exceeds inflation (measured by the GDP deflator). If the nominal rate path generates a consistent depreciation it would eventually lead to a higher inflation rate. Under an inflation targeting regime, monetary policy is geared towards avoiding this inflationary outcome, increasing the likelihood of a nominal

**Graph 13 - Effective real exchange rates - prices of June 2002<sup>1/</sup>**

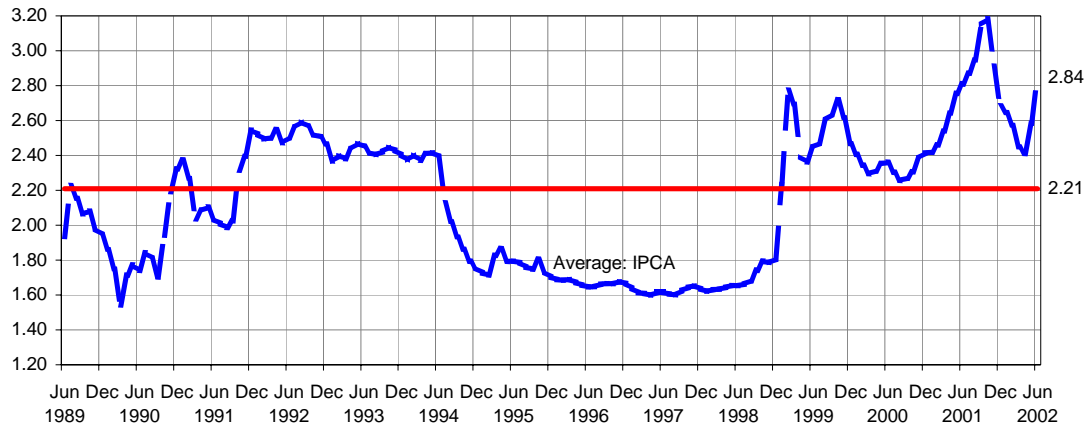


1/ Basket of currencies; Basis: May/2002=100; Median: Jan/1998 to May/2002.

8/ Please note that Graph 13 is constructed with real appreciation indicating downward movements.

exchange rate appreciation. This outcome is more likely when the longer-term trend of the real exchange rate is more appreciated than the current levels.

**Graph 13 - Effective real exchange rates - prices of June 2002<sup>1/</sup>**



With respect to growth, it is noteworthy that the major industrial countries are currently experiencing a weak growth rate and there have been major adjustments in the international capital markets. This creates a downside pressure not only for the demand for the exports of emerging market countries, but also to the access of these countries to external financing, with a negative impact on investment. It is expected that as the world economy recovers and international financial markets settle down, these factors will abate. The coming of a new administration in Brazil will also reduce uncertainty, freeing investment decisions and leading to larger purchase of durable goods.

On balance, the likelihood of any of the worse-case scenarios to occur is small. Moreover, if such contingencies occur, reasonable corrections in the future fiscal efforts are feasible. In fact, the key necessary condition is to maintain the current primary surplus, as a relaxation of the fiscal effort to a 2% of GDP primary surplus would set the debt-to-GDP ratio into an unsustainable path.

## 5. Conclusions

### **The main arguments raised in this note are worth emphasizing:**

- Under reasonable and even conservative hypotheses the debt-to-GDP should start declining over the next few years. This result is valid even if there are negative outcomes from either of the relevant determinants – real interest rate, GDP growth, real exchange rate, and contingent liabilities. The key necessary condition is to maintain the primary surplus at 3.75% of GDP.
- It is possible to construct sufficiently negative scenarios, where the debt-to-GDP ratio does not stabilize. However, the likelihood of such scenarios is small. More specifically, a further permanent real exchange depreciation is unlikely, given that the currency is substantially weaker than its 15-year average; real interest rates

are on a declining trend, but still very high compared to other emerging markets. Further decline seems to be the natural path over the medium run. Finally, a recovery in the world economy will push GDP growth rates closer to the potential output growth – around the 4.4% observed in 2000.

- Nonetheless, if a low likelihood negative scenario does materializes, further corrections in the balance of revenues and expenditures are feasible. The comfort arises from the recent institutional progress in the fiscal regime in Brazil, in particular the Fiscal Responsibility Law and the agreements with states and municipalities.
- The recent debt-to-GDP increase should not be used as an indication of future performance. Non-recurrent events explain almost all of the past behavior. The recognition of hidden liabilities amounting almost 10% of GDP explains a good proportion of the increase. In addition, the required adjustment in Brazilian external accounts led to a corrective adjustment in the real exchange rate that has already taken place. Also, the shift to consistent primary surpluses since 1998 has changed the fiscal outlook in Brazil. Finally, one should not expect real interest rates averaging 20% a year to be recurrent. In summary, if the past is to be used as a reference for the future, our analysis suggests that in the absence of major adjustments in the real exchange rate, and with the current policy of generating a sizable fiscal surplus, debt-to-GDP is likely to decline in the future.