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Brazil: Selected Issues and Statistical Appendix

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INTERNATIONAL MONETARY FUND

BRAZIL

Selected Issues and Statistical Appendix

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Approved by the Western Hemisphere Department

November 10, 2000

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Brazil: Basic Data

I. Social and Demographic Indicators

Area (sq. km)	8,547,403	Nutrition (1996)	
Arable land (percent of land area)	6.3	Calorie intake (per capita a day)	2,938
Population		Health	
Total (million) (est., 2000)	165.7	Population per physician (1997)	793
Annual rate of growth (1990-98)		Population per hospital bed (1995)	286
(percent a year)	1.4	Population per nurse (1997)	2,440
Density (per sq. km.) (2000)	19.4		
GDP per capita (US$) (1999)	3,229	Access to electricity	
		Percent of dwellings	
Population characteristics (1997)		Urban	88.5
Life expectancy at birth (years)	67	Rural	20.6
Crude birth rate (per thousand)	21		
Crude death rate (per thousand)	7	Access to safe water	
Infant mortality (per thousand live births)	34	Percent of population (1995)	69.0
Under 5 mortality rate (per thousand)	44	Urban	80.0
		Rural	28.0
Income distribution (1995)			
Percent of income received:			
By highest 10 percent of households	48.7	Education	
By lowest 20 percent of households	2.6	Adult illiteracy rate (1997)	16.1
Gini coefficient (most recent year)	0.58	Gross enrollment rates, percent in	
		Primary education (1998)	128
Distribution of labor force, percent in total		Secondary education (1998)	68
Agriculture	23.1	Tertiary education (1996)	12
Industry and mining	23.7		
Services	53.2	GDP (1999, est.)	R$960,858 million
			US$529,398 million

II. Economic Indicators, 1996–00

	1996	1997	1998	Prel. 1999	Proj. 2000
	(In percent of GDP)				
Origin of GDP					
Agriculture	8.3	8.0	8.3	8.3	8.0
Industry and mining	34.7	35.2	34.6	35.5	35.8
Services	62.3	61.9	62.3	61.1	61.2
	(Annual percentage changes, unless otherwise indicated)				
National accounts and prices					
Real GDP	2.7	3.3	0.2	0.8	4.0
Real GDP per capita	1.2	1.9	-1.1	-0.5	2.7
GDP deflator	17.4	8.3	4.7	4.3	8.3
Consumer price index (IPCA, period average)	15.8	6.9	3.2	4.9	7.2
Consumer price index (IPCA, end of period)	9.6	5.2	1.7	8.9	6.5
Unemployment rate (in percent)	5.4	5.7	7.6	7.6	7.4
	(Ratios to GDP)				
Gross domestic investment	20.9	21.5	21.2	20.4	20.8
Of which:					
Public investment	2.3	2.2	2.2	1.9	1.9
Gross national savings	17.9	17.7	16.9	15.7	16.6
External savings 1/	3.0	3.8	4.3	4.7	4.2
Private consumption	62.5	62.7	62.1	61.8	61.5
Public consumption	18.5	18.2	18.8	18.9	18.5
Public finances					
Central government 2/					
Total revenues	17.8	18.4	20.1	22.0	21.6
Total expenditures	20.4	21.0	25.5	28.9	24.3
Of which:					
Interest	3.0	2.3	6.0	9.3	4.9
Savings	-1.8	-1.8	-4.3	-6.1	-2.0
Primary balance	0.4	-0.3	0.6	2.4	2.2
Overall balance	-2.6	-2.6	-5.4	-6.9	-2.7
Consolidated public sector					
Primary balance	-0.1	-1.0	0.0	3.2	3.4
Overall balance	-5.9	-6.1	-7.9	-10.0	-4.6

Brazil: Basic Data (Concluded)

	1996	1997	1998	Prel. 1999	Proj. 2000
	(12-month percentage changes, unless otherwise indicated)				
Money and credit					
Liabilities to private sector	10.2	20.7	13.6	8.8	3.7
Of which:					
Money (M1)	10.2	61.4	9.6	25.8	5.3
Quasi money	9.0	17.3	10.3	4.2	1.4
Net domestic assets of the banking system	8.2	30.0	18.8	9.9	-3.9
Of which:					
Credit to the public sector (net)	184.5	37.1	60.9	-8.6	6.0
Credit to the private sector	4.4	12.8	16.9	6.2	6.6
Liabilities to private sector, in percent of GDP	33.5	36.2	39.1	40.5	37.3
Representative interest rate (annual average, in percent)	27.5	25.0	29.5	26.3	17.6
	(In billions of U.S. dollars, unless otherwise indicated)				
Balance of payments					
Current account	-23.1	-30.9	-33.6	-25.0	-25.3
Merchandise trade balance	-5.6	-6.9	-6.6	-1.2	0.0
Exports	47.7	53.0	51.1	48.0	56.8
Imports	53.3	59.8	57.7	49.2	56.8
Services and transfers (net)	-17.5	-24.1	-27.0	-23.8	-25.3
Of which:					
Interest	-9.2	-10.4	-11.9	-15.3	-16.9
Capital account	32.3	23.0	15.9	14.5	29.9
Foreign direct investment	10.0	17.1	25.9	30.0	26.1
Portfolio investment	6.0	5.3	-1.9	1.4	2.9
Other capital (net)	17.6	3.5	-3.4	-17.5	-0.7
Errors and omissions	-1.3	-2.9	-4.8	0.6	0.9
Change in net international reserves	9.1	-8.0	-17.7	-10.5	4.6
Exports (in percent of GDP)	6.2	6.6	6.5	9.1	9.4
Imports (in percent of GDP)	6.9	7.4	7.3	9.3	9.4
Current account (in percent of GDP)	-3.0	-3.8	-4.3	-4.7	-4.2
Merchandise exports (in US$, annual percentage change)	2.7	11.0	-3.5	-6.1	18.3
Merchandise imports (in US$, annual percentage change)	6.7	12.2	-3.5	-14.7	15.4
Terms of trade (annual percentage change)	-0.1	-5.5	-1.6	-13.0	2.4
Real effective exchange rate (end of period, 12-month percentage change)	2.5	4.8	-9.8	-27.2	...
International reserve position and external debt (as of December 31)					
Gross official reserves	60.1	51.7	44.0	35.7	29.7
(in months of imports)	11.4	8.6	7.5	7.4	5.3
Net official reserves	60.1	52.1	34.4	23.9	28.5
Outstanding external debt, in percent of GDP	23.2	24.8	30.7	45.6	39.3
Public	12.1	10.6	12.1	19.0	15.5
Private	11.1	14.1	18.6	26.6	23.8
Total debt service ratio (in percent of exports of goods & services)	53.3	76.0	83.0	143.5	103.1
Of which:					
Interest	25.0	25.4	28.3	33.9	30.7
Gross reserves/short-term debt (residual maturity, in percent)	90.4	76.8	52.9	49.8	56.3

IMF data (as of October 25, 2000)	
Membership status:	Article VIII
Intervention currency and rate (buying)	U.S. dollar at R$1.93 per U.S. dollar
Quota	SDR 3,036.10 million
Fund holdings of *reais*	SDR 4,393.57 million
(as percent of quota)	144.7 percent
Outstanding purchases and loans	SDR 1,356.75 million
SDR department	
Net cumulative allocation	SDR 358.67 million
Holdings	SDR 0.02 million

Sources: Brazilian authorities; World Bank; and Fund staff estimates.

1/ For historical data, as reported in the national income accounts statistics. Projections based on external sector accounts.

2/ Includes the federal governemt, the central bank, and the social security system (INSS).

I. Fiscal Sustainability and Monetary Versus Fiscal Dominance: Evidence from Brazil, 1991–00[1]

A. Introduction

1. This section analyzes several issues regarding fiscal sustainability (intertemporal solvency) and fiscal adjustment in Brazil during the 1990s and searches for econometric evidence of a monetary dominant regime during some subperiods, i.e., a regime where adjustments to the deterioration in public sector net worth are carried out via fiscal policy, rather than price level adjustments. The paper finds that for the 1990s as a whole, we cannot reject the hypothesis that fiscal policy was sustainable but there is little evidence supporting the presence of a monetary dominant regime. In particular, we find that:

- While for the 1990s as a whole, the operational deficit measured at constant prices was stationary—i.e., it was not growing boundlessly, implying an unsustainable path for real net public debt—the analysis of different subperiods shows significant heterogeneity.

- In the years that preceded the inception of the Real Plan of July 1994, econometric evidence points to the presence of a Fiscal Dominant (FD), or Non-Ricardian regime, rather than a Monetary Dominant (MD) regime, since there is no statistical evidence that the primary surplus actively responded to changes in real government indebtedness. During this period, inflation was an important source of fiscal finance, with monetary policy subordinated and highly constrained by fiscal financing requirements.

- A perceptible regime break seems to have taken place during the first couple of years following the implementation of the real—The presence of a MD regime cannot be ruled out, possibly helped by a substantial increase in tax revenues.

- During 1995–96, as the ex-post implicit real interest rates on public debt fell, the government borrowed and spent and, the regime seems to have shifted back to FD again around the end of 1996 until early 1999, with the fiscal deficit and net public debt entering an unsustainable path.

- The fiscal adjustment effort envisaged in the three-year Fiscal Stabilization Plan announced at the end of 1998, helped to bring public debt back to a sustainable path, but evidence does not yet point to the unequivocal presence of a MD regime. We may need more data of strong fiscal performance for the expected regime shift to be statistically robust and perceived as being permanent. The main findings are summarized in the Table below.

---

[1] Prepared by Alberto M. Ramos.

		Fiscal Policy	
		Sustainable	Unsustainable
Regime	Monetary Dominance	Cannot rule out a monetary dominant regime from August 1994 to end-1996, and potentially 1999 to 2000 (weak evidence)	
	Fiscal Dominance	1991 to July 1994	End-1996 end-1998 (weak fiscal dominance)

B. The Sustainability of Fiscal Policy in Brazil

2. In recent years, a sizable literature devoted to assessing the sustainability of a country's fiscal policy has emerged. Several techniques from this literature are applied to Brazil.

3. The government, like all other economic agents, faces an intertemporal budget constraint: the present discounted value of its net liabilities must, by definition, equal the present discounted value of future primary surpluses (tax revenues minus noninterest expenditures). If this constraint in real terms can be satisfied without a change in either policy or the price level, current fiscal policy is said to be *sustainable.* That is, the equilibrium price level and the level of seignorage can be determined independently by monetary policy (equilibrium in the money market) irrespective of budget financing considerations.

4. The Brazilian government satisfied its intertemporal budget constraint in fairly different ways during the post-war period. Upward adjustments to the primary surplus contributed to limit the real value of Brazilian debt between the mid-1970s and the mid-1980s. Between 1985 and 1994—a period encompassing six stabilization plans—the nominal balance (PSBR) followed the ups and downs of inflation, even if we can clearly identify two distinct subperiods: The first period spans the entire decade of the 1980s, and is characterized by substantial operational deficits, while the second period (1990–94) is characterized by a less acute fiscal disequilibrium, with operational balances around zero (i.e., the primary surplus was able to cover the real interest bill).

Brazil: Operational deficit, real interest payments, and primary surplus

Average (% GDP)	1985-89	1990-94	1995-98	1999
Operational deficit	5.2%	0.0%	5.1%	3.9%
Real interest payments	5.8%	2.8%	4.9%	7.1%
Primary surplus	0.7%	2.8%	-0.2%	3.2%

Sources: BCB; and Fund staff estimates.

5. The reverse Tanzi effect on revenues[2] and the high levels of inflation were behind the decline of the operational deficit observed during the early 1990s. During this period, real government debt was reduced with the help of inflation (which also led to sizable primary surpluses) and under indexation of liabilities (systematic overshooting of inflation in tandem with a reduction of the operational fiscal deficit). At the time, many argued that, despite the low operational deficits, fiscal adjustment would be needed, as the ex-inflation structural deficit remained high.

6. The *Real Plan* of 1994 successfully conquered inflation, and initially boosted the primary surplus (through higher tax collections). From 1995 until late 1998, the primary deficit and real interest payments rose, causing a buildup of real public debt (see Table above). During the period 1994–98, the states and municipalities posted the worst primary balances of all three levels of government, although the largest fiscal deterioration came from the central government—discretionary current and capital expenditures (OCCs) grew by 1.0 percentage point of GDP (accumulated real growth of 78 percent) and social security benefits for private sector workers expanded by 1.3 percentage point of GDP (see Giambiagi and Além 1999). In all, nonfinancial expenditure of the central government increased by 2.8 percentage points of GDP from 1994 to 1998.

7. During the high inflation years the OCCs had been the main variable of adjustment. However, during 1994–98, OCCs increased in real terms from R$17 billion in 1994 to R$31 billion in 1998 (at December 1998 prices). The fact that the bulk of the increase in OCCs happened after 1995, and not immediately after July 1994 (*Real Plan*), seems to indicate that the real increase in discretionary spending was not so much the inevitable consequence of the decrease in the inflation rate but instead a conscious political decision (see Giambiagi and Além 1999).

8. From 1990–94 the operational deficit was smaller than the revenues from seignorage, which favored the monetization of debt and released the pressure for tighter fiscal execution. Consequently, net public debt to GDP was on a declining trend since the operational deficit was basically zero and GDP was growing at a moderate pace (average of 1.3 percent). The opposite happened during 1995–98 (see table and figure below) leading the ratio of net public debt to GDP to increase at a fast rate despite the moderate expansion of real GDP.

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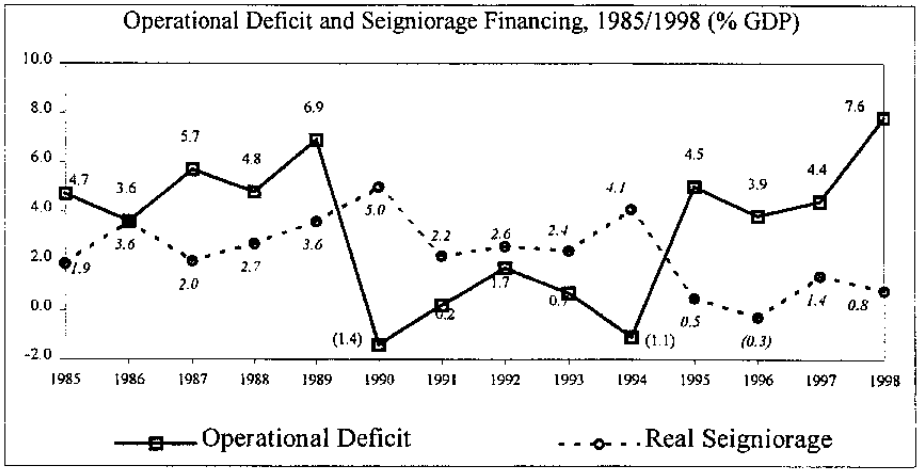
[2] Also called Bacha effect, derives from the fact that the tax system managed to insulate almost to perfection tax revenues from the effects of the Tanzi effect while high levels of inflation proved to be a very powerful and handy instrument to reduce the real value of expenditures below the original budgeted commitments (through delays in the release of funds).

Fiscal Deficit and Real Seigniorage (% GDP)

	1981/84	1985/89	1990/94	1995/98
Operacional deficit	5.0	5.1	0.0	5.1
Real seigniorage	1.8	2.8	3.3	0.6

Source: Giambiagi and Além (1999).



9. The sharp deterioration of the fiscal stance during 1995–98 eventually contributed to the abandonment of Brazil's crawling-peg exchange rate regime in early 1999. In response, taxes were raised, expenditures cut, and the primary surplus increased to over 3 percent of GDP. Through the end of the third quarter of 2000, key fiscal targets were met under a three-year (1999–01) Stand-by arrangement from the Fund. However, at the center of the recent fiscal policy debate in Brazil has been the search for an answer to the question whether the recent fiscal adjustment effort undertaken in the wake of the Russian moratorium of August 1998, and the January 1999 floatation of the *real,* represents a short-term, transitory adjustment effort or whether it represents a deeper and structural change in fiscal regime.

10. The analysis of the whole period 1991–00 and the recent evolution of the fiscal stance should help shed some light and provide valuable inputs into some of these questions. However, as seen above, with the possible exception of the last two years and the initial period of the *Real Plan*, fiscal policy does not seem to have actively responded to changes in government indebtedness which leads us to suspect that, evidence of a monetary dominant regime may be meager. In the sections that follow, we will present a stationarity test for the real operational deficit, and two tests designed to distinguish between fiscal and monetary dominant regimes (a simple single equation test, and a richer vector autoregression system (VAR)). Finally, to assess which, if any, fiscal policy variable responded to changes in public indebtedness—extra revenues or cuts in expenditure—a more disaggregated VAR system is used.

Sustainability (stationarity) test of the real operational deficit (*ODEF*)

11. In our definition, empirically sustainable fiscal policy will correspond to an **operational deficit measured at constant prices,** *ODEF*, that fluctuates about some mean rather than drifting boundlessly upward, i.e., a mean reverting stochastic process (for a detailed derivation see Appendix I). Thus, the *ODEF* is tested for stationarity. Since the *ODEF* equals the real primary deficit (*PDEF*) plus real interest payments (*RIP*), sustainability is also equivalent to the proposition that in the long run there should be a one-to-one mapping from the *PDEF* to *RIP* in order to offset one another (if both *PDEF* and *RIP* are nonstationary, they must cointegrate one-to-one). For this test, the Augmented Dickey Fuller (*ADF*) equation is:

$$(1) \qquad \Delta ODEF_t = a_0 + a_1 ODEF_{t-1} + \sum_{j=2}^{J} a_j \Delta ODEF_{t-j+1} + \xi_t$$

The null hypothesis of nonstationarity implies that H_0: $a_1 = 0$. The related *Zt* and *Zα* tests, due to Phillips (1987) and Phillips and Perron (1988) are also presented.

Empirical results

12. During the period under study, there have been dramatic changes in policy, and parameters may vary over time. Accordingly, estimates are presented for both the entire 1991–00 period and selected subsamples, namely the pre-*real* period (1991:1–1994:6), the post-*real* period (1994:7–2000), and the post-Tequila period (1995:4–2000). However, since these subperiods are to some degree arbitrary, estimates for *rolling* 24-month windows, beginning with the period 1991:1–1993:1 and ending with the period 1998–00, are also presented.

Table 1.1: Stationarity Tests, Real Operational Deficit (ODEF)

(1) $\Delta ODEF_t = a_0 + a_1 ODEF_{t-1} + \sum_{j=2}^{J} a_j \Delta ODEF_{t-j+1} + \xi_t$

	ADF(1)	ADF(2)	Zt(1)	Zt(1)	Zα(1)	Zα(1)
All sample	-8.55	-5.81	-9.69	-9.68	-97.67	-90.49
Pre-*real*	-2.39*	-1.72*	-3.93	-3.91	-32.28	-31.95
Post-*real*	-7.14	-4.66	-7.58	-7.55	-62.15	-56.19
Post-Tequila	-6.71	-4.25	-7.09	-7.09	-52.89	-47.50

Notes: Null hypothesis is H_0: $a_1=0$ (i.e. non stationary). ADF(x), Zt(x), and Zα(x) are the Augmented Dickey Fuller (Equation (5)) test, Phillip's Zt and Zα tests (See Phillips (1987) and Phillips and Perron (1988), respectively, where x is the number of augmented terms included in the test. The 95 and 99 percent critical values for the ADF(x) and Zt tests are -3.00 and -3.75, respectively. The 90 and 95 percent critical values for the Zα test are -8.0 and -13.6, respectively.

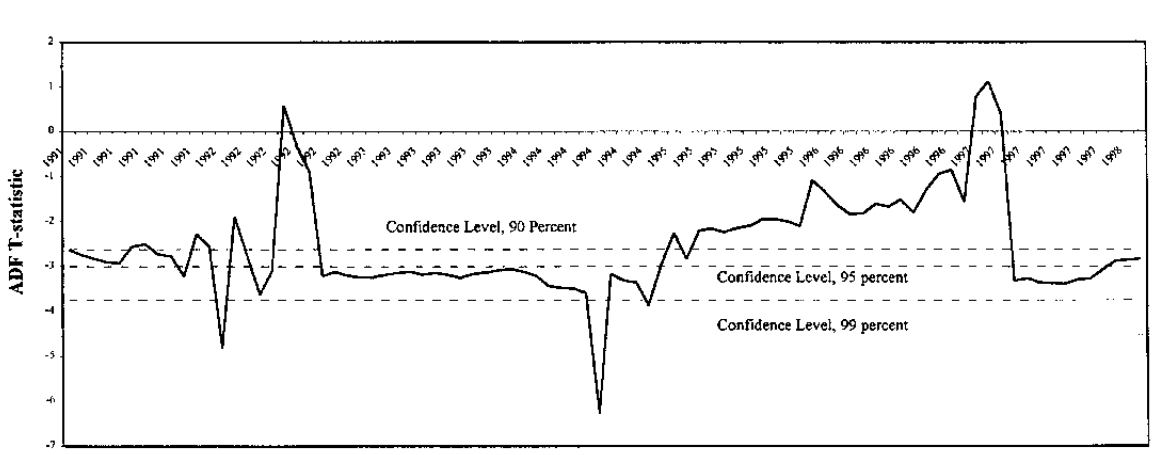
* Represents failure to reject the null hypothesis of nonstationary process. Critical values are from Fuller (1976, pp.371–73).

13. Table 1.1 presents the stationarity tests mentioned above: ADF, Zt, and Zα. For the entire sample, as well as all three subperiods, most results suggest that the operational deficit was stationary rendering fiscal policy sustainable: *with the exception of the ADF statistics for the pre-Real period, for all three statistics and all periods, the null hypothesis of the nonstationarity of ODEF is rejected at the 90 percent confidence level or better.*

14. *However, ADF statistics from rolling two-year samples (Figure 1.1) reveal a somewhat different picture. During the pre-real period, it is only in 1992 that it is not possible to reject the null hypothesis of nonstationarity*[3]*. For windows covering most of 1994 through 1996, we reject nonstationarity at the 95 percent level. Importantly, for 24-month rolling windows starting in early 1995 (capturing already part of 1997) through early 1997 (that is, ending in early 1999), the ADF statistic is higher in absolute value than the critical value, once again suggesting a nonstationary process for the operational deficit. Finally, for rolling windows starting from 1997:3 onward, we observe something akin to a regime shift, since the null hypothesis of nonstationarity is now rejected at the 90 percent level or better.*

15. It can be clearly visualized in Figure 1.1 that there is a progressive deterioration of the fiscal stance since mid-95 until early 1997 with the ADF statistic line increasing continuously until it drops abruptly in early 1997 (for the 24-month windows covering mid-1997 to mid-1999) since by mid-1999 there are already the first solid indications that the government has started to consistently post sizable primary surpluses.

Figure 1.1: ADF Statistic, Two-Year Rolling Samples



[3] The operational deficit jumped from 0.2 percent of GDP in 1991 to 1.7 percent of GDP in 1992.

C. The Adjustment Variable: Price Level (Fiscal Dominance) Versus Primary Surplus (Monetary Dominance)

16. Interconnected with the fiscal sustainability issues is the government's choice of **adjustment mechanism**, that is, what variables limit government indebtedness according to present value relations (A2) and (A3) (see Appendix I). If the primary deficit is the policy adjustment variable of choice ($PDEF = G - T^*$; through changes in G and/or T^*) it should respond to variations in the real value of government debt, thus guaranteeing balance of the government's intertemporal budget, according to equations (A2) and (A3), without requiring price level adjustments (i.e. resorting to the inflation tax). That is, the government adjusts the primary surplus upward to ward off or to limit debt accumulation, not forcing the central bank to inflate away the debt in order to satisfy the intertemporal budget constraint. In this case, monetary policy variables (domestic interest rates, the exchange rate, and the domestic price level) are not determined by fiscal considerations, but simply by money market equilibrium relations. Such a regime has been called in the recent literature *Monetary Dominant* or *Ricardian* (see Canzoneri, Cumby, and Diba (1998), CCD).

17. On the other hand, if the level of the primary surplus is chosen independently (possibly following an exogenous political process) of the level of expected real interest payments or the level of real net public debt, equations (A2) and (A3) must be satisfied, i.e., intertemporal equilibrium must be achieved, by changes in the current price level in order to tailor the real level of net public debt to the expected path of current and future primary deficits. In this case, monetary policy is subordinated to fiscal needs and we live under a *Fiscal Dominant* or *non-Ricardian* regime. The price level is then determined by fiscal needs, not the traditional equilibrium in the money market, since recurrent adjustments in the price level, rather than the primary surplus, guarantee intertemporal balance as defined by (A3) at any point in time by debasing the stock of nominal public debt—this has led to the so-called *fiscal theory of the price level* (FTPL) pioneered by recent research of Woodford (1995, 1996), Cochrane (1998), CCD (1998), Sims (1994, 1998), and others.[4] Of course, the FTPL fails to hold under an MD regime. For the FTPL to hold, as pointed out by several authors, a necessary but not sufficient condition is the prevalence of a FD regime since, under a MD regime, the price level is determined in the monetary sector of the economy.

Distinguishing between MD and FD regimes

18. Although, theoretically well understood, empirical strategies specifically designed to discriminate between different regimes and the FTPL are still at its earlier stages. Most existing evidence suggests that the post-war U.S. fiscal history has been MD rather than FD.

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[4] The distinction between FD and MD regimes is due to Sargent and Wallace (1981). Notice that, as Woodford (1995) points, if the FTPL holds, the price level adjustment need not be the result of current monetization but could instead be simply driven by wealth effects: private agents sell their (excess) government assets in return for goods, and goods prices will rise.

By contrast, Brazil is a country that witnessed high deficits, inflation, and dramatic policy shifts. As such, it will more likely have a FD regime, at least during some subperiods, and thus should provide an excellent alternative laboratory to examine such issues. We will replicate some of the existing tests in the literature for the United States and will develop alternative empirical strategies. We will also map specific periods of the 1990s when fiscal policy could be classified as FD or MD.

19. We develop a definition of a MD regime as one in which the primary surplus consistently responds to increases in real interest payments to limit the present value of the debt and therefore preserve long run public sector solvency (see Cochrane (1998). Then, two empirical tests are presented. First, a simple *backward looking* single-equation regression, similar to Bohn (1996) that tests if the government cuts its primary deficit when real interest payments rise (i.e., search for evidence of a short-run negative relationship between *PDEF* and *RIP*). Second, a more complex framework is derived, similar to one developed by CCD (1998), using a VAR system whose variables include the primary deficit and the stock of government debt. This framework allows a *forward-looking* examination of fiscal policy in the 1990s and a test for a broad range of fiscal adjustment patterns. Do current reductions in the primary deficit help pay down the debt and hence reduce debt service in the future? Do current borrowing decisions reflect anticipated movements in future interest payments? Or, is today's primary deficit set independently of future indebtedness?

Single-equation test: The response of *ΔPDEF to ΔRIP*

20. Even if the government's intertemporal budget constraint (A2) holds through adjustments in *PDEF*, it may be unrealistic to expect that the *PDEF* and *RIP/(1+r)* move (minus) one-to-one over the short run. Instead, consider the testable reaction function (see Appendix I):

(2) $$\Delta PDEF_t = \beta_0 + \beta_1 \Delta RIP_t + error_t$$

21. This is a *backward-looking* test since today's real interest payments apply to *yesterday's* outstanding debt stock and since equation (2) is specified in first differences, β_1 reflects a *short-term* relationship between *PDEF* and *RIP*, not a cointegrating relationship.[5]

22. Unfortunately, while equation (2) **can in some cases rule out a MD regime, it cannot distinguish between MD and FD regimes**. For example, under a MD regime, the primary deficit should decline when real interest payments go up ($\beta_1 < 0$). Yet, under a FD regime, if the FTPL also holds, the price level jumps and real interest payments fall in anticipation of

[5] Note also that $ODEF_{t-1}$ could be included in (2), making it an error-correction model. Such a specification, available upon request, yielded qualitatively similar results to those reported.

future primary deficits, implying again $\beta_1 < 0$. In either case—MD regime or FD and FTPL—β_1 would be negative. However, **β_1 will be zero or positive only under a FD regime**. Therefore, if $\beta_1 > 0$ or $\beta_1 = 0$, a MD regime is ruled out.

Table 1.2: Response of $\Delta PDEF$ to ΔRIP (β_1)

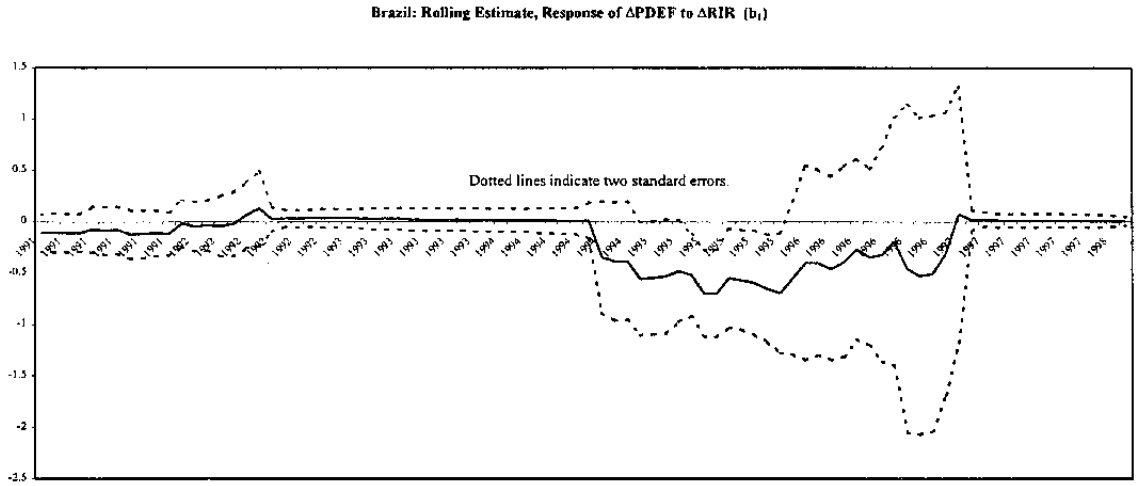
$$\Delta PDEF_t = \beta_0 + \beta_1 \Delta RIP_t + error_t$$

(Standard errors in parenthesis)	β_0	β_1
All sample	-18.0	0.00
	(233.8)	(0.02)
Pre-*real*	-10.3	-0.08
	(334.3)	(0.08)
Post-*real*	-0.11	0.00
	(316.5)	(0.02)
Post-Tequila	-79.9	0.00
	(332.4)	(0.03)

23. Table 1.2 presents estimates of equation (2) for both the entire period and the same subsamples presented above. In all cases, there appears to be no statistically significant reaction of $\Delta PDEF$ to ΔRIP. Instead, the null hypothesis of H_0: $\beta_1 = 0$ is never rejected. *The results do not favor a MD regime: i.e. for neither the entire period nor the subperiods was there evidence that the deterioration of the public sector's net worth was arrested or limited by regular adjustments to the primary deficit during the 1990s, which corroborates evidence presented earlier in the section showing that inflation seems to have been the adjustment variable of choice during the 1990–94 period, while the stochastic process driving the primary deficit, at least from 1996 until 1998, seems that have been chosen independently of the deterioration of the public sector net worth witnessed during the period.*

24. However, estimates of β_1 from rolling 24-month windows (see Figure 1.2) show evidence of periods where the presence of a MD regime cannot be ruled out. For most of the sample period, β_1 is not significantly different from zero, i.e., the zero line stays inside the two-standard bands. However, from 1995:4–1997:4 to 1995:11–1997:11, a period that includes the beginning of the *Real Plan* (July 1994), β_1 is negative and statistically different from zero (the zero line stays outside the two-standard upper band). Thus, a MD regime cannot be ruled out during this period. ***This result supports the evidence portrayed by the sustainability tests and heuristic evidence that points to a relatively conservative fiscal policy in the earlier years of the real followed by the loosening of the fiscal stance after 1996.*** However, for subsequent periods, estimates of β_1 are again not different from zero, once more ruling out a MD regime, despite the fact that for the most recent period (1999 and part of 2000), the standard errors of the parameter estimates narrow significantly (see Figure 1.2).

Figure 1.2: Response of $\Delta PDEF$ to ΔRIP (β_1, Equation (2)) Two-Year Rolling Samples (Dotted Lines Indicate Two-Standard Errors).



25. As noted before, after 1998Q4 fiscal policy responded consistently and forcefully to the increase in real interest payments and the deterioration of the public sector net worth due to high real interest payments and the debt stock effect of the floatation of the *real*. However, one cannot yet unequivocally point to the presence of a MD regime since these adjustments are recent and as such may have not have been perceived, in a statistical sense, as sufficiently permanent (possibly due to lack of enough observations) and hence not statistically related to the sharp increase in real interest payments. There is, however, a perceived break with the sharp deterioration observed from 1995 until end-1998.

Vector autoregression analysis

26. The single equation tests performed above have some limitations. Such a framework does not allow one to discriminate between *ex-post backward-looking* adjustments—where the primary deficit is reduced in response to increases in real interest payments (consistent with a MD regime)—and *ex-ante forward-looking* adjustments of the level of real interest payments (through contemporaneous price increases) in anticipation of future primary deficits (consistent with a FD regime and the FTPL). A modification of CCD's (1998) VAR will allow a richer analysis of the causality and direction of fiscal adjustment. Let,

(3) $$\Delta X_t = a_0 + a_1 \Delta X_{t-1} + a_2 \Delta X_{t-2} + ... + v_t$$

where $\boldsymbol{X} = [RIP, PDEF]$ is a dim(2) vector of the real interest payments and the real primary deficit, $\boldsymbol{a}_i$ is a vector of coefficients, and $\boldsymbol{v}_t = (v_{PDEF}, v_{RIP})$ is a vector of error terms.[6] We will assume a richer error covariance structure by positing that each element of the error vector $\boldsymbol{v}_t$ is in turn composed of "own" error terms $\boldsymbol{w}_t = (w_{PDEFt}, w_{RIPt})$ and contemporaneous correlations with "other" errors:

$$\boldsymbol{v}_t = \boldsymbol{B}\, \boldsymbol{w}_t \tag{4}$$

where $\boldsymbol{B}$ is a 2 x 2 matrix whose diagonal elements equal one and whose nonzero offdiagonal elements reflect contemporaneous correlations among the error terms. Also, (4) yields impulse response functions (IRF) that summarize the effects of current *innovations* w_t on values of $\boldsymbol{X}$.

27. The VAR system (3) estimates relationships of time-series causality between variables (Maddala, 1992) that run in both directions. These timeseries relationships have economic interpretations that depend on the direction and the sign, as summarized in Table 1.3 below.

Table 1.3: Summary of Interpretation, System (3), $X = [RIP, PDEF]$

Current Primary Deficit ($\Delta PDEF_t$) 1/ → Future Real Interest Payments (ΔRIP_{t+i})	
Positive	Government pays down future debt, consistent with **MD** regime.
Zero	Primary deficit exogenous, consistent with **FD** regime.
Negative	Government anticipates future interest bill, consistent with **MD** regime.
Current real interest payments (ΔRIP_t) 1/ → future primary deficit ($\Delta PDEF_{t+i}$)	
Positive	Unstable policy, consistent with **FD** regime; or interest rates anticipate future primary deficits.
Zero	Primary deficit exogenous, consistent with **FD** regime.
Negative	Primary deficit reduction offsets increase in public debt, consistent with **MD** regime; **or** price level increases in anticipation of future primary deficits, consistent with **FD** regime and **FTPL**.

1/ One standard innovation.

28. Consider first relationships in system (3) that run *from* the current primary deficit ($\Delta PDEF_t$) *to* future real interest payments (ΔRIP_{t+i}). Under a MD regime current *innovations* to the primary deficit w_{PDEFt} should be positively related to future government debt and hence interest payments. For example, when the government reduces the primary deficit, it pays down the debt and hence reduces future interest payments (either through the stock of

[6] If $\boldsymbol{X}$ is a cointegrating vector, an error-correction term $\theta_k X_{t-k}$ should also be included. In the analysis, it is assumed that *RIP* and *PDEF* move together one-to-one (i.e., that *ODEF* is stationary). Thus, the error correction term is *ODEF*. The econometric results were largely insensitive to the inclusion or omission of such a term.

liabilities, the interest rate, or both). However, a negative relationship between w_{PDEFt} and future *RIP* is also consistent with a MD regime if the policy makers respond to lower expected future interest payments by borrowing more and hence running higher primary deficits today. By contrast, under a FD regime, w_{PDEFt} would be uncorrelated with future *RIP*. [7]

29. Consider next the causality direction running *from* current real interest payments (ΔRIP_t) *to* future primary deficits ($\Delta PDEF_{t+i}$). Like equation (2) a *negative* relationship may either indicate that primary deficits compensate for changes in real interest payments to help limit debt accumulation (consistent with a MD regime; more plausible under a low inflation environment) or that the price level (and hence real interest payments) anticipate future primary deficits (consistent with a FD regime and the FTPL, more plausible under a high inflation environment). By contrast, a *positive* relationship indicates that primary deficits respond to real interest payments in an unstable fashion (consistent with a FD regime) or that current interest rates (and hence interest payments) increase in anticipation of perceived future primary deficits (reflecting higher risk). The FTPL interpretation in the literature ignores the possibility of a risk premium on interest rates: when private agents perceive a gap between the value of government debt today and the present value of primary surpluses in the future, they may require higher interest rates in the initial period to hold government debt. This allows for market feedback to government policies. The absence of a relationship suggests that the primary deficit is exogenous, consistent with a FD regime.

30. Exclusion (Granger causality) tests and impulse response functions (IRF's) were estimated for system (3), with two and four lags, for both the entire 1991–00 period and the selected subsamples. *Like the estimates of equation (2), we found little evidence for either the entire sample or the selected subsamples that current ΔRIP helps explain future ΔPDEF. Rather, the null hypothesis that current ΔRIP does not explain future ΔPDEF was never rejected.* In addition, all of the corresponding IRF's were insignificant.

31. *However, there was weak evidence that current ΔPDEF helped explain future ΔRIP with the correponding IRF's negative, particulalrly for the post-Real period, but the evidence was not very robust since it was highly sensitive to the number of lags used* (see regression results in Appendix I, Table A.1.1): i.e., positive current values of w_{PDEF} imply future decreases in *RIP*.

32. The rolling 24-month samples were also applied separately to both equations in the VAR system (3). F-statistics for the exclusion of past *ΔRIP* on current *ΔPDEF* and past *ΔPDEF* on current *ΔRIP* are presented in Figures 1.3 and 1.4, respectively. Under the 24-month window microsscope, we found (see figures) that during certain periods, there were now statistically significant relationships between *ΔRIP* and *ΔPDEF* and in both directions, which is not conflicting (see interpretation below).

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[7] An exception, as CCD note, occurs if w_{PDEF} is negatively correlated with future *PDEF*. In this case, w_{PDEFt} may be positively related with future *RIP* even under a FD regime.

Figure 1.3: F-Statistics for Causality Tests of ΔRIP_t on $\Delta PDEF_{t+i}$, Rolling Two-Year Samples.

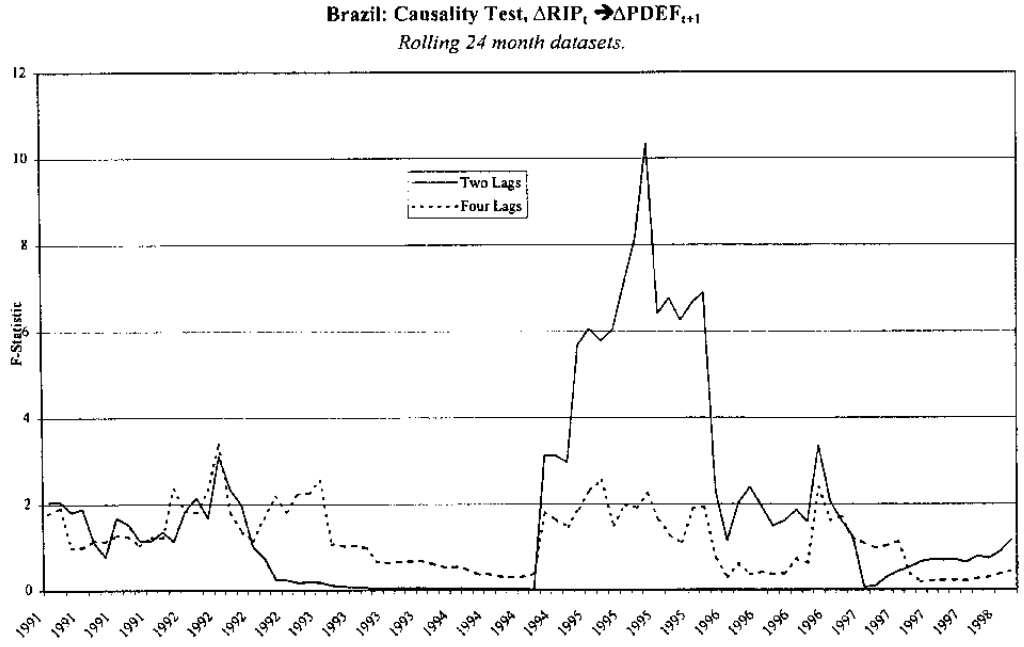
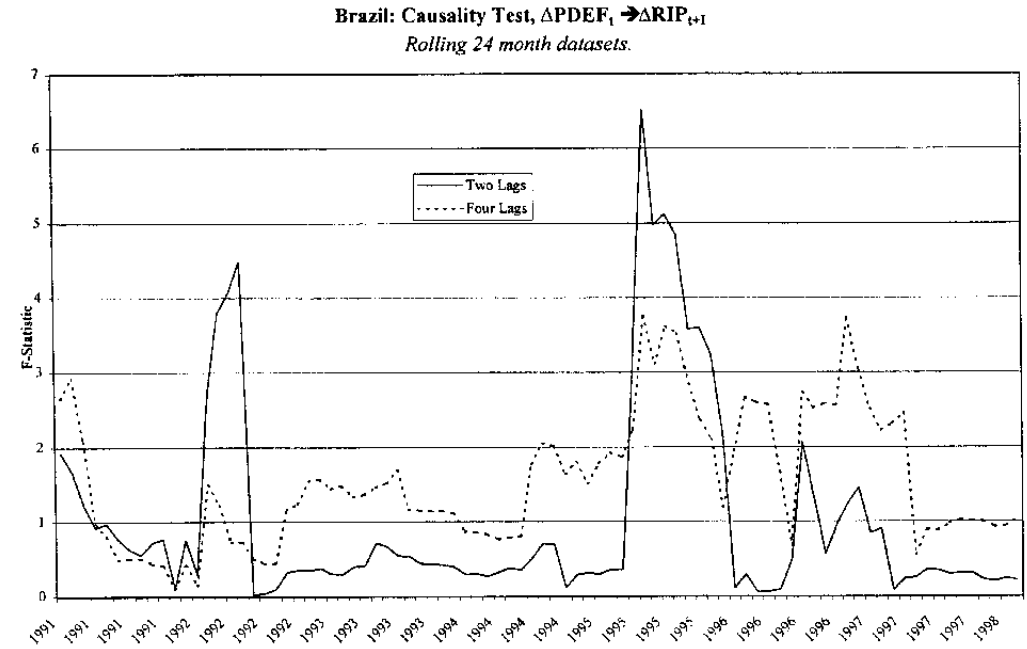


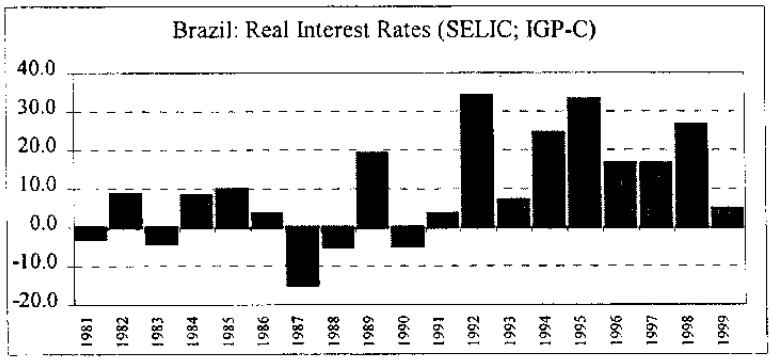
Figure 1.4: F-Statistics for Causality Tests of $\Delta PDEF_t$ on ΔRIP_{t+i}, Rolling Two-Year Samples.



33. Figure 1.3 renders evidence that confirms the results of the single equation analysis of the previous section: there was a significant negative relationship (especially for the two-lag model) between current *ΔRIP* on future *ΔPDEF* during the first years of the *Real Plan*, from (approximately) the third quarter of 1994 through early 1996. This being the low inflation period, we take this result as supporting the backward-looking interpretation that during the initial months of the *Real Plan*, government debt was kept under control by reductions in the primary deficit since the real interest bill increased sharply in 1995 (4.8 percent of GDP) from the level observed in 1993 (2.7 percent of GDP)—rejecting the forward-looking alternative of adjustments of the price level in anticipation of future primary deficits (consistent with the FTPL).

34. Likewise, Figure 1.4 (forward-looking tests) also shows a statistically significant negative relationship between past *ΔPDEF* on current *ΔRIP*, primarily during 1995. Indeed, between 1996 and 1997, both the primary surplus and the implicit real interest rates on domestic debt fell (see figure below). This finding may represent an *implicit* rational intertemporal decision by the government: with the implicit real interest rate on public debt falling during 1996–97, the government was not as compelled as it might have otherwise been to either reduce the primary deficit or to quickly implement needed reforms. That is, the government seems to have anticipated the spending of the stabilization dividends in the belief that the *Real Plan* had brought about a new paradigm, a new era of lower debt costs (possibly due to lower risk premiums) and stricter budget constraints in the near future through the deepening of the structural reform process.

35. The evidence shown above—causality running in both directions— is reconciled by realizing that the primary surplus increased in 1994 (the first year of the *Real Plan*) in response to a growing real interest bill since 1993 (backward looking adjustment), and fell in 1995 in anticipation of declining future interest payments (forward looking adjustment; in fact real interest payments dropped to 3.4 percent of GDP in 1997 from over 4.8 percent of GDP in 1995). Both findings suggest that from 1994 until 1996 the presence of a FD regime (as specified in Table 1.3) was unlikely.



36. In conclusion, regarding the adjustment between *PDEF* and *RIP*, both backward- and forward-looking tests reveal some temporal relationships between these variables during certain periods (primarily the post-*Real Plan*) but little relationship for the 1991–00 period as

a whole. Backward-looking tests reveal that, immediately after the *Real Plan*, $\Delta PDEF$ decreased in response to ΔRIP, in a stabilizing fashion, helping to restrain the debt.

D. Adjustment of Discretionary Expenditures and Revenue

37. The econometric tests performed above (particularly the rolling 24-month windows) seem to point that apart from the initial period of the *Real Plan*, Brazil lived under a fiscal dominant regime throughout the 1990s, in the sense that fiscal execution, in particular the primary deficit did not adjust to changes in the level of public indebtedness. At this stage, it is valuable to seek evidence whether responses of the *PDEF* to *RIP*, if present, occurred through policy decisions involving increases in taxes, cuts in expenditures, or a combination of both. A peculiarity of the Brazilian public finances is that the authorities are constrained in their ability to quickly implement such changes. On the expenditure side, changes in public wages, certain social entitlements, such as pension benefits, and constitutional transfers to the subnational governments are legally mandated, and many times constitutionally predetermined. These three categories represent around three-fourths of the total nonfinancial expenditure of the federal government, and probably an even higher share at the subnational level. For this reason, the room for discretionary expenditure cuts in the short-run is basically circumscribed to a few categories in the so-called other current and capital expenditure item. Thus, in order to seek evidence on how the discretionary elements of the federal budget adjusted, consider the following expression for the real operational deficit:

$$(5) \qquad ODEF_t = G^D_t - T^F_t + G^{ND}_t + RIP_t = PDEF_t + RIP_t$$

where G^D is discretionary federal spending , T^F is federal tax revenue, and G^{ND} contains all other nondiscretionary/mandatory elements of the primary expenditure (such as public sector wages, social security entitlements, and certain constitutionally mandated intragovernmental transfers). Accordingly, a modified VAR system (5) uses the vector $\boldsymbol{X} = [RIP, G^{ND}, G^D, T^F]$. Revenue and expenditure data limitations for the subnational governments and the state-owned enterprises will limit this exercise to the accounts of the central government.

38. Exclusion (Granger causality) tests and impulse response functions (IRF's) (not reported here) were computed for the modified VAR system (5), estimated with two and four lags, for both the entire period and the selected subsamples. *Once again, we found weak and unstable evidence (sensitive to the number of lags included) for the causality running from past past ΔRIP to current elements of $\Delta PDEF$.*

39. However, relationships between lagged elements of $\Delta PDEF$ and current ΔRIP were stronger. *For the entire sample, the null hypotheses that past ΔG^{ND}, ΔG^D and ΔT do not explain current ΔRIP can each be rejected at the 90 percent confidence level or better, and the corresponding IRF's are significant. Note, however, that significant relationships were concentrated mainly in the immediate post-real period.*

40. We found that (IRFs) current innovations in T^F are associated with lower real interest payments in the future, but only after the *Real Plan* (and not before). This result thus suggests

that the *Real Plan* represented a break in the fiscal regime, since the authorities attempted to limit indebtedness by allowing the tax burden to rise during this period.[8] Interesting enough, the analysis reveals no relationship between current innovations to discretionary spending G^D and future RIP, as the stochastic process guiding expenditures seems to have been set independently of the evolution of net public debt. Further, current innovations to nondiscretionary expenditure items (G^{ND}, such as wages, pension benefits, and transfers to subnational governments) are negatively related to future *RIP*, perhaps reflecting the ex-ante rational intertemporal strategy mentioned above. *Thus, the important information content of this last test is that, possibly in anticipation of lower interest payments, the government seems to have loosened the fiscal stance in 1995 by increasing mainly the portion of the primary deficit that contains wages and entitlements, not discretionary spending (OCCs).* For instance, expenditure with benefits by the social security system for private sector workers (INSS) increased from 4.1 percent of GDP in 1994 to 5.3 percent of GDP in 1995, with contribution revenues basically held constant, while the discretionary spending component was kept basically constant at around 3.3 percent of GDP from 1994 until 1996. Discretionary spending as a percentage of GDP did however accelerate very rapidly in 1997 and 1998.

E. Sustainability Tests: Conclusions and Policy Implications

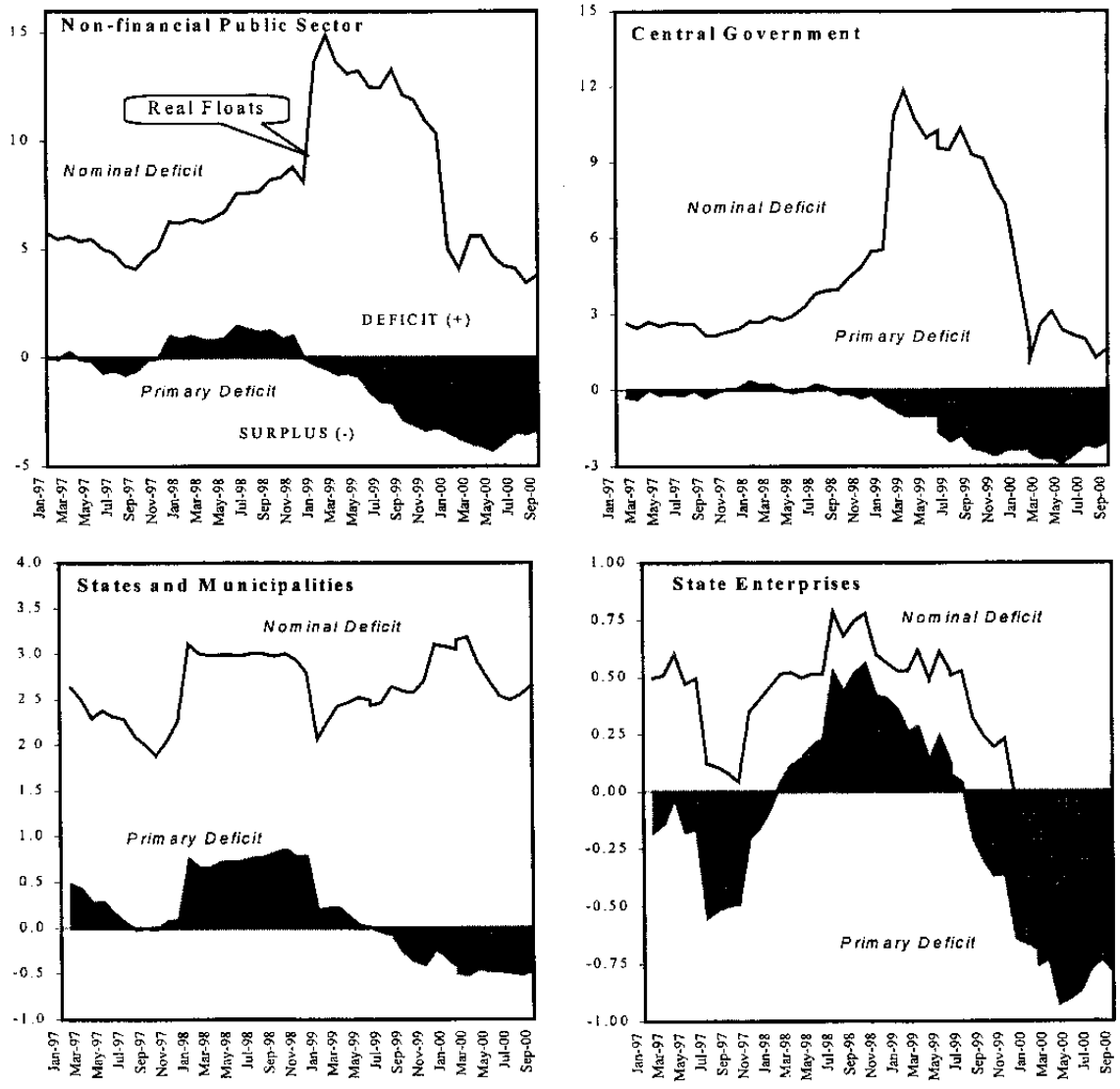
41. It is borne out in the data that substantial fiscal adjustment took place at the end of 1998, and especially during 1999 and 2000 (see Figure 1.5). During this period, Brazil's fiscal policy was sustainable in the sense that its operational deficit appears to be stationary. But a MD regime *as defined*—a statistically significant relationship between *PDEF* and *RIP*—is still found to be absent.

42. Active responses of fiscal policy to variations in real interest payments (backward- and forward-looking) seem to have been concentrated in the period that followed the implementation of the *Real Plan*. The government allowed the primary surplus to increase in 1994 offsetting the observed increase in real interest payments, but relaxed the fiscal stance in 1995 and 1996 mainly through increases in the nondiscretionary entitlement component, possibly in anticipation of expected lower interest payments in the near future. However, subsequent increases in discretionary spending in 1997 and 1998 shifted the debt dynamics into an unsustainable path until, late in 1998, a strong fiscal adjustment program at all levels of government, in place until this day, placed net pubic debt on a sustainable and declining path again.

43. In June 1999, the central bank announced the adoption of an inflation targeting regime as the main anchor for inflation expectations. It is well known that such a program requires that the monetary authority not be dominated by fiscal financing requirements. Nonetheless, it

[8] The tax burden increased from 25.3 percent of GDP in 1994, to 27.9 percent of GDP in 1994, and 28.0 percent of GDP in 1995.

Figure 1.5. Brazil: Nominal and Primary Deficit (% of GDP; 12-months); 1997M1-2000M9



Source: Central Bank, and Fund staff estimates
(-) Surplus, (+) Deficit.

should be stressed that to empirically find that the presence of a MD regime cannot be confirmed does not necessarily imply that the monetary authority will be unable to pursue an independent monetary policy in an inflation targeting framework. We suspect that more observation showing consistently strong fiscal results, as envisaged under the three-year Fiscal Stabilization Plan, may consolidate the fiscal adjustments in an econometric sense, showing then a perceptible regime switch. However, what an independent monetary policy requires above all is *credibility*: that is, markets must believe that future adjustments to the primary surplus, if required, will in fact occur.

Fiscal Identities and Stationarity Tests

Intertemporal budget constraint and fiscal sustainability

44. The government's flow real budget constraint for period t can be written as:

(A1) $$G_t + (1 + i_t)\, B_{t-1}/P_t - T_t + M_{t-1}/P_t = [B_t + M_t]/P_t$$

where G_t and T_t are *real* government expenditures and revenues, i_t is the implicit nominal interest rate on period $t-1$ debt, P_t is the price level, B_t is the stock of interest bearing public debt, and M_t is the zero-interest monetary base. Equation (A1) for period $t+1$ can equivalently be written as:

(A1') $$[B_t + M_t]/P_t = [T_{t+1} + S_{t+1} - G_{t+1} + (M_{t+1} + B_{t+1})/P_{t+1}] / (1 + r_{t+1})$$

where $S_{t+1} = i_{t+1}M_t/P_{t+1}$ is the foregone interest payments on the public's real money holdings that accrue to the government (a measure of seignorage revenue) and r is the real interest rate $(1+r) = (1+ i)P_{t-1}/P_t$. Let $LIAB_t = (M_t + B_t)/P_t$ and $PDEF_t = [G_t - T_t - S_t]$ be net public liabilities and the primary deficit measured at constant prices. Iterating equation (1') forward from the current period ($t=0$) to infinity yields the intertemporal budget constraint that the government must satisfy for all t:

(A2) $$LIAB_0 = -\sum_{t=1}^{\infty} PDEF_t/\Pi_t(1+r_t) + \lim_{t\to\infty} LIAB_t/\Pi_t(1+r_t);$$

The transversality, or no Ponzi game, condition requires that:

(A3) $$\lim_{t\to\infty} LIAB_t/\Pi_t^{\infty}(1+r_t) = 0$$

45. Equations (A2) and (A3) summarize the notion of intertemporal budget balance. These expressions hold, by definition, and hence as identities, are *not* testable. However, it is possible to test whether the *observed* joint dynamic behavior of *G, T, M, B,* and *P* over time is *sustainable,* i.e. consistent with intertemporal budget balance. By contrast, if fiscal policy is not sustainable, an adjustment to one or more fiscal variables will be required at some future date.

45. Several tests of fiscal sustainability have been developed in the literature, including Hamilton and Flavin (1986), Wilcox (1989), Trehan and Walsh (1991), Bohn (1991), Hakkio and Rush (1991), and others. Trehan and Walsh (1991) test whether the (real) operational deficit measured at constant prices, $ODEF_t = LIAB_t - LIAB_{t-1}$, is *stationary* about a constant. Their test is the empirical counterpart to McCallum's (1984) demonstration that, over an infinite horizon, a constant interest inclusive deficit is consistent with intertemporal budget balance.[1] Trehan and Walsh's test is similar to that of Hakkio and Rush (1991), namely a test for the one-to-one cointegration of interest-inclusive government expenditures $GG_t = G_t + RIP_t$ and T^*_t, where $RIP_t = r_t * LIAB_{t-1}$ and $T^*_t = T_t + S_t$ but does not require that both GG_t and T^*_t be non stationary.

Distinguishing between a monetary dominant and fiscal dominant regimes

46. Conceptually, under a MD regime, the government actively adjusts the primary surplus on a regular basis to control the level of real indebtedness according to (A2). It is then straightforward from the present value requirement in equation (A2) that under a MD regime, movements in *PDEF* should be inversely proportional to those of *RIP* (negative covariance).

47. For example, assuming for simplicity a constant interest rate r, the constant primary deficit required to satisfy (A2) is $PDEF^* = -r/(1+r)\ LIAB_0 = -RIP/(1+r)$. More generally, if the primary deficit follows a stationary AR(1) process, $PDEF_t = \lambda_0 + \lambda_1 PDEF_{t-1} + v_t$, with $\lambda_1 < 1$, where v_t contains both an error term and one-time adjustments under a MD regime, the primary surplus that satisfies (A2) equals a factor proportional to real interest payments plus a constant term: $PDEF^*_t = \alpha + \beta RIP_t$, with $\alpha = \lambda_0 \Sigma \lambda_1^j/(1+r)^{j+1}$ and $\beta = -(1+r)^{-1} < 0$.

48. Thus, we have specified a reaction function that captures systematic responses of the current primary deficit to either real interest payments, change in interest rates (including changes in the exchange rate for dollar-denominated debt), or both.

Granger causality tests and impulse response functions for the modified VAR

49. Exclusion (Granger causality) tests and impulse response functions (IRF's) for system (3), with two and four lags, for both the entire 1991–00 period and the selected subsamples are shown in Table A.1.1.

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[1] To see this, suppose that the government runs a constant deficit of k dollars each period. With a constant real interest rate, the right hand side of equation (A3) is written as: $lim_{t\to\infty} = [LIAB_0 + tk]/(1+r)^t$, which converges to zero.

Table A.1.1: Summary of results, system (3)

$$\Delta X_t = a_0 + a_1 \Delta X_{t-1} + a_2 \Delta X_{t-2} + ... + v_t \quad ; \qquad X = [\, RIP, PDEF \,]$$

	2 Lag Model				*4 Lag Model*			
	$PDEF_t \rightarrow RIP_{t+i}$		$RIP_t \rightarrow PDEF_{t+i}$		$PDEF_t \rightarrow RIP_{t+i}$		$RIP_t \rightarrow PDEF_{t+i}$	
	F-Stat	IRF	F-Stat	IRF	F-Stat	IRF	F-Stat	IRF
Whole period	0.82	NS	1.51	NS	3.36**	Neg.	0.61	NS
Pre-*real*	0.43	NS	1.13	NS	0.95	NS	1.26	NS
Post-*real*	0.57	NS	0.90	NS	2.40*	Neg.	0.32	NS
Post-Tequila	0.27	NS	0.98	NS	1.83	Neg.	0.43	NS

** Significant at 95% level.
* Significant at the 90% level.

F-Stat: Test for hypothesis that lagged variable does not help explain contemporaneous variable in system (6). IRF: impulse response function. NS: Not significant. Neg: negative and significant.

The Data

50. Brazil's consolidated net public sector comprises the central government—the federal government, central bank, and social security system for private sector workers; INSS—state and municipal governments, and the public enterprises at all three levels of government. Net public liabilities (domestic and external) includes debt (B) and the monetary base (M). Gross international reserves and other financial assets of the nonfinancial public sector are netted out from the gross debt statistics. Starting in 1996, official government debt has been impacted by discrete adjustment on account of the proceeds from the privatization of public assets and the transfer of debts of some of the privatized enterprises to private hands (debt reduction operations). However, beyond the yearly nominal deficits (PSBR), the debt stock also increased due to the explicit recognition of a number of past arrears and other previously unsecuritized debts—such as the recapitalization to federal banks. Thus, an unadjusted end-period measure of liabilities in current *reais* ($B_t + M_t$) equals the previous period's liabilities plus the (flow) current nominal fiscal deficit (the primary deficit plus interest payments, or the PSBR) minus debt operations associated with privatization ($PRIV_t$) plus, explicit recognition of arrears and other discrete adjustments to the debt stock (ARR_t) while an *adjusted* measure of liabilities exclude these latter effects. Nominal magnitudes are converted in constant (deflated) *reais* $(B_t+M_t)/P_t = LIAB_t$ and as ratios to GDP, $(B_t + M_t)/GDP_t$.[1]

[1] The deflator is the centered general price index (*IGP-DI centrado;* a composite of wholesale, consumer, and construction cost prices), base June 1995 = 100. The deflator is adjusted to reflect prices at end-of-month. GDP data use end-year (December) prices. To calculate *annual flows* as a percent of GDP, real monthly flows from January to December are summed; this sum is then multiplied by the *December* price level and then divided by the above GDP figure based on *December* prices. This procedure (valorization) may yield annual flows in percent of GDP different from other published figures.

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II. Medium and Long-Term Fiscal Sustainability in Brazil: 2000–10[1]

A. Introduction

1. A main challenge facing Brazil in the medium term is to consolidate the fiscal adjustment effort undertaken since 1998Q3 and ensure the conditions for sustainable balanced growth. To achieve that goal, fiscal policy should be crafted to allow a smooth and nonnegligible decline of the debt to GDP ratio during the decade, in order to provide the necessary flexibility in the management of monetary policy and reduce the vulnerability of the country to adverse macroeconomic shocks—while leaving room for the continuation of the process of identification and recognition, in nondestabilizing fashion, of some "contingent" liabilities of the Treasury generated during the high inflation period of the 1980s and early 1990s. Actively pursuing a declining path of the debt to GDP ratio is also warranted on account of the fact that this ratio has increased substantially since 1995, particularly during the high interest rate period of 1997–99, and because the current composition of public debt, being far from ideal (short-term structure and biased toward floating rates), can sometimes generate enhanced vulnerability concerns among market participants regarding roll-over risks, which are often translated into higher risk premiums on both domestic and foreign financing.

2. Brazil has, however, recently taken several steps in the direction of institutionalizing fiscal discipline, notably through the approval of the Fiscal Responsibility Law (FRL), which, among other things, establishes that no permanent expenditure item can be created without prior identification of a new permanent source of revenue or permanent cut in previous expenditure items; sets ceilings on personnel expenditures and on public debt by level of government; curtails moral hazard by eliminating the scope for bailouts of subnational governments; and increases transparency and accountability in the management of public finances. Further, Congress has recently approved an ancillary piece of legislation to the FRL that stipulates the judicial and administrative sanctions to be impose upon those that violate the precepts of the FRL.

3. From a consolidated primary deficit of around 1 percent of GDP in 1997 and an even balance in 1998, Brazil has successfully managed to post fiscal primary surpluses in excess of 3 percent of GDP in 1999 and so far in 2000 (see Table 2.1 and Figure 2.1). However, given the short-term rigidities of several expenditure items, the fiscal adjustment effort carried out during 1998–00 was necessarily biased toward increases in revenues, many of which nonrecurrent (concessions, tax rate hikes such as the CPMF and Cofins, and incentives to collect tax arrears), and a substantial real retrenchment in discretionary public spending. From now on, the desirable fiscal effort should be anchored in structural fiscal reforms, which should lead to a more equitable distribution of the tax burden, enhanced

[1] Prepared by Alberto M. Ramos.

Table 2.1. Brazil: Primary Surplus 1997-2000

(12-month statistic)	Dec-1997		Dec-1998		Dec-1999		September-2000	
	R$ million	% GDP	R$ million	% GDP	R$ million	% GDP	R$ million	% GDP
Central Government	**(2,886)**	**(0.33)**	**5,042**	**0.55**	**22,677**	**2.36**	**22,243**	**2.11**
States and Municipalities	**(6,436)**	**(0.74)**	**(1,731)**	**(0.19)**	**2,122**	**0.22**	**5,067**	**0.48**
States			(3,726)	(0.41)	1,591	0.17	4,605	0.44
Municipalities			1,995	0.22	531	0.06	462	0.04
Public Enterprises	**500**	**0.06**	**(3,204)**	**(0.35)**	**6,310**	**0.66**	**8,491**	**0.80**
Federal			(2,283)	(0.25)	6,406	0.67	7,323	0.69
State			(591)	(0.06)	103	0.01	1,137	0.11
Municipal			(330)	(0.04)	(199)	(0.02)	31	0.00
TOTAL	**(8,822)**	(1.01)	**107**	0.01	**31,109**	3.24	**35,801**	3.39

Source: IMF staff estimates.

microeconomic efficiency of the economy (e.g., tax reform), and the achievement of higher efficiency and effectiveness of public spending (e.g., social security reform).

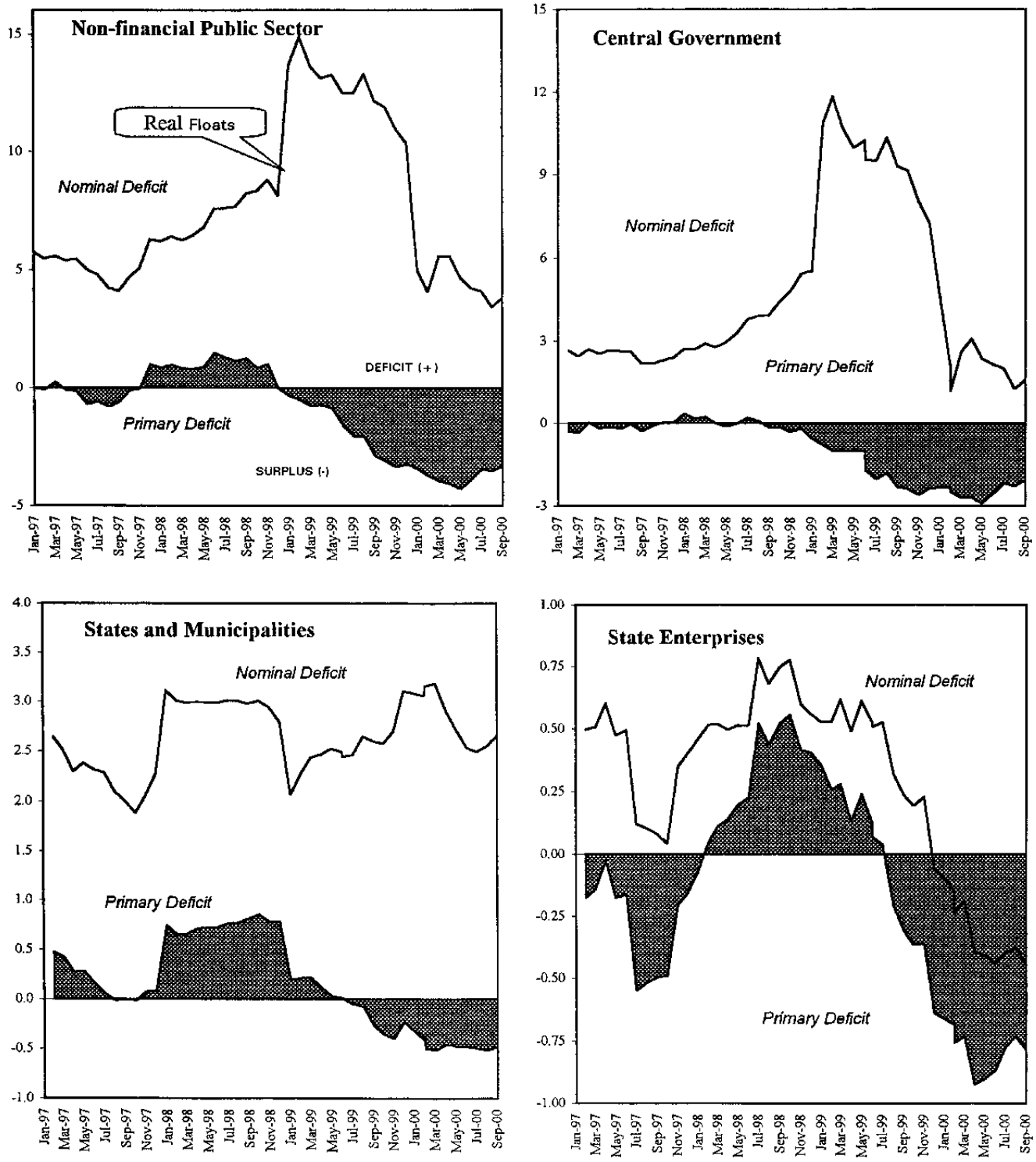
In the words of Blanchard et al (1990);

> "*... sustainability is essentially about whether, based on the policy currently on the books, a government is headed towards excessive debt accumulation.*"

4. To gauge whether fiscal developments during the period 2000–10, as far as we can anticipate them, will lead to unsustainable debt accumulation and to assess the margin of maneuver the government might have in fiscal management without rekindling unsustainable debt dynamics, we will in this section construct a minimalist above-the-line scenario for the evolution of the main revenue and expenditure items of the central government. With this, we will then derive a path for the primary surplus of the consolidated public sector based on a stylized conjecture for the evolution of the primary surplus of the subnational governments and the state-owned public enterprises at all three levels of government.[2] Based on a macro framework construct we will then discuss the implied net public debt profile of the central scenario and perform stress tests by varying key macro variables that impinge on the debt dynamics and the primary surplus, such as the level of real interest rates, real GDP growth, the depreciation of the *real* versus the U.S. dollar, and the real rate of growth of federal discretionary expenditure and personnel expenses.

[2] Sustainability is by definition a forward-looking concept as it is largely determined by current expectations of future fiscal/macroeconomic performance. In this exercise, sustainability is defined as a stable or declining path of net public debt to GDP after allowing for the incorporation of new net liabilities into the debt stock (discrete debt stock adjustments reflecting the financial impact of the recognition of previously unsecuritized liabilities).

Figure 2.1. Brazil: Nominal and Primary Deficit (% of GDP; 12-months); 1997M1-2000M9



Source: Central Bank, and Fund staff estimates
(-) Surplus, (+) Deficit.

B. Primary Surplus of the Central Government: Central Scenario

5. For the central government (CG) we will assume that, apart from a few well defined items, tax revenues will show a unitary elasticity to nominal GDP. Revenue items projected separately involve the CPMF tax collections, concession revenues, dividends, the *Oil Account* surplus *(PPE)*, and the revenues of the social security system for private sector workers (INSS). The assumption of unitary elasticity of revenues has not been validated empirically, at least in the short run, as there is nonnegligible heterogeneity of the tax burden across economic sectors. For instance, exports are usually not taxed as final products—but are taxed in the intermediate stages of production by cascading contributions,—and the agriculture sector is lightly taxed when compared with the industrial sector. From the income side, there are also sizable discrepancies in the taxation of wages, profits, and other income. These discrepancies tend to be stronger during periods of sharp acceleration or deceleration of economic activity, and are of material importance for short run projections, being less important for long-term scenarios. Here, as a simplification, and without loss of generality, for the long term scenario we assume balanced growth across sectors on average during the decade, that is, we assume an expansion of the taxable base in line with nominal GDP.

6. In the baseline (central scenario: no policy action) we assume a financial transactions tax ***(CPMF)*** rate of 0.30 percent from June 2000 to June 2002, and zero afterwards. Approval of the *Poverty Fund,* involving a constitutional amendment currently under review in congress, might lead to an increase of the tax rate back to 0.38 percent (coupled with a surcharge of the federal VAT tax (IPI) on luxury goods). However, we assume that the approval of the *Poverty Fund's* earmarked sources of revenue will lead to a concomitant increase in expenditure, leading to, in essence, no impact on the primary deficit. As such, since the *Poverty Fund* has not yet been approved, in our scenario, CPMF revenues are still expected to decline in 2001 an 2002 from the level observed in 2000, reaching zero during 2003–10 (see Table 2.2).

7. ***Concession*** revenues are derived separately since they tend to be bulky and nonrecurrent. In 2001 the government expects to get R$8.7 billion (0.7 percent of GDP) in revenue from this source[3]. A residual amount of around 0.2 percent of GDP is expected to accrue in 2002. In the period 2003–05 we expect again significant concession revenues from the auction of the high speed 1.8 GHz data, voice, and image transmission frequencies (third generation frequencies, GSM-Global System for Mobility technology). The GSM concessions could generate around 0.3 percent of GDP per year during 2003–05.

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[3] R$5.8 billion from the concession of the C, D, and E cellular bands, R$2 billion from the last installment payment of the B-band concession frequencies, and R$0.9 billion from oil and gas exploration and other concessions.

Table 2.2. Brazil: Baseline (Central Scenario); 2000-2010

	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Central government (CG)						(In percent of GDP)							
Total revenues	**20.13**	**21.98**	**21.56**	**21.49**	**20.23**	**19.71**	**19.71**	**19.71**	**19.41**	**19.41**	**19.41**	**19.41**	**19.41**
CPMF	0.89	0.83	1.28	1.11	0.60	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Concessions	1.02	0.95	0.48	0.70	0.20	0.30	0.30	0.30	0.00	0.00	0.00	0.00	0.00
Oil Account	0.20	0.25	0.07	0.53	0.35	0.35	0.35	0.35	0.35	0.35	0.35	0.35	0.35
INSS Revenues	5.06	5.11	5.10	5.07	5.07	5.07	5.07	5.07	5.07	5.07	5.07	5.07	5.07
Dividends	0.26	0.19	0.17	0.19	0.16	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14
Other	12.70	14.65	14.46	13.89	13.85	13.85	13.85	13.85	13.85	13.85	13.85	13.85	13.85
Transfers to S&Ns	**3.04**	**3.20**	**3.42**	**3.33**	**3.33**	**3.33**	**3.33**	**3.33**	**3.33**	**3.33**	**3.33**	**3.33**	**3.33**
Expenditure	**16.48**	**16.47**	**15.90**	**15.79**	**14.62**	**14.50**	**14.68**	**14.52**	**14.36**	**14.20**	**14.05**	**13.90**	**13.75**
Personnel 1/	5.02	5.12	5.02	4.75	4.63	4.54	4.46	4.37	4.29	4.20	4.12	4.04	3.97
INSS Benefits 2/	5.84	6.08	6.09	5.90	5.87	5.87	5.87	5.87	5.87	5.87	5.87	5.87	5.87
OCCs	5.56	5.33	4.93	5.32	4.29	4.26	4.53	4.45	4.38	4.30	4.23	4.16	4.09
non-discretionary (TDA; FAT; LC/87)	0.88	1.04	0.92	0.81	0.77	0.84	0.53	0.53	0.53	0.53	0.53	0.53	0.53
discretionary 3/	4.68	4.29	4.01	4.51	3.52	3.42	4.00	3.92	3.85	3.77	3.70	3.63	3.56
Other (Subsidies net of financial expenditure)	0.06	-0.06	-0.14	-0.17	-0.17	-0.17	-0.17	-0.17	-0.17	-0.17	-0.17	-0.17	-0.17
BCB	**-0.02**	**-0.08**	**-0.07**	**-0.09**	**-0.08**	**-0.08**	**-0.08**	**-0.08**	**-0.08**	**-0.08**	**-0.08**	**-0.08**	**-0.08**
Primary surplus: CG [A]	**0.59**	**2.23**	**2.17**	**2.28**	**2.20**	**1.80**	**1.62**	**1.78**	**1.64**	**1.80**	**1.95**	**2.10**	**2.25**
o/w deficit INSS	*-0.78*	*-0.97*	*-0.99*	*-0.82*	*-0.80*	*-0.80*	*-0.80*	*-0.80*	*-0.80*	*-0.80*	*-0.80*	*-0.80*	*-0.80*
Prim. surplus: public enterprises [B]	-0.35	0.66	0.70	0.25	0.20	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10
Prim. surplus: states and municipalities [C]	-0.19	0.22	0.52	0.51	0.30	0.20	0.15	0.10	0.10	0.10	0.10	0.10	0.10
Prim. surplus of the NFPS =[A]+[B]+[C]	**0.1**	**3.1**	**3.4**	**3.0**	**2.7**	**2.1**	**1.9**	**2.0**	**1.8**	**2.0**	**2.2**	**2.3**	**2.4**
Nominal balance (PSBR)	**7.9**	**10.0**	**4.6**	**3.5**	**2.5**	**2.0**	**2.1**	**1.9**	**2.0**	**1.8**	**1.6**	**1.3**	**1.1**
Net public debt	**43.4**	**49.7**	**50.0**	**49.7**	**48.5**	**47.9**	**47.5**	**47.1**	**46.7**	**46.1**	**45.4**	**44.4**	**43.3**
Primary surplus needed to stabilize net debt at 48.5% of GDP from 2002-2010						**-1.6%**	**-1.5%**	**-1.5%**	**-1.5%**	**-1.5%**	**-1.5%**	**-1.5%**	**-1.5%**
Net public debt/revenues CG	216%	226%	232%	231%	240%	243%	241%	239%	240%	238%	234%	229%	223%
Net public debt/total revenues (CG+States & Munic.) 4/	147%	158%	162%	161%	164%	165%	163%	162%	162%	160%	158%	154%	150%
Primary surplus CG/net revenues CG	3%	12%	12%	13%	13%	11%	10%	11%	10%	11%	12%	13%	14%

Source: IMF staff estimates.

1/ Real growth (drift) of 2.0 percent per year from 2002-2010.
2/ Real growth (drift) of 4.0 percent per year from 2002-2010.
3/ Real growth of free discretionary expenditure (excludes education and health care) of 0.0 percent per year from 2005-2010.
4/ Assumes that the tax collections of the states and municipalities will remain constant at the 9.4 percent of GDP collected in 1999.

8. The ***Oil Account (PPE)*** surplus, projected at 0.53 percent of GDP in 2001, is expected to be reduced to more moderate levels from 2002 onwards. As a working assumption, we presume that the approval of an explicit taxation system for oil products and it derivatives after 2001, as a substitute for the current cross-subsidization scheme, could yield around 0.35 percent of GDP per year on average during 2002–10.

9. The distribution of ***dividends*** to the Treasury by federally-owned enterprises (financial and nonfinancial) has been magnified in recent years by the balance-sheet effect of the floatation of the *real* in early 1999 on the profits of the federal banks and by exceptionally high international oil prices. With the continuation of the government's federal privatization program, the sale of noncontrolling stakes in some enterprises, and more moderate levels of crude oil prices, we expect this revenue item to reach around 0.14 percent of GDP on average from 2003–10 (see Table 2.2).

10. Regarding the ***revenues of the INSS,*** barring large changes in the share of formal/informal labor relations or a change in the current contribution rate structure, we assume that revenues will average around 5.1 percent of GDP during this decade. Clearly, this requires that the real wages in the formal sector of the economy grow with real GDP, thus maintaining the share of formal sector labor income in total income (see Table 2.2).

11. Finally, ***transfers to the states and municipalities*** are expected to remain constant as a percentage of GDP since both income tax and the IPI (the two main shared taxes) are expected to track the evolution of nominal GDP.

12. Hence, with the termination of concession revenues in 2005 and CPMF collections in 2002, and with the decline in dividend collections and the PPE surplus to more moderate levels after 2001, total revenues of the federal Treasury are expected to drop by over 2 percentage points of GDP after 2005 from the level expected in the budget proposal for 2001 (see Table 2.2).

13. With regard to nonfinancial expenditure, it is a well known stylized fact that, apart from a fraction of the other current and capital expenditure item (OCCs), in the short run, the margin for maneuver is limited.

14. Despite the government's policy of granting no generalized wage increases for the last five years, expenses with ***personnel*** (active and inactive) have nevertheless, in recent years, shown a significant nominal drift on account of factors related to the age-structure dynamics of the public service (affecting expenses with retired civil servants), the restructuring of some careers' pay structure, the normal career progression of individuals (career drift), selective wage increases granted to a few specific occupations, and extra payments derived from judicial decisions. Taking this into account, in the baseline scenario we assume that the nominal wage bill will grow between 4 percent and 5 percent, respectively, per year on average from 2002 until 2010. Notice that this assumption does not necessarily preclude real wage gains in the public sector since we are assuming away any other potential savings on personnel expenses. If, in the future, the assumed nominal growth

of personnel expenses turns out to be smaller than the one assumed, or if, through further streamlining and efficiency gains the workforce is reduced, for the same wage bill, these savings/gains could be passed on to the remaining public servants in the form of real wage increases, not across the board, but, as the government has done in the past, concentrated on careers whose pay profiles show the biggest discrepancy with respect to equivalent occupations in the private sector.[4] We will also derive an alternative scenario (Scenario B) where the total wage bill of the federal government grows with nominal GDP and analyzes the implications of such a policy for debt sustainability. Regarding social security contribution rates of public sector workers, we assume a baseline scenario where the current contribution rates on both current and retired civil servants are unaltered. However, it would be highly desirable for fiscal and equity reasons to broaden the tax base by including both civil retirees and the military.

15. Regarding the evolution of the ***INSS benefit payments*** we are assuming that benefits are updated by past inflation and the average historical drift of around 4 percent per year, (the result of demographic factors and the increase in the reference real wages for the calculation of the retirement benefit). As such, we conservatively assume a deficit of the INSS of around 0.8 percent of GDP on average during the decade. In this scenario, increases in the minimum wage (and benefit payments) beyond past inflation are assumed to be coupled with the identification of additional permanent sources of revenue, or with a reduction of other permanent sources of expenditure, as mandated by the recently approved Fiscal Responsibility Law, in order to preserve fiscal transparency and long-term solvency of the public sector.

16. Finally, the ***OCC's (Other Current and Capital expenditures)*** are subdivided between nondiscretionary spending—unemployment benefits, and other small items such as the LC/87 transfers that compensate the states for revenue losses derived from the exemption of state-level VAT (ICMS) on exports—and the discretionary component (subject to appropriation limits). The nondiscretionary component is expected to stay constant as a percentage of GDP after taking into account that LC/87 transfers to the states will peak at 0.31 percent of GDP in 2003 dropping to zero thereafter. A peculiarity that should be taken into account is that under the discretionary component, around 50 percent of the total is allocated to health care and education. Further, the recently approved *Health Care Act* demands that health related expenditures at the federal level should grow with nominal GDP, while the Constitution mandates that a fixed proportion of tax revenues should be spent on education. Therefore, these two important items can grow more, but no less, than nominal GDP, suggesting that there is no scope for potential real savings on them. For the remaining

[4] In this scenario, we are not taking into account the possibility of hiring future civil servants under the same rules as the private sector (CLT rules) which would have an immediate impact on budget finances through the increased federal contribution to the workers severance fund FGTS (8 percent of the wage bill) but which is expected to generate substantial savings when the new entrants retire.

50 percent of free discretionary spending, we will construct three alternative real growth scenarios, ranging from no real growth (baseline scenario), 2.5 percent real growth (Scenario A, Table 2.3), and the same growth of real GDP (Scenario B, Table 2.4). The 2.5 percent real growth per year represents an interesting proposition since, although below expected real GDP growth, it is approximately double the average population growth rate. As such, it allows for better and/or higher provision of public goods to the population while leading to a smooth decline of such expenditure categories as a percentage of GDP throughout the decade, since in the steady state real GDP is expanding at a faster rate.

17. In all, for the year 2001, our scenario is consistent with the budget proposal submitted to congress. While congressional revisions to both revenues and expenditures are likely, we assume that the bottom line primary surplus of R$28.1 billion (around 2.3 percent of GDP) will be preserved. Further, for 2002 and 2003 we assume that the ***federal government*** *Budget Guidelines Law* (LDO) target of a primary surplus of 2.2 percent and 1.8 percent of GDP will be observed. As such, the 2002–03 level of OCCs is calculated as a residual, that is, given the scenario for revenues and other expenditure items, a value higher than the one assumed will not be consistent with the primary surplus target unless additional revenue sources are found or other expenditure items reduced. In 2004, following two years of very low execution in discretionary spending, we assume that discretionary OCCs will expand to the level observed during 2000 (4 percent of GDP) and grow thereafter in line with the assumptions underlying the different scenarios.

18. *In terms of the execution of fiscal policy, given the underlying scenario assumptions, we anticipate that 2002 and 2003 will be difficult years regarding the level of discretionary OCC spending if the primary surpluses of the LDO are to be met, as concession revenues, CPMF collections, and the surplus of the PPE are bound to decrease from the levels expected to prevail in 2001 (net revenues drop 1.8 percentage point of GDP from 2001 to 2003 and do not recover in the following years, see Table 2.2).*[5] After 2004, under the baseline scenario, the primary surplus starts to recover gradually from 1.6 percent of GDP in 2004 to 2.25 percent of GDP in 2010 aided by the erosion of free discretionary spending and personnel expenses as a percentage of GDP, which would provide a gain of almost 1 percentage point of GDP in 2010 in comparison with 2004, more than offsetting the expected decline in revenue during the same period (see Table 2.2, Baseline Scenario). Under Scenario B—with both personnel expenses and OCCs growing in tandem with nominal GDP— the federal government primary surplus will decline from 1.8 percent of GDP in 2003 to 1.3 percent in 2005 and 1 percent of GDP during 2006–10 (see Scenario B, Table 2.4).

[5] If the *Poverty Fund* is approved, the additional revenues that could arise from the CPMF and the IPI surcharge could enable an expansion of free discretionary spending from the levels depicted in the baseline scenario without a deterioration of the primary surplus.

Table 2.3. Brazil: Scenario A

	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
						(In percent of GDP)							
Central government													
Total revenues	**20.13**	**21.98**	**21.56**	**21.49**	**20.23**	**19.71**	**19.71**	**19.71**	**19.41**	**19.41**	**19.41**	**19.41**	**19.41**
CPMF	0.89	0.83	1.28	1.11	0.60	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Concessions	1.02	0.95	0.48	0.70	0.20	0.30	0.30	0.30	0.00	0.00	0.00	0.00	0.00
Oil account	0.20	0.25	0.07	0.53	0.35	0.35	0.35	0.35	0.35	0.35	0.35	0.35	0.35
INSS revenues	5.06	5.11	5.10	5.07	5.07	5.07	5.07	5.07	5.07	5.07	5.07	5.07	5.07
Dividends	0.26	0.19	0.17	0.19	0.16	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14
Other	12.70	14.65	14.46	13.89	13.85	13.85	13.85	13.85	13.85	13.85	13.85	13.85	13.85
Transfers to S&Ms	**3.04**	**3.20**	**3.42**	**3.33**	**3.33**	**3.33**	**3.33**	**3.33**	**3.33**	**3.33**	**3.33**	**3.33**	**3.33**
Expenditure	**16.48**	**16.47**	**15.90**	**15.79**	**14.62**	**14.50**	**14.68**	**14.57**	**14.46**	**14.34**	**14.24**	**14.13**	**14.02**
Personnel	5.02	5.12	5.02	4.75	4.63	4.54	4.46	4.37	4.29	4.20	4.12	4.04	3.97
INSS benefits	5.84	6.08	6.09	5.90	5.87	5.87	5.87	5.87	5.87	5.87	5.87	5.87	5.87
OCCs	5.56	5.33	4.93	5.32	4.29	4.26	4.53	4.50	4.47	4.44	4.42	4.39	4.36
non-discretionary (TDA; FAT; LC/87)	0.88	1.04	0.92	0.81	0.77	0.84	0.53	0.53	0.53	0.53	0.53	0.53	0.53
discretionary	4.68	4.29	4.01	4.51	3.52	3.42	4.00	3.97	3.94	3.91	3.89	3.86	3.83
Other (subsidies net of financial expenditure)	0.06	-0.06	-0.14	-0.17	-0.17	-0.17	-0.17	-0.17	-0.17	-0.17	-0.17	-0.17	-0.17
BCB	**-0.02**	**-0.08**	**-0.07**	**-0.09**	**-0.08**	**-0.08**	**-0.08**	**-0.08**	**-0.08**	**-0.08**	**-0.08**	**-0.08**	**-0.08**
Primary surplus CG [A]	**0.59**	**2.23**	**2.17**	**2.28**	**2.20**	**1.50**	**1.62**	**1.73**	**1.55**	**1.66**	**1.77**	**1.87**	**1.98**
o/w deficit INSS	*-0.78*	*-0.97*	*-0.99*	*-0.82*	*-0.80*	*-0.80*	*-0.80*	*-0.80*	*-0.80*	*-0.80*	*-0.80*	*-0.80*	*-0.80*
Prim. surplus: public enterprises [B]	-0.35	0.66	0.70	0.25	0.20	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10
Prim. surplus: states and municipalities [C]	-0.19	0.22	0.52	0.51	0.30	0.20	0.15	0.10	0.10	0.10	0.10	0.10	0.10
Prim. surplus of the NFPS =[A]+[B]+[C]	**0.1**	**3.1**	**3.4**	**3.0**	**2.7**	**2.1**	**1.9**	**1.9**	**1.7**	**1.9**	**2.0**	**2.1**	**2.2**
Nominal balance (PSBR)	**7.9**	**10.0**	**4.6**	**3.5**	**2.5**	**2.0**	**2.1**	**1.9**	**2.1**	**1.9**	**1.8**	**1.6**	**1.4**
Net public debt	**43.4**	**49.7**	**50.0**	**49.7**	**48.5**	**47.9**	**47.5**	**47.1**	**46.8**	**46.4**	**45.9**	**45.2**	**44.4**
Primary surplus needed to stabilize net debt at 48.5% of GDP from 2002-2010						**-1.6%**	**-1.5%**	**-1.5%**	**-1.5%**	**-1.5%**	**-1.5%**	**-1.5%**	**-1.5%**
Net public debt/revenues CG	216%	226%	232%	231%	240%	243%	241%	239%	241%	239%	236%	233%	229%
Net public debt/total revenues (CG+States & Munic.) 4/	147%	158%	162%	161%	164%	165%	163%	162%	163%	161%	159%	157%	154%
Primary surplus CG/revenues CG	3%	12%	12%	13%	13%	11%	10%	11%	10%	10%	11%	12%	12%

Source: IMF staff estimates.

1/ Real growth (drift) of 2.0 percent per year from 2002-2010.
2/ Real growth (drift) of 4.0 percent per year from 2002-2010.
3/ Real growth of free discretionary expenditure (excludes education and health care) of 2.5 percent per year from 2005-2010.
4/ Assumes that the tax collections of the states and municipalities will remain constant at the 9.4 percent of GDP collected in 1999.

Table 2.4. Brazil: Scenario B

	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Central government						(In percent of GDP)							
Total revenues	**20.13**	**21.98**	**21.56**	**21.49**	**20.23**	**19.71**	**19.71**	**19.71**	**19.41**	**19.41**	**19.41**	**19.41**	**19.41**
CPMF	0.89	0.83	1.28	1.11	0.60	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Concessions	1.02	0.95	0.48	0.70	0.20	0.30	0.30	0.30	0.00	0.00	0.00	0.00	0.00
Oil account	0.20	0.25	0.07	0.53	0.35	0.35	0.35	0.35	0.35	0.35	0.35	0.35	0.35
INSS revenues	5.06	5.11	5.10	5.07	5.07	5.07	5.07	5.07	5.07	5.07	5.07	5.07	5.07
Dividends	0.26	0.19	0.17	0.19	0.16	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14
Other	12.70	14.65	14.46	13.89	13.85	13.85	13.85	13.85	13.85	13.85	13.85	13.85	13.85
Transfers to S&Ms	**3.04**	**3.20**	**3.42**	**3.33**	**3.33**	**3.33**	**3.33**	**3.33**	**3.33**	**3.33**	**3.33**	**3.33**	**3.33**
Expenditure	**16.48**	**16.47**	**15.90**	**15.79**	**14.62**	**14.50**	**14.97**	**14.97**	**14.97**	**14.97**	**14.97**	**14.97**	**14.97**
Personnel	5.02	5.12	5.02	4.75	4.75	4.75	4.75	4.75	4.75	4.75	4.75	4.75	4.75
INSS benefits	5.84	6.08	6.09	5.90	5.87	5.87	5.87	5.87	5.87	5.87	5.87	5.87	5.87
OCCs	5.56	5.33	4.93	5.32	4.18	4.06	4.53	4.53	4.53	4.53	4.53	4.53	4.53
non-discretionary (TDA; FAT; I.C/87)	0.88	1.04	0.92	0.81	0.77	0.84	0.53	0.53	0.53	0.53	0.53	0.53	0.53
discretionary	4.68	4.29	4.01	4.51	3.41	3.22	4.00	4.00	4.00	4.00	4.00	4.00	4.00
Other (subsidies net of financial expenditure)	0.06	-0.06	-0.14	-0.17	-0.17	-0.17	-0.17	-0.17	-0.17	-0.17	-0.17	-0.17	-0.17
BCB	**-0.02**	**-0.08**	**-0.07**	**-0.09**	**-0.08**	**-0.08**	**-0.08**	**-0.08**	**-0.08**	**-0.08**	**-0.08**	**-0.08**	**-0.08**
Primary surplus CG [A]	**0.59**	**2.23**	**2.17**	**2.28**	**2.20**	**1.80**	**1.33**	**1.33**	**1.03**	**1.03**	**1.03**	**1.03**	**1.03**
o/w deficit INSS	*-0.78*	*-0.97*	*-0.99*	*-0.82*	*-0.80*	*-0.80*	*-0.80*	*-0.80*	*-0.80*	*-0.80*	*-0.80*	*-0.80*	*-0.80*
Prim. surplus: public enterprises [B]	-0.35	0.66	0.70	0.25	0.20	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10
Prim. surplus: states and municipalities [C]	-0.19	0.22	0.52	0.51	0.30	0.20	0.15	0.10	0.10	0.10	0.10	0.10	0.10
Prim. surplus of the NFPS =[A]+[B]+[C]	**0.1**	**3.1**	**3.4**	**3.0**	**2.7**	**2.1**	**1.6**	**1.5**	**1.2**	**1.2**	**1.2**	**1.2**	**1.2**
Nominal balance (PSBR)	**7.9**	**10.0**	**4.6**	**3.5**	**2.5**	**2.0**	**2.4**	**2.4**	**2.7**	**2.7**	**2.8**	**2.8**	**2.8**
Net public debt	**43.4**	**49.7**	**50.0**	**49.7**	**48.5**	**47.9**	**47.9**	**47.8**	**48.1**	**48.5**	**48.8**	**49.1**	**49.4**
Primary surplus needed to stabilize net debt at 48.5% of GDP from 2002-2010						**-1.6%**	**-1.5%**	**-1.5%**	**-1.5%**	**-1.5%**	**-1.5%**	**-1.5%**	**-1.5%**
Net public debt/revenues CG	216%	226%	232%	231%	240%	243%	243%	243%	248%	250%	251%	253%	255%
Net public debt/total revenues (CG+States & Munic.) 4/	147%	158%	162%	161%	164%	165%	164%	164%	167%	168%	169%	170%	172%
Primary surplus CG/revenues CG	3%	12%	12%	13%	13%	11%	8%	8%	6%	6%	6%	6%	6%

Source: IMF staff estimates

1/ Real growth (drift) of real GDP from 2002-2010.
2/ Real growth of 4.0 percent per year from 2002-2010.
3/ Real growth of free discretionary expenditure (excludes education and health care) identical to real GDP (4 percent per year) from 2005-2010.
4/ Assumes that the tax collections of the states and municipalities will remain constant at the 9.4 percent of GDP collected in 1999.

19. In order to close the baseline primary surplus scenario for the consolidated public sector, we will make a conjecture regarding the evolution of the primary surplus of the state owned nonfinancial enterprises and the subnational governments.

20. The primary surplus of the ***state-owned nonfinancial enterprises (SOEs)*** is expected to decline to more moderate-than-recently-observed levels from 2002 onwards reflecting the continuation of the privatization program (smaller set of public enterprises) and the return of international oil prices to more moderate levels (reducing the surplus of the state oil-refining monopoly Petrobrás). Also, the SOEs are expected to bolster investment levels in order to deal with the projected stronger real expansion of GDP and to pursue economically viable investment opportunities, particularly in the oil and gas sectors. Accordingly, in the steady-state we assume that the SOEs should be generating primary surpluses no larger than 0.1 percent of GDP per year (see Table 2.2).

21. Fiscal adjustment at the subnational level has been a reality since 1997. The ***states and municipalities*** have posted a combine primary deficit of 0.7 percent of GDP in 1997 and 0.2 percent of GDP in 1998, shifting to a surplus of over 0.2 percent of GDP in 1999, and around 0.5 percent of GDP in the 12-months to September 2000. For the period 2000–10 the states and municipalities' primary surplus is assumed to remain consistently in the black but declining over time. The baseline scenario assumes that the covenants imbedded in the debt restructuring agreements signed with the Treasury by almost all the states and the biggest municipalities will continue to be honored. Further, the fiscal and debt targets contemplated by the Fiscal Responsibility Law and its ancillary legislation will force many subnational governments to pursue further fiscal adjustment (especially with regard to personnel expenses and the imbalances of many of the subnational level-sponsored retirement programs), limiting the likelihood of observing deficits at these levels of government. However, as own revenues and transfers expand with nominal GDP, we expect debt service payments to lose weight as a percentage of net revenues (the renegotiated debts should be amortized over a 30-year period in fixed monthly installments).[6] Further, the subnational governments will also be affected by the *Health Care Act* and will be hard pressed to boost investment in basic infrastructure. As a result, the primary surplus is expected to decline gradually until 2005, reaching afterwards a primary surplus of around 0.1 percent of GDP per year on average until the end of the decade, although, a slightly better performance cannot be discarded if cautious fiscal management prevails (see Table 2.2).

22. *Under the assumptions outlined above, the primary surplus of the* ***consolidated public sector*** *is expected to peak at 3.4 percent of GDP in the year 2000, declining to its lowest level in 2004 (1.9 percent of GDP), recovering gradually until the end of the decade to the*

[6] As own revenues and transfers grow and inflation drops, the debt payment ceiling of 13 percent of net revenues established in the debt renegotiations contracts with the Treasury will be increasingly less binding and affect a much smaller set of states.

equivalent of 2½ percent of GDP in 2010.[7] *Under the assumptions of Scenario B—real wages and OCCs growing in real terms with GDP—the primary surplus will decline continuously until 2006 (reaching 1.2 percent of GDP) stabilizing thereafter. In conclusion, a more indulgent fiscal stance (baseline scenario versus scenario B) is expected to cost over 5 percent of GDP in accumulated lost primary surpluses over seven years and even more in terms of public debt (around 6 percentage points of GDP due to accrued interest).*

C. Macroeconomic Framework and Debt Dynamics

23. According to our medium- and long-term macro scenario, in the steady-state, real interest rates drop to 7.5 percent per year, real GDP grows by 4 percent, inflation declines gradually, stabilizing at 2.5 percent per year in 2005, and the foreign exchange rate stays on average on the Purchasing Power Parity curve for a foreign inflation rate of 1.5 percent per year. Further, the incorporation of liabilities in the debt statistics (FCVS and other liabilities) is expected to reach 0.75 percent of GDP in 2002. In the period 2003–10 recognition of liabilities net of privatization proceeds is expected to average 0.5 percent of GDP per year (see Table 2.5).[8]

24. *Under these assumptions the primary surplus needed to stabilize the debt to GDP ratio at the 48.5 percent expected to prevail at the end of 2002, hovers around 1.5 percent per year. Alternatively, under the traditional present value method, the constant steady state level of the primary surplus whose infinite horizon present value equals the 48.5 percent of GDP debt stock of 2002 (i.e. it pays off the debt stock) should lie in the range of 1.1 percent to 1.2 percent of GDP per year, assuming zero net incorporation of liabilities into the debt stock.*[9]

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[7] The 1.5 percentage point of GDP decline in the consolidated public sector primary surplus from the year 2000 to the year 2004 can be decomposed into a 0.55 percentage point of GDP decline in the primary surplus of the central government (faster decline in revenue than in expenditure), a 0.60 percentage point of GDP erosion of the surplus of the state-owned enterprises, and a 0.37 percentage point of GDP decline in the expected primary surplus of the states and municipalities.

[8] The scenario assumption of net recognition of government liabilities of 0.5 percent of GDP per year from 2003 to 2010 (4 percent of GDP during the period) provides room for the fulfillment of the government's intention to gradually incorporate into the debt stock the liabilities of the mortgage insurance/subsidy scheme (FCVS) and, if needed, other contingent liabilities of the Treasury incurred during the high inflation years, and the recapitalization of the federal banks.

[9] The present value method, solves equation $b_{t-1} = \Sigma_{s=0} [(1+g)/(1+r)]^{s+1} d_{t+s}$ for a constant primary surplus d^*, for all s.

Table 2.5: Macroeconomic Framework and Baseline (Central Scenario) Nominal Deficit, Primary Deficit, and Net Public Debt (%GDP 2000-2010)

	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
						(In percent of GDP)						
Baseline (central scenario):												
Net public debt (end of period)	**49.7**	**50.0**	**49.7**	**48.5**	**47.9**	**47.5**	**47.1**	**46.7**	**46.1**	**45.4**	**44.4**	**43.3**
Primary surplus	3.2	3.4	3.0	2.7	2.1	1.9	2.0	1.8	2.0	2.2	2.3	2.5
Nominal balance (PSBR)	10.0	4.6	3.5	2.5	2.0	2.1	1.9	2.0	1.8	1.6	1.3	1.1
Exogenous change in debt stocks	-0.2	-0.4	0.0	-0.1	-0.5	-0.5	-0.5	-0.5	-0.5	-0.5	-0.5	-0.5
Privatizations	0.9	1.4	1.1	0.7	...	...	...	...	...	...	...	...
Incorporation of nonsecuritized debts and other liabilities	1.1	1.8	1.1	0.8	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Overnight interest rate; annualized (percent)												
End of period	19.0	16.5	14.5	12.5	10.7	10.5	10.2	10.2	10.2	10.2	10.2	10.2
Period average 1/	25.6	17.4	15.1	12.98	10.7	10.5	10.2	10.2	10.2	10.2	10.2	10.2
Average real interest rate; annualized (percent) 1/ 2/	4.7	6.9	10.7	9.2	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5
Exchange rate (R$/US$)												
End of period	1.79	1.90	1.94	1.98	2.01	2.03	2.05	2.07	2.09	2.11	2.13	2.15
Percentage change (+=US$ appreciation)		6.2	2.0	2.0	1.5	1.2	1.0	1.0	1.0	1.0	1.0	1.0
Average	1.81	1.84	1.92	1.96	1.99	2.02	2.04	2.06	2.08	2.10	2.12	2.14
General price inflation (IGP-DI), (accumulated during the period, percent)	20.0	9.8	4.0	3.5	3.0	2.75	2.5	2.5	2.5	2.5	2.5	2.5
Real GDP growth (percent)	0.79	4.00	4.50	4.50	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00

Source: Fund staff estimates.

1/ Calculated on the basis of the capitalized overnight daily interest rate prevailing during the period.

2/ Average of the annualized monthly overnight interest rate deflated by the annualized monthly inflation rate (measured by general price index; IGP-DI) during the period.

25. *Under our macroeconomic and baseline scenario assumptions the derived profile for the consolidated primary surplus implies that net public debt will decline smoothly, at the rate of around 0.7 percentage point of GDP per year on average, reaching a ratio of around 43.3 percent of GDP in 2010, with the PSBR declining to slightly over 1 percent of GDP.*[10] *Assuming that public investment remains broadly constant as a percentage of GDP, this implies an increase in public sector savings of over 3.5 percentage points of GDP in the year 2010 in comparison with the year 2000. This increase in public sector savings should support the necessary balance of payments adjustment, and free additional funds for private investment during the decade (see Section 10 on External Sustainability). The improvement in the macroeconomic conditions underpinning the baseline scenario for the period 2000–2010 is certainly predicated on a relatively strong fiscal stance (consistency requirement), since weaker-than-assumed fiscal performances will almost certainly lead to higher implicit probabilities of default and higher sovereign interest rate spreads.*[11]

26. Further, not only is the net public debt to GDP ratio declining in the baseline scenario, but also other indicators of fiscal sustainability point to a moderate improving trend during the decade. The ratio of net public debt to total revenues of the central government improves slightly from 232 percent in the year 2000 to around 220 percent in 2010, after peaking at 243 percent in 2003 (see Table 2.2). In the same vein, the ratio of net public debt to total revenues of the general government (includes states and municipalities) improves from a peak of 165 percent in the year 2003 to 150 percent in 2010. While somewhat improved, this ratio will, nevertheless, still exceed the normative reference target ratio of 100 percent used by the Brazilian Treasury in the debt renegotiations with almost all the states and the largest municipalities. This points to the necessity of deepening the fiscal adjustment effort at all levels of government during this decade through reforms that improve the structural fiscal fundamentals that led to a subpar fiscal performance in the late 1990s. Finally, the indicator of the primary surplus effort of the central government (primary surplus as a share of gross revenues) does not point to a scenario where the share of revenues

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[10] These results corroborate the findings of Giambiagi (2000d) which, under slightly different assumptions, recommends a consolidated public sector primary surplus of around 2 percent of GDP per year for the period 2003–2010, in order to obtain a declining ratio of net public debt to GDP of around 1 percentage point of GDP per year during the same period.

[11] As corroborated in a recent report by the World Bank (2000b), the nominal fiscal deficit, the trade deficit, and net foreign debt all have a statistically positive impact on Brazil's risk premium. The report estimates that a 1 percentage point of GDP decline in the nominal deficit is expected to reduce the interest rates risk premium by around 60 basis points. Since a decline in the nominal fiscal deficit also impacts the trade balance and, to a lower extent, to net foreign debt levels, the whole effect on risk premia is certainly larger. Further, lower interest rates spur growth, which further improves fiscal performance, leading to a virtuous circle.

committed to the generation of the envisaged surpluses increases beyond what is expected to be observed in 2000–2002 (see Table 2.2).

27. Under Scenario A, where the discretionary component of OCCs grows in real terms by 2.5 percent per year, net debt to GDP will still decline, albeit at an uncomfortably slow pace, reaching 44.4 percent of GDP at the end of the decade. However, when both OCCs and personnel expenses grow with real GDP, (Scenario B) net debt stops falling around 2004 (notice that until 2003 strong primaries are guaranteed by the LDO targets) and it enters an unsustainable path (see Table 2.4). *In conclusion, the debt dynamics projection point to the fact that while there might be some room for a moderate real increase in OCCs (still below real GDP growth) a more expansionary fiscal stance might rekindle fears of unsustainable debt dynamics and would leave basically no cushion for additional recognition of liabilities beyond the amount envisaged in the baseline scenario or for a deterioration of the macroeconomic picture that leads to higher real interest rates, lower real GDP growth, and eventually a more depreciated path for the nominal exchange rate.* For this reason, Scenario B is a riskier proposition and points to the necessity of control over the real growth of the wage bill and discretionary OCCs during the decade and the need to push forward the structural fiscal reform agenda. Under Scenario B, since the fiscal effort of the central government decreases substantially after 2002 (as measured by the primary surplus share of gross revenues), all the other indicators of fiscal sustainability also point to a scenario of gradual deterioration of the fiscal stance, particularly after 2005 (see Table 2.4).

D. Stress Tests

28. In this section we will stress test the central scenario and the implied net public debt ratio path by varying the level of real interest rates, the nominal exchange rate, real GDP growth, and the real growth rate of OCCs and personnel expenses (see Tables 2.6 and 2.7, and Figures 2.2 and 2.3).

29. Net public debt shows heightened sensibility to both real GDP growth and the level real interest rates (see Table 2.6 and Figure 2.3).[12] If the average real GDP growth between 2000 to 2010 turns out to be 1 percentage point lower, the path of net public debt will then show an increasing trend after 2003 and will reach a high level (55 percent of GDP) by the end of the decade. The same is true for an increase of average real interest rates of around 200 basis points from 2001–2010 (see table). *The stress tests performed show that the critical points beyond which unstable debt dynamics seem to kick in are around*

[12] Since higher real growth generates a higher primary surplus, through the reduction as a percentage of GDP of the INSS deficit, OCCs, and the wage bill, the debt dynamics are more sensitive to shocks to real GDP growth than changes in real interest rates. It also points to the fact the a country can grow out of its problems, since an extra percentage point of GDP growth on average reduces the debt to GDP ratio in 2010 by around 10 percentage points of GDP from the baseline figure.

Table 2.6. Brazil: Sensitivity Analysis of the Baseline (Central Scenario) to Real Interest Rates and Real GDP Growth.

Baseline (central scenario)			
	Pri. Def.	Net Debt	PSBR
2000	-3.39%	50.04%	4.65%
2001	-3.04%	49.69%	3.45%
2002	-2.70%	48.47%	2.55%
2003	-2.10%	47.91%	2.01%
2004	-1.87%	47.55%	2.11%
2005	-1.98%	47.05%	1.88%
2006	-1.84%	46.68%	1.98%
2007	-2.00%	46.12%	1.77%
2008	-2.15%	45.38%	1.56%
2009	-2.30%	44.44%	1.32%
2010	-2.45%	43.31%	1.06%

Real Int Rates +2% (2001-10)			
	Pri. Def.	Net Debt	PSBR
2000	-3.39%	50.04%	4.65%
2001	-3.04%	50.24%	4.01%
2002	-2.70%	49.63%	3.21%
2003	-2.10%	49.96%	2.97%
2004	-1.87%	50.51%	3.17%
2005	-1.98%	50.98%	3.03%
2006	-1.84%	51.62%	3.23%
2007	-2.00%	52.12%	3.13%
2008	-2.15%	52.47%	3.02%
2009	-2.30%	52.66%	2.89%
2010	-2.45%	52.69%	2.74%

Real Int Rates +1% (2001-10)			
	Pri. Def.	Net Debt	PSBR
2000	-3.39%	50.04%	4.65%
2001	-3.04%	49.97%	3.73%
2002	-2.70%	49.05%	2.87%
2003	-2.10%	48.93%	2.49%
2004	-1.87%	49.01%	2.63%
2005	-1.98%	48.98%	2.44%
2006	-1.84%	49.09%	2.58%
2007	-2.00%	49.04%	2.42%
2008	-2.15%	48.81%	2.25%
2009	-2.30%	48.40%	2.06%
2010	-2.45%	47.80%	1.84%

Real GDP growth +1% (2000-10)			
	Pri. Def.	Net Debt	PSBR
2000	-3.39%	49.54%	4.57%
2001	-3.04%	48.66%	3.32%
2002	-2.70%	46.93%	2.38%
2003	-2.10%	45.93%	1.88%
2004	-2.16%	44.80%	1.64%
2005	-2.38%	43.41%	1.22%
2006	-2.35%	42.02%	1.12%
2007	-2.61%	40.31%	0.72%
2008	-2.87%	38.29%	0.28%
2009	-3.11%	35.95%	-0.18%
2010	-3.36%	33.28%	-0.67%

Prim. Surp. to Stabilize Debt/GDP			
	Pri. Def.	Net Debt	PSBR
2000	-3.39%	50.04%	4.65%
2001	-3.04%	49.69%	3.45%
2002	-2.70%	48.47%	2.55%
2003	-1.57%	48.47%	2.57%
2004	-1.54%	48.47%	2.52%
2005	-1.54%	48.47%	2.45%
2006	-1.54%	48.47%	2.44%
2007	-1.54%	48.47%	2.44%
2008	-1.53%	48.47%	2.44%
2009	-1.53%	48.47%	2.45%
2010	-1.52%	48.47%	2.45%

Real Int Rates -2% (2001-10)			
	Pri. Def.	Net Debt	PSBR
2000	-3.39%	50.04%	4.65%
2001	-3.04%	49.14%	2.89%
2002	-2.70%	47.33%	1.90%
2003	-2.10%	45.95%	1.11%
2004	-1.87%	44.74%	1.15%
2005	-1.98%	43.40%	0.86%
2006	-1.84%	42.17%	0.90%
2007	-2.00%	40.76%	0.63%
2008	-2.15%	39.16%	0.36%
2009	-2.30%	37.37%	0.08%
2010	-2.45%	35.38%	-0.22%

Real Int Rates -1% (2001-10)			
	Pri. Def.	Net Debt	PSBR
2000	-3.39%	50.04%	4.65%
2001	-3.04%	49.41%	3.17%
2002	-2.70%	47.90%	2.22%
2003	-2.10%	46.92%	1.55%
2004	-1.87%	46.12%	1.62%
2005	-1.98%	45.19%	1.35%
2006	-1.84%	44.37%	1.42%
2007	-2.00%	43.36%	1.18%
2008	-2.15%	42.17%	0.93%
2009	-2.30%	40.77%	0.66%
2010	-2.45%	39.17%	0.37%

Real GDP growth -1% (2000-10)			
	Pri. Def.	Net Debt	PSBR
2000	-3.39%	50.56%	4.73%
2001	-3.04%	50.75%	3.58%
2002	-2.70%	50.06%	2.72%
2003	-2.10%	50.00%	2.15%
2004	-1.57%	50.45%	2.61%
2005	-1.56%	50.93%	2.57%
2006	-1.30%	51.70%	2.89%
2007	-1.34%	52.46%	2.92%
2008	-1.38%	53.19%	2.94%
2009	-1.42%	53.91%	2.97%
2010	-1.45%	54.62%	2.99%

Source: IMF staff estimates.

Table 2.7. Brazil: Scenario A and B, and Sensitivity Analysis of the Baseline to the Foreign Exchange Rate.

Scenario A (OCCs grow 2.5% real)			
	Prim. Def.	Debt	PSBR
2000	-3.39%	50.04%	4.65%
2001	-3.04%	49.69%	3.45%
2002	-2.70%	48.47%	2.55%
2003	-2.10%	47.91%	2.01%
2004	-1.87%	47.55%	2.11%
2005	-1.93%	47.10%	1.93%
2006	-1.75%	46.83%	2.08%
2007	-1.86%	46.42%	1.93%
2008	-1.97%	45.88%	1.77%
2009	-2.07%	45.21%	1.61%
2010	-2.18%	44.38%	1.42%

Scenario B (OCC & W's grow with GDP)			
	Prim. Def.	Debt	PSBR
2000	-3.39%	50.04%	4.65%
2001	-3.04%	49.69%	3.45%
2002	-2.70%	48.47%	2.55%
2003	-2.10%	47.91%	2.01%
2004	-1.58%	47.85%	2.42%
2005	-1.53%	47.84%	2.38%
2006	-1.23%	48.14%	2.70%
2007	-1.23%	48.45%	2.73%
2008	-1.23%	48.77%	2.76%
2009	-1.23%	49.09%	2.78%
2010	-1.23%	49.41%	2.81%

Baseline: FX rate 5% depreciated			
	Prim. Def.	Debt	PSBR
2000	-3.39%	50.97%	5.15%
2001	-3.04%	50.67%	3.57%
2002	-2.70%	49.48%	2.64%
2003	-2.10%	48.94%	2.09%
2004	-1.87%	48.59%	2.19%
2005	-1.98%	48.11%	1.96%
2006	-1.84%	47.76%	2.06%
2007	-2.00%	47.23%	1.86%
2008	-2.15%	46.51%	1.64%
2009	-2.30%	45.60%	1.41%
2010	-2.45%	44.49%	1.16%

* FX rate at 2.26 in 2010

Baseline: FX rate 7.5% depreciated			
	Prim. Def.	Debt	PSBR
2000	-3.39%	51.44%	5.40%
2001	-3.04%	51.17%	3.63%
2002	-2.70%	49.98%	2.69%
2003	-2.10%	49.45%	2.13%
2004	-1.87%	49.11%	2.23%
2005	-1.98%	48.65%	2.00%
2006	-1.84%	48.31%	2.10%
2007	-2.00%	47.78%	1.90%
2008	-2.15%	47.08%	1.69%
2009	-2.30%	46.18%	1.46%
2010	-2.45%	45.08%	1.20%

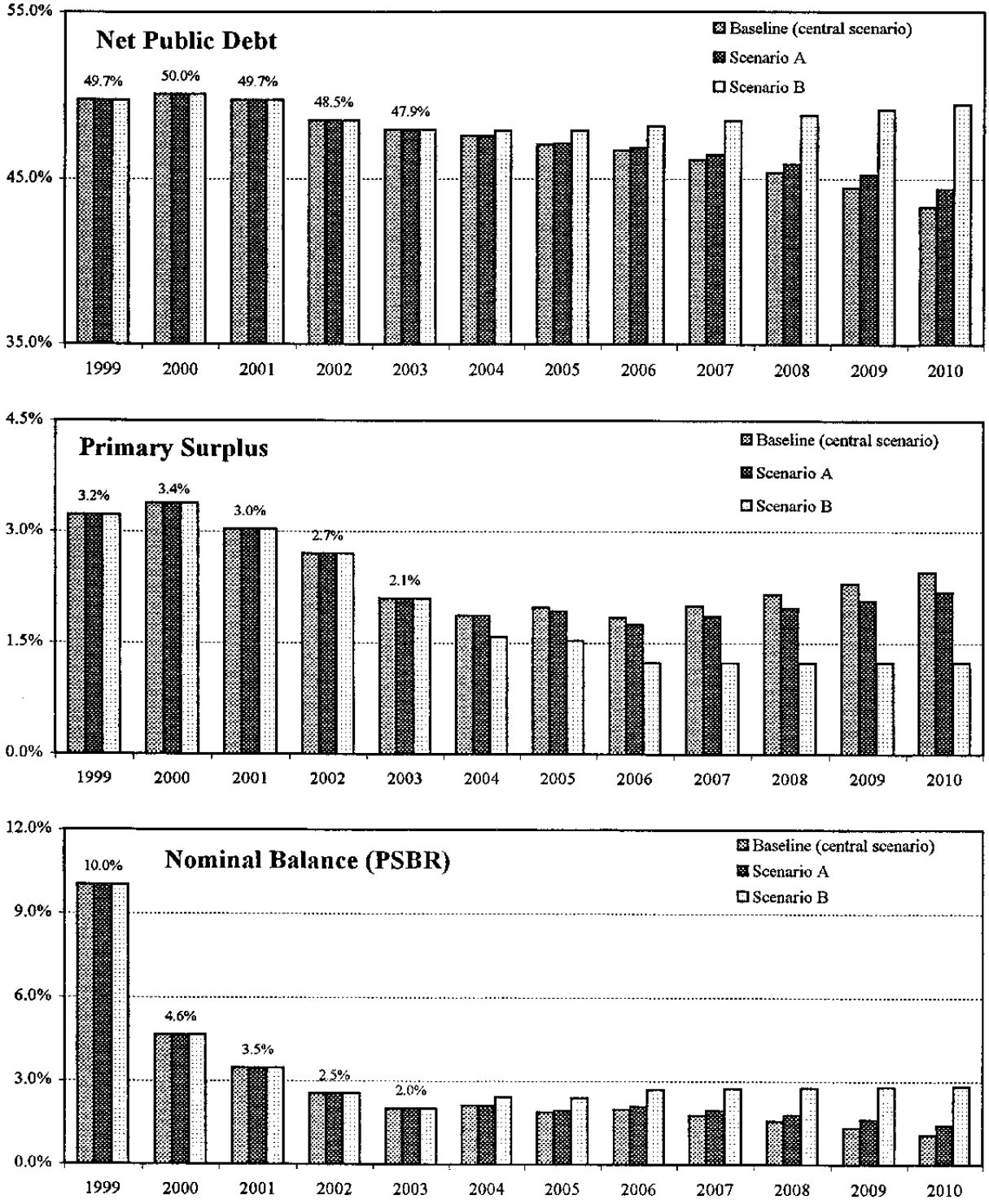
* FX rate at 2.31 in 2010

Baseline: FX rate 10% depreciated			
	Prim. Def.	Debt	PSBR
2000	-3.39%	51.91%	5.65%
2001	-3.04%	51.66%	3.69%
2002	-2.70%	50.48%	2.74%
2003	-2.10%	49.97%	2.17%
2004	-1.87%	49.63%	2.27%
2005	-1.98%	49.18%	2.04%
2006	-1.84%	48.85%	2.14%
2007	-2.00%	48.34%	1.94%
2008	-2.15%	47.64%	1.73%
2009	-2.30%	46.76%	1.50%
2010	-2.45%	45.67%	1.25%

* FX rate at 2.37 in 2010

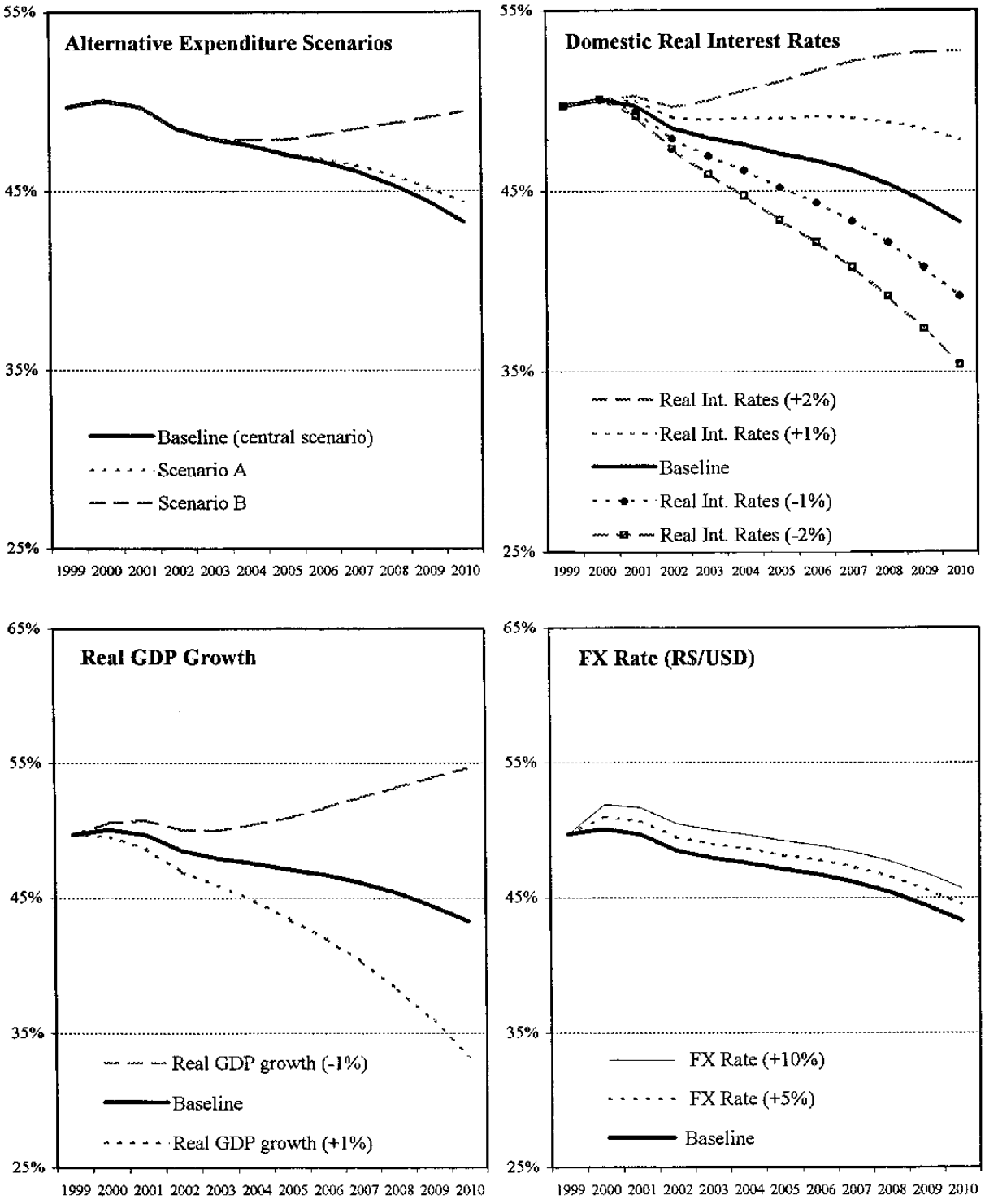
Source: IMF staff estimates.

Figure 2.2. Brazil: Net Public Debt, Primary Surplus, and Nominal Balance (PSBR)



Source: Fund staff estimates

Figure 2.3. Brazil: Net Public Debt Sensitivity Analysis; 2000-2010



Source: Fund staff estimates.

75 basis points of lower average real GDP growth or 130 basis points of higher real interest rates.

30. Further, the debt dynamics show that the debt to GDP ratio could support well a nominal exchange rate depreciation shock of over 10 percent—*ceteris paribus*, the declining path of debt to GDP is not derailed by such a shock (see Table 2.7).

31. In the case of a shock to real GDP growth, we have explicitly modeled the impact on the primary surplus. However, in the case of higher real interest rates, we have not considered the potentially negative effect this might have over real growth and the primary surplus. If such transmission mechanism were to be explicitly modeled, it would have magnified the potentiality destabilizing effect of monetary tightening on the debt to GDP ratio.

E. Conclusion and Policy Implications

32. *Given that the baseline scenario cannot sustain high levels of stress both to real GDP growth or the level of real interest rates—even in a baseline scenario in which discretionary expenditure shows no real growth throughout the period—the exercise performed in this section indicates that it is imperative that the fiscal effort be sustained during the decade and at a level that allows for a reasonable decline of debt to GDP.* That is, fiscal dividends arising from structural fiscal reforms and further reform of the social security system, particularly for public sector workers, are critical to allay concerns regarding Brazil's vulnerability to adverse macroeconomic shocks, be it domestic or external, and to avoid the need to resort to abrupt fiscal retrenchments in case such shocks materialize—since hasty fiscal adjustment programs are usually more disruptive and tend to be suboptimal in terms of welfare than more gradual ex-ante fiscal consolidation strategies. In addition, staying the course of fiscal discipline considerably improves the chances of attaining an investment-grade sovereign rating sooner, which would further assist the fiscal and external adjustment processes since it would lead to lower domestic interest rates and lower external financing costs.

33. The baseline scenario implied debt dynamics profile also shows that *it is imperative to honor the spirit of the recently approved Fiscal Responsibility Law* and avoid the creation of permanent spending items without the identification of the concomitant permanent sources of financing. Prudence and responsibility in the setting of the main drivers of automatic spending such as the level of the minimum wage and the real increase in social security benefits[13] and public sector wages are in this regard critical since they have a permanent nature and can potentially crowd out other meritorious and needed social spending items.

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[13] INSS benefit payments are currently the single biggest nonfinancial expenditure item in the federal budget with the bulk of payments heavily biased towards the most expensive length-of-service pensions.

Reduction of the earmarking of federal revenues would also aide in the management of fiscal policy.

34. *The high sensitivity of the debt path to GDP growth also points the importance of pushing forward with structural macroeconomic and microeconomic reforms that can improve the noninflationary growth potential of the economy in the long run and raise the national savings rate.* In that regard, a comprehensive tax reform designed to stabilize the tax burden, while reducing microeconomic distortions and spreading the tax burden in an equitable way among different economic agents/sectors, would not only improve the competitiveness of the domestic production but also have a potential indirect positive fiscal impact by enlarging the taxable base.

35. With regard to the intertemporal tradeoffs, the stronger the fiscal effort earlier in the decade, the greater the present discounted value of the dividends to be extracted from fiscal adjustment in terms of further room to increase social spending in the future and the concomitant improvement in social indicators, since savings (interest bill) will be higher earlier in the decade when real interest rates exceed the steady-state neutral level but also because promises of fiscal adjustment in the future are discounted by markets leading to higher contemporaneous interest rate risk premiums than otherwise.

36. To preserve and institutionalize the needed strong fiscal stance after 2003, and to assist in the formation of market expectations with regard to the path of fiscal policy, it would be desirable that, at least the central government announces primary fiscal and debt targets for the subsequent three years, mirroring the current practice with regard to the inflation targets. Currently, the Budget Guidelines Law sets the target for the primary surplus for the following year and indicative targets for the subsequent two, while the Fiscal Responsibility Law requests that the President should propose to the senate the indebtedness ceilings for all levels of government. However, it would be desirable to go beyond these requisites and set in the law the requirement for a floor on the primary surplus and a specific provision envisaging a decline of net public debt, on average, for the next three years.

37. *It is also critical that, at the subnational level the fiscal adjustment effort undertaken in recent years is not brought to a halt. Further fiscal consolidation will not only release additional resources for needed investment and social expenditure by these government levels but will also help reduce the current federal government debt default-risk exposure to other levels of government.* Therefore, in the spirit of the recently approved Fiscal Responsibility Law, the central government should strive to enforce the debt restructuring agreements signed with state and local governments, as done in the past, and encourage subnational governments to continue down the road of fiscal responsibility. *Concurrently, the federal government should vigorously pursue the remaining structural fiscal reform agenda, continuously assess the debt-stock impact of the incorporation of contingencies (explicit and implicit contingent liabilities), and be ready to proactively respond, with fiscal instruments, to any surprises that might deteriorate the government's creditworthiness.*

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III. Social Spending in Brazil: Recent Trends in Social Assistance and Insurance[1]

A. Introduction

1. Brazil has a broad array of social insurance and assistance programs. As discussed in Section IV, social security benefits are Brazil's main social safety nets and account for nearly half of total public social spending, or approximately 10 percent of GDP. Excluding pensions and other social security benefits, unemployment insurance is the main social insurance program in Brazil. Only a small share of public outlays on social programs (approximately 1 percent of GDP) is devoted to social assistance. Most of these programs (for instance, old-age and disability benefits) are targeted and in general pro-poor.

2. In recent years, progress in strengthening Brazil's social insurance and assistance programs has been twofold. First, efforts have been focused on improving program design and service delivery; and on distinguishing clearly social assistance and social insurance programs, as well as their sources of finance, while at the same time preventing shortfalls in finance for other untargeted social programs, such as education and health care. Second, social assistance policies are being integrated into broader human development initiatives. A case in point is the recently-launched *Alvorada* Program.

3. This section is structured as follows. Subsection A provides an overview of the existing social assistance programs. Subsection B focuses on the effectiveness of social assistance programs. Subsection C discusses the regional dimension of human development and the recently-launched *Alvorada* program. Subsection D concludes.

B. Social Assistance Programs: An Overview

4. **Most social assistance and insurance programs in Brazil are provided according to the Social Assistance Law (LOAS).** These programs comprise rural pensions,[2] pensions to elderly and disabled persons,[3] and income support programs.[4] Some subnational

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[1] Prepared by Luiz de Mello.

[2] Rural pensions are treated as a social insurance program by the Ministry of Social Security and Assistance. However, these benefits have a social assistance nature, given the weak link between contributions and benefits. There were over 6 million recipients of rural pensions, at a total cost to the budget of approximately R$10 billion in 1999.

[3] The main such program is BPC (*Benefício de Prestação Continuada*), which replaced RMV (*Renda Mensal Vitalícia*).

[4] A national income support program—in effect since 1997—benefits low-income municipalities, defined as those with revenues and per capita income lower than the state average. For a list of all municipalities in the program, see www.mec.gov.br/Rendamin/partic.htm.

governments also have their own income support programs.[5] These programs are in general well targeted.

5. **Excluding social security benefits, the main social safety nets in Brazil are labor protection programs**, some of which are financed by the private sector. In particular:

- There are two **unemployment insurance** programs in Brazil paid through FAT and FGTS.[6] FAT is an unemployment fund financed by taxes on enterprises' payroll and gross earnings, whereas FGTS is a government-run fund of individual accounts for formal sector workers. Access to the FAT unemployment insurance is universal among formal sector workers, but FGTS benefits are restricted to those formal sector workers with individual accounts.

- The **salary bonus** consists of a monthly salary paid on an annual basis to formal sector workers earning up to two minimum wages.[7] Other labor programs include **job creation, retraining**, and **on-the-job training**, as well as nutrition benefits provided to low-income workers.[8]

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[5] A subnational income support program that has obtained widespread public support is *Bolsa Escola*, consisting of targeted cash transfers to low-income families on the condition of school attendance of all children in the household. The program was implemented in 1995 in the Federal District and in the city of Campinas, and subsequently in a few states and about 60 municipalities. For more information, see World Bank (2000a). Child labor eradication (PETI), a federal government-funded program, consists of a cash transfers to low-income households to keep children in school who would otherwise need to work.

[6] Forty percent of FAT (*Fundo de Amparo ao Trabalhador*) resources are passed on to the National Development Bank (BNDES) to fund its development loan portfolio. The remaining funds are used to finance unemployment insurance and the salary bonus, as well as labor training and job creation programs, to be discussed below. FGTS (*Fundo de Garantia por Tempo de Serviço*) was created in 1966 as an unemployment insurance fund financed through employers' contributions (8 percent of employees monthly earnings). The individual accounts are managed by CEF (*Caixa Econômica Federal*). See Paes e Barros, Corseuil, and Bahia (1999); and Oliveira and others (1999), for more information.

[7] The salary bonus—in effect since the promulgation of the 1988 Constitution—is paid to private- and public-sector workers. The benefit amounts to a fourteenth salary per year, in addition to the thirteenth salary all workers in the formal sector receive at the end of the year. For more information, see www.mtb.gov.br/spes/abono/esta/estas.htm.

[8] The worker's nutrition program (PAT)—in effect since 1976—consists of income tax deductibility for enterprises providing meals to their employees earning up to 5 minimum wages. Benefits can be paid through vouchers to be redeemed in restaurants and supermarkets, or as meals provided in the workplace. At the employer's discretion, the benefit can be extended to workers earning more than 5 minimum wages.

6. **FGTS unemployment insurance resources are also used to finance infrastructure development programs**, particularly housing, urbanization and sanitation, given Brazil's low private savings rates and limited sources of long-term financing for infrastructure projects in the private sector. These programs benefit the poor by providing housing for low-income households. Because they are labor-intensive, spending under these programs also generates earnings opportunities for the working poor.

7. **FGTS has suffered from financial imbalances.** Net inflows to FGTS are falling with rising informality in the labor market and withdrawals due to the increase in registered unemployment in recent years (Table 3.1).[9] Moreover, there is a mismatch in the maturity composition of FGTS assets and liabilities: whereas FGTS's assets have long-term maturities, most of its liabilities are short term.[10] Furthermore, despite the statutory minimum remuneration, in the period of chronic inflation, the rate of return on individual accounts was lower than that of other financial assets, including savings accounts (Oliveira and others, 1999).[11]

8. **Core social assistance programs have been protected from fiscal adjustment in 1999 and 2000.** In November 1998, 22 core social programs were identified in coordination with the IDB and the World Bank to be preserved from cuts in the ensuing period of fiscal adjustment (Table 3.2). The share of GDP devoted to these programs varied between 1.2–1.3 percent in 1998–00, at the same time that spending on other programs was substantially cut. The main protected programs are the unemployment insurance, the social assistance benefits provided through LOAS, and the equalization components in the publicly-provided education and health care systems, discussed in Section 4. Allocations for 2001 have increased to 1.3 percent of GDP. This is a positive development that reflects the government's current efforts to strengthen the better targeted social assistance programs.

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[9] The share of the labor force engaged in informal activities reached 54 percent in 1998, against 43 percent in 1990. Withdrawals are allowed in the case of unfair dismissal, illness, retirement, death, and/or to purchase a house or finance housing repairs and upgrading. Based on PNAD-96 data, only 12 percent of the poor are employed in the formal sector, against over 33 percent for the nonpoor. According to PPV-96 data, over 80 percent of the household in the lowest income quintile are headed by informal sector workers.

[10] In the past, financial imbalances were also due to the indexation of loan repayments to salary increases. In the period of high inflation, the mismatch in nominal increases in wages and salaries and consumer price inflation reduced loan recovery in the housing projects financed through FGTS.

[11] The system guarantees a minimum real rate of return on individual accounts of 3 percent per annum. Higher statutory rates of return are guaranteed based on the length of employment and contribution level. In 1998, withdrawals amounted to 98 percent of deposits, against 80 percent in 1994 and 85 percent in 1995 (Carvalho and Pinheiro, 1999). In this respect, the Supreme Court has recently ruled in favor of monetary correction of the FGTS account balances in the period of the Collor I and *Verão* stabilization programs.

Table 3.1. FGTS Outturn
(In billions of reais)

	1995	1996	1997	1998	1999	2000 1/
Gross revenues	9.8	11.7	12.9	16.8	17.4	4.5
Withdrawals	9.0	11.2	13.6	17.3	17.6	3.5
Unfair dismissal	5.5	6.5	7.1	10.8	11.9	...
Retirement	1.9	2.4	2.9	2.5	1.6	...
Housing	1.0	1.4	2.4	2.4	2.6	...
Other	0.7	0.9	1.3	1.5	1.6	...
Net revenues	0.8	0.5	-0.7	-0.5	-0.2	1.0
Memorandum items:						
Number of withdrawlas for unfair dismissal (in millions)	8.8	8.2	8.1	9.2	11.1	...
Number of withdrawals for retirement (in millions)	0.5	0.5	0.6	0.6	0.5	...

Sources: Caixa Economica Federal; and IMF staff calculations.

1/ Until March 2000.

C. The Effectiveness of Social Assistance and Insurance Programs

9. **Social security benefits are the most important social safety nets in Brazil.** However, these programs suffer from three main shortcomings:

- **There are significant differentials between private and public sector pensions and within these social security regimes.** Whereas private sector pensions averaged less than two minimum wages in the second half of the 1990s, public sector pensions in the executive branch of the federal government were, on average, seven times higher. Within the social security regime for private-sector workers (RGPS), nearly 80 percent of pensions are below 1.5 minimum wage. In addition, there are significant differentials within the social security regime for public-sector workers (RJU), where average pensions vary from 15 minimum wages in the executive branch of the federal government to over 54 minimum wages in the federal legislature. These differentials have been reduced over time, but remain sizable.

- **Social security coverage is limited.** While all civil servants are covered and benefit from higher pensions, only approximately 58 percent of the working age population in the private sector is covered by social security (Ministry of Social Security and Assistance, 2000). Coverage is lower among informal sector workers and the self-employed. Coverage rates also vary according to occupation and among the states.

Table 3.2. Federal Spending on 22 Core Programs, 1995-01
(In millions of *reais*)

Program	1995	1996	1997	1998	1999 (prelim.)	2000 (proj.)	2001 (budget)	Targets (1999)	Eligibility
Education	1,072	1,040	1,449	1,950	2,285	2,219	2,595		
Provision of textbooks	198	204	289	370	298	310	536	60 million textbooks	School-based
School health	11	17	15	24	16	16	16	1.8 million students	School-based, municipal income
School lunch	655	454	673	786	903	920	920	35.4 milion students	School-based, municipal income
Gestao Eficiente Program 2/	0	198	229	252	124	84	123	51,000 schools	School-based
FUNDEF Complement	0	0	100	425	685	672	675	(n/a)	School-based, municipal income
School Development Fund	208	167	144	94	257	216	324	82,000 schools	School-based, municipal income
Health	714	1,737	2,447	2,570	2,735	3,125	3,415		
Child Nutrition Program	129	32	102	59	153	174	174	830,000 beneficiaries	School-based, municipal income
Pharmaceutical assistance (SUS) 3/	423	217	420	351	160	164	168	4,000 municipalities	Municipal income
National Immunization Program	83	119	163	173	268	278	264	15 million vaccinations	All municipalities
Floor assistance (PAB)	0	1,258	1,572	1,722	1,780	1,780	1,790	5,500 clinics	Municipal income
Family health program (PACS/PSF)	79	111	162	226	324	682	973	100,000 providers (w/ equipment)	Municipal income
Women's health program 3/	0	0	29	39	51	46	46	8 million women	Municipal income
Labor	3,413	4,201	4,436	5,159	5,556	5,507	5,865		
Unemployment Insurance	2,928	3,401	3,549	4,182	4,525	4,323	4,589	(n/a)	Enterprise-based
Salary Bonus	468	543	532	579	640	686	781	4.3 million formal-sector workers	Formal-sector wage less than 2 MWs.
Labor Training (PLANFLOR)	17	257	355	398	390	497	495	1.7 million formal-sector workers	Enterprise-based
Social Assistance	278	491	1,195	1,571	2,055	2,311	4,324		
Support for Children	199	191	219	218	223	248	261	1 million children	Household p/c income less than 0.5 MWs.
Support for the Disabled	56	55	59	61	67	66	69	88,000 beneficiaries	Household p/c income less than 0.5 MWs.
Support for the Elderly	24	23	26	26	29	31	32	189,000 beneficiaries	Household p/c income less than 0.5 MWs.
LOAS (BPC, support for the elderly and disabled)	0	130	793	1,140	1,549	1,735	2,441	711,500 beneficiaries	Household p/c income less than 0.25 MWs.
Child Labor Eradication Program (PETI)	0	0	15	40	83	113	273	39,000 beneficiaries	Household income
Support for Adolescents	0	92	83	86	51	18	19	84,000 beneficiaries	Household income
Income Support (Renda Minima)	0	0	0	0	54	100	1,229	(to be defined)	Household income
Total	5,477	7,470	9,528	11,249	12,631	13,162	16,200		
Memorandum item:									
Total as a share of GDP	0.85	0.96	1.08	1.23	1.31	1.22	1.31		

Sources: Brazilian authorities; and IMF staff estimations.

1/ As of July 5, 2000.
2/ In 1997, includes R$100 million relative to FUNDEF outlays.
3/ As reported by the Ministry of Health.

- **Household survey data provide mixed results on the incidence of public spending on social security benefits**. Most pension recipients are concentrated in the lowest and highest income quintiles.[12] There is evidence that these benefits have alleviated poverty among the elderly, as expected.[13] It has been argued that rural pensions are probably the best targeted social insurance program in Brazil (World Bank, 2000b).

10. **Publicly-funded labor programs are less efficient social protection instruments**. This is because:

- There is some evidence of **poor targeting** in the case of the unemployment benefit, and the salary bonus (Table 3.3).[14] [15] The share of these benefits in household income

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[12] Based on data for the metropolitan region of São Paulo, Soares (1999) shows that nearly 33 percent of public pensions accrue to those recipients in the lowest income quintile, against nearly 21 percent in the highest quintile. According to PNAD data for the whole country, the share of public pensions accruing to the lowest quintile falls to nearly 27 percent and that accruing to the highest quintile increases to nearly 30 percent.

[13] According to Paes de Barros, Mendonça, and Santos (1999), pensions and social security benefits account for almost 60 percent of per capita household income of the poor in the over-60 age group, against nearly 47 percent for the nonpoor in the same age group. Poverty incidence and income gaps are also lower among the over-60s than in the population as a whole. Moreover, the incidence of poverty is lower among households with an elderly member, given the impact of old-age pensions on the intra-household distribution of income.

[14] Using POF-96 data, Ramos (1999) shows that 43 percent of unemployment benefit payments accrue to households with income between 20 and 30 minimum wages, against 5.5 percent in the case of households with income between 3 and 5 minimum wages. In the case of former PIS/PASEP and FGTS accounts, 47 percent of withdrawals are made by households with income over 30 minimum wages, against 2.3 percent in the case of households with income between 2 and 5 minimum wages. Using PPV data, Barros, Corseuil, and Foguel (2000) show that only 32 percent of unemployment benefit recipients are poor. The World Bank (2000a) also provides evidence that the unemployment benefit is not pro-poor, with the exception of the Northeast, where its impact is primarily on urban workers in the second consumption quintile.

[15] In the case of the salary bonus, households earning up to 2 minimum wages receive 21 percent of outlays, against 27 percent for those earning more that 30 minimum wages. The high concentration of recipients among high-income households can be attributed to the fact that POF data do not allow for distinguishing current salary bonus receipts from remuneration on former PIS/PASEP account balances. Using PPV data, Paes de Barros,

(continued...)

Table 3.3. The Incidence of Social Assistance and Insurance Programs: A Summary of Recent Empirical Findings

	Impact on the Poor	Data Coverage and Source	Reference
Public pensions	The share accruing to the lowest income quintile is 27 percent, against nearly 30 percent in the highest income quintile.	Whole country (PNAD-1995)	Soares (1999)
	Pensions account for almost 60 percent of per capita household income of the poor in the over-60 age group, against nearly 47 percent for the nonpoor in the same age group. The over-60s account for 10 percent of households in the highest income quintile and below 4 percent in the lowest quintile.	Whole country (PNAD-1997)	Paes de Barros, Mendonça, and Santos (1999)
Social security transfers 1/	These benefits increase the income share of the lowest income quintile from 2.4 percent to 3.3 percent of national income.	São Paulo (PCV-1994)	Soares (1999)
Labor programs	Unemployment benefit: nearly 43 percent of unemployment benefit payments accrue to households with income between 20 and 30 minimum wages, against 5.5 percent in the case of households with income between 3 and 5 minimum wages. Only 32 percent of unemployment benefit recipients are poor.	Whole country (POF-96)	Ramos (1999)
		Northeast and Southeast (PPV-96–97)	Paes de Barros, Corseuil, and Foguel (2000)
	Salary bonus: households earning up to 2 minimum wages receive 21 percent of outlays, against 27 percent for those earning more that 30 minimum wages.	Whole country (POF-96)	Ramos (1999)
	Only 36 percent of salary bonus recipients are among the poor.	Northeast and Southeast (PPV-96–97)	Paes de Barros, Corseuil, and Foguel (2000)
Water and sanitation	Water: only 12 percent of public spending accrues to the lowest quintile, against 26 percent for the highest quintile.	Northeast and Southeast (PPV-96–97)	Von Amsberg (2000)
	Sanitation: only 4 percent of public spending reaches the lowest quintile (relative to 32 percent for the highest quintile).		

1/ Maternity and disability benefits, unemployment insurance, and education grants.

has been shown to be higher in high income households. Information on the recipients of special labor programs, such as the workers' nutrition program, as well as job creation and training programs, is not readily available. This would allow for a better assessment of the

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Corseuil, and Foguel (2000) also show that the salary bonus is poorly targeted, with only 36 percent of recipients among the poor.

incidence of these outlays (Table 3.4). These special programs are better targeted to low-income workers and therefore their incidence rates are likely to be higher than that of the unemployment insurance paid through FAT and FGTS. It has been argued that the incidence of the workers' nutrition program has improved by extending the program to smaller enterprises, where labor compensation is typically lower.[16]

- The truly needy often do not have **access** to the unemployment benefits paid through FAT and FGTS because eligibility is based on formal employment and a sizable share of the working poor are engaged in informal activities.[17] Also, FGTS account balances are typically low for low-income workers, due to short job tenure in the formal sector and high job turnover. Among the working poor, the value of the unemployment benefit paid through FAT often exceeds their FGTS balances.

- The government's ability to engage in counter-cyclical **job creation** is limited. This would provide additional social protection in periods of economic downturn, when job losses are likely. However, the labor-intensive investment programs financed through FGTS are procyclical because FGTS inflows rise with formal employment and pay.[18] Also, Brazil has limited experience with **public works programs**, despite the effectiveness of the Northeast drought program implemented in 1998.

- **Training and retraining programs** need to be more attuned to market needs. Given the disparities in skills among labor market participants and the regional differences in the demand for training, efforts have been made to provide these programs in conjunction with state and municipal job creation agencies. Labor training programs have also been provided by BNDES using FAT resources.

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[16] In recent years, the number of smaller enterprises participating in the program has increased. In 1995, 37 percent of the workers in the formal sector benefited from the program. Most beneficiaries (nearly 5.5 million in 1996) are in the Southeast. However, the average number of beneficiaries per firm fell from nearly 200 in 1990 to less than 130 in 1996, reflecting the rise in the number of smaller enterprises in the program and the increase in informality in the labor market. Also see Lobato, Aquino, and Ribeiro (1999).

[17] A recent survey of low-income communities in the municipality of Rio de Janeiro shows that unemployment in these communities is over three times higher than the average for the entire metropolitan region of Rio de Janeiro (18.5 percent, against 5.4 percent for the metropolitan region in 1998). Youth unemployment has also been shown to be higher in these communities, and employment is concentrated in the informal sector.

[18] In 1997, investment financed by FGTS totaled approximately R$2 billion and created 126 thousand jobs. Annual investments through FGTS averaged 0.65 percent of GDP in the period 1990–98 (Carvalho and Pinheiro, 1999).

Table 3.4. FAT Outturn, 1999-00
(In billions of *reais*)

	1999	2000 (proj.)
Revenues	8.2	8.7
Of which:		
Contributions (PIS/PASEP)	6.1	7.1
Expenditures	8.2	8.7
Unemployment insurance	4.5	4.2
Salary bonus	0.6	0.7
Training programs (PLANFOR)	0.4	0.5
BNDES transfers	2.4	2.8
Other	0.3	0.5
Memorandum items:		
Number of unemployment benefit recipients (in millions)	4.3	...
Average unempployment benefit value (in minimum wages)	1.6	...
Number of salary bonus recipients (in millions)	4.5	...

Sources: Ministry of Labor and Employment; and IMF staff calculations.

11. **Labor legislation offers limited social protection**. Given the cost of formal employment and high mobility into the informal sector, severance pay legislation creates an incentive for employers and employees to terminate labor contracts and claim unfair dismissal. In this case, employers are required to pay 40 percent of the workers FGTS balance as compensation and workers can draw their FGTS balances and remain working informally.[19] However, minimum wage legislation is a good social protection instrument because of the higher concentration of minimum wage earners among the working poor and because the minimum wage has been shown to be a powerful determinant of pay in the informal sector.[20] Recent studies have shown that increases in the minimum wage have had a stronger impact on poverty in the post-1994 period, relative to the period of high inflation

[19] Employers are also required to give a month's notice and grant two hours per day in the month prior to dismissal, with no reduction in compensation for the worker to look for another job. See Amadeo and Camargo (1996), and Gonzaga (1998), for more information.

[20] Carneiro (2000) shows that increases in the minimum wage are associated with higher nominal wages in both the formal and the informal sectors. This can be attributed, at least in part, to high mobility in and out of informality. This empirical finding is confirmed by anecdotal evidence of informal indexation of compensation in the informal sector to nominal adjustments in the minimum wage.

(Amadeo and Neri, 1999; World Bank, 2000a). It has been argued that, in the period of high inflation prior to 1994, nominal increases in the minimal wage, although frequent, did not preserve its purchasing power.

12. **The housing/sanitation programs financed through FGTS and FAT are poor poverty-reduction instruments**. The incidence of spending on the housing programs funded by FGTS is low because loans are restricted to applicants with household income between 4 and 12 minimum wages and the housing deficit is concentrated among the poor. Financing options are limited for low-income households, with income up to 3 minimum wages, and emphasis is placed on government provision of housing, upgrading of the existing housing stock in degraded areas, urbanization, and sanitation. Loans to higher income households are also provided by CEF (*Caixa Econômica Federal*) using its own resources.[21] Because of its eligibility conditions, the implicit subsidy in the system is often extended to the middle class.[22] It has been shown that the incidence of publicly-funded sanitation programs is also relatively poor.[23] Low cost recovery in mortgage payments in the case of low-income

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[21] Although FGTS is an important source of finance, most spending on housing is financed outside FGTS. Of the approximately 32 million housing units build in the last 30 years, only 5.6 million units have been financed through FGTS (Gonçalves, 1998). In the absence of a market for long-term housing financing in the private sector, most funding for housing/sanitation projects is provided by public institutions, particularly CEF.

[22] In the absence of benchmarks for the long-term user cost of capital in Brazil, it is difficult to calculate the implicit subsidies in housing loans. Rates are lower on FGTS loans for housing projects for low-income groups (with household income up to 3 minimum wages) than for higher-income households (with income between 4 and 12 minimum wages). CEF loans outside FGTS, typically for households with income above 12 minimum wages, have higher rates but even these tend to be subsidized.

[23] Access to safe water ranges between 36 percent of households in the lowest income decile to 96 percent in the highest decile. In the case of sanitation, access rates vary between 11 percent for households in the lowest income quintile and 84 percent in the highest quintile. The incidence of public spending on these services is poor with 12 percent of water services accruing to the lowest quintile and 26 percent to the highest quintile. Incidence differentials have been shown to be higher for sanitation, where only 4 percent of public spending reaches the lowest quintile relative to 32 percent for the highest quintile. For more information, see von Amsberg (2000). According to PNAD-95, nearly 80 percent of rural households and 27 percent of urban households lack adequate sanitation. See World Bank (2000a), for more information.

households has compromised the financial balance of FGTS without improving the incidence of public spending on housing and urbanization.[24]

13. **Spending on housing, urbanization, and sanitation has been affected adversely by fiscal retrenchment, particularly at the subnational level**. These programs can be financed through FGTS or through the budget, when cost-recovery is unlikely and the program has a clear social assistance function, as discussed above.[25] The impact of fiscal adjustment on these programs has been twofold. First, stricter restrictions on subnational borrowing and indebtedness have limited the ability of states and municipalities to borrow from FGTS. Prudential regulation on financial institutions' exposure to subnational government debt has also reduced the ability of public banks to lend to subnational governments. Private banks that are not constrained by these regulations are in general not willing to finance long-term infrastructure development projects. Second, fiscal adjustment at the federal level has limited further the availability of finance for housing/sanitation projects outside FGTS.

14. **Public spending on housing has benefited from improved governance in recent years**. This has been achieved through increased community participation in housing programs for low-income households. It has been argued that better oversight for the use of the resources transferred to subnational governments, particularly municipalities, has reduced misallocation of funds. Direct lending to higher income borrowers has also reduced transactions costs.[26] As in the case of other federal financial institutions, CEF operations have been object of stricter central bank oversight and regulation.

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[24] The housing deficit, measured as the share of inadequate and informal housing units and/or household co-habitation in the total housing stock, is concentrated among the poor: nearly 87 percent of the housing deficit is concentrated among households earning up to 3 minimum wages. It is estimated that the housing deficit in Brazil is approximately 14 percent of the housing stock, or approximately 5.4 million units in 1996. This share has fallen since 1981, when the deficit was estimated at 17 percent. See Gonçalves (1998), Santos (1999), SEPURB (1996, 1998), and World Bank (2000b) for more information.

[25] Housing programs for low-income households include *Habitar-Brasil*, funded by the federal budget, and *Pro-Moradia*, funded by FGTS. According to SEPURB (1998), public outlays on these two programs totaled R$2 billion between 1995 and 1998. The programs benefited 723,000 households, and created 205,000 jobs in 3,176 municipalities.

[26] Through housing credits, applicants borrow directly from CEF to purchase/build new housing, as long as they are not home owners, and that monthly loan repayment does not exceed 30 percent of household income.

D. Social Policies and Human Development: The *Alvorada* Program

Background

15. With a score of 0.74 in the UNDP's human development index (HDI) in 1999, Brazil ranks among the countries with medium human development.[27] However, the national average hides sizable differentials in human development indicators across regions (Figure 3.1). Although all regions have had a upward trend in their HDI scores since 1980, those with low human development indicators do not seem to be catching up fast enough with their more developed counterparts. Inequality in human development also exists within the states and certain poorer municipalities have lagged behind the regions with higher HDI scores in the states where they are located.

The *Alvorada* Program

16. **There has been growing recognition that the recent positive trends in human development, as well as a faster catch-up for the least developed states and municipalities, can only be sustained through a concerted policy effort**. With the exception of cash transfers such as social security benefits and unemployment insurance, for instance, most existing social programs in Brazil are not designed to address these regional inequalities in human development. Regional development programs often benefit regions that are considered poor within the state where they are located, rather than relative to a national poverty benchmark. As a result, poorer regions in richer states often benefit from these programs although they may be more prosperous than richer regions in poorer states. Initiatives in the past—the creation of regional development agencies and banks, for instance—have been unsuccessful in dealing with regional inequalities in human and economic development.

17. **The *Alvorada* Program consists of focusing social policies and outlays on existing social programs in the states and municipalities with human development indices below**

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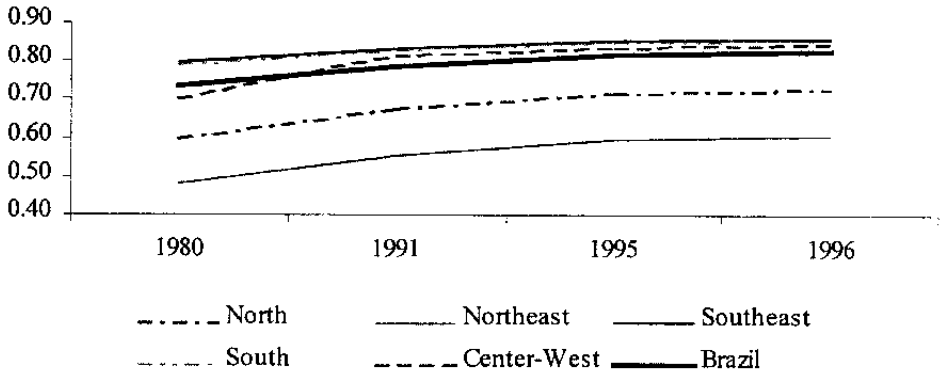
[27] Among Latin American countries, Brazil's score is comparable to that of Peru (0.74) but is lower than those of Chile (0.84), Argentina (0.83), and Uruguay (0.83), for instance. See the UNDP's 1999 World Development Report, for more information. The 1999 scores are not comparable over time because of a methodological change in 1997. According to the old methodology, Brazil scored 0.83 in 1996, against 0.73 in 1980. In 1996, the scores of more developed states such as Rio Grande do Sul and São Paulo (0.87 each) are comparable with the industrial country average (0.91). Less developed states such as Maranhão (0.55) and Piauí (0.53) fare poorly with HDI scores below the developing country average (0.58).

Figure 3.1. Human Development Indices (HDI), 1980-96
(by Region)



Sources: Data provided by the authorities; and IMF staff calculations.

the national median. The *Alvorada* Program was originally named IDH-14 Program, given its focus on the 14 states with HDI scores below the national median.[28] The program was subsequently enlarged to benefit poorer regions within richer states that would not be eligible for assistance under the IDH-14 program.[29] The priority programs are in the areas of health care, education, and income support (Table 3.5). A large share of spending on priority programs will be devoted to infrastructure development, including sanitation. Funding for these programs has been scarce in light of the ongoing consolidation of fiscal adjustment since late-1998, as discussed above.

18. **Most financing needs will be met by the federal budget.** The federal government will finance R$7.4 billion out of the total estimated budget of R$ 3.3 billion between 2000-02. A large share of total financing (R$5.0 billion) is already programmed in the multiyear budget framework (PPA). Additional funding will come from Poverty Fund

[28] These states are: Acre, Alagoas, Bahia, Ceará, Maranhão, Pará, Paraíba, Pernambuco, Piauí, Rio Grande do Norte, Rondônia, Roraima, Sergipe, Tocantins. Approximately 31 million people, living in 186 micro regions and 1,797 municipalities, will benefit from the program in these states.

[29] The additional states are Amazonas, Amapá, Espírito Santo, Goiás, Minas Gerais, Mato Grosso, Paraná, Rio Grande do Sul and São Paulo. These states have HDI scores above the national median but, nevertheless, contain 81 micro regions and 389 municipalities with HDI scores below the national median. Extension of the IDH-14 program to these micro regions will benefit an additional 5 million people.

Table 3.5. The *Alvorada* Program Budget, 2000-02
(In billions of *reais*)

	Original IDH-14 Program			Program Extension			Total
	2000	2001	2002	2000	2001	2002	
Total financing	1.1	5.0	5.4	0.3	0.7	0.8	13.3
Domestic	1.1	2.4	2.7	0.3	0.4	0.4	7.4
Multi-year budget	0.8	1.6	1.7	0.3	0.3	0.3	5.0
Additional federal resources	0.4	0.9	1.0	0.0	0.1	0.1	2.4
Foreign	0.0	0.5	0.5	0.0	0.0	0.0	1.1
Foreign lending to states	0.0	0.4	0.4	0.0	0.0	0.0	0.8
State counterparts	0.0	0.1	0.1	0.0	0.0	0.0	0.2
Poverty Fund	0.0	2.1	2.1	0.0	0.3	0.4	4.9

Sources: Data provided by the authorities; and IMF staff calculations.

resources in 2001-02. Subnational governments will also contribute, particularly in counterpart funds for foreign-financed projects.[30] Extension of the original IDH-14 programs will cost the federal government R$0.2 billion between 2000-02, in addition to the R$0.9 billion already programmed in the multiyear budget.

19. **To facilitate monitoring and evaluation, targets have been set for each program,** in terms of output indicators such as coverage of the sanitation and water network, school enrollment rates, and number of beneficiaries of income support programs. The impact of these programs on the relevant social and human development indicators is to be more closely monitored than in the past, and the authorities have approached the World Bank and the IDB for assistance in this respect.

E. Conclusions

20. Brazil devotes nearly half of public outlays on social programs to social insurance and assistance. Programs of a clear social assistance nature account for a small share of these outlays, or nearly 1 percent of GDP. These expenditures are not only low relative to total public spending on social programs but, more importantly, most social assistance programs

[30] The subnational share in financing may be underestimated in the case of health care because of the recent institutional changes requiring the states and municipalities to earmark12 percent and 15 percent, respectively, of their revenues (net of intergovernmental transfers) to finance outlays on health care.

in Brazil do not provide adequate social protection. Almost one-half of spending on these programs is allocated to unemployment insurance, which benefits higher income workers in the formal sector. Other programs are reasonably well targeted and cost-effective,particularly the rural pensions. Leakages may nevertheless occur due to difficulties in income certification and self-targeting in the case of rural pensions and income support. Spending on infrastructure development, including housing and sanitation, has been affected adversely by fiscal consolidation.

21. Against this background, it has often been argued that a gradual expansion of Brazil's safety nets can be achieved primarily through better targeting, rather than increased spending. The most important gap in social assistance in Brazil is the absence of a program targeted to informal sector workers. In this respect, labor market participation indicators could be used for the purpose of categorical targeting of social assistance program, given the difficulty to reach the poor in the informal sector.[31] Much remains to be done if social assistance is to be a powerful social safety net and poverty alleviation instrument in Brazil. Protection of a number of core social assistance programs from cuts in periods of fiscal adjustment does not ensure adequate social protection if the programs in question offer limited assistance to the truly needy.

[31] Because income certification is often difficult, particularly for the poor in the informal sector, categorical targeting, or proxy targeting, involves the use personal and/or household characteristics that are associated with poverty. In recent years, social assistance programs in Latin America have focused on household characteristics for the purpose of categorical targeting when accurate income-testing is difficult or costly. See Souza (2000), for more information.

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IV. Social Spending in Brazil: Education and Health Care[1]

A. Introduction

1. Brazil spends approximately 20 percent of GDP on social programs. Nevertheless, increases in social spending over time have not led to commensurate improvements in social indicators, particularly in the areas of education and health care. This can be attributed, at least in part, to imbalances in the composition of public social spending, deficiencies in service delivery, and poor targeting. Although many programs are well-targeted and reach the poor, others have a relatively regressive impact on income distribution.

2. Social spending in Brazil has to be assessed in the context of the country's highly skewed income distribution. The 10 percent richest households own nearly half of national income, while the 50 percent poorest own just above 10 percent of the nation's income. Based on 1996 data, nearly 23 percent of the population (approximately 35 million people) live below the poverty line and own less than 3 percent of national income. Nevertheless, the income gap—the income shortfall below the poverty line—is only 1.6 percent of GDP.[2] Consequently, well-targeted publicly-funded social programs could in principle be used to reduce the incidence and depth of poverty at a relatively low cost to the budget.

3. Against the background of a stringent fiscal adjustment since late-1998, recent pressures have emerged to relax the government's stance on social spending while, at the same time, improving the quality of publicly-funded social programs. These pressures have highlighted the need for a more indepth analysis of public spending on social programs and performance indicators in the formulation of policy objectives in the social area. This chapter sheds some light on the possible directions for reform over the medium term in order to improve the efficiency and effectiveness of public spending on social programs.

4. This section is organized as follows. Subection B presents the main trends in social spending in the period 1995–99. Subsections C and D deal with, respectively, education and health care. Conclusions are presented in Subsection E.

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[1] Prepared by Luiz de Mello.

[2] Calculation of poverty incidence and the income gap is based on the 1996 household expenditure survey (PNAD) and the widely-used poverty line of R$ 65.00 per capita per month, or approximately half a monthly minimum wage per capita, in 1996. Data from the latest household expenditure survey (PNAD-99), released in June 2000, show a slight increase in poverty incidence.

B. Public Social Spending: An Overview

Background

5. **Brazil spends a large share of GDP on publicly-funded social programs.** Total social spending of the consolidated general government amounts to approximately 20 percent of GDP (Table 4.1).[3] Most social spending is financed by the federal government (nearly 60 percent of the total in 1996). Most subnational spending is on education and health care (approximately 5 percent of GDP in 1996). Federal social spending is skewed towards transfer payments, particularly pensions and other social security benefits (Table 4.2). This share has risen in recent years, thereby putting pressure on other social programs. States and municipalities already spend more on social security than on health care, or housing, urbanization, and sanitation.

Social spending and performance indicators

6. **Efficiency in the provision of social services can be assessed for a country's social indicators and level of public spending on social programs.**[4] This is confirmed by the results of the more formal efficiency analysis presented in Appendix I. Brazil fares poorly compared with other Latin American countries in key social indicators, including health care and particularly education (Table 4.3), despite the country's relatively high ratio of total social spending to GDP.[5]

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[3] There is no consensus over the definition of social spending in Brazil. IPEA (*Instituto de Pesquisa Econômica Aplicada*, Ministry of Planning and Budget) also treats outlays on public transportation, land reform, and environment protection as social spending. These outlays amount to less than 1 percent of GDP. For the purpose of this paper, social spending includes education and culture; health care and nutrition; housing, urbanization, and sanitation; social security and assistance; and unemployment insurance and labor. More recent data on social spending for the consolidated general government are not available. See Fernandes and others (1998), for more information on federal government social outlays.

[4] In principle, governments that achieve better social indicators while spending less public resources on social programs can be considered as more efficient than those that achieve comparable social indicators using more public resources or, alternatively, exhibit worse social indicators for the same level of public spending. See Appendix I for more information.

[5] Information on social spending in Latin America and the Caribbean is not readily available for the consolidated public sector. This underestimates total spending in countries, such as Brazil, where subnational jurisdictions are important providers of social services, particularly education and health care, as discussed above. The choice of indicators used to measure the efficiency of public spending on health care and education was guided by their appropriateness as proxies for the education and health status of the population, and the availability of internationally comparable data for a wide range of countries. See Gupta and

(continued...)

7. **Government spending may be weakly correlated with performance indicators due to poor incidence of social programs and limited access of the poor to social services.**[6] In Brazil, empirical analysis of the incidence of social spending is in its infancy because of, at least in part, data deficiencies (Box 4.1). Most social spending is untargeted, particularly health care and education. In the case of targeted programs, means-testing is often difficult because the poor typically work in the informal sector, where income certification is inadequate. Subnational governments are important providers of social services, but have few targeted social programs. Some programs are relatively well-targeted (for instance, maternity and disability benefits, daycare, kindergarten, and primary education, among others). Recent studies have suggested that, surprisingly, some untargeted social spending has a stronger positive redistributive impact on household income than some targeted social assistance programs.[7] Better incidence of social spending is crucial for poverty reduction because output growth alone has a relatively low impact on poverty in Brazil.[8]

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others (2000), for more information on international social development goals and performance indicators. See World Bank (2000a), for more information.

[6] See World Bank (1995) and Clements (1997), for more information. Using 1997 data, the World Bank (2000b) estimates that only 18 percent of total federal social spending (excluding social security) reaches the poorest 20 percent of the population. A lower incidence rate (7.4 percent) is reported for federal social security spending.

[7] Using household survey data for the metropolitan region of São Paulo, Soares (1999) shows that the income share of the lowest quintile increases from 2.4 percent to 3.7 percent when social spending (comprising education, school lunch, and health care) is imputed in total household income. The redistributive impact of social spending is stronger than that of some targeted cash transfers (comprising maternity and disability benefits, unemployment insurance, and education grants). If these transfers are included in total household income, the income share of the lowest quintile increases from 2.4 percent to 3.3 percent, against 3.7 percent in the case of untargeted social spending.

[8] The elasticity of poverty incidence with respect to income is relatively low in Brazil. PNAD-96 data have national coverage and suggest that a one-percent increase in mean consumption reduces the poverty headcount by approximately 1.0 percent. PME data, on the other hand, have narrower coverage (6 metropolitan regions) and suggest a lower elasticity, in the neighborhood of 0.6 (Neri, 1999), against approximately 1.5–2.0 percent on average for developing countries.

Table 4.1. Consolidated Social Spending by Function, 1995-96
(In billions of *reais*)

	1995			1996		
	Federal government	States and municipalities	Total	Federal government	States and municipalities	Total
Social insurance and assistance	56.4	15.0	71.3	68.7	19.2	87.8
Social security 1/	52.4	13.0	65.4	63.5	16.6	80.1
Labor	3.0	0.1	3.1	3.8	0.2	4.0
Social assistance	1.0	1.9	2.9	1.3	2.4	3.7
Education, culture, and science	7.4	21.0	28.4	7.3	24.9	32.2
Health and nutrition	14.5	8.1	22.6	13.8	11.6	25.3
Housing, urbanization, and sanitation	0.6	7.6	8.2	1.7	9.8	11.6
Total	78.9	51.7	130.5	91.5	65.4	156.9
			(In percent of GDP)			
Social insurance and assistance	8.7	2.3	11.0	8.8	2.5	11.3
Social security 1/	8.1	2.0	10.1	8.2	2.1	10.3
Labor	0.5	0.0	0.5	0.5	0.0	0.5
Social assistance	...	...	...	0.2	0.3	0.5
Education, culture, and science	1.1	3.2	4.4	0.9	3.2	4.1
Health and nutrition	2.2	1.3	3.5	1.8	1.5	3.3
Housing, urbanization, and sanitation	0.1	1.2	1.3	0.2	1.3	1.5
Total	12.2	8.0	20.2	11.7	8.4	20.1
			(In percent of total social spending)			
Social insurance and assistance	43.2	11.5	54.7	43.8	12.2	56.0
Social security 1/	40.1	10.0	50.1	40.5	10.5	51.0
Labor	2.3	0.0	2.3	2.4	0.1	2.6
Social assistance	...	...	...	0.8	1.5	2.4
Education, culture, and science	5.7	16.1	21.8	4.7	15.8	20.5
Health and nutrition	11.1	6.2	17.3	8.8	7.4	16.1
Housing, urbanization, and sanitation	0.5	5.8	6.3	1.1	6.3	7.4
Total	60.4	39.6	100.0	58.3	41.7	100.0

Sources: IPEA; and IMF staff calculations.

1/ Includes civil servants' benefits, private sector pensions (*RGPS*), and public sector pensions (*RJU*).

Table 4.2. Federal Social Spending by Function, 1995-00
(In billions of *reais*)

	1995	1996	1997	1998	1999	Budget	
						2000	2001
Federal social spending	79.9	93.5	104.5	118.3	132.2	140.0	161.8
Health	13.7	13.7	15.7	15.4	18.1	17.8	22.1
Education and culture	8.4	8.7	9.7	13.7	15.5	17.1	21
Of which:							
FUNDEF 1/	0.0	0.0	0.1	4.1	5.2	7.9	9.3
Social assistance	0.8	1.2	2.1	3.1	3.8	2.7	3.2
Of which:							
LOAS 2/	0.0	0.1	0.8	1.1	1.5	1.7	2.4
Social insurance	50.2	61.1	67.5	76.2	84.7	88.9	102.1
Private sector pensions (*RGPS*)	32.9	41.7	46.1	52.1	58.2	62.9	73.2
Public sector pensions (*RJU*) 3/	15.4	17.4	19.7	21.9	24.1	23.7	26.1
Other	1.9	2.0	1.7	2.2	2.4	2.3	2.8
Benefits to civil servants	1.3	1.7	2.0	1.9	1.9	1.9	2.1
Housing and urbanization 4/	0.1	0.3	0.4	0.3	0.3	2.2	1.2
Labor	5.4	6.8	7.1	7.7	7.9	9.4	10.1
Of which:							
Unemployment Insurance	3.3	3.8	4.0	4.6	4.5	4.9	5.1
Memorandum items:							
Federal social spending							
In percent of GDP	12.4	12.0	11.9	12.9	13.8	12.9	13.1
In percent of total government spendin	62.2	63.6	62.9	64.6	65.9	63.7	63.7

Sources: Ministry of Planning and Budget; and IMF staff calculations.

1/ Federal government transfers to FUNDEF (*Fundo Nacional de Desenvolvimento da Educacao e Valorizacao do Magisterio*).

2/ *Lei Organica da Assistencia Social*.

3/ Refers to the federal government only.

4/ Includes R$1.4 billion relative to FCVS outlays in 2000.

Table 4.3. Public Spending on Health and Education and Indicators: Brazil and Latin America, 1985-97
(In units as indicated)

	Initial level		Most recent level 1/		Annual percent change		Sample size
	Brazil	Latin America	Brazil	Latin America	Brazil	Latin America	
Indicators							
Health							
Immunization, DPT (% of children under 12 months)	65.0	64.4	79.0	87.4	1.6	3.2	34
Immunization, measles (% of children under 12 months)	67.0	61.9	99.0	88.0	3.3	3.6	34
Births attended by health staff (% of total)	...	52.8	...	66.8	...	3.2	13
Safe water (% of population with access)	75.0	73.4	69.0	78.6	-0.8	0.9	30
Sanitation (% of population with access)	24.0	65.2	67.0	69.7	10.8	1.0	27
Mortality rate, under-5 (per 1,000 live births)	62.0	45.2	44.0	34.3	-3.4	-3.1	29
Mortality rate, infant (per 1,000 live births)	55.0	36.5	34.0	25.0	-4.7	-3.5	38
Education							
Illiteracy rate, adult total (% of people aged 15 and above)	21.7	17.3	16.1	12.9	-2.5	-3.2	27
Persistence to grade 5, total (% of cohort)	...	69.9	...	79.8	...	1.9	13
School enrollment, primary (% gross)	99.6	103.1	122.8	106.4	1.8	0.3	23
School enrollment, primary (% net)	81.2	86.3	89.7	90.3	1.1	0.5	19
School enrollment, secondary (% gross)	35.4	52.9	45.1	58.0	2.7	1.1	23
School enrollment, secondary (% net)	14.3	43.1	19.5	47.4	3.5	2.1	16
Public spending 2/							
Health							
In percent of GDP	1.6	2.3	1.9	2.5	0.3	0.1	29
In percent of total government expenditures	10.0	8.3	10.1	9.8	0.0	1.6	29
Education							
In percent of GDP	0.8	3.6	1.3	4.1	0.5	0.6	29
In percent of total government expenditures	5.5	13.8	6.6	16.8	1.0	3.0	29

Sources: World Bank, World Development Indicators; and IMF staff calculations.

1/ Refers to 1997 for most countries.
2/ Refers to central government only for all countries, except Argentina (general government); and Peru, St. Kitts and Nevis, and Bolivia (public sector).

Box 4.1. Social Spending Data in Brazil: Strengths and Weaknesses

Data on federal government spending on social programs are available from SIAFI (*Sistema de Acompanhamento Financeiro*) and SIDOR (*Sistema Integrado de Dados Orçamentários*). For states and municipalities, data are available from SIAFEM (*Sistema de Acompanhamento das Finanças de Estados e Municípios*). Information on social spending is also available from the IBGE, based on national accounts data.

As in other countries, broad data coverage is typically achieved at the expense of data quality and reliability. Data are available, but infrequently consolidated, for the three levels of government (federal government, states, and municipalities), and for direct expenditures (*administração direta*), and spending carried out by autonomous agencies (*fundações* and *autarquias*). Data collected by the National Treasury (STN) on subnational finances through SIAFEM do not cover spending by autonomous agencies. This is an important limitation because a significant share of social spending is carried out by these agencies. However, national accounts data collected by the IBGE, through DECNA (*Departamento de Contas Nacionais*), cover disaggregated state and local government spending and are consistent with SIAFI/SIDOR data at the federal government level. Subnational government data on social spending are of poorer quality and typically reported at a higher level of aggregation for most social programs, particularly health care and education. States and municipalities often misreport the functional classification of social spending.

International data comparability has improved in many areas, particularly education. A database (SIGPE, *Sistema de Informações sobre os Gastos Públicos da Área de Educação*) of education indicators, including public sector spending, was created by IPEA (*Instituto de Pesquisa Econômica Aplicada*, Ministry of Planning and Budget). Annual data on education spending and indicators, including information on students, teachers and curricula, are available from the School Censuses (*Censo Escolar*). Also, Brazil has reported education spending following the OECD classification since 1998. The OECD classification excludes culture and sports from education outlays, and includes fringe benefits and pension payments. These fringe benefits are recorded separately for the social sector as a whole in Brazilian accounts. See Abrahão and Fernandes (1999), for more information).

Information on access to social services, as well as on private outlays on education and health care, is available from household expenditure surveys. PNAD (*Pesquisa Nacional por Amostra de Domicílios*) is the main household survey conducted in Brazil. It has nationwide coverage, has been conducted annually since 1967 (with few exceptions), and reports data on a wide range of household characteristics including employment status, income sources, and education attainment. It does not however provide detailed information on access to social services on a regular basis, and typically does not distinguish between social insurance and social assistance benefits. The PPV (*Pesquisa sobre Padrões de Vida*), conducted in 1996 and 1997, provides information on access to social services but has a relatively small sample: 5,000 households in the Northeast and Southeast. PPV is methodologically similar to the Living Standard Measurement Surveys (LSMS) supported by the World Bank in many countries. The PCV (*Pesquisa de Condições de Vida*) provides very detailed information on household income sources, including access to social services, social security earnings and benefits, and private spending on health and education. Its first wave (1990) covered 5,500 households in the metropolitan region of São Paulo, while the second wave (1994) covered 12,000 households in the state of São Paulo, including those covered in capital's metropolitan region in the first wave. Other household surveys widely used in the analysis of social spending and indicators include POF and PME. POF (*Pesquisa de Orçamentos Familiares*) is a national household income survey conducted in 1987 and 1996. POF contains detailed information on labor compensation, including severance pay, unemployment insurance, and receipt of labor-related benefits such as the salary bonus. High-frequency data are available from PME (*Pesquisa Mensal de Emprego*), which provides monthly information on employment and earnings for households in six major metropolitan areas. Given the survey's focus on employment and earnings, PME does not provide information on most transfer payments, such as pensions and social assistance benefits. RAIS (*Relação Annual de Informações Sociais*) also provides useful information on transfer payments to households.

8. **Minimum wage policy is an important determinant of social spending**. Most transfers to individuals and households (income support, disability benefits, and pensions, among others) are linked to the minimum wage and constitute a sizeable share of total social spending. Recent studies have shown that real increases in the minimum wage alleviate poverty, but they also inflate the cost of social assistance and insurance programs.[9] This tradeoff affects the composition of social spending across government levels because most minimum wage-linked social assistance and insurance programs are financed by the federal government. With the rising share of social security in subnational social spending, real increases in the minimum wage are likely to put additional pressure on the already high payroll costs facing states and municipalities.

9. **There has been increased rigidity in financing for social programs**. Revenue-sharing arrangements are known to have reduced flexibility in fiscal policymaking in Brazil (Ter-Minassian, 1997). The federal government has also relied increasingly on taxes that are not shared with states and municipalities, such as social security taxes and contributions, to finance social spending. These are typically levied on enterprise payroll and earnings and are known to have a detrimental impact on formal employment and international competitiveness, among others. More recently, new legislation was passed: (1) introducing a floor for total federal spending on health care programs; and (2) earmarking spending on health care at the subnational level, as in the case of education (to be discussed below). States and municipalities are now required to earmark 12 percent and 15 percent, respectively, of their revenues (net of intergovernmental transfers) to finance outlays on health care.

C. Education

Background

10. Publicly-provided services comprise a wide range of programs, including formal and vocational education, as well as adult and special education. Access to these services is universal. Brazil has a long tradition in decentralized provision of education services. Federal government spending covers primarily higher education and vocational training programs (Table 4.4). The 1988 Constitution decentralized most spending assignments to states and municipalities, but little emphasis was placed on granting policymaking autonomy to subnational governments in program design, service delivery, and resource management. It is estimated that private outlays amount to nearly 25 percent of public spending on education.

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[9] A recent study (Neri, 2000) using household expenditure survey data (PNAD-98) shows that a 10 percent real increase in the minimum wage reduces poverty by 1.3 percent among formal sector workers. If pensions are included in household income and both formal and informal sector workers are taken into account, a 10 percent real increase in the minimum wage reduces poverty by 4.5 percent.

Table 4.4. Public Spending on Education by Government Level, 1995-97
(In billions of *reais*)

	Total		Federal government		States		Municipalities	
	1995	1997	1995	1997	1995	1997	1995	1997
Education outlays	34.5	44.5	10.5	12.5	14.9	19.9	9.1	12.1
Pre-school	1.5	2.0	0.1	0.3	0.1	0.1	1.4	1.6
Primary education	10.2	19.4	2.6	2.9	6.2	8.5	1.5	7.9
Secondary education	2.4	3.3	0.5	1.7	1.0	1.5	0.8	0.1
Tertiary education	6.8	7.3	4.3	4.6	2.4	2.6	0.1	0.0
Others 1/	13.7	12.6	3.1	2.9	5.3	7.2	5.3	2.5

Sources: Ministry of Education; and IMF staff calculations.

1/ Includes teachers' pensions and social security benefits.

11. Education spending also comprises other programs dealing with the procurement and distribution of school lunches (*Merenda Escolar* program)[10] and textbooks, transport for students in poor rural areas, and health care services in schools in poor municipalities. These programs involve joint ventures within the *Comunidade Solidária* program.[11] Other programs aim at improving students' access to information technology products in poor municipalities and the provision of education services by television, including those for upgrading teacher skills (IPEA, 2000).

[10] The program aims at ensuring at least 15 percent of the child's daily calorie intake during the school year. It is implemented on preschool and primary education institutions. A supplementary allocation is provided to those poor municipalities participating in the *Comunidade Solidária* program towards covering delivery and procurement costs. Coverage increased from 32 million children in 1994 to 35 million in 1997, of which 29.3 million are in primary education. See Lobato, Aquino and Ribeiro (1999), for more information.

[11] The program coordinates federal government aid to poor municipalities. Eligibility is based on income per capita and assistance is provided over a three-year period based on progress in improvement of social indicators.

Trends in expenditures and performance indicators

12. **The sectoral composition of spending on education is skewed towards higher education**. Although nearly one-half of public spending is on primary education, higher education spending per student is almost 16 times as high as outlays on primary education (R$7,321 against R$460 in 1995). In 1998, the average spending per student in primary education was R$565. There are significant variations in teachers' compensation, reflecting differentials in the pay scale between entry and top-level salaries, between state and municipal schools, and among the states. Typically, state school teachers are better paid than their municipal counterparts. The ratios of students to teacher are also lower in higher education. Indicators are worse in the poorer states of the North and Northeast (Table 4.5), reflecting, to a great extent, discrepancies in teachers' compensation and skill mix, among others. The implementation of FUNDEF in 1998 (Box 4.2) has ensured better equalization of education spending across and within the states but increased rigidity in intergovernmental fiscal relations. [12]

Education and social development

13. **Education spending affects poverty primarily by improving the earnings possibilities of the poor**. In Brazil, up to 50 percent of earnings inequality can be explained by differentials in education attainment (Paes de Barros and Mendonça, 1999), as the labor market pays a high premium for skilled workers. [13]Quality differentials affect education attainment between the poor and the nonpoor. It has been shown that undereducated workers are more likely to fall into poverty than their more educated counterparts. Mobility in and out of informality in the labor market has also been shown to be lower among the less educated.

14. **There are few studies on the incidence of education spending in Brazil, and most empirical evidence is mixed**. While public spending on secondary and higher education has been shown to have a regressive impact on income distribution, public spending on preschool

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[12] In addition to transfers within FUNDEF, education outlays are financed by *Salário-Educação*, a tax levied on payroll, and special social security contributions. There are special contributions to finance vocational training in industry, commerce, and tourism.

[13] The impact of schooling on wage differentials is not homogeneous in Brazil. Paes de Barros, Corseuil, and Mendonça (1999) show that the impact on earnings of an extra year of formal education is higher among the more educated. Income inequality is also affected by schooling, and this association has become stronger in the 1990s (Neri and Camargo, 1999). Studies on the private rate of return on education suggest that these rates are higher for tertiary education. Social rates of return are typically lower given the subsidies in publicly provided services. According to the World Bank (1999), consultations with the poor have revealed that unemployment, followed by lack of schooling and urban services, are considered the most important causes of poverty.

(daycare and kindergarten) and primary education tends to be more progressive. [14]Overall, the incidence of public spending on education is poor given that public outlays on higher education, which tend to be more regressive, account for a large share of total federal expenditures on education. Private outlays on education are concentrated in the highest income quantile, relfecting differentials in the ability to pay for these services and the country's skewed income distribution. The incidence of public spending on special programs, such as school lunches and daycare facilities, is in general better than that of spending on other education programs. This is because the special programs are better targeted to low-income households and poor municipalities.

[14]Using 1990 data, the World Bank (1995) shows that the two highest quintiles receive 63 percent of public spending on higher education, against 19 percent for the two lowest quintiles. Using household survey data for the metropolitan region of São Paulo, Soares (1999) shows that primary education spending is progressive, with those in the lowest income quintile receiving 30 percent of total spending, against nearly 7 percent in the highest income quintile. Public spending on primary education accounts for nearly 2.5 percent of household income. According to the IDB (1999), only 5 percent of expenditures on secondary education goes to the lowest income quintile, against nearly 25 percent in the case of primary education. In the case of higher education, over 95 percent of spending accrues to the two highest quintiles. See World Bank (2000a), for more information.

Table 4.5. Education Indicators by State
(In units as indicated)

	Registered students 1/					Primary education 2/		Secondary education 2/		Age-grade gap 3/	Enrollment rates 4/			
	Total	Federal	State	Municipal	Private schools	Completion rate (percent)	Length (years)	Completion rate (percent)	Length (years)		Primary school		Secondary school	
											Gross	Net	Gross	Net
Rondônia	317,816	...	177,664	118,387	21,765	40.1	10.9	53.0	3.8	46.8	126.9	90.5	46.7	19.5
Acre	144,284	297	90,815	46,284	6,888	30.9	12.0	75.3	3.9	57.8	138.6	89.8	55.9	18.3
Amazonas	653,857	592	341,557	274,077	37,631	48.6	11.3	72.2	3.7	64.6	127.7	88.1	52.3	14.9
Roraima	79,277	73	73,056	4,957	1,191	35.4	10.0	71.1	3.9	45.4	133.6	92.6	84.2	25.1
Pará	1,614,743	3,848	561,310	986,275	63,310	29.4	12.6	80.1	4.7	64.0	130.9	91.5	46.1	12.9
Amapá	127,140	...	94,071	25,919	7,150	40.5	11.2	83.4	4.1	48.1	141.3	91.3	88.7	22.8
Tocantins	356,149	...	216,825	129,255	10,069	38.0	11.6	72.7	4.0	64.4	165.6	92.7	71.3	16.6
Maranhão	1,634,218	943	418,213	1,126,943	88,119	43.1	11.4	81.1	3.7	65.2	148.5	88.0	46.9	17.0
Piauí	781,240	116	264,259	455,720	61,145	40.1	12.4	84.1	4.3	63.3	133.3	91.1	35.7	10.7
Ceará	1,868,119	550	477,960	1,180,636	208,973	60.7	10.5	73.1	3.7	60.4	140.0	89.8	46.9	17.0
R. G. do Norte	656,199	180	287,524	303,733	64,762	63.2	11.5	84.9	3.7	56.4	146.3	91.5	58.1	19.3
Paraiba	896,022	...	332,893	481,839	81,290	47.5	11.8	75.5	3.8	66.5	145.2	91.9	40.3	13.8
Pernambuco	1,817,763	1,287	668,962	925,795	221,719	53.0	11.7	77.9	3.9	58.6	146.5	91.2	58.4	19.4
Alagoas	701,643	29	175,308	467,311	58,995	44.9	13.1	82.1	3.9	67.8	132.4	86.3	34.7	11.5
Sergipe	434,225	265	202,648	195,187	36,125	52.1	12.1	80.4	3.8	67.5	135.5	90.1	47.2	12.5
Bahia	3,702,727	742	1,291,451	2,209,254	201,280	50.2	11.5	82.2	3.8	68.4	161.4	91.9	45.2	12.3
Minas Gerais	3,773,247	3,108	2,062,693	1,505,666	201,780	73.2	9.3	78.8	3.5	42.2	153.6	97.4	67.7	29.2
Espírito Santo	614,779	...	310,383	234,699	69,697	60.4	9.9	84.0	3.6	36.0	133.2	94.5	81.5	39.5
Rio de Janeiro	2,474,649	11,583	676,980	1,303,228	482,858	69.8	10.1	78.1	3.8	41.6	131.2	96.7	80.0	36.8
São Paulo	6,325,294	207	4,052,972	1,511,184	760,931	71.4	8.7	77.9	3.4	26.4	126.5	98.2	95.3	51.9
Paraná	1,732,395	433	813,596	786,423	131,943	63.8	9.9	74.8	3.7	28.4	124.2	97.0	83.9	44.0
Santa Catarina	981,603	615	538,634	366,754	75,600	71.9	9.6	70.5	3.7	26.9	125.3	96.8	74.5	44.1
R. G. do Sul	1,758,376	1,148	906,816	695,197	155,215	66.4	9.8	72.7	3.8	22.5	123.1	95.7	79.1	46.0
M. G. do Sul	460,031	577	229,454	190,208	39,792	45.7	10.8	66.3	3.8	42.4	131.5	94.4	67.2	32.2
Mato Grosso	604,741	...	315,572	250,827	38,342	41.4	10.4	66.7	3.7	44.1	135.4	93.7	57.4	26.5
Goiás	1,140,089	485	666,626	388,611	84,367	47.6	11.1	77.2	3.8	51.7	148.2	95.9	70.9	26.4
Federal District	409,116	1,493	341,213	...	66,410	61.4	10.4	77.8	3.9	33.3	138.4	97.9	101.5	48.2
Brazil	36,059,742	28,571	16,589,455	16,164,369	3,277,347	65.8	10.4	78.5	3.6	46.6	128.1	95.3	68.1	30.8

Sources: Ministry of Education; and IMF staff calculations.

1/ 1999.
2/ 1997.
3/ Share of students with age-grade gap, 1998.
4/ 1998.

Box 4.2. Spending on Education and the Implementation of FUNDEF

In 1998, a fund—FUNDEF (*Fundo Nacional de Desenvolvimento do Ensino Fundamental e Valorização do Magistério*)—was created to finance subnational spending on education. Accordingly, states and municipalities are required to earmark 15 percent of their own tax revenues and transfers to primary education. The key objectives of FUNDEF are: (1) to reduce shortfalls in financing at the subnational level; and (2) to ensure better equalization in expenditure capacity across and within states. A national minimum curriculum was also set through FUNDEF.

The 1988 Constitution requires subnational jurisdictions and the federal government to earmark, respectively, 25 percent and 18 percent of total revenues to education. However, these targets were not always met at the subnational level due to financing shortfalls, particularly in poorer states and municipalities. With the creation of FUNDEF, a floor was introduced for municipal outlays per student. More recently, some differentiation has been introduced for the spending floors per student between first/fourth grades and fifth/eighth grades. For 2001, the minimum spending levels will be raised to R$353 per student in first/fourth grades (up from R$333 in 2000), and R$370.65 per student in fifth/eighth grades (up from R$349.65 in 2000). There have been pressures to increase the differentiation rate and for creating different spending floors for rural and urban schools. An important innovation of FUNDEF is that the federal government is required to top up spending in the case where subnational jurisdictions cannot afford the minimum spending requirement. In 2001, the federal government transfer is expected to reach R$0.7 billion, virtually unchanged from 2000, given the expected increase in subnational revenues.

To reduce pay inequality across states and within the education sector, 60 percent of the resources spent on primary education are earmarked to wages and salaries, leaving 40 percent to finance capital outlays and operations and maintenance. In the first year of implementation of FUNDEF, teachers' salaries rose by over 18 percent in municipal schools—where salaries are typically lower—and by nearly 8 percent in the schools run by state governments. These increases were higher in the poorer municipalities of the North and Northeast. FUNDEF also resulted in an increase in total revenues in poorer municipalities. These increased revenues are highly fungible and misuse of FUNDEF resources may occur in the absence of adequate oversight. There is anecdotal evidence of municipalities spending FUNDEF resources on infrastructure upgrading in schools to improve road paving for the entire street where the school is located. The favor of current spending over capital outlays within the education sector has helped to prevent leakages in funding and misuse of resources in investment projects with low social return. More recently, it has been argued that FUNDEF has crowded out some subnational spending on secondary education and that resources are needed to ensure that there will be no bottlenecks in the system in light of the increased coverage of the primary school system. To deal with these problems, a new program (PROMED) will be implemented to strengthen secondary education.

15. **The increase in policymaking autonomy at the subnational level has had a positive impact on performance indicators**. Recent research has shown that the states in which public schools are free to manage their budgets and appoint the headmaster, as well as to implement participatory management schemes, tend to have lower repetition and dropout rates, and their students tend to have better test scores (Box 4.3).[15] It has been argued that better accountability has also been achieved by granting more managerial autonomy to schools.

16. **Emphasis on improving the efficiency of basic education spending has yielded encouraging results**. School attendance increased from 90 percent to over 95 percent of the population aged 7–14 years between 1994 and 1999. School enrollment rates increased by 41 percent in secondary education and by 25 percent in tertiary education between 1994 and 1998. Enrollment in graduate courses increased by 16 percent in the case of Master's degrees and by 28 percent in the case of Doctorate programs. Nevertheless, dropout and repetition rates remain high. Between 1990 and 1997, the repetition rate fell to 34 percent in primary education and 22 percent in secondary education. Expected delay is 2.4 years for pupils in primary education. Expected stay in school is 10.4 years. Dropout rates in higher education fell little between 1990 and 1997, and the average stay rose from 7.2 months to 8.4 months.[16]

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[15] A recent study on the Curumim Program (Paes de Barros, Mendonça and Soares, 1998), implemented in the state of Minas Gerais, suggests that test scores, enrollment and repetition rates, as well as age-grade gap indicators have improved in a sample of pupils in primary schools that participated in the program, after controlling for other determinants of school performance, such as parents' educational background and occupation, and number of books at home, among others.

[16] See www.mec.gov.br/Destaq/ministro.htm, for more information.

Box 4.3. Recent Trends in Education Policy

In an effort to improve the efficiency of public spending on education, a two-pronged strategy was followed in the 1990s. Emphasis was placed on ensuring access to, and improving service delivery in, primary education, as well as more stringent regulation and standard setting for secondary and tertiary education. The provision of primary education services has increasingly taken place in partnership with subnational governments and civil society. Given the discrepancies in the ability of state and municipal governments to finance education spending, as discussed above, greater coordination with the federal government has been pursued to ensure minimum provision and equalization of primary education spending capacity across and within states.

Subnational governments, particularly municipalities, have enjoyed greater autonomy in program design and implementation. More policymaking autonomy at the local level of government has been exercised with increased use of demand-driven, result-oriented, participatory administration in public schools. The implementation of participatory administration schemes took place primarily after 1995. These entities are involved in the school's administrative, financial, and educational decision-making processes. The most common participatory administration schemes are the School Council, available in 1997 in over 37 percent of the nearly 42,000 schools funded by state governments, and the Parents and Teachers Association, available in nearly one-third of states schools. See Parente and Lück (1999), for more information. Schools are enjoying more autonomy in the organization of curricula and pedagogical projects (subject to minimum standards set by the federal government); personnel management; teaching planning and methods; and procurement.

In secondary education, there has been greater emphasis on improving access to formal education and vocational training. The reform of vocational education has been carried out in coordination with the Ministry of Labor. Plans involve the creation of community centers for vocational training in partnership with municipal governments, trade unions, and community associations. Also, standard setting has been pursued through the implementation of a national exam in 1998. Unlike the higher education case, to be discussed below, the secondary education exam is optional and aims at providing secondary school leavers with a degree, which may subsequently be used for entry in higher education institutions. As discussed in Box 4.2, a new program will also be implemented to strengthen secondary education (PROMED). Emphasis on standard setting and monitoring has been placed in the case of tertiary education. Since 1996, national exams have been extended to graduate students. These exams focus on the coverage of curricula and aim at assessing the quality of services provided, particularly by private institutions and those public institutions in remote, less developed regions, where services are of poorer quality. Higher education institutions are also recertified periodically on the basis of these exams.

D. Health Care

Background

17. Publicly-provided health care services in Brazil consist essentially of curative and preventive care, immunization, nutrition, and epidemiological and sanitary surveillance, among others. As in the case of education, access to publicly-provided services is universal. The national health care system (SUS) combines central government financing with decentralized service delivery: the federal government reimburses private health care providers and subnational governments, particularly municipalities, for the delivery of health

care services and maintenance of public hospitals and clinics.[17] Public spending on health care also comprises special programs designed and managed in coordination with subnational governments. Community care programs (PACS and PSF) have also focused on the decentralized provision of preventive care services in poor municipalities.[18]

Recent trends in spending and main issues

18. **More policymaking autonomy has been granted to municipal governments with the implementation of SUS.** Emphasis has been placed on increasing the system's coverage and ensuring access of the population to publicly-funded health care. Nevertheless, spending through SUS has not ensured equalization and significant discrepancies persist in expenditure capacity across states (Table 4.6). Transfers from the federal government to states and municipalities are based primarily on the cost of the services provided at the municipal level, rather than needs, and past trends in state budget allocations. More prosperous states—where a wider range of more sophisticated, costly health care services is provided—receive more transfers on a per capita basis than poorer states. Better equalization has nevertheless been pursued in recent years.

19. **Subnational governments have increased spending on health care.** The fees paid for the health care services provided through SUS are in general low and often do not ensure full cost recovery. Due to shortfalls in financing, a number of states and municipalities have increased spending on health care using their own budgetary resources. It is estimated that states and municipalities spend approximately one-half of federal spending through SUS. States and municipalities are now required to earmark 12 percent and 15 percent, respectively, of their revenues (net of intergovernmental transfers) to finance outlays on health care. Also, participation of private health care providers in SUS has fallen slightly over time because of delays in reimbursement, and low fees paid for the services provided. It is estimated that private outlays on health care are nearly as large as public spending.

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[17] SUS (*Sistema Único de Saúde*) was created by the 1988 Constitution to replace INAMPS, which provided health insurance only to formal sector workers and their families. SUS was implemented in the early 1990s to extend publicly-provided health care services to the poorer states of the North, Northeast, and Center-West, where INAMPS coverage was limited, and to informal sector workers and their families.

[18] The National Development Bank (BNDES) also provides loans to finance capital spending on health care. In 1998, BNDES loans in the health care sector totaled R$530 million, or over one-quarter of its social loan portfolio.

Table 4.6. Health Indicators by State, 1996
(In units as indicated)

States	Doctors 1/	Health spending (per capita)	Immunization rate 2/			Health care admittance		Access to 4/		Community Care Program 5/				Infant mortality 6/
			DPT 3/	Polio	Measles	In-patient	Out-patient	Drinking water	Sanitation	Number of households	Share of pre-natal	Immunization rate	Malnutrition rate	
Acre	4.1	24.8	51.1	61.3	54.9	38,258	25,393	31.0	17.5	...	...	...	...	...
Amapá	6.3	24.8	71.9	73.7	72.9	18,357	277,787	55.5	6.1	...	...	...	...	...
Amazonas	6.2	25.6	57.9	85.0	71.2	114,844	1,276,553	55.6	12.8	...	...	...	...	...
Pará	6.8	23.1	91.6	53.2	65.6	455,013	2,360,867	36.0	2.0	...	...	...	...	...
Rondônia	3.9	25.7	77.1	73.8	82.6	115,564	769,261	42.2	2.9	10,782	70.0	74.5	9.3	...
Roraima	5.4	24.2	89.2	83.4	88.2	9,995	175,065	52.9	5.2	...	...	...	...	...
Tocantins	5.3	32.6	71.5	64.4	71.5	9,033	665,112	30.1	0.1	33,877	75.0	74.6	10.8	...
Alagoas	9.8	35.2	40.2	41.0	44.1	222,377	1,670,590	46.9	8.5	148,462	53.9	62.2	19.1	83.0
Bahia	7.1	29.6	51.4	55.8	56.7	1,006,662	5,773,200	45.5	16.6	118,732	62.9	68.2	11.8	50.2
Ceará	7.0	39.3	93.3	100.0	98.4	530,132	4,639,923	39.8	7.6	884,559	73.0	73.0	...	40.9
Maranhão	3.8	32.4	57.2	38.4	72.6	417,468	3,119,852	24.7	7.8	233,124	59.2	66.0	11.9	63.2
Paraíba	9.6	38.7	69.6	75.0	74.4	22,727	1,985,110	51.6	15.7	335,476	69.2	69.0	11.6	65.5
Pernambuco	11.1	41.8	74.8	100.0	87.2	612,522	5,079,588	56.5	19.1	408,499	61.1	75.1	14.6	67.0
Piauí	5.5	37.6	70.8	64.4	71.0	227,784	2,030,883	24.7	1.7	209,309	59.9	73.7	14.5	49.1
Rio Grande do Norte	9.2	32.7	72.9	66.3	76.8	184,021	1,551,387	48.7	10.3	143,655	75.6	80.3	7.6	34.3
Sergipe	9.2	32.5	81.0	87.1	83.7	125,517	1,504,090	59.5	20.1	58,405	59.0	62.2	10.5	53.0
Espírito Santo	13.7	31.2	88.0	80.9	94.1	20,477	1,064,931	77.2	48.7	...	...	...	...	28.2
Minas Gerais	12.6	44.9	66.4	69.8	71.3	1,339,511	15,203,923	78.1	56.8	...	...	...	...	31.2
Rio de Janeiro	24.3	47.6	73.5	77.5	81.0	890,315	8,570,947	91.5	72.8	...	...	...	...	27.1
São Paulo	18.8	49.2	83.2	88.3	95.0	2,266,171	22,618,980	95.5	79.3	...	...	...	...	26.4
Paraná	11.0	52.8	92.2	92.2	92.2	75,981	9,619,926	85.2	27.8	...	...	...	...	29.8
Rio Grande do Sul	15.1	46.4	78.7	79.9	84.1	805,562	4,062,293	85.1	44.4	...	...	...	...	22.2
Santa Catarina	9.2	39.7	79.6	83.8	87.8	412,195	2,808,217	89.1	38.5	...	...	...	...	24.7
Distrito Federal	29.5	47.7	100.0	100.0	54.9	137,357	1,325,605	86.2	75.5	...	...	...	...	27.6
Goiás	10.2	41.9	81.5	82.4	79.6	321,595	2,644,765	70.9	27.5	12,479	86.3	90.3	7.0	26.3
Mato Grosso	5.8	38.8	72.4	68.5	78.6	194,083	2,116,249	58.6	13.4	...	...	...	...	28.5
Mato Grosso do Sul	10.4	36.2	69.5	68.7	77.0	155,171	1,040,134	76.0	9.0	...	...	...	...	29.6
Brazil	13.0	41.8	75.1	77.8	79.9	11,932,654	104,208,881	75.4	44.0	...	...	...	...	40.0

Sources: Ministry of Health; and IMF staff calculations.

1/ Per 10,000 population.
2/ In percent.
3/ Children less than 1 year of age.
4/ In percent, 1991.
5/ PACS/PFS.
6/ Per 1,000 population. 1994.

20. **The incidence of health care spending is typically better than that of education**. There is some evidence that spending on health care is fairly progressive, but private outlays are concentrated in the highest income quintile, as expected.[19] It has been shown that the incidence of public spending is worse for the health care services provided by the private hospitals and clinics associated with SUS (*hospitais conveniados*) than for the services provided by public health care institutions.[20] Information on the recipients of certain special programs, that would allow for a better assessment of the incidence of these outlays, is not readily available.[21] However, because these special programs are more targeted to low income households and poor municipalities, it is expected that the incidence of public spending on these programs is better than that on the other, untargeted health care programs.

21. **Recent initiatives have addressed some of the limitations of decentralized provision of health care**. Local governments are often too small to reap the benefits of economies of scale in health care provision and cannot typically finance the provision of more specialized curative care services. To overcome these difficulties, intermunicipal administrative ventures (*Consórcios Intermunicipais de Saúde*) have been created within SUS. These ventures also perform functions such as personnel management, including hiring new staff, licensing private health care providers, and procurement. More recently, efforts have been made to strengthen the institutional framework within which these ventures are created (Ribeiro and Costa, 1999). According to the Ministry of Health, as of July 1999, there are 143 intermunicipal ventures in Brazil, covering a total of 1,740 municipalities.

22. **More emphasis has been placed on improving performance in service delivery in recent years**. Typically, an input-based funding system does not focus on performance targets to encourage efficiency in service delivery. It also distorts spending towards more expensive inpatient care. Specific programs have incorporated explicit targets for coverage

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[19] Soares (1999) shows that spending on health care is progressive, with those in the lowest income quintile receiving over 31 percent of total spending, against nearly 8 percent in the highest income quintile. Public spending on health care accounts for approximately 2 percent of household income. In the case of private outlays on health care, households in the lowest income quintile account for almost 11 percent of total outlays, against nearly 42 percent for households in the highest quintile. This reflects quality differentials between publicly and privately-provided services, and the ability to pay of different income groups. According to the IDB (1999), over 20 percent of health care spending accrues to the lowest income quintile, against only 5 rcent in the case of secondary education.

[20] Based on PPV data, the World Bank (2000b) shows that nearly half of all urban users of public hospitals and health care institutions are poor, whereas nearly half of the users of *hospitais conveniados* are in the highest income quintile.

[21] The World Bank (2000b) shows that incidence of the *Milk Program* is good, with nearly 60 percent of spending accruing to the two lowest income quintiles.

and a progressive funding schedule for increased coverage. As a result, access to health care services has improved in poorer regions. A better match between the supply and demand for health care services has also been achieved through greater involvement of civil society in program design and implementation.

23. **Equalization of expenditure capacity among the states has been pursued recently**. Inequalities have been reduced over time in the transfer system. This has been achieved through increases in budget allocations for poorer states, where coverage has been extended with the implementation of SUS. Funding for basic health care programs and preventive care has also increased (Ministry of Health, 2000). A minimum transfer of R$10 per capita was implemented within PAB (*Piso de Atenção Básica*) and these resources are transferred to the municipalities to finance the provision of basic health care services, including prenatal care, oral hygiene and immunization. Total allocations for PAB are programmed at R$1.8 billion in 2001.

E. Conclusions

24. Preliminary information based on the most recent national household survey (PNAD-1999), released in late July 2000, has revealed important improvements in health and education indicators in Brazil. These indicators have improved against the background of economic slowdown, contraction in real wages, and rising unemployment following the depreciation of the real in January 1999. However, Brazil's performance in a number of social indicators, particularly health and education, is not commensurate with the country's income level and share of social spending in GDP. This is due primarily to inefficiencies in program design and implementation. In particular, the composition of total social outlays is skewed towards social insurance, where coverage is limited and most pensions and benefits are typically poorly targeted. Also, the share of social insurance in total social spending has risen in recent years, thus crowding out expenditures on other social programs. Adequate means-testing is carried out in a relatively small number of social programs, but relatively untargeted outlays still account for a large share of spending within each sector, particularly in health care and education. To overcome these deficiencies, recent initiatives in health care and education have combined increased emphasis on decentralized service delivery and managerial autonomy.

25. Education has been the hallmark of Brazil's social policies, where success in rationalizing spending has been validated by impressive improvements in social indicators. Efforts have been made to equalize spending capacity across and within states, given the disparities in revenue mobilization capacity at the subnational level, to strengthen minimum standards, to involve civil society in program design and implementation, and to introduce goal-oriented management and incentive schemes for funding. Nevertheless, access to basic education remains limited in certain poorer areas and the incidence of public spending could be improved in secondary and tertiary education. It has been argued that better targeting could be achieved without abandoning universal access to services by, for instance, introducing cost recovery for higher education, which benefits the nonpoor disproportionately more. This would release resources in the budget for financing primary

and secondary education programs that benefit the poor, and increasing coverage in poorer areas.

26. In health care, recent efforts have been made to improve access and funding mechanisms for service delivery. These efforts are noteworthy but protection of spending levels will be achieved at the expense of flexibility in budgeting, due to increased earmarking of revenues, particularly at the subnational level. The incidence of health care spending differs between public and private health care facilities. This suggests the need for more careful analysis of differentiated access to health care services depending on the service provider and reallocating funding towards providers and services that have a more beneficial impact on the poor.

27. With the consolidation of fiscal adjustment, emphasis in social policymaking in Brazil, particularly in the health care and education sectors, could be shifted from preserving public spending from further retrenchment to a more indepth assessment of the efficiency and effectiveness of public outlays and the adequacy of the existing programs to alleviate poverty and foster social development. Despite the caveats of the efficiency analysis presented in this section, the results reported suggest that much remains to be done in ensuring that increases in social spending translate into significant improvements in social indicators. Given Brazil's significant interregional and interpersonal inequalities, it is important that the federal government remain at the forefront of social policymaking.

Measuring Efficiency in Education and Health

Background

28. Brazil's performance on education and health indicators compares poorly with other Latin American countries, as discussed above. The combination of relatively poor performance indicators and high total public spending suggests inefficiencies in program design and service delivery. To estimate the effectiveness of government spending on health care and education in Brazil, an efficiency frontier can be constructed using the methodology described in Box 4.4. The analysis is carried out for a sample of Latin American and Caribbean countries. Three output indicators are used in the analysis in the case of education (net primary school enrollment, net secondary school enrollment, and persistence to grade 5) and two output indicators are used in the case of health care (immunization rates for DPT and measles). One input indicator (public spending) is used to construct the efficiency frontiers for both health care and education.[22]

The results

29. Compared with other Latin American and Caribbean countries, Brazil is relatively efficient in the provision of education services (Appendix Table 4.1).[23] In health care, Brazil scores highly in output efficiency and lies on the efficiency frontier for immunization. Nevertheless, in terms of input efficiency, Brazil ranks 21 in the sample of 29 under examination, with efficiency score equal to 0.18. This implies that, other things equal, the same, or higher, level of output can be achieved with only 18 percent of the public funds spent. The results show that countries with higher spending levels are relatively less efficient than countries that yield comparable output with less input. Countries that have education spending patterns skewed towards teachers' compensation, for instance, tend to be less efficient. Likewise, countries that spend proportionally more resources on expensive curative

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[22] In the case of education, the analysis is carried out for one input indicator (public spending) and each output indicator separately (net primary school enrollment, net secondary school enrollment, and persistency to grade 5). This is because, at least in part, in the case of education, information is not available for most countries in the sample for all three output indicators. The methodology requires the elimination of these countries, thereby severely reducing the sample size. The data used in the calculation of the efficiency frontiers are available from the World Bank's World Development Indicators data set. The data refer to latest year for which information is available.

[23] Countries with score equal to 1.0 define best practices for the sample of countries under examination. These countries dominate those that produce less output with the same or higher level of input (input efficiency) or use more input to produce the same or lower level of output (output efficiency). These countries lie on the efficiency frontier, as depicted in Appendix Figure 4.1.

care programs relative to preventive care will also tend to fare poorly in terms on efficiency scores.

30. The results of the empirical analysis should be assessed with some caution for three main reasons. First, public spending data on health care and education exclude subnational outlays. This underestimation of total public outlays overstates efficiency in the provision of education and health care and the upward bias is likely to be greater in countries where subnational governments are important providers of health care and education services. In the case of Brazil, relative efficiency is more likely to be overstated in the case of education than health care because subnational spending accounts for a lower share of total government spending on health care. Second, performance in social indicators may be affected by factors other than (public and private) spending. For instance, social development is likely to be correlated with variables such as income levels, poverty incidence, and lagged spending levels, among others. Unfortunately, these explanatory variables cannot be taken into account in these nonparametric models. Finally, spending data for all countries in the sample, including Brazil, exclude private outlays on health care and education. The exclusion of private outlays underestimates the use of inputs in the provision of health care and therefore overestimates the efficiency of government spending. This upward bias is obviously greater the higher the share of private outlays in total spending.

31. To test the sensitivity of the efficiency scores to the exclusion of subnational governments in Brazil, the empirical analysis was carried out using total public, rather than only central government, spending in health care and education. Information on total spending for other countries in the sample is not available, but, as suggested above, the upward bias in efficiency is likely to be high in Brazil, given that most spending on health care and education is subnational, particularly in the case of education.[24] Brazil remains on the efficiency frontier in the case of immunization but has a lower input efficiency score. The fall in the efficiency scores is worse in the case of education, as expected, particularly when the net secondary school enrollment rate is used as the output indicator.

32. The sensitivity of the efficiency analysis was further tested by using all three output indicators in education jointly using the FDH methodology, as in the case of health care. In this case, the sample size is reduced to 12 countries. Brazil remains on the efficiency frontier when central government spending is used as the input indicator. When total, rather than only central government, spending is used as the input indicator, Brazil's rank in the sample falls to the ninth position based on the input efficiency score (0.90) and to the eleventh position based on the output efficiency score (0.88).

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[24] By using total public, rather than only central government, spending for Brazil, a downward bias is introduced in the Brazilian efficiency scores. In this case, the unbiased efficiency estimates are likely to lie between the scores reported in Appendix Table 4.1 and those computed using total government spending as the input indicators in the FDH analysis.

Box 4.4. Measuring Efficiency in Social Spending: FDH Analysis

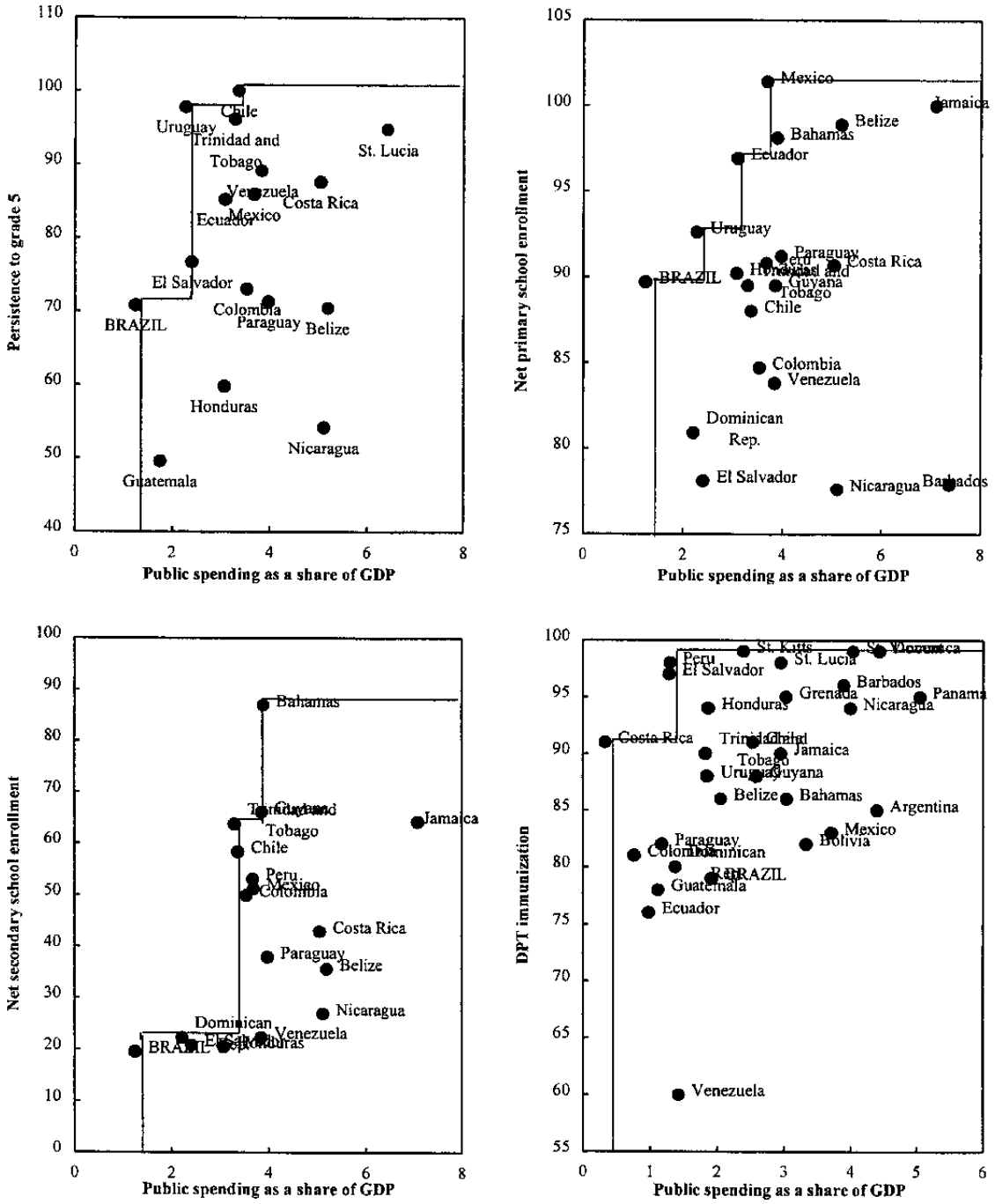
The efficiency of public spending can be measured in different ways. Regression analysis offers insights into how efficiently governments provide social services, after controlling for other determinants of social development. However, the elasticities calculated using standard regression analysis suffer from a number of limitations, including the sensitivity of parameter estimates to the functional specification of the reduced-form equations to be estimated. Also, most models from which reduced-from equations are derived are based on assumptions (on utility maximizing behavior, for instance) that are not easily applicable to public goods.

Alternative, nonparametric methods have been developed in recent years to measure efficiency in the provision of public goods and services (Tulkens and Van den Eeckaut, 1995). These methods consist of defining an efficiency frontier for the provision of social services treating public spending as an input in a social production function. Outputs are conventionally proxied by social indicators, such as school enrollment rates, illiteracy rates, life expectancy, among others. By using information on both inputs and outputs, the production frontier defines best practices for the production/provision of social outputs and the use of inputs in the set of producers under examination. The tradeoffs in the choice of inputs and outputs is well documented in the literature (Harbison and Hanushek, 1992; Jimenez and Lockheed, 1995). Unlike standard regression analysis, the calculation of these nonparametric efficiency frontiers does not depend on the assumptions used in the theoretical model or the functional specification of the social production function.

A widely-used nonparametric method is Free Disposal Hull analysis (FDH). In this case, a producer is efficient in the provision of public goods and services if its combination of outputs and inputs lies near the efficiency frontier constructed for the sample of producers. The analysis allows for the ranking of producers according to their efficiency scores. The only assumption made is that inputs and outputs be freely disposed of; in other words, it is possible with the same production technology to lower outputs while maintaining the same level of inputs, and increasing inputs while maintaining the same level of output.

FDH analysis shows that a producer (government, for instance) is relatively inefficient in the provision of, say, education services if another producer uses less input (public spending) to generate as much or more output (education indicator). The degree of efficiency is determined as follows. First, the relatively efficient production results are identified for the sample of countries under examination, based on their public spending levels and output indicators in education and health care. Second, an efficiency score is calculated as the distance of individual production results to the production frontier (FDH). This distance can be calculated from the point of view of inputs and outputs. The input efficiency score is the ratio of inputs used by a given producer A to the inputs used by producer B. This efficiency score indicates the excess use of inputs by the inefficient producer and therefore the extent to which resources are used inefficiently. By the same token, the output efficiency score is the ratio of producer A's output to that of producer B. This ratio indicates the loss of output relative to the most efficient producer with equal or lower level of inputs. Finally, the producers in the sample are ranked according to their input and output scores. Alternatively, a producer is found to be dominated by other producers that achieve a higher level of output using the same, or lower, level of input (output efficiency); or the same level of output using less inputs (input efficiency). Dominance analysis is useful if the sample of producers is small.

Appendix Figure 4.1. Social Spending and Indicators in Latin America 1/



Sources: World Bank database; and IMF staff calculations.

1/ The lines depict the efficiency frontiers.

Appendix Table 4.1. Efficiency Analysis: Scores in Education and Health (Brazil and Latin America)

	Net primary school enrollment 1/						Net secondary school enrollment 2/						Persistency to Grade 5 3/						Immunization 4/					
	Input efficiency			Output efficiency			Input efficiency			Output efficiency			Input efficiency			Output efficiency			Input efficiency			Output efficiency		
	Score	Rank	Dominates	Score	Rank	Dominates	Score	Rank	Dominates	Score	Rank	Dominates	Score	Rank	Dominates	Score	Rank	Dominates	Score	Rank	Dominates	Score	Rank	Dominates
Argentina	...	...	..	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	0.08	29	0	0.99	13	0
Bahamas	0.95	5	4	0.97	7	5	1.00	4	5	1.00	3	6	...	...	...	...	...	...	0.11	26	0	0.94	19	0
Barbados	0.18	20	0	0.77	19	0	...	...	...	...	...	...	...	...	...	...	...	...	0.33	12	1	0.97	13	1
Belize	0.71	7	1	0.98	6	1	0.63	16	0	0.41	15	0	0.25	16	0	0.70	13	0	0.17	22	4	0.99	10	4
Bolivia	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	0.10	27	0	0.99	9	0
Brazil	**1.00**	**4**	**9**	**1.00**	**4**	**9**	**1.00**	**5**	**0**	**1.00**	**4**	**0**	**1.00**	**3**	**4**	**1.00**	**3**	**4**	**0.18**	**21**	**0**	**1.00**	**7**	**0**
Chile	0.38	15	4	0.91	10	4	0.97	6	8	0.92	7	6	1.00	2	8	1.00	2	8	0.13	23	2	0.95	18	2
Colombia	0.37	16	2	0.87	16	3	0.94	7	5	0.78	10	5	0.66	8	3	0.73	11	3	0.44	9	4	0.90	23	4
Costa Rica	0.46	13	2	0.89	14	2	0.66	14	2	0.49	13	2	0.46	12	2	0.88	7	2	1.00	5	17	1.00	6	17
Dominica	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	0.91	6	1	1.00	5	1
Dominican Republic	0.59	9	3	0.90	11	3	1.00	3	2	1.00	2	2	...	...	..	...	...	...	0.26	17	1	0.82	28	1
Ecuador	1.00	3	10	1.00	3	11	...	...	...	...	...	...	0.74	5	4	0.87	8	5	0.43	11	1	0.83	27	1
El Salvador	0.54	11	2	0.84	17	2	0.92	8	1	0.94	5	1	0.96	4	5	0.78	10	5	1.00	4	14	1.00	4	14
Grenada	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	0.42	10	1	0.96	16	0
Guatemala	...	...		...	...	...	...	...	...	...	..	...	0.72	6	0	0.70	14	0	0.30	14	1	0.86	26	1
Guyana	0.33	18	2	0.88	15	2	1.00	2	5	0.76	11	5	...	...	...	...	...	...	0.13	24	0	0.89	25	0
Honduras	0.74	6	1	0.93	8	7		13		0.92	6	0	0.42	13	1	0.61	15	1	0.69	8	2	0.96	17	2
Jamaica	0.52	12	1	0.99	5	1	0.55	17	0	0.74	12	0	...	...	...	...	...	...	0.11	25	0	0.91	21	0
Mexico	1.00	2	9	1.00	2	10	0.89	10	5	0.80	9	5	0.62	9	3	0.86	9	3	0.09	28	0	0.98	12	0
Nicaragua	0.25	19	0	0.76	20	0	0.65	15	0	0.31	17	0	0.25	15	0	0.54	16	0	0.32	13	0	0.97	14	0
Panama	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	0.25	16	0	0.96	15	0
Paraguay	0.57	10	3	0.90	12	3	0.82	12	2	0.44	14	2	0.56	11	2	0.71	12	2	0.29	15	0	0.90	22	0
Peru	0.62	8	5	0.90	13	5	0.89	9	5	0.83	8	6	...	...	...	...	...	..	1.00	3	13	1.00	3	13
St. Kitts	...	...	...	...	...	...	...	...		...	..	...	...	...	.	...	..	...	1.00	2	10	1.00	2	10
St. Lucia	...	...	...	...	...	...	...	...	...	...	..	..	0.36	14	0	0.85	5	0	0.81	7	5	0.99	8	5
St. Vincent	...	...	...	...	...	...	...	...	...	...	..	...	...	...	...	...	...	...	1.00	1	3	1.00	1	2
Trinidad and Tobago	0.39	14	6	0.92	9	5	1.00	1	9	1.00	1	9	0.70	7	8	0.98	4	8	0.18	19	3	0.93	20	2
Uruguay	1.00	1	12	1.00	1	12	...	...	...	...	...	...	1.00	1	12	1.00	1	12	0.18	20	0	0.90	24	0
Venezuela	0.34	17	2	0.83	18	2	0.87	11	0	0.35	16	0	0.61	10	4	0.89	6	4	0.24	18	0	0.69	29	0
Memorandum Item:																								
Brazil 5/	0.56	12	2	0.88	2	13	0.56	17	0	0.56	17	0	0.56	12	2	0.71	13	2	0.10	26	0	1.00	7	0

Sources: IMF staff calculations.

1/ Input: public sector spending on education in percent of GDP. Output: net primary school enrollment.
2/ Input: public sector spending on education in percent of GDP. Output: net secondary school enrollment.
3/ Input: public sector spending on education in percent of GDP. Output: persistency to grade 5.
4/ Input: public spending on health in percent of GDP. Output: immunization rates for DPT and measles.
5/ Efficiency analysis based on total, rather than only central government, spending on health care and education.

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V. Exchange Rate Changes and Consumer Price Inflation: 20 Months After the Floating of the Real[1]

A. Introduction

1. This section reviews the impact of exchange rate changes on domestic inflation following the floating of the *real* in January 1999. It updates findings by Schwartz (1999), drawing on more than one year of additional data and experience under inflation targeting, and using a more refined methodology.

2. In the first six months following the floating of the *real* in January 1999, Brazil experienced surprisingly low inflation. With the *real* losing over 30 percent of its value against the U.S. dollar from early January 1999 to June 1999, cumulative consumer price inflation, as measured by the broadest available index (IPCA) that is also used for inflation targeting, amounted to less than 4 percent over the same period. At the time, Schwartz (1999) attributed the low passthrough[2] to consumer prices to three main factors: first, the relatively low percentage share of the overall cost of production affected by exchange rate movements, reflecting the fairly small share of imported inputs in industry; second, the apparent evidence that industries "sacrificed" profit margins by not changing their prices fully in response to the exchange rate shock; and third, some exceptional and seasonal factors, particularly in agriculture, that may have helped to mitigate inflation in the first six months after the *real* was floated.

3. However, already the third quarter of 1999 witnessed an "exchange rate/inflation scare," and the general picture of a low and well-contained passthrough appeared threatened by expectations of significantly higher inflation rates down the road. What in June 1999 had seemed to be an exchange rate that was fairly stable in the range of R$1.70-R$1.80 per U.S. dollar, was suddenly moving toward R$2.00 per U.S. dollar. At the same time, what had been a low average monthly inflation rate of 0.35 percent in the second quarter of 1999, became a rather worrisome average monthly inflation of 0.91 percent in the fourth quarter of 1999. Could it be that the first six months after the floating of the *real* had been misleading?

4. Luckily for Brazil, things began to turn around already in the fourth quarter of 1999, with the exchange rate strengthening again and settling back to about R$1.70–R$1.80 per U.S. dollar, and the 12-month rate of consumer price inflation remaining below 9 percent at end-1999, thereby allowing the BCB to meet its inflation target in the first year of operating within the new monetary policy framework.

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[1] Prepared by Pau Rabanal and Gerd Schwartz.

[2] Passthrough is defined here as the cumulative consumer price inflation relative to the cumulative depreciation of the *real* vis-à-vis the U.S. dollar.

5. Notwithstanding occasional shocks that moved both exchange rates and inflation in one or the other direction, the passthrough from exchange rate developments to inflation has indeed remained fairly low so far in 2000: twenty months after the floating of the *real*, the measured passthrough to consumer prices is less than 28 percent. It is not clear, though, whether this continues to reflect exceptional factors, e.g., the decline in food prices experienced in the first half of 2000, or economic "fundamentals." In addition, given the renewed strength of demand, with real output expected to grow on average by about 4 percent in 2000, it is also unclear to what extent the passthrough can be expected to remain low in the future, particularly since it has relied on the compression of profit margins, which, no doubt, was helped by the fairly weak domestic demand that prevailed in 1999. Clearly, an answer to this puzzle would hold important information for the monetary policy stance under the inflation targeting regime.

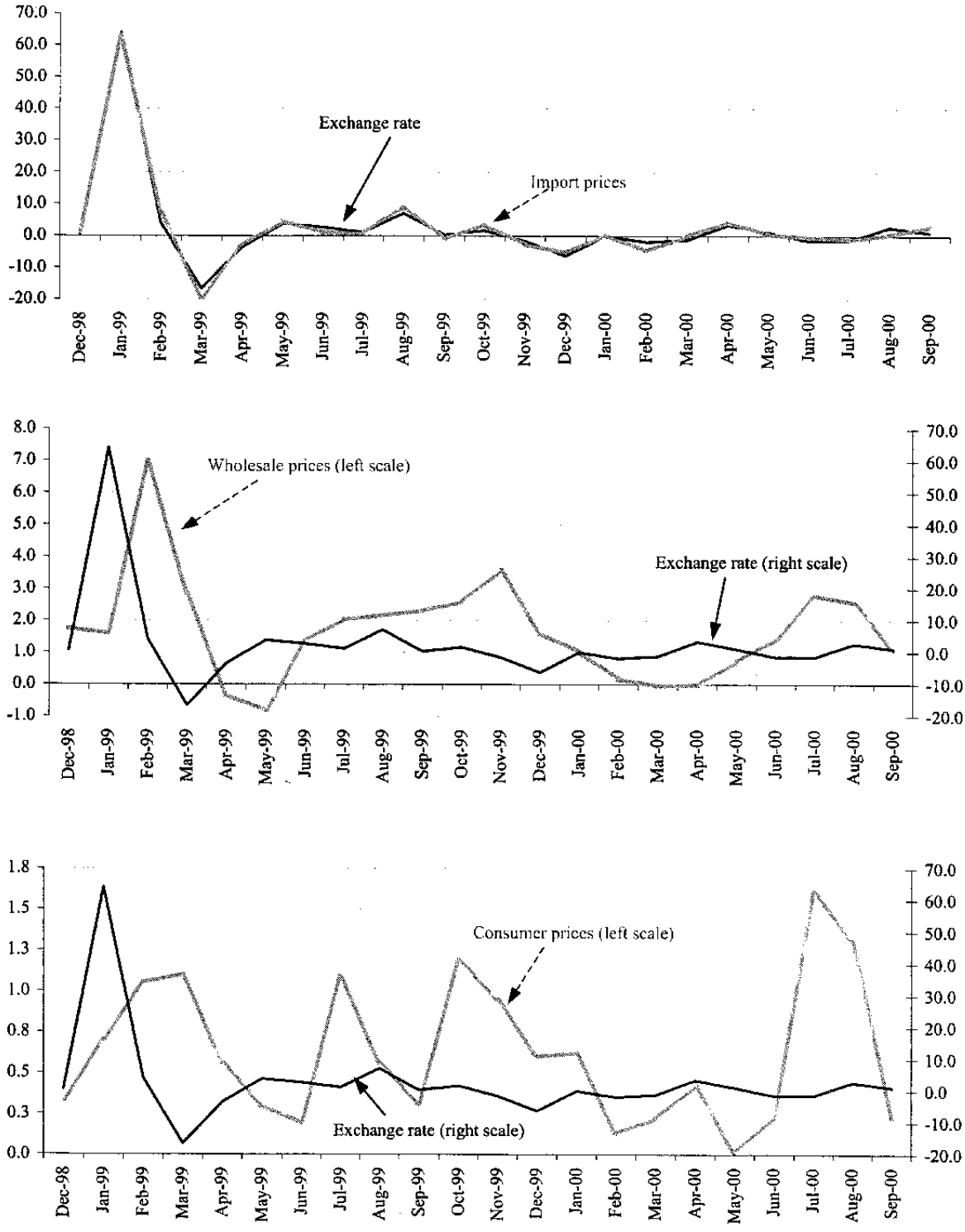
B. General Passthrough Determinants and Some Observations for Brazil

6. A large body of theoretical and empirical literature has reviewed the passthrough from exchange rates to prices. In general, the literature contends that the parameters determining the passthrough can broadly be separated into two categories: initial conditions, and policies implemented following a change in the exchange rate regime. McCarthy's (1999) research, for example, emphasizes the importance of initial conditions. In analyzing the experiences in several OECD economies, he finds that, in general, the passthrough tends to be low and highly correlated with the degree of openness of the economy. In contrast, Borensztein and de Gregorio (1999), who look at 49 episodes of large devaluations find that passthrough experiences differ significantly across countries, and that the policies which were implemented following the change in the exchange rate regime significantly affected the ultimate outcome: 16 percent of all observations had to be excluded from the initial sample because they resulted in hyperinflation, which reflected, among others, an inadequate policy stance. In comparing passthrough experiences in a panel data study of 71 countries, Goldfajn and Werlang (2000) find that the passthrough is higher the longer the time horizon considered, and that it is correlated with the business cycle, the size of the initial real exchange rate misalignment, and the degree of openness of the economy.

7. To explore these issues for Brazil, as an initial exercise, a graphical examination on the extent to which movements in the exchange rate affect other prices in the economy seems useful. Figure 5.1 plots, for the floating exchange rate period, monthly changes in the exchange rate against changes in import unit values (expressed in *reais*);[3] wholesale prices

[3] The series reflects unit values for imports of goods and nonfactor services, as published by FUNCEX, where the original index was transformed using the prevailing exchange rate.

Figure 5.1. Brazil: Monthly Change in Prices (in Percent)



Source: IBGE, BCB, FUNCEX, and Getulio Vargas Foundation.

and consumer prices.[4] Accordingly, after the floating of the *real* in January 1999, we detect some correlation between wholesale prices and the nominal exchange rate with a one-month lag, while consumer price inflation seems to react to significant movements in the exchange rate with a lag of three months. Small movements in the exchange rate do not seem to affect any price indicator. Note that, as shown in Figure 5.1, in all cases the fluctuations in the price indices are much smaller than the fluctuations in the exchange rate, and, overall, the passthrough is fairly small, particularly for consumer prices.

8. Figures 5.2 and 5.3 repeat the same exercise with quarterly and annual changes, respectively. Wholesale prices appear to adjust to exchange rate developments with a one-quarter lag; consumer prices appear to follow a similar pattern, although the correlation is less strong. In Figure 5.3, the correlation between wholesale prices and exchange rates seems to occur at longer lags and be less strong than in the previous figure; as in Figure 5.2, there continues to be a positive lagged correlation between exchange rates and consumer prices.

9. These graphical examinations seem to suggest that there is a clear correlation between exchange rate developments, wholesale prices, and consumer prices. Large changes in the exchange rate seem to have a lagged effect on prices.

10. How strong is the correlation between the exchange rate and prices? Table 5.1 shows cross correlations between changes in the exchange rate, and changes in import unit values (in *reais*) (IMP), wholesale prices (WPI), and consumer prices (CPI) at different time horizons and frequencies, using a sample period from January 1996 to September 2000.[5] Accordingly, there is an immediate, almost full impact of exchange rate changes on import prices, suggesting that Brazil is a price taker in international markets. In general, however, correlations between exchange rate changes and other prices are higher for longer periods, i.e., the effects of exchange rate changes on prices show up more strongly in cumulative changes over longer periods of time than in month-to-month changes. Table 5.1 also seems to suggest a logical chronological sequence of price developments being passed on through the supply chain, where the effect of the exchange rate change on prices peaks first for import

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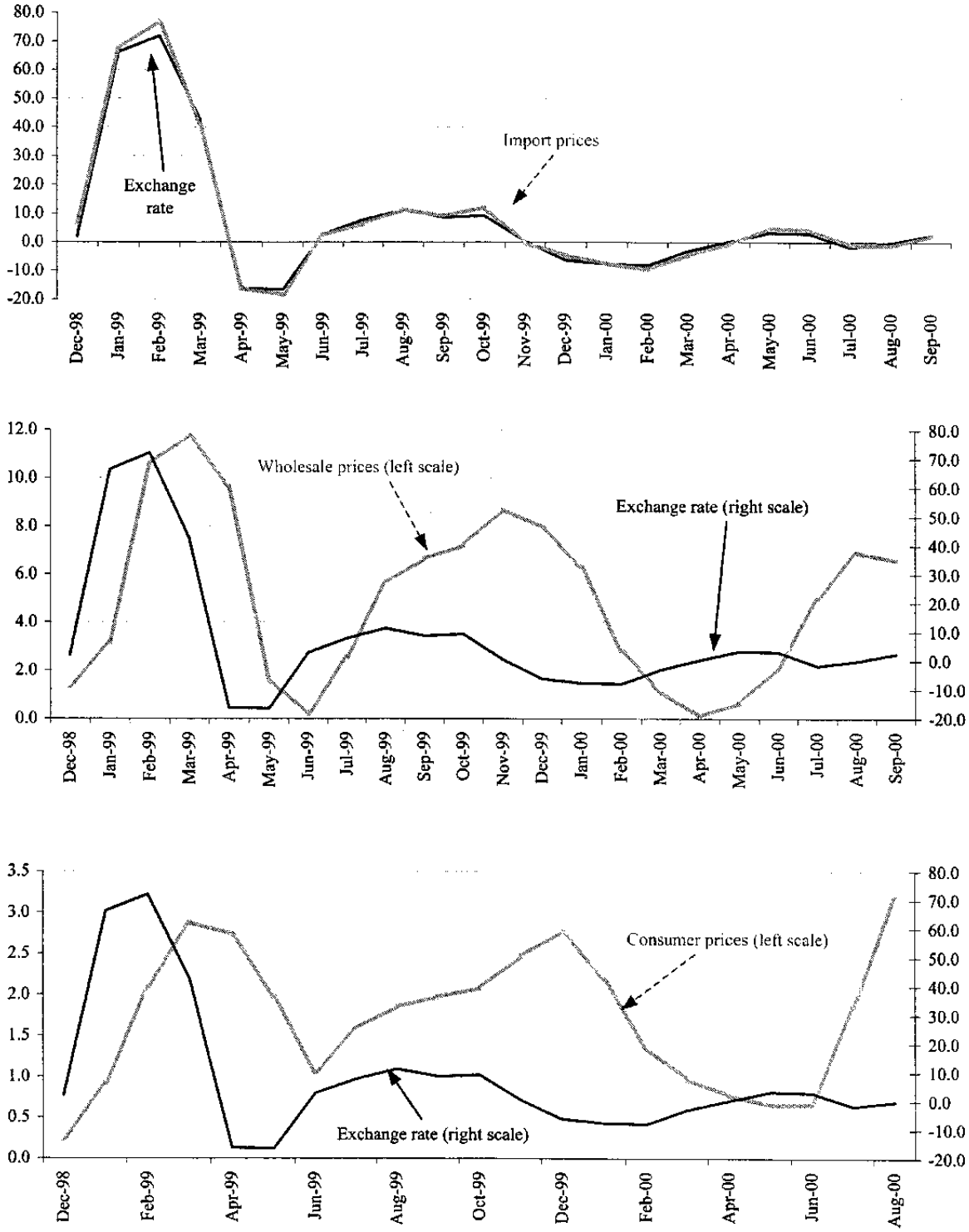
[4] Wholesale prices reflect the wholesale price index (IPA-DI) of the Getulio Vargas Foundation (FGV); an alternative wholesale price index (IPA-OG), also published by FGV, which has a higher component of imported goods than the IPA-DI, delivered very similar results. For a similar comparison, using only the industry component of the IPA-OG index, see IPEA (2000). Consumer price inflation is measured on the basis of the IPCA, published by the IBGE.

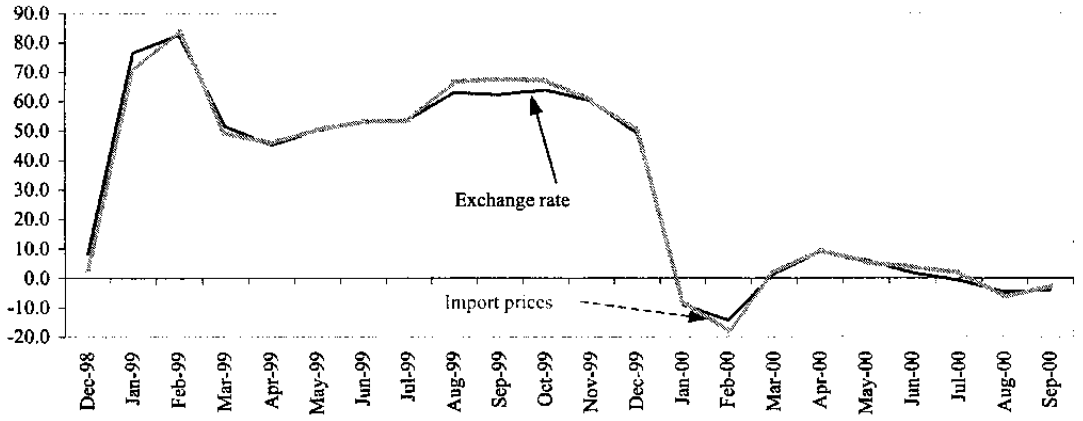
[5] While, ideally, the passthrough should be measured using only data for the floating exchange rate regime that started in mid-January 1999, there are only some 20 observations so far. Using some data from the fixed exchange rate period is likely to bias our estimates toward a low passthrough. Therefore, it reduces the measured impact of the large depreciation following the floating of the *real* in January 1999.

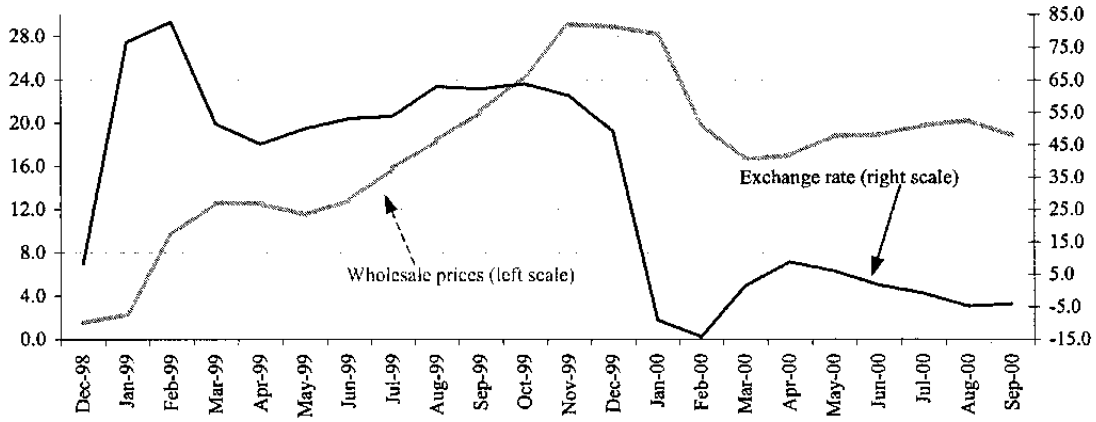
Figure 5.2. Brazil: Three-Month Change in Prices (in Percent)

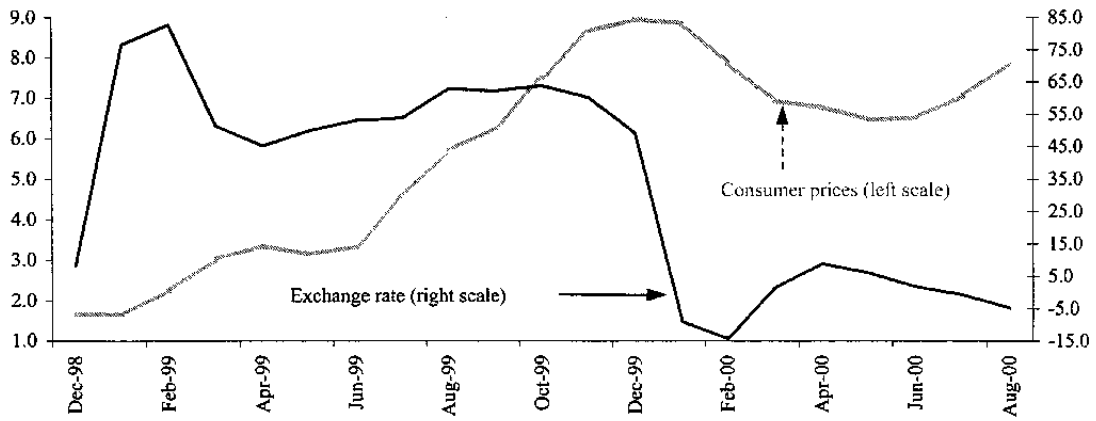


Source: IBGE, BCB, FUNCEX, and Getulio Vargas Foundation.

Figure 5.3. Brazil: 12-Month Change in Prices (in Percent)







Sources: IBGE, BCB, FUNCEX, and Getulio Vargas Foundation.

Table 5.1. Brazil. Cross Correlations Between Changes in the Exchange Rate in Month *t* and Changes in Different Price Indicators in Month *t+k* 1/

Lead *(k)*	Monthly Change			Quarterly Change			Twelve-Month Change		
in Months	IMP	WPI	CPI	IMP	WPI	CPI	IMP	WPI	CPI
0	**0.96**	0.05	0.01	**0.96**	0.35	0.00	**0.96**	0.27	-0.23
1	0.08	**0.68**	0.13	0.59	**0.66**	0.21	0.82	0.47	-0.16
2	-0.29	0.27	**0.23**	0.03	0.53	**0.28**	0.60	0.55	-0.10
3	-0.06	-0.10	0.08	-0.25	0.18	0.17	0.50	0.57	-0.04
4	0.02	-0.18	-0.09	-0.15	-0.10	0.04	0.42	0.58	0.01
5	-0.03	0.02	-0.06	-0.01	-0.07	-0.01	0.34	0.61	0.07
6	-0.01	0.07	0.20	0.05	0.04	0.02	0.29	0.64	0.13
9	0.04	0.15	0.22	0.01	0.33	0.21	-0.03	**0.80**	0.43
12	-0.02	0.05	0.10	-0.19	0.14	0.14	-0.44	0.56	**0.47**
15	0.05	-0.12	0.00	-0.01	-0.21	-0.21	-0.27	0.35	0.36

Source: Authors' estimates.

1/ Refers to data from January 1996 to September 2000, using end-of-month exchange rates. Exchange rate changes are measured on the basis of the R$/US$ rate. The highest correlation in each column is shown in bold. The results did not change significantly when using another starting date for the cross-correlations.

prices (without a lag), then for wholesale prices, and finally for consumer prices. As expected, in the short run, wholesale price changes show a stronger correlation with exchange rate changes than consumer prices, suggesting that, to some extent, exchange rate shocks were absorbed through lower profit margins of wholesalers.

11. Table 5.1 also suggests that, with the correlation of the 12-month rate of change between the exchange rate and prices peaking after about nine to twelve months, the full passthrough of exchange rate shocks seems to occur relatively more rapidly in Brazil than in most industrialized countries that operate with an inflation targeting framework.

12. Following these preliminary assessments we proceeded to evaluate the exchange rate passthrough in a more comprehensive model framework, using a VAR model similar to the one used by McCarthy (1999), and as adapted for Brazil. This allows us to measure passthrough from exchange rate changes to several price indicators at different time horizons, based on impulse response functions that trace the dynamic effects of the system.

13. McCarthy (1999) estimated a six-variable VAR with the following ordering for the endogenous variables: the price of oil in domestic currency, output,[6] the nominal exchange rate (relative to the U.S. Dollar), import price inflation, producer price inflation and consumer price inflation. The idea behind this ordering is that supply and demand shocks are identified by the first two variables. Nominal exchange rate shocks are identified by the third variable, while the other three variables contain sequential shocks that can be attributed to the various stages of the supply chain; this allows us to trace the dynamic effects of a nominal exchange rate shock on all price indicators. The VAR is estimated recursively in a nonstructural way. This estimation procedure allows us to recover the structural shocks, by making use of the Cholesky decomposition of the variance-covariance matrix of the reduced form residuals.

14. To apply McCarthy's VAR methodology for the case of Brazil, two issues needed to be addressed. First, the price of oil (and oil-based products) is an administered price in Brazil. Hence, international oil price developments will not translate immediately to domestic prices. Still, changes in international oil prices will eventually translate into domestic price adjustments, and therefore reflect a relevant supply shock that has to be taken into account. Second, there is no producer price index in Brazil, and a wholesale price index (WPI) has to be used instead. This series is a satisfactory indicator of passthrough at intermediate stages of production, also since it contains a higher percentage of tradable goods than the CPI.[7]

C. Some Statistical Preliminaries

15. To determine the stationarity of the variables in the system, unit root tests were run on the (natural logarithms) of the price of oil in domestic currency, output, the nominal exchange rate, import unit values (in *reais*), wholesale prices, and consumer prices. The null hypothesis of a unit root (i.e., nonstationarity) could not be rejected at the 5 percent level for the price of oil, the nominal exchange rate, import unit values (in *reais*), wholesale prices, consumer prices and output; the null hypothesis of a second unit root was rejected for all series, although it could not be rejected for consumer prices at the 1 percent level. In general, these results suggests that taking the first difference of the various series would induce stationarity.

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[6] In applying Mc Carthy's (1999) model to Brazil, output was proxied alternatively by industrial production, and by a series of monthly output proxies, prepared by the BCB. Both series yielded rather similar results, and we decided to use the monthly series of output proxies, as it seemed more comprehensive.

[7] About 90 percent of the components of the WPI are tradables, while the CPI contains about 50 percent of tradables. Initially we considered including wages in the VAR. However, since the sample suggested that the exchange rage did not Granger-cause wages, and that wages did not Granger-cause price indicators, wages were dropped from the VAR.

16. Next, we ran Granger causality tests for both model specifications (levels and first differences). The exercises focused on Granger causality between the nominal exchange rate and the three price indicators. These tests helped further to determine the dynamic behavior of the variables in the system. We used three lags of each variable on the basis of the results from pairwise regressions, starting from six lags, and eliminating the highest nonsignificant lag.[8] To check the stability of the results over time, separate tests were performed for the period January 1995-September 2000, and for the sub-periods starting in January 1997 and January 1999. The results are shown in Table 5.2.

Table 5.2. Brazil: Granger Causality Tests Between the Nominal Exchange Rate and Three Price Indicators.

	Test on Levels			Test on Monthly Changes			Test on 12-Month Changes		
Sample Period	IMP	WPI	CPI	IMP	WPI	CPI	IMP	WPI	CPI
Jan 1995-Sep 2000	No	Yes	Yes	No	Yes	No	No	No	Yes
Jan 1997-Sep 2000	No	Yes	Yes	No	Yes	Yes*	No	Yes	Yes
Jan 1999-Sep 2000	No	Yes	Yes	No	Yes	Yes	No	Yes	Yes

Source: Authors' estimates.

Note: The table shows Granger causalities between the nominal exchange rate and import unit values (in *reais*) (IMP), wholesale prices (WPI) and consumer prices (CPI), respectively. *Yes* means rejection at the usual 5 percent level of the null hypothesis of no Granger causality running from exchange rates to prices; *Yes** means rejection at a 10 percent level of the same null hypothesis. Granger causality tests for the quarterly changes yielded results that were similar to the monthly changes and are omitted here.

17. The results in Table 5.2 suggest that there is Granger causality running from the nominal exchange rate to wholesale and consumer prices, but no Granger causality running from the nominal exchange rate to import prices. Since these results reflect lagged relationships, they do not contradict the findings of the simple causality exercise, which suggested that there is a strong *contemporaneous* relationship between import prices (in *reais*) and the nominal exchange rate. The exchange rate and import prices (in *reais*) show an almost full contemporaneous correlation, and there is no lagged causal relationship: hence, exchange rate movements provide no guidance for forecasting *future* import prices, which supports the suggestion that Brazil is a price taker in international markets.

18. Granger causality between the exchange rate and wholesale prices and consumer prices is more pronounced when running the test on variable levels ("a more depreciated exchange rate causes a higher price level") instead of changes in variables ("exchange rate changes cause price changes"). The causal links between the exchange rate, the WPI, and the CPI are likely to strengthen with a longer data series for the floating exchange rate regime.

[8] The Granger causality tests for the subperiod January 1999 to September 2000 only used one lag.

D. Estimating the VAR for Brazil

19. The VAR model that was estimated consisted of six variables with the following ordering: the price of oil in *reais*, output, the nominal exchange rate (*reais* per U.S. dollar), import unit values (in *reais*), the WPI (IPA-DI) and the CPI (IPCA). The model was estimated using three lags of the endogenous variables, as suggested by the Granger causality tests; this lag length was sufficient to induce white noise residuals. To account for the floating of the *real* in January 1999, and reduce a possible estimation bias, the model included a dummy variable that takes the value of one for January 1999 and is zero otherwise. The sample period for the model estimates was January 1995 to September 2000. While this covers a relatively long period of fixed exchange rates, discarding pre-January 1999 data would not yield a sufficient number of observations.

20. The same model was estimated in levels ("Model 1") and first differences ("Model 2").[9] This allows evaluating the impact of the *level* of the exchange rate on the *level* of wholesale prices and consumer prices, and the impact of exchange rate changes on changes in wholesale and consumer prices.

21. The columns of Table 5.3 show the actual passthrough from December 1998 onward,[10] and the estimated cumulative passthrough to the price level of a shock in the level of the nominal exchange rate under the two model specifications (levels and first differences).[11] Since the main focus here is on the dynamic effects of a shock to the nominal

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[9] The unit root tests generally suggested to estimate the VAR in first differences. Still, by estimating the VAR in levels, we allow for the possibility of cointegration between variables. Using Johansen's cointegration test in the e-Views econometrics package, we identified three cointegrating relationships between the five variables in the system. While this test is useful in identifying the number of cointegrationg relationships, it does not offer guidance on which variables are actually cointegrated. However, given the evidence on the presence of cointegration, we assume that estimating the VAR in levels is a valid strategy. See Nelson and Plosser (1982), and Sims et al. (1990) for a discussion on estimating VAR models when series are nonstationary and possibly cointegrated.

[10] The passthrough is measured here by $PT_{t,t+j}=P_{t,t+j}/E_{t,t+j}$, where $PT_{t,t+j}$ denotes the cumulative passthrough after j months, $P_{t,t+j}$ the cumulative change in the price level after j months, and $E_{t,t+j}$ is the cumulative change in the nominal exchange rate after j months. As presented here, the passthrough is measured based on changes in the R$/US$ rate, i.e., a change in the exchange rate from R$1.2 per U.S. dollar to R$1.8 per U.S. dollar implies a depreciation of 50 percent, i.e., (1.8/1.2-1)*100. As measured by Schwartz (1999), the same change would have implied a depreciation of 33.3 percent , i.e., (1.2/1.8-1)*100.

[11] For the specification in first differences, monthly responses were accumulated to obtain the cumulative response of the levels of the variables. We estimate the VAR in both cases with

(continued...)

Table 5.3. Brazil: Actual Passthrough and Passthrough Estimates (in Percent)

	Actual Passthrough Since December 1998			Model Estimates			
				Model 1 (Levels)		Model 2 (First Differences)	
Months	WPI	CPI	CPI/WPI	WPI	CPI	WPI	CPI
1	2.5	1.1	0.44	7.3	1.2	17.9	4.3
3	27.7	6.8	0.24	38.7	8.4	64.1	16.6
6	25.8	8.5	0.33	41.1	11.0	74.7	29.1
9	32.8	10.2	0.31	49.7	15.0	70.8	34.9
12	58.8	18.2	0.31	56.9	18.3	67.7	37.8
18	67.7	21.9	0.32	63.8	22.2	65.3	41.5
20	79.3	27.5	0.35	64.8	23.0	64.7	42.0
24	...	...	...	66.3	24.3	64.0	42.8
36	...	...	...	68.6	26.4	63.3	43.5
Cumulative Passthrough Relative to Total Passthrough over 20 Months (in Percent)							
1	3.1	4.0	...	11.3	5.4	27.6	10.1
3	34.9	24.6	...	59.8	36.6	99.1	39.6
6	32.5	31.0	...	63.4	47.6	115.5	69.3
9	41.4	37.0	...	76.6	65.0	109.5	82.9
12	74.1	66.2	...	87.8	79.4	104.8	89.8
18	85.4	79.7	...	98.4	96.6	100.9	98.6
20	100.0	100.0	...	100.0	100.0	100.0	100.0
24	...	...	...	102.2	105.4	98.9	101.7
36	...	...	...	105.8	114.9	97.9	103.5

Source: Authors' estimates.

1/ Cumulative percentage deviations of prices from their long-run values in response to a 1 percent standard deviation shock in the nominal exchange rate.

exchange rate to wholesale prices and consumer prices, we omit the results for all other variables.

22. In general, the two model estimates (levels and first differences) are rather different. Interestingly, the estimates from Model 1 (levels) appear closer to the actual passthrough since the *real* was floated than the estimates from Model 2 (first differences).

23. For **wholesale prices**, the results from Model 2 suggest that the passthrough occurs fairly rapidly and in a nonmonotonic fashion, with the cumulative passthrough peaking at

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three lags of every endogenous variable. Therefore, when we estimate the VAR in first differences, we are effectively using up to four lags of every endogenous variable.

75 percent already after six months and then dropping to 63 percent after 36 months. This is inconsistent with the actual passthrough experience so far, which has occurred more slowly and continued to increase cumulatively. Actually, a 75 percent passthrough to wholesale prices was reached only after about 19 months, not already after 6 months as predicted by Model 2. In general, the estimates of Model 2 appear counterintuitive, also because they seem to imply that wholesalers have a significant degree of market power to pass external shocks through to retailers fairly rapidly. This makes it all the more difficult to understand why then the cumulative passthrough to wholesale prices would decline after six months, as predicted by Model 2.

24. In contrast, the passthrough estimates from Model 1 are by and large more in line with actual observations, although the actual passthrough is overestimated for the first nine months and underestimated thereafter. Both model estimates suggest that roughly two-thirds of the initial exchange rate shock can be expected to have been passed through to wholesale prices after 20 months; this compares to a somewhat higher actual passthrough of just below 80 percent.

25. For **consumer prices**, both model specifications suggest that the cumulative passthrough increases monotonically over time, reaching, depending upon model specification, 26 percent to 44 percent after 36 months (Table 5.3). Again, the passthrough estimated by Model 2 was stronger and occurred much faster than in Model 1. Accordingly, the estimates from Model 2 suggest that, already after six months, the cumulative passthrough reaches a level that exceeds the cumulative passthrough under Model 1 after 36 months.

26. Again, Model 1 tracked the actual experience in the first 20 months better than Model 2. After 20 months, Model 1 predicts that roughly 23 percent of the initial exchange rate shock would have been passed through to consumer prices, which compares to 28 percent actual passthrough. Also, as suggested in Table 5.3, most of the passthrough to consumer prices occurs during the first year. While the cumulative passthrough to consumer prices continues to increase through 36 months, the additional increases beyond the first 20 months are fairly small.

E. Concluding Remarks

27. This section has analyzed the passthrough from exchange rate developments to prices in Brazil during the first 20 months after the *real* was floated in January 1999. While the actual passthrough has been moderate since January 1999, it would seem interesting to know whether model-based estimates would generate a similar outcome, or whether the low actual passthrough may be considered an outlier. In modeling the passthrough, this section has applied an approach first suggested by McCarthy (1999). McCarthy's (1999) model has the advantage that it tries to isolate the effect of exchange rate fluctuations from other factors (e.g. oil price shocks), so that the measured change in prices is considered to be only partially due to exchange rate factors. The model suggests that different prices react rather differently to the same exchange rate shock.

28. The analysis presented here shows that import prices (in *reais*) have a strong concurrent relationship with exchange rate shocks, reflecting the fact that Brazil is a pricetaker in international markets. At the same time, developments in the exchange rate do not explain future developments in import prices, which depend on conditions in international markets, in which Brazil is a price taker.

29. Both actual observation and model estimates suggest that, as a rough rule of thumb, after 18 months about two-thirds of the initial exchange rate shock has been passed through to wholesale prices, and one third of these two-thirds (or two-ninth of the initial shock) has been passed through to consumer prices. Hence, the passthrough to wholesale prices occurs more rapidly and is more pronounced compared to the passthrough to consumer prices.

30. The model estimates are comforting in the sense that they suggest that, 20 months after the floating of the *real* in January 1999, the initial shock has worked itself through the system already, given relatively short transmission lags. In addition, the estimates suggest that the relatively small fluctuations in the foreign exchange rate that have been experienced following the initial shock are unlikely to have a sizeable impact on consumer prices, and are more likely to be absorbed along the supply chain.

31. However, the relatively large difference in the passthrough to wholesale prices and to consumer prices suggests that, up to now, much of the absorption of exchange rate shocks has taken place somewhere along the supply chain, and must have led to a significant compression of profit margins.

32. Profit margins may not remain compressed forever, and two issues need to be kept in mind in this regard. First, a significant pickup in domestic demand could render the model estimates unstable, and result in a significantly larger actual passthrough. With much of the period for which data were used relating either to the fixed exchange rate regime or to a trough in the business cycle, it is unlikely that estimates based on historical data can provide good guidance on likely future outcomes. This calls for continued caution, particularly concerning the stance of monetary and fiscal policies.

33. Second, regardless of the stage of the business cycle, another large exchange rate shock, as unlikely as it may seem, may not necessarily have the same quantitative effect as the shock that occurred in January 1999, particularly considering that profit margins along the supply chain have already been compressed. Yet, if it were to happen, it could hit prices more quickly and more strongly than before, which may leave little time for a policy response.

34. These considerations suggest that the model estimates presented in this section may not be stable over time. In particular, as the output gap closes, the passthrough from exchange rate developments to prices, particularly consumer prices, may be significantly stronger than what has been observed in the past.

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VI. Testing the Effectiveness of the Overnight Interest Rate as a Monetary Policy Instrument[1]

A. Introduction

1. This section analyzes the effectiveness of the overnight interest rate (the "SELIC" rate) as a monetary policy tool in Brazil. In particular, it addresses the question whether the SELIC rate that the Brazilian Central Bank (BCB) uses as a main policy tool is a good indicator of the monetary policy stance, and what effects it has on other market interest rates, output, and prices.[2] Two main hypotheses are tested. First, with the annualized SELIC rate currently at 16.5 percent and average annual bank lending rates above 50 percent—implying both fairly high lending spreads and real interest rates—it may be argued that, apart from signaling, small changes in the SELIC rate, say by some 50 or 100 basis points, probably do not matter much. Second, as a corollary, one may also argue that the more significant effects of monetary policy, such as the recent pickup in bank lending, have been brought about by reductions in bank intermediation spreads (or simply lending spreads) and the ongoing structural reforms in the banking sector that have increased competition. If this were correct, one could ask if the SELIC rate has had a significant impact on these lending spreads, or whether it were other factors, like recent reductions in the reserve requirement on demand deposits, that have been shaping the effects of monetary policy.

2. These hypotheses are first discussed in some detail, largely using circumstantial evidence, and then tested using a simple vector-autoregression (VAR) model that traces the dynamic macroeconomic effects of monetary policy shocks that result from either changes in the SELIC rate or from changes in lending spreads (e.g., via reductions in the reserve requirement on demand deposits). VARs are a simple and convenient method for summarizing the dynamic relationship between variables. Also, once estimated, VARs can be used to simulate the response over time of any variable in the set to either an "own" disturbance or a disturbance to any other variable in the system.

3. This section is structured as follows. Following this introduction, we review the transmission mechanism of monetary policy; then we move on to discussing lending spreads and interest rates in Brazil; next, we present some statistical preliminaries for the VAR model, which is followed by a discussion of the results of the VAR model. The last part of this section presents some preliminary conclusions.

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[1] Prepared by Pau Rabanal and Gerd Schwartz.

[2] The SELIC rate is the relevant interest rate in the overnight interbank market when public sector debt instruments are used as collateral, and it is the most important reference rate in the Brazilian economy; also see Zandamela (1998).

B. The Transmission Mechanism of Monetary Policy—A Review

4. The traditional view of the transmission mechanism of monetary policy has focused on the effects of real interest rates. If prices are sticky, an increase in short-term nominal interest rates will increase real interest rates and the real cost of capital. This, in turn, is likely to adversely affect spending on durable goods, such as fixed investment and inventories, and spending on housing and consumer durables. Also, in an open economy, monetary policy actions affect the trade balance (and therefore aggregate demand) through their effect on nominal and real exchange rates. In turn, changes in aggregate demand affect the level of production in the short run, and prices in the long run.

5. Bernanke and Gertler (1995), and Bernanke, Gertler, and Gilchrist (1998) noted that there is also a "credit channel" that complements the traditional channel by focusing on endogenous developments in credit markets that propagate and amplify shocks to the macroeconomy. The key mechanism involves the link between the "external finance premium" (the difference between the cost of funds raised in credit markets, and the opportunity cost of a firm's internal funds) and the net worth of potential borrowers (i.e., borrowers' liquid assets plus collateral value of illiquid assets less outstanding obligations).[3]

6. To illustrate the credit channel, suppose the central bank increases nominal interest rates. The traditional view predicts that firm profits drop because of a contraction in sales and increased costs of financing. Simultaneously, however, the firms' asset value is likely to be reduced because future revenues are discounted at higher rates. Hence, firm balance sheets deteriorate, net worth is reduced, the amount of collateral is also reduced, and the probability of default on outstanding loans increases ("balance sheet effect"). At the same time, monetary policy affects lending spreads through the supply of credit relative to other forms of financing ("bank lending channel"). Specifically, banks will take into account the adverse impact of monetary tightening on their clients' balance sheet, and accordingly tighten their supply of credit, thereby increasing lending spreads. As bank credit and other forms of financing are not perfect substitutes, firms cannot simply offset a reduction in bank credit, e.g., by issuing their own debt. As a result, some investments will not to be undertaken, which further depresses aggregate demand, output, and net profits ("bank lending effect"). Hence, the credit channel magnifies monetary policy actions by affecting firms' balance sheets, net worth, collateral, risk of default, and, ultimately, the external finance premium.[4]

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[3] The external finance premium may broadly be viewed as bank lending spreads; changes in interest rates tend to change the external finance premium in the same direction. For a more detailed review of the credit channel in Brazil, see Zandamela (1998).

[4] A similar argument can be applied to consumption. The traditional effect predicts that higher interest rates will provide incentives for savings and disincentives for consumption. However, individuals engaged in the purchase of durable goods, such as housing, will have to repay their debt at a higher interest rate. This higher debt burden will cause a decrease in the consumption of other goods.

7. This general framework seems useful for studying monetary policy in Brazil, particularly given the prevailing large lending spreads. In particular, within this framework, it seems straightforward to consider the impact of monetary policy on economic activity, where "monetary policy" comprises both the SELIC rate and measures that affect lending spreads.[5] In studying the macroeconomic effects of monetary policy, we abstract from the effects that monetary policy has on credit aggregates.[6]

C. Brazil: Bank Intermediation And Interest Rates

8. In this part we present largely circumstantial evidence on some main elements in the transmission mechanism for monetary policy in Brazil. In particular, we look at the role of the banking system in the monetary transmission mechanism and speculate on the role of the SELIC and of lending spreads in affecting the credit channel.

9. With the high and variable inflation that prevailed in Brazil in the 1980s and early 1990s, banks operated in a favorable environment: effective real interest rates were often negative; the real value of bank liabilities was eroded by inflation, and the inflation-induced high liquidity facilitated the repayment of loans. However, banks centered their operations not around lending, but around the "float," which was inflation-related revenue based on various types of low cost liabilities (e.g., taxes collected, demand deposits, collateral against loans) that paid little or no interest for several days. Banks usually invested these almost free resources in short-term government securities that paid high nominal interest rates; in high inflation years, like 1991-92, about 40 percent of bank revenues were inflation-related.[7]

10. While the introduction of the *Real* plan in mid-1994 brought about macroeconomic stability, in and by itself it did little to reduce real interest rates or government (re)financing needs. As a result, banks, until most recently, felt no urgency to expand their domestic lending operations, and, as a result, the degree of competition for markets and customers remained low. More recently, with declining real interest rates, liberalization of banking sector activities, including opening to foreign competition, and an active program for

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[5] In equilibrium, the marginal productivity of capital equals the risk free real interest rate. The external finance premium may be approximated by the spread between the risk free interest rate and the effective lending interest rates charged by banks. The risk-free interest rate can be approximated, alternatively, either by the overnight interest rate or by the cost of funds for banks, both of which are fairly similar.

[6] While some of the VAR literature has tried to disentangle "balance sheet effects" and "bank lending effects" of the credit channel, it is difficult to separate the two effects from aggregate data, as pointed out by Bernanke and Gertler (1995). It is simply assumed here that there is a "credit channel" that goes from the SELIC rate and from lending spreads to overall economic activity, and an attempt is made to quantify the overall importance of this effect.

[7] A recent issue of the *Quarterly Review of Economics and Finance* contained several good papers on these and other banking issues in Brazil, including Baer and Miles (2000), Baer and Nazmi (2000), Makler (2000), Ness (2000) and Studart (2000). Also see Nazmi (1999).

restructuring and privatizing public banks, Brazilian banks have started to actively develop their lending portfolios.[8] Against this background, it may be argued that, during much of the period since 1994, changes in the SELIC rate per se might not have had much impact on banking operations or economic activity in general, and that the functioning of the credit channel remained largely subdued.

11. Figure 6.1 plots the evolution of the annualized SELIC rate and annual average bank lending rates for individuals, enterprises, and a weighted average of the two.[9] Accordingly, the three lending rates have evolved almost in parallel, suggesting that they all react to the same events, and the spread between bank lending rates and the SELIC rate has remained fairly constant. Only since late 1999, when the BCB started to address the determinants of high lending spreads and pursue options for reducing these, spreads have started to decline.

12. A recent study by the BCB (1999) identified five main sources of the high lending spreads: the default rate for loans, the tax burden, administrative costs, profit margins in the banking industry, and minimum reserve requirements for various type of deposits. Most of these are not directly controlled by the BCB. The study concluded that loan defaults are the most important determinant of lending spreads, accounting for 35 percent of the total spread; followed by taxes (25 percent); administrative costs (22 percent); and bank profit margins (18 percent). The study defined lending spreads as the difference between effective bank lending rates and the banks' effective cost of funds (*taxa de captação*) rather than the effective remuneration on demand deposits, and, hence, did not directly quantify the impact of changes in reserve requirements on demand deposits. Still, it acknowledged that lowering reserve requirements would induce a reduction in lending spreads.

13. The four factors whose impact on lending spreads was quantified—loan defaults, taxes, administrative costs, and profit margins—largely reflect macroeconomic, legal, or "cultural" factors. For example, loan defaults reflect macroeconomic conditions and the business cycle, but also moral hazard that may be created by imperfections in the legal system. Similarly, administrative costs reflect administrative efficiency, while profit margins reflect the degree of competition in the banking industry as well as demand factors (in this case, particularly government financing needs, which resulted in a typical situation of crowding out). Given the high spreads, the stock of credit to the private sector has remained consistently low in Brazil, and at end-1999 amounted to about 29 percent of GDP. In contrast, in Asian economies, like Thailand or South Korea, loans accounted for more than 130 percent of GDP following the 1998 crisis, but even in the United States they account for

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[8] This view is also expressed in various trade publications. See, for example, BBA Icatu's Monthly Report on Banks, of September 2000, which, under the header "Are Banks Heading to New Frontiers?" discusses bank efforts to develop their client base.

[9] See BCB (1999) for a description of the methodology to compute these interest rates. Data reflect a survey of 17 major banks operating in Brazil.

Figure 6.1: The Evolution of Annual Interest Rates: The SELIC and Average Bank Lending Rates (Percent)

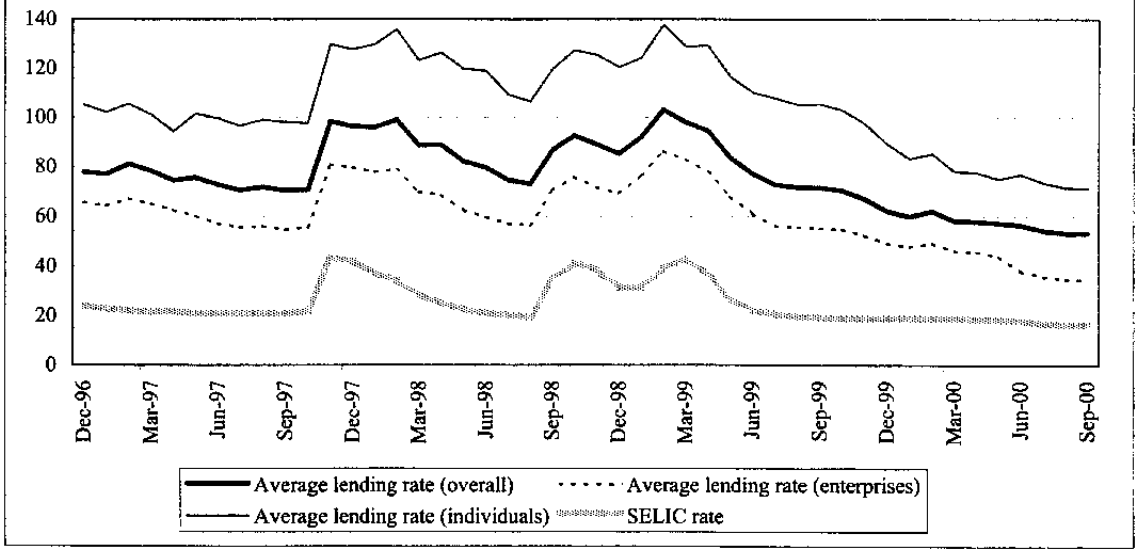
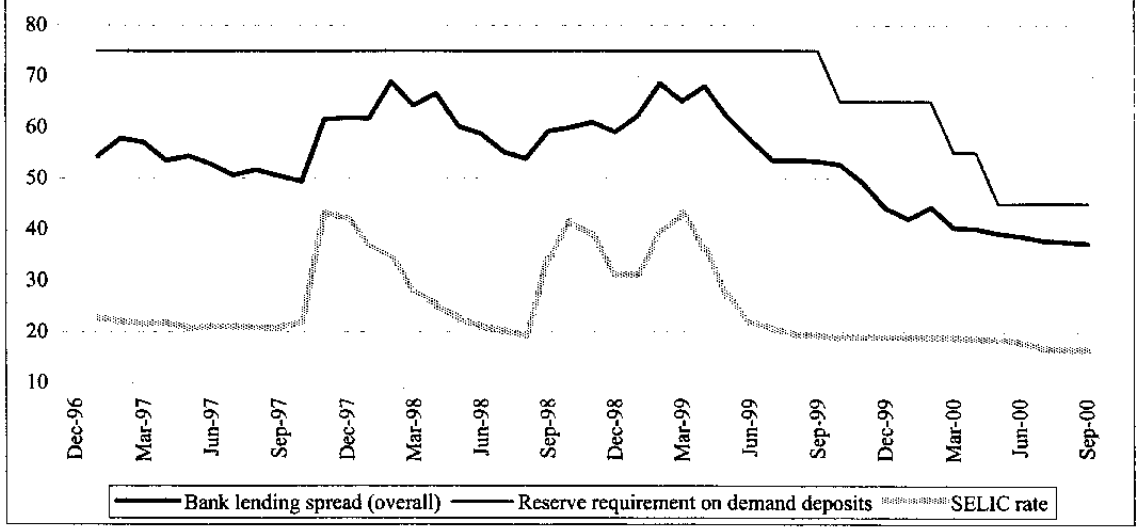


Figure 6.2. The Evolution of Bank Lending Spreads (Percent), the SELIC rate (Percent), and Reserve Requirements (Percent of Demand Deposits)



Source: Central Bank of Brazil.

over 60 percent, and in the United Kingdom for about 100 percent of GDP.[10]

14. To help analyze these issues, Figure 6.2 plots the evolution of the reserve requirement on demand deposits and of lending spreads, as published by the BCB. The reserve requirement on demand deposits was kept at 75 percent between January 1997 and October 1999;[11] since then, the BCB has gradually reduced it to its current level of 45 percent, thereby increasing loanable funds by over R$10 billion (about 1 percent of GDP) and allowing for a potential reduction of lending spreads. Figure 2 suggests that lowering reserve requirements on demand deposits may indeed have helped to reduce lending spreads. As a rough check on this relationship we ran a simple OLS regression of lending spreads (SPREAD) on the SELIC rate and the reserve requirement on demand deposits (*RR*), covering the period since January 1997. This resulted in the following estimate (with t-statistics in parentheses): [12]

$$(1) \qquad SPREAD_t = \underset{(6.4)}{0.50}\, SELIC_t + \underset{(20.3)}{0.59}\, RR_t \qquad R^2 = 0.82 \qquad n = 44$$

15. The coefficients on both the SELIC rate and the reserve requirement are fairly large and significant at any level. This simplistic first estimate would suggest that a reduction in the reserve requirement on demand deposits by 10 percentage points reduces lending spreads by 5.9 percentage points, while a reduction in the SELIC by the same 10 percentage points reduces lending spreads by 5 percentage points.

16. More generally, in addition to reducing reserve requirements, there are several other measures that can be expected to reduce lending spreads. These would include tightening fiscal policies, strengthening property rights, fostering competition in the banking industry, and measures for reducing bank administrative costs. Fiscal adjustment, for example, reduces the government's demand for credit, thereby allowing interest rates to fall; it also increases macroeconomic stability by reducing inflationary expectations and increases the economic growth outlook. In an environment of solid macroeconomic performance and protection of property rights, the loan default rate should decrease, adding further to a reduction of lending spreads. Also, increasing competition should foster efficiency in the banking sector; further reducing reserve requirements should reduce lending spreads by increasing the availability of loanable funds. Finally, reductions in bank administrative costs may also be brought about by central bank actions that facilitate the operations of the banking system.

17. These initial considerations suggest that lending spreads are determined by several factors, including also the SELIC rate, but they do not address the issue of the effectiveness of monetary policy via the SELIC rate. While Figure 6.1 showed that movements in the

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[10] Also see Averbug and Giambiagi (2000), and Baer and Nazmi (2000).

[11] Previously, since mid-1994, the reserve requirement for demand deposits had been reduced gradually from initially 100 percent.

[12] A constant term was not significant, and was therefore excluded from the regression.

SELIC immediately imply affect all market interest rates, and while Figure 7.2 and the simple regression above showed that they also affect lending spreads, one may still question if a reduction in the SELIC rate by 100 or so basis points has a significant effect on the credit channel when average borrowing rates have remained above 50 percent while inflation has been running in the single digits. These issues will be explored further below.

D. Modeling the Transmission Mechanism: Statistical Considerations

18. To explore further the role of the SELIC rate in the transmission mechanism, a simple VAR model was used to trace the dynamic effects of monetary policy. While the main focus here is on the effects of shocks to the SELIC rate, we also evaluate the macroeconomic effects of reducing the spread between the SELIC rate and other market interest rates (by, for instance, reducing the reserve requirement on demand deposits, reducing taxes on financial transactions, or allowing for more liquidity in the system). VARs are generally a convenient method for summarizing the dynamic relationship between variables. Once estimated, they can be used to simulate the response over time of any variable in the set to either an "own" disturbance or a disturbance to any other variable in the system. Before proceeding to estimate a VAR, several standard econometric issues need to be addressed, particularly stationarity of the variables and causality.

19. The variables included in the VAR presented here are the SELIC rate (SELIC), the average bank lending spread for individuals and enterprises (SPREAD), real output as represented by a series of monthly GDP proxies (OUTPUT),[13] the consumer price index (as measured by the IPCA that is also used for the purpose of inflation targeting) (IPCA), and money (M1). The reason for having a monetary aggregate in the VAR is to include a money market equilibrium (LM-type) equation in the model. The VAR is applied to monthly data from January 1995 to August 2000, yielding 68 observations. While the *Real Plan* was

[13] Qualitatively, the various results presented here were largely invariant to using either the monthly series of GDP proxies or industrial production; see Appendix 2 for data sources. Also, note that the model estimated here uses actual output rather than a measure of the output gap. The Brazilian economy has performed well below its potential for several years, and the available econometric techniques are unlikely to yield a realistic picture of the output gap. Also, some of these techniques are problematic conceptually. For example, it is common to compute an output gap as the residual between actual output and potential output, where the latter is estimated with a Hodrick-Prescott filter. However, this filter is double-sided, and, in taking moving averages of past, current, and future levels of output to compute potential output, it violates one of the main assumptions of OLS (and VARs estimated using OLS), namely that future values of output are uncorrelated with current shocks. As a result, estimates employing the technique would be biased and inconsistent. But even other alternatives, e.g., estimating the output gap as the residual of a regression of output on a constant, a linear trend, and a quadratic trend, would not yield a realistic picture of the output gap in an economy that has already for some time been performing below its potential.

introduced in July 1994, the January 1995 starting date was chosen to assure that variables had stabilized following the period of hyperinflation that had prevailed earlier.[14]

20. For each series included in the VAR, unit root tests were performed to check for stationarity.[15] The null hypothesis of existence of a unit root could not be rejected at the five-percent level of significance for OUTPUT, SELIC, SPREAD, and M1, using either the Augmented Dickey-Fuller (ADF) or Phillips-Perron (P-P) tests. For the IPCA, the presence of a unit root was rejected at the five-percent level of significance under the P-P test; this result probably owes to the low power of the P-P test, and we assume a unit root to be present, as suggested by the ADF test. The hypothesis of a second unit root was rejected for all series except for the IPCA at the five-percent level of significance. Hence, for all series except for the IPCA, taking the first difference would induce stationarity. For the IPCA, the presence of a unit root in the first difference was rejected at the five-percent level of significance, using both the ADF test and the P-P test, but not at the 1 percent level. Overall, the data suggest that the first differences of OUTPUT, SELIC, SPREAD, and M1 are stationary, and that the second difference of the price level (i.e., the acceleration rate of prices) is also stationary.

21. Next, pairwise Granger causality tests for levels and first differences were run to check the dynamic behavior of the variables in the system. Table 6.1 shows the Granger causality tests for the model in levels and first differences. The variables in the original model, which we will refer to as the "level" specification are OUTPUT, SELIC, SPREAD, the inflation rate as indicated by the IPCA, and M1. The causality tests were carried out for the level specification and the first difference of the level specification. We chose to run the tests for lags of one, two, and three months.

22. Three results stand out from the Granger causality tests on the model in levels, independent of the number of lags. First, the SELIC rate Granger-causes lending spreads (SPREAD) but not vice versa, although, curiously, there is some indication of Granger-causality running from SPREAD to SELIC at a two-period lag, which may be spurious. Note that Granger causality tests do not pick up contemporaneous causality. Figure 6.1 showed a strong contemporaneous correlation between the SELIC rate and bank lending rates, and it seems likely that changes in the SELIC rate cause changes in lending rates (and therefore lending spreads) contemporaneously, and not with a lag.

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[14] The results were somewhat sensitive to the starting date. Earlier starting dates (e.g., August or September 1994) changed many of the results; later starting dates did not. This suggests that some variables took time to stabilize following the introduction of the *Real Plan*.

[15] The relevant statistics for the unit root tests are presented in Appendix I.

Table 6.1. Granger Causality Tests 1/

	Levels (Lag Length in Number of Months)			First Order Differences (Lag Length in Number of Months)		
	One	Two	Three	One	Two	Three
Impact of output						
Output ⇒ SELIC rate	No	No	No	No	Yes	Yes
Output ⇒ spread	No	No	No	No	No	No
Output ⇒ inflation	Yes	Yes	Yes	No	No	No
Output ⇒ money	Yes	Yes*	Yes*	No	No	No
Impact of the SELIC rate						
SELIC rate ⇒ output	Yes	Yes	Yes	Yes	Yes	Yes
SELIC rate ⇒ spread	Yes	Yes	Yes	No	Yes*	No
SELIC rate ⇒ inflation	Yes	Yes	Yes*	No	No	No
SELIC rate ⇒ money	No	No	No	No	No	No
Impact of spread						
Spread ⇒ output	Yes	Yes	Yes	Yes	Yes*	Yes
Spread ⇒ SELIC rate	No	Yes	No	No	No	No
Spread ⇒ inflation	Yes	Yes	Yes	Yes	Yes	Yes*
Spread ⇒ money	Yes*	No	No	No	No	No
Impact of inflation						
Inflation ⇒ output	Yes*	No	No	No	No	No
Inflation ⇒ SELIC rate	No	No	No	No	No	No
Inflation ⇒ spread	Yes*	No	No	No	No	No
Inflation ⇒ money	No	No	Yes	No	No	No
Impact of money						
Money ⇒ output	Yes	No	No	No	No	No
Money ⇒ SELIC rate	No	No	No	No	No	No
Money ⇒ spread	No	Yes*	Yes*	No	Yes	Yes
Money ⇒ inflation	Yes	Yes	Yes	No	No	No

1/ The variables included in the model in levels are those in left-hand column; for the first-order differences specification, the results refer to first order differences of the variables in the left-hand column; e.g., the first-order difference of output being the change in output, and the first-order difference of inflation being the change in inflation, i.e., the acceleration rate of prices. The table shows the results of Granger causality tests at one to three month lags, with the direction of causality shown by the arrow. "No" means the Null hypothesis of no Granger causality could not be rejected; "Yes" means rejection of the same hypothesis at the 5 percent significance level; "Yes*" means rejection of the same hypothesis at the 10 percent level.

23. Second, both the SELIC rate and lending spreads Granger-cause inflation and output. As a result, there seems to be a transmission channel of monetary policy that goes from adjustments in the SELIC rate and lending spreads to economic activity. This relationship holds at all lags, suggesting that monetary policy actions via the SELIC rate or via lending spreads have a significant effect on economic activity. At the same time, there is no strong indication of Granger causality running from the inflation rate to either the SELIC rate or to lending spreads. This is probably due to the fact that the SELIC rate reacts to changes in inflation expectations rather than inflation outcomes; since the SELIC impacts also on

lending spreads, the same would also apply to these spreads. Also, during the fixed exchange rate regime that prevailed until January 1999, monetary policy was aimed at maintaining the exchange-rate parity. Hence, prior to January 1999, we would only expect inflation to have impacted on the SELIC rate to the extent that inflationary pressures were threatening the sustainability of the exchange rate regime, which was generally not the case.

24. Third, there is strong evidence that money Granger-causes inflation. The relationship between output and inflation is less clear, with some Granger-causality running in both directions. There is some evidence for the standard money demand relationship, with Granger causality running from both output and spreads to M1, although the latter is fairly weak and with equally weak Granger causality running the other way around. Finally, Granger causality between output and inflation is less clear with causality running in both directions. The fact that there is some indication of Granger causality running from money to output with a one period lag, suggests that money may have at least a short term effect on real variables. However, this result should be interpreted with care, considering the significant remonetization of the Brazilian economy in the context of the *Real* plan.

25. Granger causality tests on first differences of the model show that most causalities vanish. For instance, there is no longer any Granger causality between changes in output and changes in inflation. However, changes in either the SELIC rate or lending spreads continue to Granger-cause changes in output; output changes in turn Granger-cause changes in the SELIC rate with a lag. Also, changes in lending spreads are shown to Granger-cause inflation, and changes in money supply Granger-cause lending spreads with a lag.

26. The unit root tests suggested that, to have stationary variables, the model should be estimated in first differences, i.e., where all variables are expressed in first differences of their levels, and the price level is expressed in second differences. However, the fact that many Granger causalities vanish when taking first differences, may indicate overdifferentiation: while the series become stationary, possible cointegrating relationships may no longer hold.[16] While having stationary series is important in other econometric contexts, it is not clear that it is strictly necessary in a VAR system, which to some extent, is driven by cointegrating relationships between variables, irrespective of their stationarity.[17]

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[16] Using Johansen's cointegration test, three cointegrating relationships between the five variables in the system were identified. While this test is useful in identifying the number of cointegrating relationships, it does not offer guidance on which variables are actually cointegrated. Still, given the evidence on the presence of cointegration, we assume estimating the VAR in levels to be a valid strategy.

[17] See the Doan (1996), Nelson and Plosser (1982), and Sims et al. (1990) for a discussion on estimating VARs when series are nonstationary and possibly cointegrated. In general, in this paper, estimating first differences of the original model yielded larger standard errors and rendered most of the effects statistically not significant.

E. Analyzing the Monetary Policy Transmission Mechanism in Brazil

27. The VAR model was estimated in a nonstructural, recursive way, for both the level specification and the first differences specification.[18] As just argued, working with nonstationary variables is frequently harmless when cointegration relationships are present. Also, working with nonstationary variables in a VAR context frequently also convenient: as stationary variables are often first or second order differences of levels, they are somewhat harder to interpret. In our case, for example, it may be easier to discuss the impact of interest rate shocks on output, than to discuss the impact of shocks to the change in interest rates on changes in output. Since the differences between the two specifications were, for the most part, not significant, only the results from the level specification are discussed here.[19]

28. In contrast, the ordering of variables in a VAR is always important, since it has strong implications for the identification of macroeconomic disturbances. In particular, it is crucial that variables enter in a logical sequence.[20] There would seem to be two main logical orderings of variables for our purposes. The first ordering would be "output, inflation, SELIC rate, lending spreads, money," with the rationale being that exogenous supply and demand shocks affect prices and output, and these (plus intrinsic shocks) in turn affect the SELIC rate and lending spreads; money then accommodates, given the value of all other variables. The second ordering would be "SELIC rate, lending spreads, output, inflation, money," implying that overnight interest rates and lending spreads are determined in anticipation of supply and demand shocks; money would adjust, given the behavior of all other variables in the system.

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[18] Except for the prices, which enter as the inflation rate in the "level specification" and as changes in inflation in the "first differences specification" of the model.

[19] Qualitatively, the various results presented here were not particularly sensitive to the following changes: using lending rates instead of lending spreads; using industrial production instead of the output proxy; using base money (monthly average) or M2 instead of M1; using quadratically detrended output ("output gap") instead of output levels; and using lending spreads for firms instead of overall lending spreads. When using wholesale prices (IPA-DI) instead of consumer prices (IPCA), the impact on inflation of interest rate shocks and lending spreads became completely insignificant. Finally, two minor changes in the estimation procedure did not affect the main results: the first involved including a dummy variable indicating changes in the reserve requirements for demand deposits; the second involved including the reserve requirement as an exogenous variable.

[20] In a sense, a VAR amounts to regressing separately every endogenous variable against lags of all other endogenous variables using Ordinary Least Squares (OLS). Then, using the Cholesky decomposition of the variance-covariance matrix of the errors, the underlying shocks are recovered from the reduced form residuals. However, the decomposition of the shocks heavily relies on the ordering of the variables in the system. Economic theory and some priors about the contemporaneous relationship between variables need to be used in deciding the ordering of the variables.

29. With "reduced form" VAR equations it is not possible to distinguish pure supply and demand shocks unless some long-run restrictions are imposed, as, for example, in Blanchard and Quah (1989). An alternative would be to estimate a structural VAR, as, for example, Bernanke (1986) did. Still, shocks to the SELIC rate and to lending spreads, which are a main focus of this section, are perfectly identified assuming that shocks to the SELIC rate also affect lending spreads contemporaneously, but not vice versa. In the discussion that follows, we interpret shocks to the SELIC as "monetary policy shocks" and shocks to lending spreads "other financial market shocks." The model was estimated using three lags of every endogenous variable. The choice of the number of lags is consistent with the Granger causality tests presented above, and seems sufficient to induce white noise residuals.

30. Figure 6.3 shows the impulse responses for the VAR with the first ordering suggested above, and Figure 6.4 shows the same for the second ordering.[21] The impact of shocks to the SELIC rate and to lending spreads are the crucial point of this exercise

31. In Figure 6.3, increases in both the SELIC rate and in lending spreads cause significant negative deviations of output from its long run value. Both magnitude and persistence of the output response are larger for shocks to the SELIC rate than for shocks to lending spreads; however, the output response peaks after five to seven months for both. Figure 6.3 also confirms a strongly positive and persistent reaction of lending spreads to the SELIC rate, which peaks after four months. The fact that the effects taper off only slowly may be related to the fact that, in the past, upward adjustments in the SELIC rate (and consequently lending spreads) were implemented rapidly and usually in crises situations, whereas downward adjustments were made over a period of many months. Hence, the initial upward adjustment in the SELIC rate had a persistent effect on subsequent levels of lending spreads. There is also a significant, but relatively small feedback in the opposite direction, where the SELIC rate responds positively to movements in lending spreads; this somewhat counterintuitive response also peaks after four months. A possible explanation for this may be that it reflects the strong contemporaneous correlation between the two variables, as suggested in Figure 6.1. Also, the apparent feedback from lending spreads to the SELIC rate is fairly small, and strictly speaking, only significant between lags three and five.

32. According to these results, increases in the SELIC rate would have both a direct adverse impact on output, and a significant but smaller adverse indirect impact on output via lending spreads. This transmission mechanism generally peaks after four to six months, attesting to a rapid response of output to interest rate shocks.

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[21] Figure 6.5 shows an alternative specification where (using the same ordering of variables as in Figure 6.3), lending rates are used instead of lending spreads. In general, as mentioned in footnote 19 above, the results were not significantly sensitive to either using lending spreads or lending rates.

Figure 6.3. Brazil: Impulse Response to One Standard Deviation Innovations (± 2 Standard Errors)--First Ordering of Variables

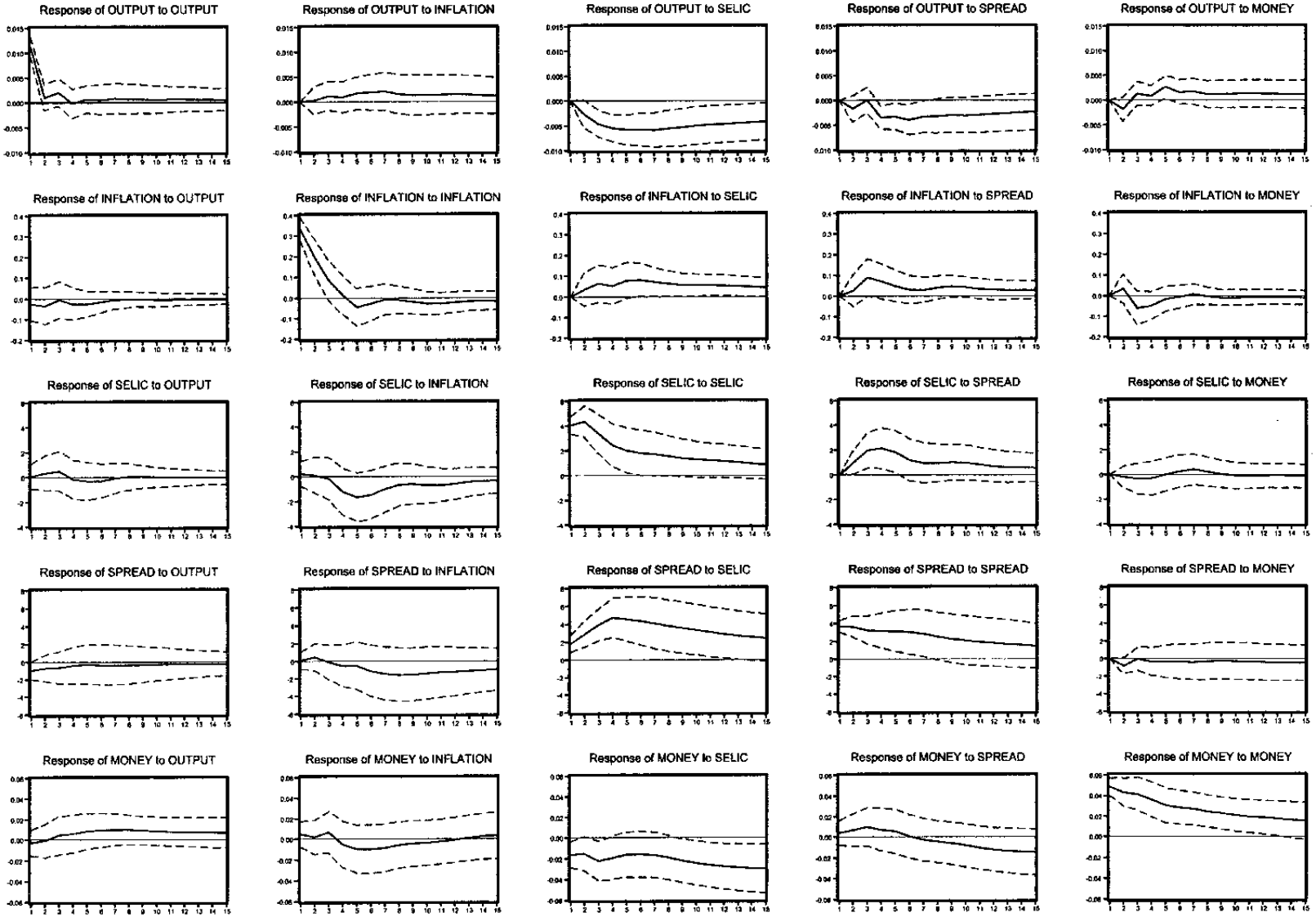


Figure 6.4. Brazil. Impulse Response to One Standard Deviation Innovations (± 2 Standard Errors)--Second Ordering of Variables

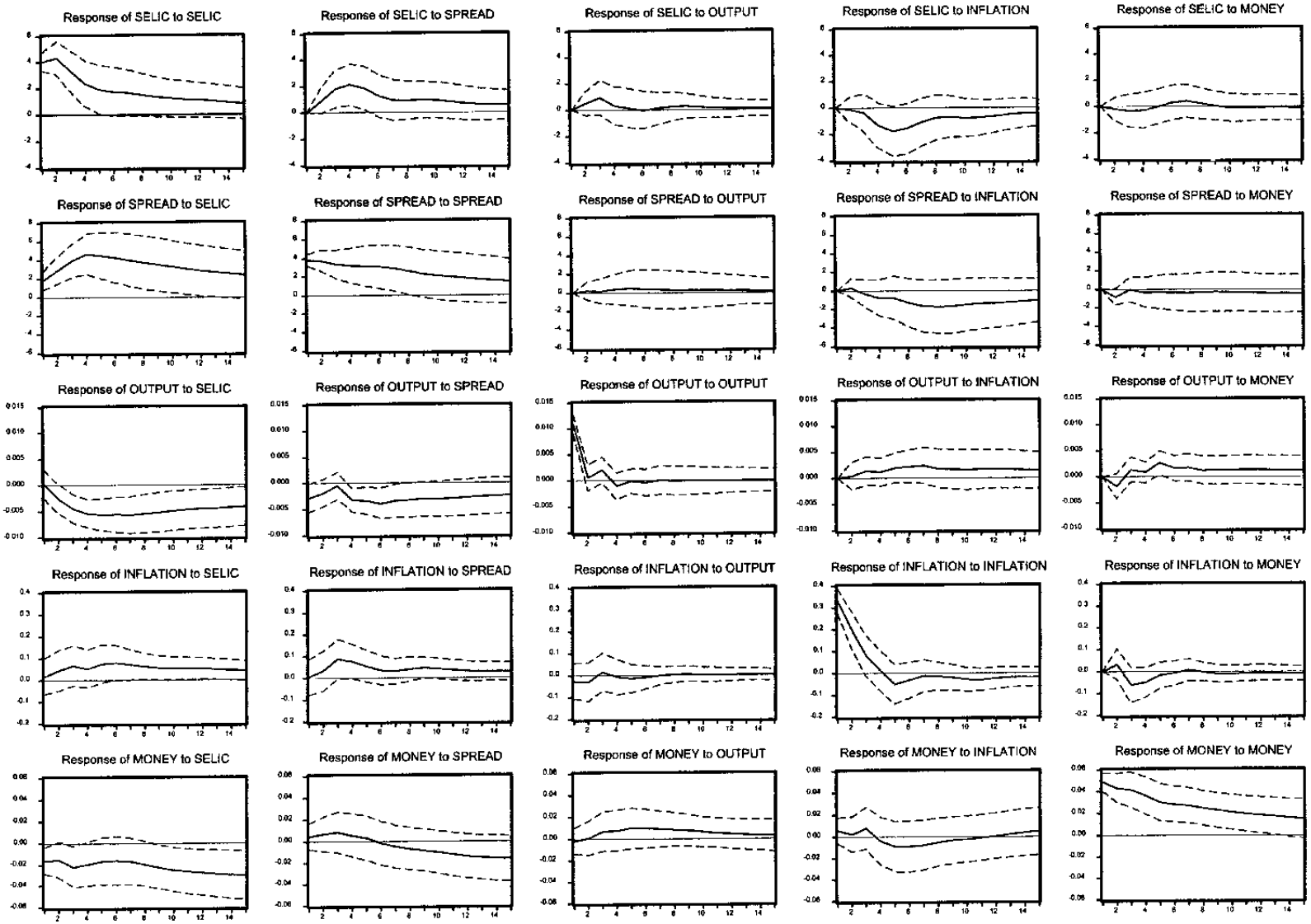
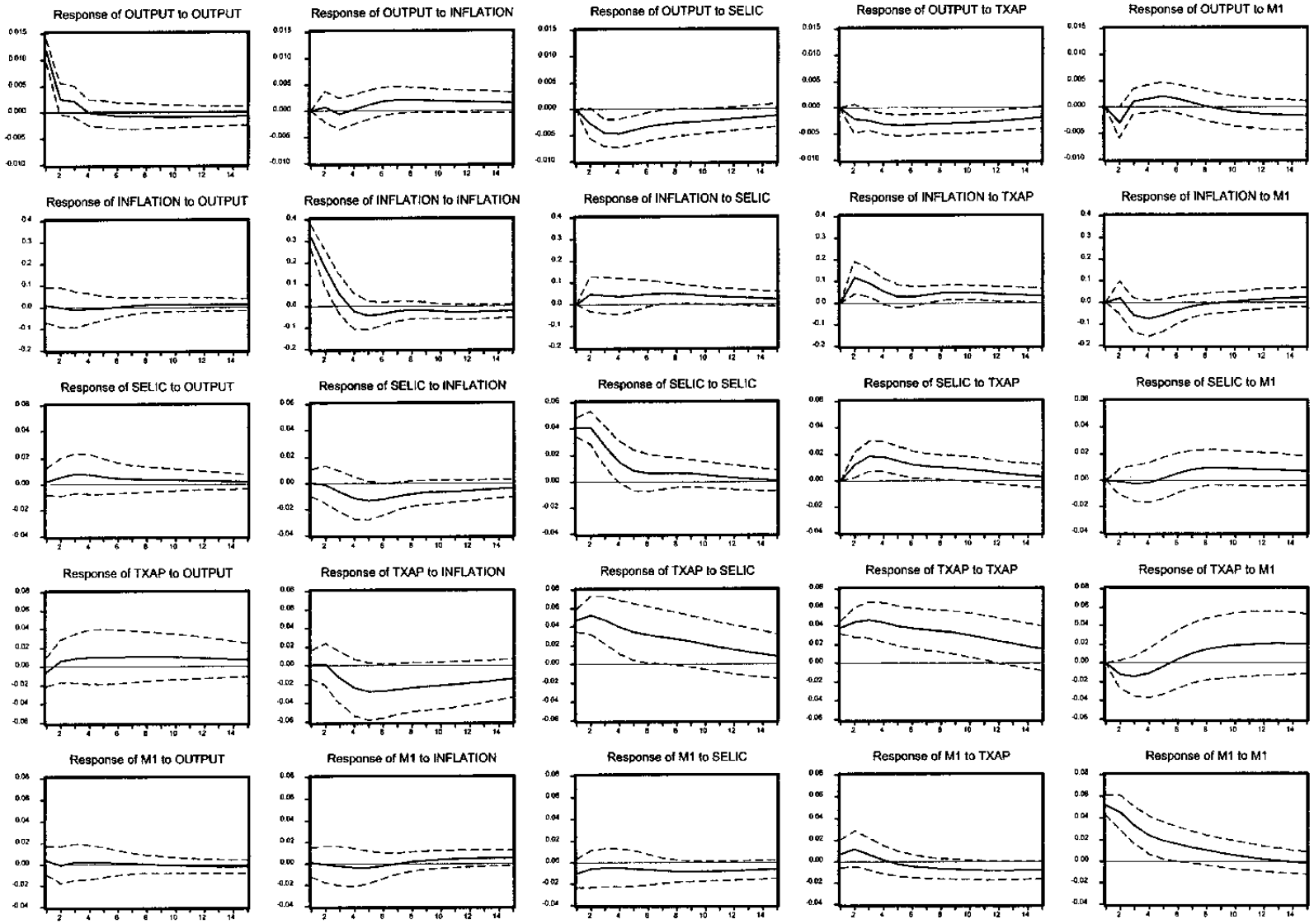


Figure 6.5. Brazil: Impulse Response to One Standard Deviation Innovations (± 2 Standard Errors)--Using Lending Rates (TXAP)



33. Although not strongly significant, Figure 6.3 also reveals a somewhat puzzling response of inflation to changes in either the SELIC rate or lending spreads, where increases in either of these two variables seems to result in higher inflation. This effect is not uncommon in the VAR literature, and is referred to as the "price puzzle effect," which describes a situation where inflation and interest rates seem to move in the same direction as a result of interest rates reacting to inflation expectations. For example, if future inflation is expected to increase, say due to the expected impact of a bad harvest on food prices, the central bank may tighten monetary policy in anticipation, which may mitigate the increase in inflation, but interest rates and inflation would probably still move in the same direction.[22]

34. The results in Figure 6.3 also suggest that shocks to output have a significant effect on output itself, but that the persistence is rather low. This may reflect the low, below potential, output growth rates in recent years, and may not be stable once output starts to grow closer to its potential rate. All other effects of output shocks are insignificant. Similarly, shocks to the inflation rate cause a significant but low-persistence increase in subsequent inflation rates. Again, all other effects of shocks to the inflation rate are not significant.

35. The response of money to other variables in the system is insignificant except for a negative response of money demand to increases in the SELIC rate, as suggested by economic theory. A contraction in money demand, in turn, appears to have a small adverse effect on output, although this is not strictly significant. The other variables in the model do not seem to be affected significantly by changes in money, although inflation seems to drop slightly following a contraction in money, with the reaction peaking after three months. As already mentioned, the small reaction of inflation to money may simply reflect the remonetization of the Brazilian economy under the *Real* plan, where the money supply initially increased rapidly; it may also reflect that money aggregates were a "passive" element under the fixed exchange rate system that prevailed until January 1999.

36. Figure 6.4 shows the impulse response when the second variable ordering is used. While the SELIC rate now enters the model first, the results do not change much. Increases in either the SELIC rate or lending spreads have a strong and persistent adverse effect on output, with the impact of the SELIC rate again being much stronger. The price puzzle is still present, although it remains not fully significant. The SELIC rate continues to have an adverse impact on money. Shocks to output, inflation, and money have the same effects as in

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[22] See also Grilli and Roubini (1996), who emphasize that the price puzzle might arise from inflationary expectations. To separate monetary policy shocks from endogenous responses to inflationary pressures, they suggest to use the spread between the risk-free short-term and long-term interest rates. This might be a good measure of real interest rate changes since it captures movements of short term rates not due to inflation. Unfortunately, Brazilian data series for long-term government bonds are fairly short. Using the spread between the SELIC rate and the implicit interest rate for one year swaps ("Pre x DI" for 12 month contracts) as a proxy for the long term risk-free interest rate did not resolve the price puzzle.

the previous ordering, which suggests that the model is fairly robust. As in Figure 6.3, Figure 6.4 continues to show a two-way feedback between the SELIC rate and lending spreads, which is surprising, also given the results from the Granger causality tests.

37. Overall, the VAR results presented here convey a consistent picture concerning the effectiveness of monetary policy. First, they show that positive shocks to either the SELIC rate or to lending spreads adversely affect output, and do so with a delay of at least a quarter. Second, they also show that shocks to the SELIC rate have a relatively stronger and more persistent impact on output than shocks to lending spreads. Third, they show that shocks to the SELIC rate also have a significant and persistent indirect effect on output, through their effect on lending spreads.

F. Concluding Remarks

38. This section has explored the effectiveness of the overnight interest rate in the monetary transmission mechanism in Brazil. In particular, it analyzed the effects of movements in the overnight interest rate (the SELIC rate) and in bank intermediation spreads (or lending spreads) on overall economic activity. In September 2000, annualized lending spreads averaged 37 percent, compared to an annualized SELIC rate of 16.5 percent, implying that the SELIC rate accounted for not even one third of average bank lending rates.

39. In general, given the sheer magnitude of lending spreads in Brazil, it could be argued that monetary policy via the "direct" channel, i.e., changes in the SELIC rate, may be less effective than monetary policy via various "indirect" channels, i.e., the determinants of lending spreads, which include, for example, administrative costs, minimum reserve requirements, banking system liquidity, loan default risks, the degree of competition in the banking sector, and taxes.

40. Two main hypotheses were tested in this regard. First, given still relatively high real interest rates and the fact that the largest part of bank lending rates consists of lending spreads, it may be argued that, apart from signaling, small changes in the SELIC rate, say by some 50 or 100 basis points, probably do not matter much. Second, one may also argue that the more significant effects of monetary policy, such as the recent pickup in bank lending activities, have been brought about by reductions in lending spreads and ongoing structural reforms in the banking sector that have increased competition.

41. As it turns out, however, both hypotheses can safely be refuted. The evidence presented in this section, which ranges from casual empiricism and circumstantial evidence to a more formal analysis using a VAR model, suggested that movements in the SELIC rate do matter, and that the SELIC rate itself is also an important determinant of lending spreads. In particular, movements in the SELIC rate have a significant impact on all market interest rates, and therefore on lending spreads.

42. To analyze the broader issue of the effectiveness of monetary policy via the SELIC rate, a simple VAR model was used. In particular, the model was meant to quantify the importance in the monetary transmission mechanism of movements in the SELIC rate and

the bank lending rate, and comprise both the "traditional channel" and the "credit channel" of monetary policy. The estimation results provide compelling evidence that changes in the SELIC rate have a powerful, i.e., significant and persistent, effect on output and lending spreads, and are probably a more effective tool of monetary policy than other policies that affect lending spreads. The model results appeared robust, and, in particular, were not significantly affected by changes in the definition of variables or the ordering of variables in the VAR model.

43. At least two small puzzles remained. First, it seemed difficult to explain why, as suggested by the VARs, bank lending rates would feed back into the SELIC; this effect was largely absent from the Granger causality tests. A possible explanation may be that the result could owe to the fact that the BCB has been implementing simultaneously measures to reduce both lending spreads and the SELIC rate. Second, there was also a small and not very significant "price puzzle" effect, where increases in either the SELIC rate or lending spreads seemed to increase inflation. The interpretation offered here was that interest rate increases may have coincided with exogenous shocks that increased inflationary expectations, such as, exchange rate developments, oil price changes, administered price changes, or minimum wage changes. For example, the SELIC rate was increased when the Real was floated in January 1999, which was followed by a period of somewhat higher inflation than had previously been the case. More generally, with changes in the SELIC rate determined by changes in inflation expectations (where the latter is usually correlated with inflation outcomes), it may well appear to be the case within a simple time series framework that interest rate increases go hand in hand with higher inflation. This paradox may already explain part of the price puzzle that showed up in the VAR. More detailed research in these two issues would clearly be desirable.

RESULTS OF THE UNIT ROOT TESTS

44. For the unit root tests, the monthy series for real output (OUTPUT), consumer prices (IPCA), wholesale prices (IPADI), and M1 were transformed by taking the natural logarithm. The real output series was also deseasonalized using the X11-additive procedure. The sample period used was January 1995 to August 2000. Two standard tests were used, the Augmented Dickey-Fuller (ADF) test, and the Phillips-Perron (P-P) test.

Table 6.A1. Unit Root Test Results

	ADF	Additional Regressors	P-P	Additional Regressors	ADF	Additional Regressors	P-P	Additional Regressors
SELIC	-1.51	2	-1.61		-6.44 *	1	-6.22 *	
SPREAD	-1.79	c,1	-1.81	c,2	-7.30 *	c	-7.32 *	c,1
OUTPUT	-2.16	c,1	-3.10	c,t	-12.6 *	c	-13.1 *	c
IPCA	-3.28	c,t,1	-4.01 **	c,t	-3.47 **	c,t,1	-3.49 **	c,t
M1	-2.27	c,t	-2.53	c,t	-8.89 *	c	-8.82 *	c

Symbols "*" and "**" mean rejection of the null hypothesis of unit root at the 1 percent and 5 percent levels of significance, respectively, under either the Augmented Dickey-Fuller test (ADF) or the Phillips-Perron (PP) tests. The numbers in the "Additional Regressors" column refer to the number of lagged terms of the endogenous variable that were included in the test; c means a constant was included in the test; t means a time trend was included in the test.

MODEL SPECIFICATION AND DATA SOURCES

45. Different model specifications were tried out initially. Based on the considerations discussed in this section, the model was defined to include the SELIC rate; the overall lending spread for enterprises and individuals; the natural logarithm of seasonally adjusted real output; inflation (IPCA), as defined by the first difference of the natural logarithm of the price level; and the natural logarithm of money (M1).

46. Monthly (end-of-period) data for the annualized overnight interest rate (SELIC), the various bank lending spreads, base money, and M1 (end-of-period) were obtained from the various BCB press releases; the general methodology for collecting the lending rate data is described in BCB (1999). The series for M2 was defined as M1 plus time and savings deposits; notably it excludes public debt instruments, that are included in the national definition of M2. Data on the nominal exchange rate of the *real* against the U.S. dollar were also obtained from the BCB. The model was run with various alternative specifications of these variables. For example, using average bank lending rates instead of bank lending spreads, did not alter the general conclusions presented in this section; similarly, the outcome was largely indifferent to whether M1 or M2 was used.

47. Output was proxied by a series of monthly GDP proxies, prepared by the BCB, and, alternatively by industrial production, as obtained through IBGE (Brazilian Statistical Institute). Both series were deflated using the general price index (IGP-DI). Working with the series of monthly GDP proxies seemed an improvement over the industrial output series as it also takes into account other productive sectors. However, qualitatively, the two variables yielded fairly similar results.

48. Consumer price inflation (IPCA) was taken directly from the Statistical Institute (IBGE). The index provides information on consumer prices in 11 metropolitan regions for families earning between 1 and 40 minimum wages. The IPCA is the main index for the BCB's inflation targeting framework. Alternative price indices that were tried out, particularly wholesale prices (IPA-DI and IPA-OG), were obtained from the Getulio Vargas Foundation. Since the IPCA is used for inflation targeting, it was decided that it would be the best index to use for the purpose of this section.

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VII. Forecasting Inflation in Brazil: How Useful are Time Series Techniques?[1]

A. Introduction

1. The numerous price indices that are produced by a variety of Brazilian institutions reflect the country's history of high inflation, and suggest that inflation concerns still weigh heavily in Brazil's collective memory. With cumulative inflation, as measured by one of the consumer price indices (INPC), reaching 6,550 percent during 1980–84, 573,018 percent during 1985–89, and 32,258,701 percent during 1990–94, the cumulative 49 percent that were registered during 1995–99 appeared uncharacteristically low from a historical perspective. Five years of consistently low inflation apparently were not long enough to wipe out memories of hyperinflation and of the anxieties and behavioral peculiarities that came along with it. Toward this background, it seemed almost natural that the choice of the new nominal anchor following the floating of the *real* in January 1999 fell on inflation itself. A few additional indicators of inflation have been added since then,[2] which would seem to safeguard employment opportunities for Brazil's inflation forecasters for the foreseeable future.

2. As is natural under inflation targeting, the Brazilian Central Bank (BCB) has been in the forefront of inflation forecasting. Since the transmission channel of monetary policy usually takes several months, if not years, to fully work its way through the economy, the monetary authorities need to be forward-looking. Sources of pressure on the price level of the economy have to be identified as early as possible, so that the monetary authorities can take action preemptively and keep inflation at targeted levels. Early identification of inflationary pressures and early corrective action usually avoid higher costs of disinflation later on.

3. Since the start of the inflation targeting regime, the BCB has been publishing in its regular *Quarterly Inflation Reports (QIRs)* forecasts for inflation at different horizons that represent the institution's best estimate at the time. The main tool used to produce these forecasts has been a small-scale structural macroeconomic model, although the BCB has also developed various other tools, such as leading indicators of inflation.

4. In this section, we compare the inflation forecasting power of various models, including the BCB's own model. In particular, we explore the inflation forecasting power of time series models, including simple univariate models, "classical" vector autoregression (VAR) models, and Bayesian vector autoregression (BVAR) models. BVARs, in particular, provide an alternative approach to inflation forecasting that has yet to be explored by the BCB. Several other central banks, such as the Federal Reserve Bank of Minneapolis, where

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[1] Prepared by Pau Rabanal and Gerd Schwartz.

[2] This includes various preview indicators, such as the mid-month indicator of the index used for inflation targeting (IPCA), and various newly-developed indicators of core inflation.

this forecasting tool was first developed, or the Bank of Spain,[3] have been using BVARs successfully as an inflation forecasting tool and as a complement to structural macroeconomic models. Considering that inflation targeting in Brazil has only been in effect for five full quarters, for the time being the application of any statistical or econometric forecasting tool to Brazilian data has to rely also on data from the period prior to the change in the monetary policy regime in January 1999. In applying these various time series techniques to Brazil, the analysis in this section focuses on the accuracy of out-of-sample forecasts, and relative performance of the models vis-à-vis the forecasting tools used by the BCB. Following the BCB's presentation in its *QIRs*, we perform several out-of-sample forecasts. Special attention is given to short-term forecasts, particularly to one-month-ahead and four-month-ahead forecasts.

B. Inflation Forecasts of the Central Bank of Brazil—A Brief Review

5. Since the beginning of publication in June 1999, each *QIR* has provided quarterly forecasts of inflation that are based on the BCB's small-scale structural model (SSM)—the BCB's main tool for inflation modeling and for policy simulation and analysis. The BCB's structural macroeconomic model, which was discussed in the *QIR* of March 2000, and also in Bogdanski et al. (2000), aims at capturing the main relationships between key variables in the transmission mechanism. The model includes an aggregate demand equation, an aggregate supply equation, an interest rate rule, and an exchange rate equation that are estimated using standard econometric techniques. The model's projections are based on simulations; these can be carried out rather flexibly once the basic model structure has been estimated. Based on these simulations, the BCB has published in each of its *QIR*, a central quarterly projection for future inflation, as well as confidence bands for that projection which depend on an assumed probability distribution. These simulations include different assumptions about the evolution of the endogenous variables of the model (e.g., the nominal interest rate, and variables that affect the exchange rate, such as the risk premium and the U.S. Federal Funds rate), and about possible exogenous shocks (such as the evolution of oil prices, food prices, fiscal variables, minimum wages, and adjustments of administered prices).

6. The forecast horizon in the BCB's *QIR* has ranged from four quarters (in the first *QIR* of June 1999) to ten quarters (in the *QIR* of June 2000). As the SSM is fairly new still, even short-term forecasts have sometimes been subject to significant errors. For instance, using a constant SELIC rate of 19 percent and data up to August 1999, the September 1999 *QIR* projected the 12-month rate of inflation for December 1999 at 7.4 percent, while the actual outcome was 8.9 percent, which, when the report was published, was assumed to be outside of the 50 percent confidence interval. Also, the June 2000 *QIR*, using data through May 2000 and a constant SELIC rate of 17.5 percent, did not fully anticipate the impact on consumer prices of various adjustments in administered prices and of adverse weather conditions which jointly caused a temporary spurt in inflation in July and August of 2000. This left the 12-

[3] See, respectively, Litterman (1984), and Ballabriga, Álvarez González, and Jareño (2000).

month inflation rate for September 2000 outside of the 40 percent confidence interval established in the June 2000 *QIR*.

7. In addition to the forecast for future quarters, the more recent *QIRs* also show a forecast for the current quarter. When the *QIR* is released at the end of a quarter, only the values for the first two months of the current quarter are known, but the full quarter result will only be known about two weeks after the report is released. For example, the June 2000 report included forecasts starting with Q2 2000: inflation for April and May 2000 were already known when the report was released at end-June 2000, but June 2000 inflation was not. The quarterly forecast for the current period can be derived in at least two possible ways. First, it can be done by using the small-scale structural model itself, which, as it is a quarterly model, would not take into account the information on inflation for the first two months of the quarter. Alternatively, a separate monthly forecasting tool can be used, and the projected value for the current month can be added to the known values for the two previous months.

8. The BCB's other main approach for projecting future inflation is based on leading indicators of inflation. The general concept was presented in the March 2000 *QIR*, and a more detailed discussion is contained in Chauvet (2000) and Chauvet et al. (2000). A main purpose of the leading indicators approach is to project the timing of inflation turning points ("peaks and troughs"), but leading indicators can also be combined with inflation in a bivariate VAR process to yield linear forecasts of inflation. Leading indicators do not attempt to capture structural relationships between macroeconomic variables, but rather to extract information from variables that seem to have an important predictive power for future inflation. The leading indicators approach uses Kalman filtering to combine different variables into a single composite leading indicator that is meant to signal inflation turning points. With many variables potentially having some predictive power for inflation—the BCB's March 2000 Inflation Report stated that out of over 200 possible variables, 49 were analyzed in more detail concerning their predictive power for inflation—there is a large number of possibilities for combining these variables into a single leading indicator, and the computational resources needed to identify the best leading indicator can become quite large.

9. So far, notably absent from the BCB's presentation of its inflation forecasting tools are time series models. While these models have certainly been explored by the BCB, they have not been presented to the public, which raises the question of how useful these techniques may (or may not) be for forecasting inflation in Brazil.

C. Time Series Techniques For Projecting Inflation: An Overview

10. In this section, three different time series techniques for projecting inflation are presented and evaluated with regard to their forecasting performance: univariate regression, unrestricted VAR, and Bayesian VAR. The inflation projections derived from these models are compared with the BCB's own SSM-based forecasts. The first of these techniques, univariate regression, only employs information available on past values of inflation, and is meant as a benchmark naïve forecast to help assess the possible forecast improvement that

the other two methods, VARs and BVARs, may bring about.[4] Both VAR and BVAR forecasts are derived from a system of several variables.

11. Unrestricted (or nonstructural) VARs consist of a system of variables, which is modeled with little economic theory, in the sense that no exclusion restrictions are imposed. It is assumed that every endogenous variable in the system is a linear function of the lagged values of all endogenous variables in the system. The unrestricted VAR approach has become popular since it requires a minimum of assumptions, and can be estimated efficiently using OLS. Once estimated, the VAR can also be used for forecasting purposes, given a set of initial values for the endogenous variables. It can also be used to analyze the dynamic impact of random disturbances on the system of variables, and for variance decomposition exercises. Here, we focus on the VAR as a forecasting tool.

12. While unrestricted VAR models are a useful and powerful tool to analyze statistical and structural relationships between economic variables, their forecasting power has often been poor.[5] One reason for this is that forecasts made using unrestricted VAR models often suffer from overparametrization. Usually, the number of observations available is fairly small, so that the resulting degrees of freedom may be inadequate to produce precise coefficient estimates, which may then result in large out-of-sample forecast errors. Another possible consequence of generously parametrizing VAR models is that the resulting estimates may reflect random rather than systematic empirical variability (also called "overfitting"). Overfitting becomes particularly problematic when using a VAR for forecasting. The usual approach to degrees of freedom issues is to reduce the number of regressors, which in a VAR translates into reducing the number of lags, based on statistical criteria.[6] By doing so, a coefficient of zero is implicitly imposed for all lags that are dropped.

13. While in VAR models the problem of overfitting is addressed by imposing exclusion restrictions (i.e., dropping lags), the Bayesian VAR approach offers an alternative approach that consists of using prior statistical and economic knowledge for an initial guess of the values of all coefficients. The Bayesian procedure suggests to specify "fuzzy" restrictions, where information is processed based on assumed probability distributions for the model's various coefficients. Therefore, the BVAR approach complements the autoregressive representation of the model with a prior distribution of the coefficients.[7] In general, the prior

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[4] This benchmark naïve forecast could be improved upon, even in the univariate context, by using more elaborate ARIMA techniques. This option was not explored.

[5] For instance, Robertson and Tallman (1999) show that the information contained in futures contracts is a better predictor of the U.S. Federal Funds rate than VAR-based forecasts.

[6] In general, these criteria, like the Akaike or Schwarz criteria, select an optimal lag length by weighing the gains from using more lags against the related loss of degrees of freedom.

[7] Traditional econometric techniques (including VARs) view model coefficients as parameters, whereas Bayesian econometrics considers model coefficients to be random variables, and, hence, to have a distribution function. Through the prior distribution that is

(continued...)

distribution should be selected so as to offer a reasonably large range of uncertainty, and to be modified by the sample distribution if both distributions were to differ substantially.

14. Selecting the prior distribution is probably the most distinctive aspect of BVAR modeling. In principle, this may take different forms and rely on information from a variety of sources, which makes it a rather flexible tool. Exact restrictions (including exclusion restrictions similar to those used in VARs) can be viewed as a special case that increases the "tightness" of the restrictions. The prior information used in the BVAR framework is usually of statistical-empirical origin, and lacks economic content. This economic "neutrality" often makes the resulting specification more broadly acceptable, as it does not require an agreement on the "true" structure of the economy.

15. The essential part of the prior information consists of three empirical regularities that are characteristic of time series analysis. First, the best forecast of the future value of a series is its current value (the "random walk" assumption); this satisfactorily approximates the behavior of many macroeconomic series, as suggested by Nelson and Plosser (1982). Second, recent lagged values of a series usually contain more information on its current value than the more distant lagged values. Third, lagged values of a series contain more information on that series' current value than the lagged values of other variables.

16. The actual data can override these assumptions if there is strong evidence about a coefficient. When formulating the prior distribution in a BVAR model it is common to assume a Normal distribution. However, the complete specification of a Normal distribution of the prior on a VAR would be intractable because of the large number of parameters involved. Instead, a general form for the prior involving a few *hyperparameters* is chosen.[8]

D. Methodology and Results

17. This section presents the estimates derived from the three time series techniques (univariate model, classical VAR, and Bayesian VAR), and compares them with those of the BCB's SSM model. There are three main results: first, even naïve models for predicting inflation do not necessarily fare much worse than more sophisticated ones; second, the various models usually overpredict and underpredict actual inflation in the same direction; and third, forecasts beyond the short term (i.e., more than four months ahead) tend to be fairly inaccurate under any model.

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imposed, it is possible to control how much weight is given to each source of information. By using a combination of the prior information on the coefficents' distribution and the sample information, Bayesian estimation techniques produce a posterior distribution of coefficients.

[8] See Appendix I for a detailed explanation of the hyperparameters and the associated prior distribution. The term "hyperparameter" in Bayesian VAR modeling was adopted to avoid confusion with the term "parameter" used in classical econometrics.

18. Using the various estimated models, we computed out-of-sample one-month, four-months (one quarter), and seven-months (two quarters) ahead forecasts for inflation. For the three time series techniques, we used the specification that delivered the best estimates in terms of minimizing the mean squared forecast error. For the univariate model, we estimated a simple AR(1) process for inflation. For the multivariate models, the system that was estimated consisted of seven endogenous variables: the SELIC rate, the average bank lending rate,[9] the consumer price index (IPCA), the wholesale price index (IPA-DI), the nominal exchange rate of the *real* against the U.S. dollar, and M1.[10] The VAR was estimated in first differences, using four lags of every endogenous variable in the system; using a larger number of lags generally worsened the accuracy of the results. The Bayesian VAR was estimated in levels, using six lags of every endogenous variable.[11]

19. In addition to these three estimates, we also present a fourth forecast, which is obtained by using the BVAR1 model and assuming that the SELIC rate will be left constant during the forecast period at the level of the last observation. This is done to match the main scenario that the BCB presents in its *QIRs*.[12] In the BVAR context, this fourth estimate assumes that the SELIC rate is not necessarily a systematic function of past values of other endogenous variables.

20. The selection and ordering of the endogenous variables in the VARs and BVARs reflects our general views on the transmission mechanism of monetary policy in Brazil, and the passthrough of exchange rates on domestic inflation.[13] The variables considered here (i.e., money, interest rates, exchange rates, wholesale prices) could potentially have some effects on future consumer price inflation, and, a priori, it seems reasonable to think that their contribution to the forecasting of consumer price inflation should be statistically significant. Initially, we also tried several other indicators that, a priori, may be considered good candidates for inflation forecasting, including world oil prices, domestic fuel and energy

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[9] This is a market interest rate that averages bank lending rates for individuals and corporate entities, as reported in the monthly BCB press releases available on the BCB's website (http://www.bcb.gov.br). Also see BCB (1999) for a detailed description on how this variable was derived.

[10] The IPCA, IPA-DI, M1, and the nominal exchange rate are all expressed in natural logarithms.

[11] See Appendix on how hyperparameters for the prior distribution were chosen.

[12] The *QIRs* of September 1999, December 1999, and March 2000 assumed a constant path for the annualized SELIC rate of 19 percent. The June 2000 and September 2000 QIRs assumed a constant path for the annualized SELIC rate of 17.5 percent and 16.5 percent, respectively.

[13] See Rabanal and Schwartz (2000a and 2000b), and also McCarthy (1999).

prices, and nominal wages. However, adding these variables to the system did not improve the forecasts, and they were excluded.[14]

21. Table 7.1 presents the one month, four-months (next quarter), and seven-months (two quarters) ahead forecast for inflation for the different models that were estimated; Table 7.2 presents the deviations of predicted from actual inflation. The various time series models were all estimated with monthly data from January 1995 onward.[15]

22. Table 7.1 suggests that, in general, the various models forecasted inflation as going in the same direction, that is either up or down. For example, using data to either November 1999 or February 2000, all models predicted the 12-month rate of inflation for March 2000 to decrease relative to December 1999. There were only few exceptions: for example, using data up to either February 2000 or May 2000, the BCB's SSM model was the only one that (correctly) predicted September 2000 inflation to go up relative to June 2000. Similarly, using data to February 2000, the BVAR1 model was the only one that (correctly) predicted June 2000 inflation to go down relative to March 2000.

23. The direction of change that the various projections pointed to was not always correct, suggesting that all models have some difficulty in predicting inflation turning points. For example, using data to November 1999, the various models wrongly predicted inflation to rise in the second quarter of 2000; the same also holds true for the BCB's model, and the AR1, VAR, and BVAR2 models, with data up to February 2000. Hence, with the models generally projecting inflation to increase through June 2000, the further decline in inflation that actually occurred through June may have come as a surprise also to the BCB. This may have led the BCB to initiate its 200 basis point reduction in the SELIC rate during June-July 2000. The subsequent upward revision of the December 2000 inflation forecast by 1.1 percentage points that occurred from the June 2000 *QIR* to the September 2000 *QIR* suggests that the BCB was equally surprised by the high July-August inflation outcomes as it had been by the fairly low inflation that prevailed through June. While the planned increases in administered prices in July 2000 and continued relatively high international oil prices were taken into account in the inflation projections that were presented in the June 2000 *QIR*, it

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[14] Since domestic ex-refinery fuel prices are determined by the government, world oil price developments do not automatically impact on domestic inflation.

[15] The comparisons presented in Tables 7.1 and 7.2 should be interpreted with caution. Strictly speaking, it would not be valid to compare a model projection made with one SELIC rate assumption with the actual inflation outcome that occurred with another SELIC rate. In practice, however, the sensitivity of the one-quarter or two-quarters ahead inflation forecasts to fairly moderate changes in the SELIC rate is not very large. As a result, most of the deviations between actual inflation and model predictions that are shown in Tables 7.1 and 7.2 may safely be attributed to forecast errors, rather than different prevailing SELIC rates.

Table 7.1. Actual Inflation and Inflation Forecasts (12-Month Rate, in Percent)

Information Set	Forecast for	Actual	BCB 1/	AR1	VAR	BVAR1	BVAR2
Data to May 1999	Jun 1999	3.32	...	3.49	3.41	3.31	3.29
	Sep 1999	6.25	7.20	5.79	5.59	4.91	4.63
	Dec 1999	8.94	8.25	7.25	6.77	5.43	4.73
Data to August 1999	Sep 1999	6.25	...	6.54	6.73	6.49	6.46
	Dec 1999	8.94	7.40	8.26	7.84	7.59	7.49
	Mar 2000	6.92	6.10	7.26	6.35	5.85	5.78
Data to November 1999	Dec 1999	8.94	8.90	9.26	9.07	9.03	8.92
	Mar 2000	6.92	7.60	8.86	8.42	7.83	7.48
	Jun 2000	6.51	7.80	10.20	9.73	8.65	8.28
Data to February 2000	Mar 2000	6.92	7.00	6.94	6.92	6.96	6.97
	Jun 2000	6.51	7.40	7.07	7.38	6.91	7.03
	Sep 2000	7.77	7.50	6.65	6.60	5.83	6.01
Data to May 2000	Jun 2000	6.51	6.60	6.41	6.38	6.62	6.64
	Sep 2000	7.77	6.70	5.33	5.40	5.80	5.81
	Dec 2000	...	5.60	3.94	3.64	4.03	4.02
Data to August 2000	Sep 2000	7.77	7.90	8.78	8.44	8.22	8.11
	Dec 2000	...	6.70	9.00	8.66	6.28	6.00
	Mar 2001	...	7.00	10.66	8.86	6.20	5.92
Memorandum item:							
Direction of Change 2/							
Data to May 1999	Jun 1999	Up	...	Up	Up	Up	Up
	Sep 1999	Up	Up	Up	Up	Up	Up
	Dec 1999	Up	Up	Up	Up	Up	Up
Data to August 1999	Sep 1999	Up	...	Up	Up	Up	Up
	Dec 1999	Up	Up	Up	Up	Up	Up
	Mar 2000	Down	Down	Down	Down	Down	Down
Data to November 1999	Dec 1999	Up	Up	Up	Up	Up	Up
	Mar 2000	Down	Down	Down	Down	Down	Down
	Jun 2000	Down	Up	Up	Up	Up	Up
Data to February 2000	Mar 2000	Down	Down	Down	Down	Down	Down
	Jun 2000	Down	Up	Up	Up	Down	Up
	Sep 2000	Up	Up	Down	Down	Down	Down
Data to May 2000	Jun 2000	Down	Down	Down	Down	Down	Down
	Sep 2000	Up	Up	Down	Down	Down	Down
Data to August 2000	Sep 2000	Up	Up	Up	Up	Up	Up

Sources: BCB; and authors' estimates.

1/ Reflects BCB forecasts from the quarterly SSM model with constant nominal interest rates, as presented in the QIRs for June 1999, September 1999, December 1999, March 2000, June 2000, and September 2000, respectively.

2/ Reflects change of the projected 12-month rate for a given quarter vis-à-vis the actual (for the one-month forecast) or the projected 12-month rate for the previous quarter.

Table 7.2. Deviation of Forecast from Actual Inflation (in Percentage Points)

Information Set	Forecast for	BCB 1/	AR1	VAR	BVAR1	BVAR2
Data to May 1999	Jun 1999	...	0.17	0.09	-0.01	-0.03
	Sep 1999	0.95	-0.46	-0.66	-1.34	-1.62
	Dec 1999	-0.69	-1.69	-2.17	-3.51	-4.21
Data to August 1999	Sep 1999	...	0.29	0.48	0.24	0.21
	Dec 1999	-1.54	-0.68	-1.10	-1.35	-1.45
	Mar 2000	-0.82	0.34	-0.57	-1.07	-1.14
Data to November 1999	Dec 1999	-0.04	0.32	0.13	0.09	-0.02
	Mar 2000	0.68	1.94	1.50	0.91	0.56
	Jun 2000	1.29	3.69	3.22	2.14	1.77
Data to February 2000	Mar 2000	0.08	0.02	0.00	0.04	0.05
	Jun 2000	0.89	0.56	0.87	0.40	0.52
	Sep 2000	-0.27	-1.12	-1.17	-1.94	-1.76
Data to May 2000	Jun 2000	0.09	-0.10	-0.13	0.11	0.13
	Sep 2000	-1.07	-2.44	-2.37	-1.97	-1.96
Data to August 2000	Sep 2000	0.13	1.01	0.67	0.45	0.34
Memorandum items:						
Mean squared errors 2/		66	198	185	204	231
One month ahead		1	21	12	5	3
Four months ahead		113	213	205	170	184
Seven months ahead		72	446	420	545	632
Mean squared errors 3/		66	222	188	137	119
One month ahead		1	24	14	6	4
Four months ahead		119	262	246	167	164
Seven months ahead		80	500	402	316	251
Mean squared errors 4/		75	206	169	96	80
One month ahead		1	5	7	2	2
Four months ahead		121	151	141	94	90
Seven months ahead		117	688	535	286	222

Sources: BCB; and authors' estimates.

1/ Reflects BCB forecasts from the quarterly SSM model with constant nominal interest rates, as presented in QIRs for June 1999, September 1999, December 1999, March 2000, and June 2000, respectively.
2/ Mean squared errors of the forecast, multiplied by 100.
3/ Mean squared errors of the forecast, multiplied by 100, excluding all projections made with data up to May 1999.
4/ Mean squared errors of the forecast, multiplied by 100, excluding all projections made with data up to May 1999, and excluding projections for September 2000.

was probably the unexpected increase in the IPCA food-price component,[16] that, in retrospect, seems to make the June-July reductions in the overnight interest rate appear as a departure from a cautious monetary policy stance.

24. Table 7.2 suggests that the BCB's SSM model generally outperforms the various time series models. However, this seems less related to the model itself, but to the fact that the SSM forecasts make use of exogenous information, e.g., on planned price increases.

25. Still, while September 2000 inflation was underestimated by all models, only the BCB's SSM model with data up to May 2000 correctly predicted an upturn in inflation for September 2000. Even though the BCB's SSM model underpredicted the upturn by about 1.1 percentage points, the various time series models underpredicted by more, reflecting the fact that, in contrast to the SSM model, they were not fed with any exogenous information on the increases in administered prices that were planned for July. Hence, the relevant question would not be why the time series models fare worse than the SSM in predicting September inflation, but why the SSM model did not fare better.

26. In general, Table 7.2 indicates that, at the four-month and seven-month horizons, all models fared far worse than at the one-month horizon. Still, the one-month-ahead forecasts presented in the *QIRs* are likely to have been generated largely outside of the SSM model, also since the SSM uses quarterly rather than monthly information.[17] Hence, a direct comparison between the performance of the quarterly SSM and the monthly time series models would not be strictly valid at the one-month horizon. It is interesting to note, though, that among the time series models, the BVARs easily outperformed the AR1 and VAR models at the one-month horizon, as indicated by the mean squared errors (MSEs) of forecasts.

27. As expected, the models generally tended to either overpredict or underpredict jointly. For example, using data to August 1999, all models underpredicted December 1999 inflation; the same happened again with September 2000 inflation, which was underpredicted by all models with data to either February 2000 or May 2000. Similarly, using data to November 1999 that included the sharp increase in inflation which had occurred during July–November 1999, all models overpredicted inflation for March 2000 and June 2000. The same holds again with data up to February 2000, where all models continued to overpredict June 2000 inflation.

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[16] Food and drink account for about 22 percent of the IPCA basket. While food and drink prices experienced deflation of 0.8 percent during January-June 2000, they experienced inflation of 3.9 percent in July-August 2000, thereby pushing up the IPCA index by a cumulative 0.9 percent during these two months (i.e., over 50 percent of total inflation).

[17] Also, note, that the *QIRs* for June 1999 and September 1999 did not include one-month ahead forecasts.

28. The results in Table 7.2 also suggest that having more data did not always make for a better forecast, except for the very short run, one-month ahead projection. For example, the inflation outcome for March 2000 was first generally underpredicted based on data to August 1999, and then overpredicted based on data to November 1999; in two of the five models (AR1 and VAR) having observations for three more months actually worsened the absolute prediction error. Also, having data up to May 2000 instead of only February 2000 did not help to improve the forecast error for September 2000 inflation in any of the models. On the other hand, having data up to February 2000 instead of only November 1999 significantly improved the forecast for June 2000 in all models. This again suggests that all models have problems to predict inflation turning points, reflecting the fact that most recent information weighs heavily in the various forecasts.

29. Interestingly, Table 7.2 indicates that the BCB's SSM model does a better job forecasting seven months ahead than it does forecasting four months ahead. This is evidenced by a comparison of the MSE for the two forecast horizons but also by the fact that in three out of four occasions, the absolute forecast error for the seven-month forecast was lower than for the four-month forecast. This is not the case for the various time series models, which seem to do relatively well for the four-months ahead forecasts, but are significantly less accurate for the seven-months ahead forecasts. This may suggest that the various time series models may work best for fairly short-term forecasts of inflation.

30. Clearly, as presented here, a main shortcoming of the various time series techniques is that they are purely backward looking in the sense that forecasts are based exclusively on past values of the endogenous variables. Hence, information on anticipated shocks, such as future adjustments of administered prices, did not enter the projection. Of course, the models could easily be extended to take such information into account. An interesting extension in this regard would be to feed the various time series models the same information on exogenous shocks used for the SSM estimates that are presented in the *QIRs*.

31. Still, as already indicated, it is interesting to note that, while the BCB's SSM model did take into account information on anticipated shocks, the better time series models, generally the BVARs, came fairly close to the performance of the SSM. For example, while, for the overall sample, the MSE of the SSM was lower than the MSE for the BVARs, this no longer holds when excluding the June 1999 inflation report (the very first *QIR*) and projections made for September 2000 (where the SSM forecast clearly benefited from exogenous information), as shown in Table 7.2.

32. For any forecasting exercise it is desirable to take into account all known information on future events, so as to avoid that the model is determined only by "history." For example, a main reason why, using data to November 1999, inflation for the first quarter of 2000 was significantly overpredicted seems to have been that inflation for the most recent actual observations (i.e., October and November 1999) were particularly high. For the BVAR2 model, the March 2000 forecast with data for November 1999 was 7.48 percent and resulted in an absolute forecast error of 0.56 percentage points. Already with one more month of data, for December 1999, which had a much lower inflation reading than October-November 1999,

the forecast error would have been roughly halved. In an environment where even one more data point may significantly affect the forecast, it becomes even more important to take into account information on likely future shocks.[18]

33. Although the "backward-looking" time series estimates presented here, particularly of the BVARs, compare relatively well to the BCB's SSM model, at least for the four-month forecasting horizon, it remains to be shown whether or not a BVAR that would make use of forward looking information could fare better than the SSM model. Still, the initial estimates presented here would suggest that exploring the BVAR models more fully would be a promising area for future research.

E. Conclusions

34. Having good forecasts of inflation is important for any monetary authority, but particularly for one that operates with an explicit inflation target, such as in Brazil. With the transmission channels of monetary policy operating with a lag, the central bank needs good inflation forecasts to be able to act preemptively, if needed, so as to keep the inflation outcome close to the inflation target.

35. This section has compared the inflation forecasting performance of three time series techniques—univariate autoregressive estimation, multivariate "classical" VAR, and multivariate Bayesian VAR—with that of the small-scale macroeconomic model of the Brazilian Central Bank. Bayesian VAR, in particular, provides a possible solution to the problem of classical VAR forecasting where, often, too many parameters are estimated with too few observations, resulting in large out-of-sample forecasting errors. This problem is judged to be particularly relevant for Brazil, where, given the many structural breaks and the hyperinflation that prevailed during much of the 1980s and early 1990s, reliable time series data are often fairly short. Bayesian VAR modeling calls for introducing prior statistical information on the endogenous variables, and allows the forecaster to decide how much weight to put on the prior information and how much on the sample data.

36. The results presented in this section suggested that a Bayesian VAR can, generally, be expected to do a better job in forecasting inflation than either a classical VAR model or a univariate model. Although the Bayesian VAR forecasts presented here scored worse than the BCB's small-scale macroeconomic model, this seems to have resulted largely from the fact that, contrary to the small-scale macroeconomic model, the Bayesian VAR forecasts did not take into account information on likely or expected future shocks (e.g., planned

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[18] In Brazil, administered prices have a strong influence on the evolution of the overall CPI. For example, the December 1999 *QIR* states that "the impact of this shock on inflation in 1999 has been far from negligible. Out of the 8.29 percent IPCA inflation between January and November, 3.5 percentage points are directly due to government managed prices." Forecasts that do not take into account likely future adjustments in these prices are likely to be significantly more inaccurate.

adjustments in administered prices). Still, the Bayesian VAR model could potentially take such forward-looking information into account. Similarly, it would also be possible to incorporate into the Bayesian VAR model information on leading indicators or market expectations of future inflation. Another issue that would seem to warrant further exploration is the forecasting horizon. It is unclear whether the observed relative deterioration of the forecasting performance of the Bayesian VAR model beyond the four-month horizon reflects on the technique itself, or whether improved models would also produce better longer-term forecasts. These and other issues remain to be explored in a more comprehensive assessment. Nevertheless, the results presented in this section suggest that Bayesian VAR modeling presents a promising tool for forecasting inflation in Brazil that would seem to warrant further exploration.

Selecting the Prior Distribution of a Bayesian VAR Model

37. Selecting the prior distribution of the coefficients is a key aspect of BVAR modeling. Accordingly, both the mean vector and the variance covariance matrix of the multivariate prior distribution have to be specified. Nelson and Plosser (1982) suggested that most macroeconomic series can be characterized by a random walk process with drift. The vector of means of the prior distribution sets the value of all coefficients to zero. The only exception is the mean of the prior distribution for the first own lag of each variable in the system, which is set to one.[19]

38. To specify the structure of the standard deviations of the prior distribution, BVAR modeling uses so-called "hyperparameters."[20] The specification of a complete Normal distribution of the priors of a VAR would be intractable because of the size of the variance-covariance matrix. Instead, a general form for the prior involving a few hyperparameters is chosen, where, for each equation i, for each variable j in the system, and for every lag l, the structure of the standard deviation is:

$$S(i,j,l) = \frac{w * g(l) * f(i,j) * s_i}{s_j} \qquad \text{(A1)}$$

In this equation, s_i is the standard deviation of a univariate autoregression on equation i;[21] w is an overall "tightness"[22] parameter, which is also the standard deviation of the first own lag; $g(l)=l^{-d}$ is the tightness of lag l relative to lag 1, with g(1)=1, $d>1$; and $f(i,j)$ is the tightness on variable j for equation i relative to variable i. It is assumed that $f(i,j)=1$ when $i=j$ and k otherwise $(0<k<1)$.

39. Therefore, all relevant information about the prior distribution is contained in the hyperparameters w, d and k. Note that a smaller value of w places a smaller weight on all standard deviations, making the prior distribution "tighter." Also, the relative standard

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[19] This vector of means for the prior distribution is commonly known as the "Minnesota prior," since it was developed by researchers at the University of Minnesota and the Federal Reserve Bank of Minneapolis. See, for instance, Litterman (1986).

[20] Also see Doan (1996) for a good description of Bayesian VAR forecasting.

[21] The ratio s_i/s_j scales the variables to account for differences in units of measurement. Thus, it enables specification of the prior without consideration of the magnitudes of the variables.

[22] The terms "tightness" and "looseness" reflect how much weight is placed on the prior distribution relative to the sample information in formulating the BVAR model. For instance, a "tight" prior involves setting relatively small standard deviations in the prior distribution. Therefore, with tight priors there is less room for the data to override the priors, implying that a relatively low weight is put on the information contained in the data.

deviation of lags of all endogenous variables decays geometrically at a rate *d*. Similarly, the higher *d*, the smaller is the weight placed on lags of all endogenous variables. Finally, the smaller *k*, the smaller is the importance placed on other endogenous variables when forecasting a given variable.

40. The BVAR methodology comprises the other forecasting models used in this paper: the other time series models explored here may be viewed as special cases of a BVAR model with extreme values for the hyperparameters. For instance, an extremely tight prior distribution (e.g., *w=0.0001*) implies the univariate model. An extremely loose prior distribution (e.g., *w=5*) implies an unrestricted VAR model.

41. Once the hyperparameters are selected, the BVAR model is estimated using Theil's (1971) mixed estimation technique. This technique provides a suitable framework for obtaining the posterior distribution of the coefficient vector by allowing to combine the different sources of information available (prior and sample). In a more technical way, Theil's mixed estimation technique involves supplementing data with prior information on the distributions of the coefficients. For each restriction on the parameter estimates, the number of observations and degrees of freedom increase by one in an artificial way; hence, the loss of degrees of freedom due to overparametrization in a VAR model disappears in the BVAR model.[23]

42. The BVAR model presented in this section was estimated using the RATS econometric package. To estimate the model, the following hyperparameters were chosen: *d=1, w=0.2* and *k=0.7*. This compares to the RATS manual,[24] which, following Litterman (1986), suggests to use the following values: *d=1, w=0.2* and *k=0.5*. We found that, for Brazil, assigning a slightly less tight prior distribution increased the accuracy of the forecasts. To select the optimal hyperparameters, we tried out various combinations of the hyperparameters, where the range of combinations that was considered was *d=1* or *2, w=0.1, 0.15* or *0.2, k=0.3, 0.5* or *0.7*. Our final choice consisted in the combination that delivered the overall best out-of-sample forecasts, as measured by the MSE criterion. In future research along these lines it would seem helpful, once the available time series allow for more in-sample forecasts, to explore the stability of the hyperparameters that produce the best forecasts.

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[23] For a detailed explanation on Theil's estimation technique, see Ballabriga et al. (2000).

[24] See Doan (1996).

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VIII. Restructuring Brazil's State-Owned Financial System[1]

A. Introduction

1. This section reviews recent government efforts to restructure banks owned by state governments. The problems of state banks developed gradually and were associated with the fiscal problems of the state governments. Over time, the state banks became the main creditors of the state governments and, in practice, were forced to roll over credits to state governments and to capitalize the interest on these credits, thus jeopardizing their solvency and profitability. This section is structured as follows: subsection B discusses the fiscal problems of the state governments and the debt restructuring agreements granted by the central government to state governments. Subsection C analyzes the financial problems of state banks prior to the restructuring of the state government debt. Subsection D discusses the Program of Incentives for the Restructuring of the State Public Financial System (PROES), explains how the debt rescheduling agreements for the states negotiated between 1997–99 have facilitated the restructuring of state banks, and presents the main results of the program. Subsection E concludes.

B. State Fiscal Problems and the Debt Restructuring Agreements of the States[2]

2. The finances of state governments deteriorated in 1995 when a small primary fiscal deficit was registered. The primary deficits widened further in the following two years (Figure 8.1).[3] The roots of the fiscal problems of the states were varied. As a result of the 1988 Federal Constitution, the states and municipalities assumed more spending responsibilities, without being fully compensated with additional sources of financing. States and municipalities assumed more responsibilities in the areas of health, education, water and sanitation, and public works as the federal government reduced its relative size in these areas. The increase in resources granted to the states appears to have been far less than those granted to municipalities.[4]

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[1] Prepared by Geraldo Maia and Lorenzo Pérez.

[2] This section draws on Alleyne (1998).

[3] Figure 8.1 contains information on the combined primary balances of the states and municipalities. Prior to 1999, separate information is not available for the states and municipalities. In 1999, the primary surplus of the states was 0.16 percent of GDP compared with a surplus of 0.21 percent of GDP for the states and municipalities together.

[4] Several authors have pointed out that the 1988 Constitution was clearer in the redistribution of revenue powers than in the redistribution of spending obligations and that, with the adoption of the constitution, the central government abandoned its spending obligations in certain areas without a formal transfer of responsibilities to states and municipalities. In these circumstances, subnational governments were forced to meet the unfilled demand for services created by the withdrawal of the central government. See Giambiagi and Além (1999); and Serra and Afonso (1999).

3. Another factor explaining the state fiscal problems in the second half of the 1990s is that, during the years of high inflation, state governments frequently tended to delay payments to take advantage of the eroding effect of inflation on the real value of nominal spending. This reliance led to unsustainable fiscal policies and practices that were unfolded with stabilization. In addition, the fiscal disequilibria of states were also caused by the lack of attention paid to expenditure control, that was reflected especially in the large size of the payrolls (on average between 70 percent and 80 percent of net revenue); the frequent practice by the state treasuries of assuming various debts of independent state agencies, including state-owned enterprises; and the neglect of the tax system, which manifested itself in the excessive tax concessions and exemptions and in high rates of tax evasion.

4. The deterioration of the fiscal situation of the states appears to have been related to the inability or the unwillingness of the federal government and the senate to exert forceful control over the growing indebtedness of states, and the periodic bailing out of the states by the federal government. In 1989, the federal government bailed out the states for a first time by formally assuming their external debt. In 1993, the federal government again helped the states by assuming their debt owed to federal financial institutions that the states had not serviced for a number of years. The expectation of federal bailouts contributed to the maintenance of unsustainable fiscal policies among states.[5] [6]

5. Apart from the factors just mentioned of a more structural nature, the management of the finances of state governments became increasingly difficult because of large increases in salaries granted to state employees at the end of 1994, that the new state governments had to honor in 1995; the sharp rise in domestic interest rates in early 1995, following the Mexican

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[5] Under a first scheme authorized in 1989 by Law 7976, the central government formally assumed much of the external debt of the states. In exchange, the states entered into debt with the central government for an equivalent amount in domestic currency, but with a longer maturity and an interest rate equivalent to that being paid by the federal government. The second scheme, permitted by Law 8727 of 1993, renegotiated the states' debt owed to federal financial institutions. The new debt of the states to the federal government had a maturity of 20 years, with a real interest rate equal to the average real interest rate of the original debt (between 6 percent and 8 percent). A debt service ceiling of 11 percent of net revenues (i.e., own revenues plus transfers from the federal government less transfers to the municipalities) was established, with any excess being capitalized. Yet another form of federal bailout for the states was a series of swapping agreements between the central bank and state banks under which the central bank swapped central bank bonds for nontradable state government securities held by state banks.

[6] Afonso has suggested that part of the willingness of the federal government to "federalize" the debt of the states was a realization that its own macroeconomic policies, for example sharp rises in real interest rates, often were the factors that precipitated the fiscal crisis in the states. The fact that the states were able to exercise considerable influence in the national congress also weakened the capacity of the central government to restrict the growing indebtedness of the states. See Afonso (1997).

crisis in 1994; and a stronger effort by the federal government to close the new borrowing opportunities available to the states.[7] The consolidated primary fiscal balance of states and municipalities swung from a surplus of 0.9 percent of GDP in 1994 to a deficit of 0.2 percent of GDP in 1995, and to a deficit of 0.6 percent of GDP in 1996. The financial situation of states also became more difficult in 1995 due to the rise in scheduled debt service payments for those states which had renegotiated debt with the federal government in 1989 and 1993, as amortization payments began falling due following the expiration of the grace periods associated with both renegotiations. For the states having substantial contractual debt, such as São Paulo, Rio de Janeiro, and Minas Gerais, the sharp rise in interest rates in March 1995 created severe problems in terms of meeting debt service.

6. The resulting cash flow problems led the states to turn increasingly to short-term revenue anticipation loans (AROs) from commercial banks at market interest rates, to accumulate arrears with respect to payroll and payments to suppliers, to roll over almost all of the securitized debt and capitalize the accrued interest (both authorized by the senate), and, in many cases, to accumulate arrears in the servicing of loans to state banks. Due to the rapidly deteriorating fiscal situation, the federal government authorized the Caixa Econômica Federal (CEF) to provide emergency lines of credit to states in 1995.[8] In exchange for these loans, which carried market interest rates and maturities up to the end of 1998, 17 states signed agreements with the federal government in 1996 that promised to implement fiscal adjustment policies consistent with obtaining zero operational balances, including by reducing payroll spending to 60 percent of net revenues by 1998; to privatize state assets; to improve and modernize their systems of tax administration and public expenditure management; and to refrain from contracting new AROs. The CEF disbursed about R$2.5 billion under this program between late 1995 and 1996.

7. The results, however, fell short of expectations. First, some of the objectives of the fiscal adjustment programs were unrealistic: for instance, the states were required to adopt measures to ensure actuarial equilibrium in their state pension systems by the end of the first quarter of 1996. Yet the fiscal adjustment programs were slow to get off the ground because the federal government was still in the process of developing its capacity to monitor the finances of the states. At the same time, because the entire amounts of the loans were disbursed upfront, the urgency to implement reforms on the part of the states waned once the

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[7] In previous administrations, large salary increases had been granted by outgoing governors, but their impact had been rapidly eroded through inflation. The increases in the wage bill granted in end-1994, which ended up in real increases of 56 percent in Rio de Janeiro, 50 percent in Minas Gerais and 27 percent in São Paulo in the 12 months through July 1995, however, were enormous compared with the real increase of just under 10 percent in the ICMS tax revenues over the same period. As a result, the ratio of payrolls to net revenues rose substantially in many states.

[8] There were three lines of credit: one to be used to pay wage and other outstanding arrears; another to finance voluntary retirement programs; and a third one to refinance outstanding AROs.

immediate crisis of meeting payroll expenses had been taken care of. The voluntary retirement programs also met with only limited success.

The 1997 rescheduling of the state debts (Law 9496/97)

8. Law 9496 authorized the central government to restructure the state debts in exchange for implementing newly-negotiated fiscal adjustment programs. The new fiscal adjustment programs of the states aimed at generating primary surpluses that would permit timely debt servicing, after the debt burden was reduced to sustainable levels through restructuring. Debt/revenue ratios of the states were targeted to fall from an average value of 2.2 percent in 1996 to 1.0 percent between 15 to 30 years time depending on the terms of the rescheduling agreements. Furthermore, 11 percent to 15 percent of the states' net revenues (own revenues plus transfers from the federal government less transfers to the municipalities) were to be committed for servicing the newly and previously restructured debt. Any debt service not covered by these percentages of net revenue was to be capitalized by the central government.

9. The debt restructuring agreements contained certain aspects of forgiveness on the existing securitized debt and a potential interest rate subsidy on the total restructured debt. The debt forgiveness arose because the capitalization of the accrued interest up to the time of the signing of the contract was added using a subsidized interest rate to the outstanding stock of debt at a specific past date. The difference between the overnight interest rate (i.e., the rate at which the central government borrows), and the interest rate on the restructured debt up to the time of the signing of the renegotiating debt contract between the state and the federal government was then assumed by the federal government.[9] The securitized debt was then consolidated with other state debts and the newly-restructured state debt carried the same interest rate used to capitalize the accrued interest between the cutoff date and the time of the signing of the rescheduling agreement.[10]

10. The renegotiation of states debt under Law 9496 resulted in a significant subsidy to states in 1997 and 1998 as the Selic rate was generally above 6 percent plus IGP-DI during the period. In 1999, however, the potential interest rate subsidy on the total restructured debt

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[9] According to Law 9496, the stock of outstanding securitized state debt was taken at March 31, 1996 and accrued interest was capitalized by using an annual interest rate of 6 percent plus inflation (as measured by the IGP-DI index).

[10] In fact, the newly-restructured debt was divided into two portions. The first portion, the so-called "*conta gráfica,*" corresponded in most cases to 20 percent of the restructured debt and currently is scheduled to be fully amortized by the end of 2002 by the states that have not done so already (Provisional Measure 2044, as of August 2000). The remaining 80 percent is to be amortized over 15 to 30 years at an interest rate of 6 percent plus the rate of inflation as measured by the IGP-DI index.

did not materialize because the annual interest rate charged (27.4 percent, i.e., IGP-DI of 19.98 percent plus 6 percent) exceeded the Selic rate (25.6 percent).[11]

11. As of December 1999, the amount of debt restructured under Law 9496 equaled about R$121.7 billion out of a total state debt of R$211.1 billion (Figure 8.2).[12] The total state debt was composed of debt owed to the National Treasury (R$180.7 billion, including the R$121.7 billion under Law 9496), debt owed to commercial and multiple banks (R$9.4 billion, out of which R$8.1 billion to federal banks, R$1.1 billion to state banks, and R$0.2 billion to private banks), debt owed to the central bank (R$5.1 billion), external debt (R$8.6 billion), and others (R$7.2 billion) (Figure 8.3). The bulk of the state debt assumed by the federal government under Law 9496 was previously held by the state banks (73 percent) and by the federal banks (24 percent) (Figure 8.4).[13] Previously rescheduled debt was excluded from this restructuring round.

C. The Financial Problems of State Banks

12. State banks were negatively affected by specific problems peculiar to them. The management of state banks was frequently changed for political reasons, as state administrations changed, something that produced discontinuities and deficiencies in the management of these institutions. Most state banks were technically deficient at the various levels of decision making, and frequently failed to introduce internal controls. This resulted in poor banking practices that brought about large credits to state governments and a high level of loans in arrears in several state banks; large holdings of collateral with little prospects of recovering the associated loans; and portfolios concentrated in loans and securities with low returns and/or low liquidity that were carried on the books at nominal values. In addition, large amounts of potential tax credits for future profits were kept on the asset side of the balance sheets, although they were unlikely to be fully realized in the future.

13. On the operating side, state banks had a structure of fixed costs that was incompatible with their revenue performance. They also usually had larger operating costs than private banks and loss making branches and agencies were kept open. Large liabilities were incurred through benefits granted to their employees, particularly pension benefits. State banks had to operate under a series of legal restrictions typical of the public sector that hampered their decision making in employment and other areas and had to finance developmental activities that frequently were not commercially attractive. The state banks also were exposed to large contingent liabilities, principally from labor demands. Finally, the success of the *Real Plan* in curbing inflation reduced the gains obtained by banks from the bank deposit float.

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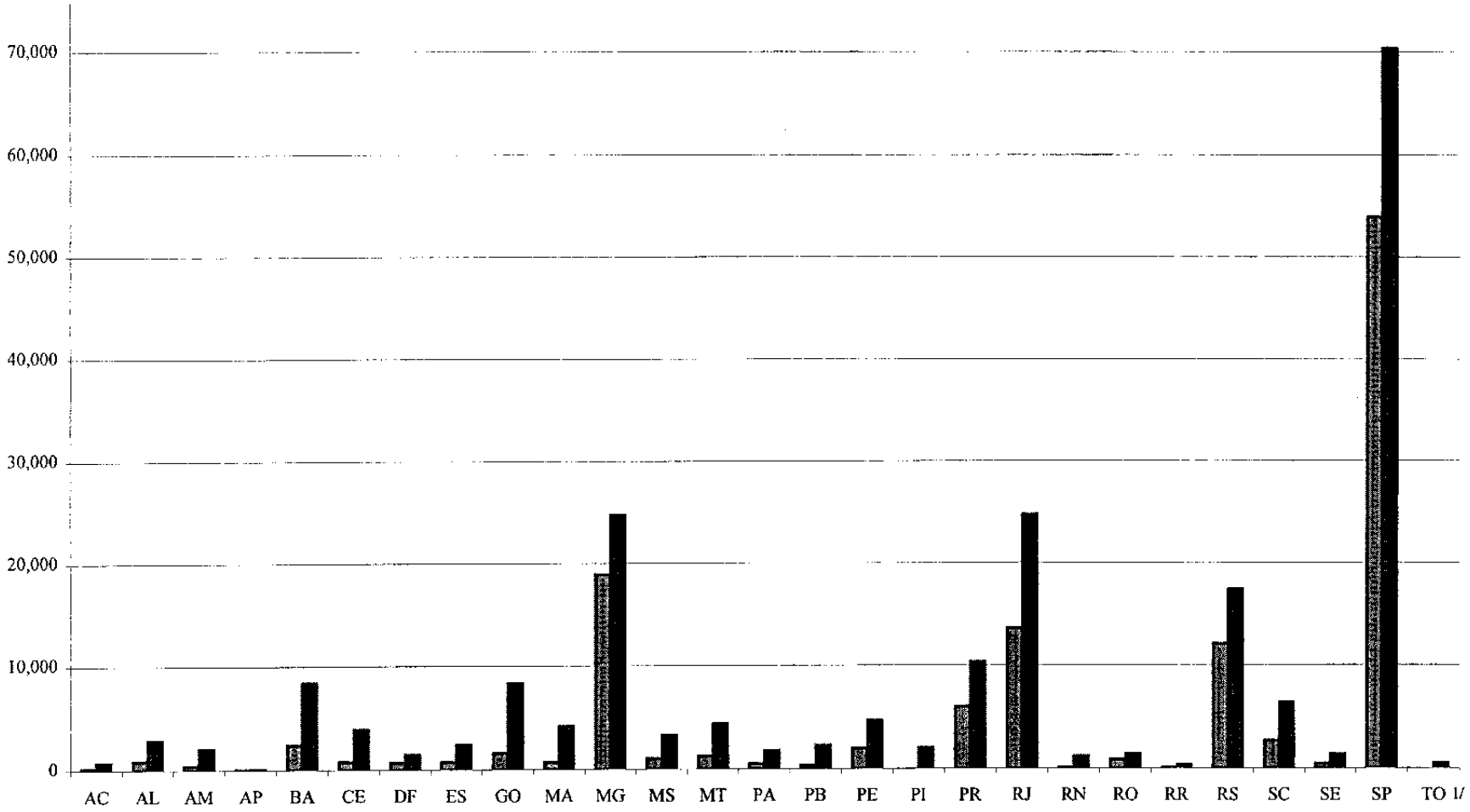
[11] Both rates are calculated on a monthly accrual basis.

[12] This is the total outstanding debt of states as of December 1999. The restructured debt also includes the debt restructured under the PROES program. Following the practice adopted by the Central Bank of Brazil in its publications, we include in the PROES debt the banking debt of the state of São Paulo to its state banks (BANESPA and Nossa Caixa–Nosso Banco).

[13] The data used to build Figure 8.4 do not include the debt of PROES.

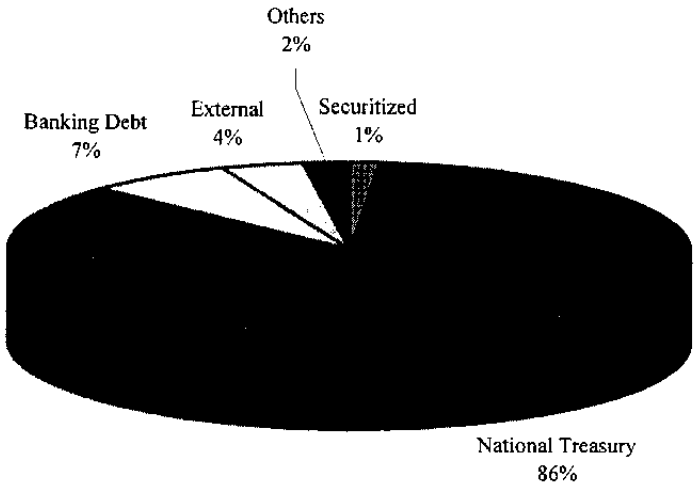
Figure 8.2. Brazil: Law 9,496 and Total Debt of States
(In millions of Reais as of December 1999)



Source: Central Bank of Brazil and staff estimates.

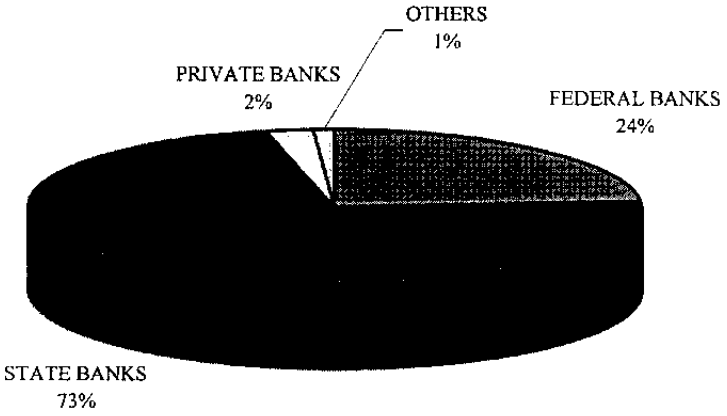
1/ AC-Acre; AL-Alagoas; AM-Amazonas; AP-Amapá; BA-Bahia; CE-Ceará; DF-Distrito Federal; ES-Espirito Santo; GO-Goiás; MA-Maranhão; MG-Minas Gerais; MS-Mato Grosso do Sul; MT-Mato Grosso; PA-Pará; PB-Paraíba; PE-Pernambuco; PI-Piauí; PR-Paraná; RJ-Rio de Janeiro; RN-Rio Grande do Norte; RO-Rondônia; RR-Roraima; RS-Rio Grande do Sul; SC-Santa Catarina; SE-Sergipe; SP-São Paulo; TO-Tocantins.

Figure 8.3 Brazil: Total Debt of States
(As of December 1999)



Source: Central Bank of Brazil / DEDIP - Public Debt Department

Figure 8.4. Brazil: Creditors of State Governments that Benefitted from the Rescheduling under Law 9,496
(As of June 2000)



Source: Treasury Department of the Ministry of Finance

14. State bank problems are well illustrated in a comparison of their financial performance with that of private banks for the period after the launching of the *Real Plan* in July 1994. In general, state banks' financial performance was considerably worse than that of private banks, and they lost ground to private and federal banks during the period analyzed. After the launching of PROES, that aims at privatizing, liquidating, or converting state banks into nondeposit-taking developmental agencies, the shrinking in size of state banks accelerated.

15. An analysis of the quality of state banks' **credit operations** reveals that the ratio of nonperforming loans (NPLs) to total credit increased sharply from end-1996 through 1998 and only started declining in 1999 (Table 8.1).[14] The sharp increase in the relative size of state banks' NPLs from June 1997 resulted in large part from a more realistic classification of credit operations that followed the inception of PROES.[15] The comparison with the private banking system shows that only between June 1995 to June 1996 the quality of private banks' credit operations was significantly inferior to that of state banks. This is a period marked by the bankruptcy of some of the large Brazilian private banks, which motivated the implementation of PROER, the central bank program to restructure private banks in difficulties; it is also possible that during that time the private banks were using more rigorous accounting standards than the state banks.[16]

16. Semi-annual **operating revenue** of state banks averaged about R$17 billion over the period December 1994–June 1997 and rose during this period to the equivalent of 30 percent of private banks' operating revenue, as the semi-annual operating revenue of private banks decreased from R$84 billion in December 1994 to R$52 billion in June 1997 (during the restructuring period that followed the implementation of the PROER) (Table 8.2). After

[14] Beginning in the second half of 1997, when PROES began and state banks started to disappear, there is a break in the series of economic and financial indicators for state banks in Tables 8.1, 8.2, 8.3, and 8.7. During this time, the federal banks were also object of some degree of restructuring (for instance, Banco Meridional was privatized, and Banco do Brasil was capitalized by R$8 billion in 1996). Overall, the market share of the federal banks increased over the period (Table 8.7), in part due to the fact that some large state banks were first federalized to prepare them for privatization. See the section below on PROES for more details.

[15] See Central Bank of Brazil – *Focus*, February 8, 2000.

[16] For information on PROER, see Maia (1999).

Table 8.1. Brazil: Credit Operations of Private and State Banks
(In millions of *reais* and in percent)

State Banks

CREDIT	Dec-94	Jun-95	Dec-95	Jun-96	Dec-96	Jun-97	Dec-97	Jun-98	Dec-98	Jun-99	Dec-99
a. Credits in arrears and in liquidation (excluding accrued interest and fines on credits in liquidation)	673	1,421	2,247	2,593	2,776	3,029	1,765	1,868	2,551	1,771	1,515
b. Total Credits	26,007	32,368	39,202	43,514	46,886	51,784	17,110	15,200	14,561	12,339	11,537
c. Credits in arrears + liquidation (percent of total credits)	**2.6%**	**4.4%**	**5.7%**	**6.0%**	**5.9%**	**5.8%**	**10.3%**	**12.3%**	**17.5%**	**14.4%**	**13.1%**

Private Banks

CREDIT	Dec-94	Jun-95	Dec-95	Jun-96	Dec-96	Jun-97	Dec-97	Jun-98	Dec-98	Jun-99	Dec-99
a. Credits in arrears and in liquidation (excluding accrued interest and fines on credits in liquidation)	1705	3,539	11,651	11,957	4,548	5,350	6,418	5,375	5,266	5,599	4,865
b. Total Credits	64,307	73,061	80,729	84,283	90,353	97,674	100,805	96,158	97,124	103,494	112,068
c. Credits in arrears + liquidation (percent of total credits)	**2.7%**	**4.8%**	**14.4%**	**14.2%**	**5.0%**	**5.5%**	**6.4%**	**5.6%**	**5.4%**	**5.4%**	**4.3%**

Sources: Central Bank of Brazil; and IMF staff estimates.

Table 8.2. Brazil: Semi-Annual Revenue and Profitability of the National Financial System

(In millions of *Reais*)

OPERATING REVENUE

	Dec-94	Jun-95	Dec-95	Jun-96	Dec-96	Jun-97	Dec-97	Jun-98	Dec-98	Jun-99	Dec-99
Private banks	84,425	79,755	62,536	56,056	51,867	52,234	73,761	76,778	79,896	234,792	100,530
Federal banks	33,473	32,509	31,454	24,158	26,135	23,466	48,051	37,899	41,210	67,844	41,182
State banks	16,809	18,179	18,847	16,545	16,782	16,131	8,200	8,086	7,434	8,567	6,352
Financial system	134,707	130,443	112,837	96,759	94,784	91,831	130,012	122,763	128,540	311,203	148,064

NET PROFIT

	Dec-94	Jun-95	Dec-95	Jun-96	Dec-96	Jun-97	Dec-97	Jun-98	Dec-98	Jun-99	Dec-99
Private banks	2,389	2,387	959	150	2,435	3,558	574	2,902	5,952	9,309	8,069
Federal banks	766	-2,178	-1,104	-7,376	1,155	1,382	2,019	1,419	774	1,438	967
State banks	-527	-230	-607	-155	204	450	-1,315	-5,309	-1,245	-383	68
Financial system	2,628	-21	-752	-7,381	3,794	5,390	1,278	-988	5,481	10,364	9,104

Source: Central Bank of Brazil: Department of Supervision - DEFIS.

June 1997, the operating revenue of state banks declined steadily as a percentage of the private banks operating revenue as the number of state banks was reduced and the operating revenue of private banks recovered.[17]

17. The comparison also is not favorable to state banks regarding **net profits**. State banks' profits were generally negative over the entire period through December 1999, except for the semesters of December 1996 and June 1997. This negative performance was accentuated after June 1997, when state banks operating revenue plunged to just R$7.7 billion on average (around 8 percent of private banks' operating revenue). Private banks' semi-annual net profits, after dropping in the second half of 1995 and the first half of 1996, recovered and rose steadily reaching over R$8 billion in each of the semesters of 1999.[18]

18. Following the pattern of net profits, the **net profit rate** of state banks (net profits divided by net worth) has been generally negative, while that of private banks positive. State banks' net profit rate deteriorated substantially in 1998, as their problems became more into the open, and only moved into positive territory in the second half of 1999 (Table 8.3). The net profit rate of private banks that had fallen in 1995–97 as a result of the making of provisions, improved from the second half of 1998.

19. The factors behind the trend in the **net profit rate** of banks can be analyzed by looking at how much of the revenues materialize in profits (measured by the **net margins**: net profits divided by revenue); the extent that assets generate revenue (measured by the **turnover ratio**: ratio of revenue to assets); and the amount of assets that has been mobilized by the net worth of the bank (measured by the **leverage ratio**: assets to net worth) (Table 8.3). The net margin ratio of state banks was generally negative during the period analyzed, worsening after December 1997, and only recently improving somewhat. Although always positive, private banks' net margin varied strongly over the entire period, and have

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[17] The operating revenue of private banks increased steadily after June 1997 reaching R$235 billion in June 1999 as the private banks profited strongly from currency depreciation and the hike in interest rates that took place in early 1999, due to their large investments in indexed government bonds. For example, the interest income of private banks increased from R$25.4 billion in the semester ending in December 1998 to R$103.9 billion in the semester ending in June 1999.

[18] A rise in the level of provisions for doubtful loans as a result of soaring delinquency rates accounts for the low level of private banks' net profits in December 1995 and June 1996. In December 1997, the low level of profits is mainly due to the recognition of losses by the Bamerindus bank, after seeking assistance under PROER.

Table 8.3. Brazil: Breakdown of the Profit Rate

(In Percent)

NET PROFIT RATE - net profit/net worth

	Dec-94	Jun-95	Dec-95	Jun-96	Dec-96	Jun-97	Dec-97	Jun-98	Dec-98	Jun-99	Dec-99
Private banks	8.72	7.55	3.73	0.57	6.37	9.73	1.41	6.46	10.69	16.94	12.58
Federal banks	3.84	-10.50	-4.59	-22.45	5.55	6.40	7.68	5.21	2.90	5.24	3.36
State banks	-12.15	-4.72	-11.74	-3.32	2.93	6.45	-39.24	-166.74	-264.89	-13.89	1.93
Financial system	5.09	-0.04	-1.37	-11.59	5.75	8.27	1.82	-1.31	6.62	12.18	9.45

NET MARGIN - net profit/operating revenue

	Dec-94	Jun-95	Dec-95	Jun-96	Dec-96	Jun-97	Dec-97	Jun-98	Dec-98	Jun-99	Dec-99
Private banks	2.83	2.99	1.53	0.27	4.69	6.81	0.78	3.78	7.45	3.96	8.03
Federal banks	2.29	-6.70	-3.51	-30.53	4.42	5.89	4.20	3.74	1.88	2.12	2.35
State banks	-3.14	-1.27	-3.22	-0.94	1.22	2.79	-16.04	-65.66	-16.75	-4.47	1.07
Financial system	1.95	-0.02	-0.67	-7.63	4.00	5.87	0.98	-0.80	4.26	3.33	6.15

TURNOVER RATIO - operating revenue/assets

	Dec-94	Jun-95	Dec-95	Jun-96	Dec-96	Jun-97	Dec-97	Jun-98	Dec-98	Jun-99	Dec-99
Private banks	39.88	29.47	21.98	15.53	14.86	12.48	17.60	16.11	18.33	48.88	21.17
Federal banks	20.72	18.04	15.43	11.20	11.67	8.84	14.22	11.52	11.79	18.64	11.23
State banks	24.29	20.82	18.06	14.46	13.36	11.70	12.50	13.90	14.78	19.19	15.99
Financial system	30.45	24.24	19.04	14.00	13.57	11.17	15.80	14.22	15.38	35.01	16.80

LEVERAGE RATIO - assets/net worth

	Dec-94	Jun-95	Dec-95	Jun-96	Dec-96	Jun-97	Dec-97	Jun-98	Dec-98	Jun-99	Dec-99
Private banks	772.42	855.97	1,107.31	1,380.84	912.72	1,144.61	1,032.77	1,060.44	783.10	874.41	740.77
Federal banks	810.87	869.20	847.95	656.44	1,076.30	1,229.81	1,285.62	1,208.79	1,310.63	1,326.67	1,275.51
State banks	1,594.72	1,791.36	2,017.56	2,447.43	1,804.86	1,976.23	1,958.25	1,827.58	10,704.89	1,619.44	1,126.06
Financial system	856.31	940.43	1,079.49	1,085.25	1,058.34	1,261.90	1,171.60	1,146.46	1,009.32	1,044.27	914.33

Source: Central Bank of Brazil: Department of Supervision - DEFIS.

increased recently.[19] Private banks, in general, were more efficient in generating revenue in relation to the size of their assets than state banks. The private banks' turnover ratio was higher than that of state banks all along the period. At the same time, state banks, in general, were more leveraged than private banks (twice as much as private banks).[20]

D. The Program of Incentives for the Restructuring of the State Public Financial System—PROES

20. The PROES program was established in August 1996 through Provisional Measure 1514 in order to reduce the role of state governments in the banking system and curb credit expansion to states and municipalities. Under the PROES arrangements, the central government financed the restructuring of state banks. State bank claims on impaired assets were exchanged for central government bonds, with the state governments becoming, in turn, debtors to the central government. The new debt of the states to the central government was consolidated with other state debts and restructured under the Law 9496 agreements.[21] The *quid pro quo* for such aid was that state governments had to agree to either liquidate state banks, privatize them, transform them into a nondeposit-taking financial institution (a development agency), or restructure the balance sheets of state banks and ensure that they would be run on a commercial basis, as a condition to keeping them open. Under any of the options chosen, the exchange, to a large extent, of nonperforming assets (state bonds) for performing assets (federal bonds) facilitated the restructuring of these banks.

21. As an initial stage toward privatization under PROES, the state banks might also be federalized. In this case, the federal government signs a buy-sell contract with the state government. After that, the federal government is accountable for the management of the bank and for preparing the bank for privatization, or if this is not possible, for liquidation. Privatization revenues of federalized banks are used to amortize state restructured debt owed to the federal government. A notable example of federalization is the case of BANESPA, one

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[19] It is interesting to note that the net margin of the financial system as a whole, deteriorated in the early 1990s, the period just prior to the private bank crisis in Brazil. Data collected for a sample of public and private banks for 1991 that included, among others, Banco do Brasil, BANESPA, BANESTADO, and the large private banks show an average net margin ratio of 0.07, significantly higher than the ratio observed after December 1994. See Fonseca (1992), as cited by Carneiro, Werneck, and Garcia (1993).

[20] The very large figure for state banks' leverage in December 1998 is due to the application of stricter accounting procedures that resulted in a negative net worth of R$1.8 billion for BANESTADO (the state bank of Paraná) (see Table 8.7).

[21] PROES debt could be amortized over 15 to 30 years at an interest rate of 6 percent plus the rate of inflation as measured by the IGP-DI index. In practice, however, the National Treasury has exchanged states debt for federal government securities of up to 15 years, notwithstanding the authorization to issue 30-year securities. See Central Bank of Brazil – *Focus*, February 8, 2000.

of the two state banks of the state of São Paulo and the largest state bank overall. The loans to the state government were the main assets of BANESPA. As a result of the difficulties caused by those nonperforming loans, during the second half of 1994, BANESPA resorted increasingly to short-term liquidity assistance from the central bank, until the central bank decided to place it under intervention on December 31, 1994.[22] BANESPA was eventually federalized, and the state of São Paulo finished paying off the balance of its "*conta gráfica*" by transferring the bank to the central government. After several delays in its privatization because of judicial challenges, the government plans to privatize BANESPA before the end of 2000.

22. If the state government decides to keep a state bank opened and maintain control over it, only 50 percent of the costs of the restructuring program are financed by the federal government. This is also the case in the instances when state governments have more than one financial institution and they decide to keep control over one of the state financial institutions, allowing the others to be privatized or liquidated.[23]

23. As of August 2000, the federal government had issued R$55.4 billion in LFT-A and LFT-B securities[24] under PROES arrangements (equivalent to around 5.8 percent of the 1999 GDP) and some R$3.1 billion are still to be issued (Table 8.4).[25] The value of bonds issued under PROES operations amounts to about R$91.9 billion through August 2000, when the accumulated interest income linked to the Selic rate is taken into account.

24. As part of PROES, the central bank provided liquidity to state banks by swapping short-term central bank bills (LBC-E) for the federal treasury securities (Table 8.5). Outright purchases of LFT-A by the National Treasury totaling R$29.3 billion at face value have partially refunded the central bank.

25. The central bank also provided a bridge loan (through the CEF) to Minas Gerais in 1997 until the PROES agreement with the federal government was finalized. In addition, the central bank also financed the assumption by the Banco do Brasil of the deposits of the banks of the states of Acre and Alagoas in 1997. Despite these several operations, the central bank did not play a significant role in the financing of PROES operations as it did in the case of PROER, where it provided the financing to restructure private banks. However, the central

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[22] See Bevilaqua (2000) for a discussion of this period.

[23] The state of São Paulo had two state banks: BANESPA and Nossa Caixa-Nosso Banco, whereas the state of Minas Gerais had four: BEMGE, Credireal, BDMG, and Minas-Caixa.

[24] LFT-A and LFT-B are federal securities of 15-year maturity that pay the Selic rate. The basic difference between them is that the LFT-A is amortized monthly and pays a premium of 0.0245 percent over the Selic, while the LFT-B is redeemed by a bullet payment at the end of the contract.

[25] The R$55.4 billion includes R$36.1 billion in bond issues to refinance the banking debt of the state of São Paulo to its BANESPA and Nossa Caixa-Nosso Banco.

Table 8.4. Brazil: PROES--National Treasury's Securities Issues--LFT-A and LFT-B

(As of August 2000)

State	Total issued (In millions of *reais*) 1/	Issue date	To be issued (In millions of *reais*)
Acre	131	3/29/99	4
Alagoas	0		427
Amapá	25	12/29/98	0
	4	2/24/99	0
Amazonas	313	8/2/99	35
	51	8/25/99	35
Bahia	165	6/1/98	50
	1,433	6/25/98	50
Ceará	985	5/27/99	175
Espírito Santo	260	11/25/98	1/0/00
Goiás	476	5/27/99	40
	60	6/20/00	40
Maranhão	30	12/15/98	0
	302	1/13/99	0
Mato Grosso	192	1/22/99	4
	336	6/15/98	105
	616	6/16/98	105
	2,280	6/24/98	105
Minas Gerais	329	7/2/98	105
	172	8/6/98	105
	903	8/19/98	105
	60	5/4/00	105
Pará	127	1/22/99	0
Paraná	2,687	3/5/99	0
	137	6/16/99	0
	735	12/1/99	0
	1,639	12/15/99	0
Perrnambuco	329	8/15/98	20
	916	8/27/98	20
Piauí	69	2/24/00	59
Rio Grande do Norte	101	3/18/99	0
	4	12/22/99	0
Rio Grande do Sul	2,380	12/10/98	0
	173	12/10/98	0
Rondônia	549	5/20/98	4
Roraima	40	2/18/99	0
Santa Catarina	198	3/29/99	2,130
	68	5/5/99	2,130
São Paulo	33,579	12/23/97	0
	2,548	12/24/97	0
Sergipe	41	1/18/99	0
Total	**55,444**		**3,053,053**

Source: Central Bank of Brazil, Public Debt Department, DEDIP.

1/ Face value.

Table 8.5. Brazil: PROES--Total LFT-A Swapped for LBC-E

(As of December 1999)

State	Swap date	Total swapped 1/ (In millions of *reais*)	Maturity range of the LBC Issued	Outright purchase by the National Treasury of LFT-A in BCB's Portfolio	
				Date	Total purchased 2/
SP	1/16/98	36,961	20-139		
BA	4/2/98	794	22-141	12/22/99	757
MG	6/15/98	12,160	32-81	12/22/99	12,160
MG	7/2/98	678	43-64		
SE	7/10/98	49	21-140	12/22/99	49
MG	9/9/98	487	23-142		
SC	9/21/98	250	25-144		
PE e BA	9/30/98	722	30-149	12/22/99	403
SC	10/6/98	414	31-150	12/22/99	653
BA	10/21/98	459	30-149		
RS	11/23/98	9,885	32-151	12/22/99	9,748
RS	12/16/98	2,028	30-149	12/22/99	2,019
AP	1/27/99	25	30-149	12/22/99	25
MT e PA	2/10/99	196	30-149	12/22/99	193
RR	2/24/99	7	58-121		
AP e PR	3/12/99	3,041	35-154	12/22/99	3,046
RN	3/25/99	54	29-148	12/22/99	52
SE e SC	4/14/99	111	30-149	12/22/99	106
RR	5/3/99	4	60-123	12/22/99	11
GO e CE	9/29/99	634	30-149	12/22/99	109
GO, CE e A	11/24/99	393	30-149		
Total		**69,352**			**29,331**

Source: Central Bank of Brazil: Institutional Communication Group - GCI - FOCUS, February 2000.

1/ Present value as of the swapping date.
2/ Face value.

bank, in its role as the bank supervision agency, evaluated the financial conditions of the state bank to be restructured and, in some cases, prepared the bank for privatization. Another major dissimilarity with PROER was that under PROES there was no case of a state bank being split into a "good bank/bad bank." In the case of BANERJ, the state bank of Rio de Janeiro, the bank was indeed split into a "good bank/bad bank," but its privatization did not take place under PROES. The "good bank" was acquired by Banco Itaú (a private bank) and the "bad bank" was liquidated by the central bank.

26. In August 1996, when PROES was initiated, 35 financial institutions were controlled by state governments, out of which 23 were commercial/multiple banks. As of August 2000, ten financial institutions had been closed, five had been privatized by the states, one is being privatized by the state government (BANESTADO of Paraná), seven had been federalized and are in the process of privatization, and five had had their balance sheet strengthened, while remaining under the control of state governments (Table 8.6). Three state banks have not participated in PROES and two states do not have banks. At the same time, 16 states have been authorized to create development agencies, out of which nine have already done so and started operations (Table 8.6). The development agencies will onlend financial resources advanced by the BNDES or multilateral creditors and will not accept deposits. They are not allowed to lend to state governments or to have access to other resources (e.g., bond issuance in foreign or domestic markets). In some cases, the development agency has inherited the development portfolio of the former state bank.[26]

27. After the restructuring done under PROES, state banks, that accounted for about 17 percent of the financial system **assets** from December 1994 to the middle of 1997 (calculated from data in Table 8.7), saw their participation in the financial system shrink drastically to about 4.5 percent of financial assets by December 1999. Private banks, by contrast, have maintained their participation in the financial system to about 52 percent over the whole period, while that of federal banks increased. In line with the reduction in their share of total assets, the participation of state banks' **liabilities** in the total liabilities of the financial system declined from 18 percent on average over the period December 1994–June 1997 to 5 percent in December 1999, whereas the share of private banks' liabilities in the financial system stood around 50 percent, and that of federal banks rose to 43 percent. As regards **net worth**, the participation of state banks in the financial system represented 10 percent over the period December 1994–June 1997, and dropped to less than 4 percent in December 1999. Conversely, the participation of private banks' net worth in the financial system increased from 52 percent over the period December 1994–June 1997 to 67 percent in December 1999, while the share of federal banks was 30 percent by end-1999.[27]

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[26] The number of institutions in August 2000 does not coincide with that of August 1996 because some state banks are being "counted twice," in the sense that a state bank may have been extinguished, while at the same time a development agency was established.

[27] The sharp drop in state banks' net worth in December 1998 is mainly explained by adjustments noted above concerning doubtful loans of BANESTADO, which resulted in a negative net worth of R$1.8 billion for this bank.

28. The decline in size of state banks is reflected also in the sharp reduction in the number of **agencies and employees** that has been taking place continuously since 1994 (Table 8.8). The number of agencies was reduced from 3,844 in 1994 to 1,586 in 1999 while the number of employees dropped from 147,898 in 1994 to 40,997 in 1999.

E. Conclusions

Brazil has been successful in addressing the problems of state banks that were largely associated with the financial problems of state governments. The restructuring of state governments debt established the necessary conditions to restructure the state banks. Through PROES the Brazilian authorities have been able to close, privatize, or convert state banks into nondeposit taking development institutions that cannot lend to state governments. Of the original 35 state banks, only five state banks have been maintained open after their balance sheets were strengthen with the help from PROES. The cost of PROES has been significant, but not high for international standards, and the program has closed a major source of quasi-fiscal losses in Brazil.

Table 8.6. Brazil: PROES - Current Status

Option	Total	Financial institution	State	Current status 1/	Date 2/	Auction price (in R$ million)
Extinction	10	Banacre	Acre	5	03.31.1998	-
		Produban	Alagoas	6	06.29.1998	-
		Banap	Amapá	5	05.26.1998	-
		Bemat	Mato Grosso	5	12.16.1997	-
		Minascaixa	Minas Gerais	5	05.08.1998	-
		Caixego	Goiás	5	11.13.1998	-
		Bandern	Rio Grande do Norte	5	05.13.1998	-
		BDRN	Rio Grande do Norte	5	05.13.1998	-
		Beron	Rondônia	5	02.12.1998	-
		Baner	Roraima	1	03.25.1998	-
Privatization carried out by the states	6	Baneb	Bahia	2	06.22.1999	260.0
		BEMGE	Minas Gerais	2	09.14.1998	583.0
		Credireal	Minas Gerais	2	08.07.1997	127.3
		Banestado	Paraná	2	10.17.2000	1,625.0
		Bandepe	Pernambuco	2	11.17.1998	182.9
		Banerj	Rio de Janeiro	2	06.26.1997	311.1
Privatization carried out by the federal government	7	Banespa	São Paulo	3	12.24.1997	-
		BEA	Amazonas	3	08.04.1999	-
		BEC	Ceará	3	05.31.1999	-
		BEG	Goiás	3	05.31.1999	-
		BEM	Maranhão	3	07.21.2000	-
		BEP	Piauí	3	03.31.2000	-
		BESC	Santa Catarina	-	08.30.2000	-
Restructuring	5	Banestes	Espírito Santo	4	03.31.1998	-
		Banpará	Pará	4	03.30.1998	-
		Banrisul	Rio Grande do Sul	4	03.31.1998	-
		Nossa Caixa Nosso	São Paulo	4	12.23.1997	-
		Banese	Sergipe	4	03.30.1998	-
Transformed into development agencies	16	Acre	Acre	-	03.31.1998	-
		Alagoas	Alagoas	-	06.29.1998	-
		AFAP	Amapá	7	05.26.1998	-
		AFEAM	Amazonas	7	08.04.1999	-
		Desenbanco	Bahia	-	03.19.1998	-
		AF de Goiás S.A.	Goiás	7	11.13.1998	-
		Mato Grosso	Mato Grosso	-	12.16.1997	-
		BDMG	Minas Gerais	-	05.08.1998	-
		AF do Paraná S.A.	Paraná	7	06.30.1998	-
		Pernambuco	Pernambuco	-	06.12.1998	-
		Piauí	Piauí	-	02.26.1999	-
		AF do R.G. do Norte	Rio Grande do Norte	7	05.13.1998	-
		Sul Caixa – Caixa	Rio Grande do Sul	7	03.31.1998	-
		AFDES do Est. de	Rondônia	7	02.12.1998	-
		AFERR	Roraima	7	03.25.1998	-
		Badesc	Santa Catarina	7	03.31.1998	-
Not participating in PROES	3	BRB	Distrito Federal	-	-	-
		Bandes	Espírito Santo	-	-	-
		Paraiban	Paraíba	-	-	-
States without state-owned banks	2	-	Mato Grosso do Sul	-	-	-
		-	Tocantins	-	-	-

Source: Central Bank of Brazil: Public Debt Department – DEDIP.

1/ Codes: 1-extinguished; 2-privatized; 3-federalized; 4-restructured; 5-legal extinction in progress; 6-under central bank intervention; 7-authorized by the central bank to operate as a development agency and already operating.

2/ Refers to original contract date. In the case of banks that have already been privatized, indicates auction date.

Table 8.7. Brazil: Balance Sheet of the National Financial System

(In millions of *Reais*)

ASSETS

	Dec-94	Jun-95	Dec-95	Jun-96	Dec-96	Jun-97	Dec-97	Jun-98	Dec-98	Jun-99	Dec-99
Private banks	211,675	270,622	284,458	360,842	349,080	418,654	419,088	476,444	435,826	480,384	474,968
Federal banks	161,542	180,238	203,855	215,713	223,859	265,503	338,027	328,960	349,413	363,878	366,607
State banks	69,195	87,311	104,348	114,393	125,618	137,842	65,621	58,190	50,313	44,648	39,716
Financial system	442,412	538,171	592,661	690,948	698,557	821,999	822,736	863,594	835,552	888,910	881,291

LIABILITIES

	Dec-94	Jun-95	Dec-95	Jun-96	Dec-96	Jun-97	Dec-97	Jun-98	Dec-98	Jun-99	Dec-99
Private banks	184,271	239,006	258,769	334,710	310,834	382,078	378,509	431,515	380,172	425,446	410,850
Federal banks	141,620	159,502	179,814	182,852	203,060	243,914	311,734	301,746	322,753	336,450	337,865
State banks	64,856	82,437	99,176	109,719	118,658	130,867	62,270	55,006	49,843	41,891	36,189
Financial system	390,747	480,945	537,759	627,281	632,552	756,859	752,513	788,267	752,768	803,787	784,904

NET WORTH

	Dec-94	Jun-95	Dec-95	Jun-96	Dec-96	Jun-97	Dec-97	Jun-98	Dec-98	Jun-99	Dec-99
Private banks	27,404	31,616	25,689	26,132	38,246	36,576	40,579	44,929	55,654	54,938	64,118
Federal banks	19,922	20,736	24,041	32,861	20,799	21,589	26,293	27,214	26,660	27,428	28,742
State banks	4,339	4,874	5,172	4,674	6,960	6,975	3,351	3,184	470	2,757	3,527
Financial system	51,665	57,226	54,902	63,667	66,005	65,140	70,223	75,327	82,784	85,123	96,387

Source: Central Bank of Brazil: Department of Supervision - DEFIS

Table 8.8. Brazil: State-Owned-Banks - Branches and Employees

STATE BANK	Branches						Employees					
	1994	1995	1996	1997	1998	1999	1994	1995	1996	1997	1998	1999
BRB - BANCO DE BRASILIA S.A.	53	53	47	56	56	55	3,514	4,812	3,865	3,518	3,630	3,652
BANCO DO EST. DE GO S.A.	164	175	166	168	166	-	4,965	4,336	3,767	3,109	2,909	-
BANCO DO EST. DE MT-EM LIQ. EXTRAJ	44	30	30	30	-	-	1,405	1,268	1,164	-	-	-
BANCO DO EST. DO AC S.A.	16	15	15	15	1	-	789	654	578	483	42	-
BANCO DO EST. DO AM S.A.	38	36	36	36	36	36	1,408	1,450	1,323	1,288	1,261	1,146
BANCO DO EST DE RONDONIA S.A.	29	28	28	28	-	-	1,420	1,101	992	979	-	-
BANCO DO EST. DO PA S.A.	40	37	37	37	37	37	1,972	1,488	1,306	1,057	852	751
BANCO DO EST. DO MA S.A.	90	90	86	79	79	77	1,874	2,348	1,665	855	714	601
BANCO DO EST. DO PI S.A.	5	6	6	7	7	7	319	290	278	262	237	234
BANCO DO EST. DO CE S.A.	77	85	85	78	71	-	2,411	3,403	2,593	1,673	1,480	-
PARAIBAN-BANCO DO EST DA PB	5	5	7	7	8	8	403	480	474	442	426	426
BANCO DO EST. DE PE S.A.	56	53	52	52	-	-	3,850	3,875	2,297	2,095	-	-
BANCO EST.DE ALAGOAS-LIQ.EXTRAJ.	28	23	23	-	-	-	1,101	1,189	1,128	-	-	-
BANCO DO EST. DE SE S.A.	49	49	47	48	49	50	1,797	1,481	1,007	1,062	1,077	1,014
BANCO DO EST. DA BA S.A.	174	174	169	169	170	-	5,653	4,520	4,193	3,917	2,867	-
BANCO DO EST. DE MG S.A.	491	518	501	473	-	-	11,012	11,309	9,679	7,969	-	-
BANCO DE CREDITO REAL DE MG S.A.	85	85	85	-	-	-	2,827	3,076	2,955	-	-	-
BANCO BANESTES S.A.	104	104	104	85	84	84	4,416	4,504	3,727	3,483	3,549	3,520
BANCO ESTADO RJ S/A-EM LIQ.EXT.	227	221	194	-	-	-	12,737	11,529	7,420	-	-	-
BANCO DO EST. DE RR S.A.	10	9	9	1	1	-	216	226	196	125	2	-
BANCO EST. AMAPA-EM LIQ.EXTRAJ.	2	2	2	-	-	-	110	100	110	-	-	-
NOSSA CAIXA-NOSSO BANCO S.A.	495	482	482	483	485	485	15,544	14,307	13,403	12,321	12,287	12,313
BANCO DO ESTADO DE SAO PAULO S/A	612	612	610	569	-	-	38,864	37,854	34,872	30,002	-	-
BANCO DO EST. DO PR S.A.	392	393	392	391	391	377	12,652	13,880	12,886	12,004	11,578	9,641
BANCO DO EST. DE SC S.A.	255	254	255	255	256	-	5,991	8,666	8,483	8,048	7,474	-
BANCO DO EST. DO RS S.A.	303	312	315	316	370	370	10,648	9,183	8,988	8,529	8,081	7,699
Total	3,844	3,851	3,783	3,383	2,267	1,586	147,898	147,329	129,349	103,221	58,466	40,997

Source: Central Bank of Brazil: Department of the Organization of the National Financial System - DEORF.

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IX. Foreign Direct Investment and Transnational Enterprises in Brazil[1]

A. Introduction

1. Brazil was the second largest recipient of foreign direct investment among developing nations during the 1990s (behind the People's Republic of China), with total inflows amounting to approximately US$97 billion. This impressive performance was far from homogeneous over time, and this section identifies two main phases characterizing FDI inflows to Brazil during the decade. The period 1990–94 was marked by the beginning of important structural reforms that affected the quality but failed to immediately increase the amount of FDI inflows in a substantial manner, due to the unfavorable macroeconomic environment dominated by very high inflation rates. Foreign direct investment in this period reflected mainly the restructuring and modernization of transnational enterprises already established in the Brazilian manufacturing sector. In contrast, the period 1995–99 marked the deepening of the structural reform process which, combined with improved macroeconomic conditions, significantly boosted the level and altered the composition of FDI inflows to Brazil. In this phase, and particularly with the stimulus of the privatization of public utilities, the service sector became the leading destination of foreign direct investment inflows.

2. Following a discussion on the two subperiods defined, the section reviews some of the important issues associated with the impact of transnational enterprises in the Brazilian economy. Notwithstanding the lack of consistent data set on the subjects of FDI and the performance of transnational enterprises, available information supports the views that:

- the level of FDI should remain robust beyond the horizon of the privatization program to the extent that the efficiency, and thus the potential GDP growth of the economy have increased, improving the prospects for investors;
- transnational enterprises in Brazil's manufacturing sector have been giving increased importance to exporting their products;
- transnational enterprises contribute to increase the productivity of the economy; and
- the overall impact of FDI and transnational enterprises on the external accounts was positive in 1995 (the only year for which detailed data are available).

B. The Beginning of Reforms and the Characteristics of FDI in 1990–94

3. FDI inflows averaged only US$1.6 billion or 0.2 percent of GDP per year between 1990–94. Despite these modest results, which may be ascribed mainly to macroeconomic instability and political uncertainty, the period was important to the extent that it marked the start of structural reforms that contributed to the subsequent rise in FDI inflows to Brazil.

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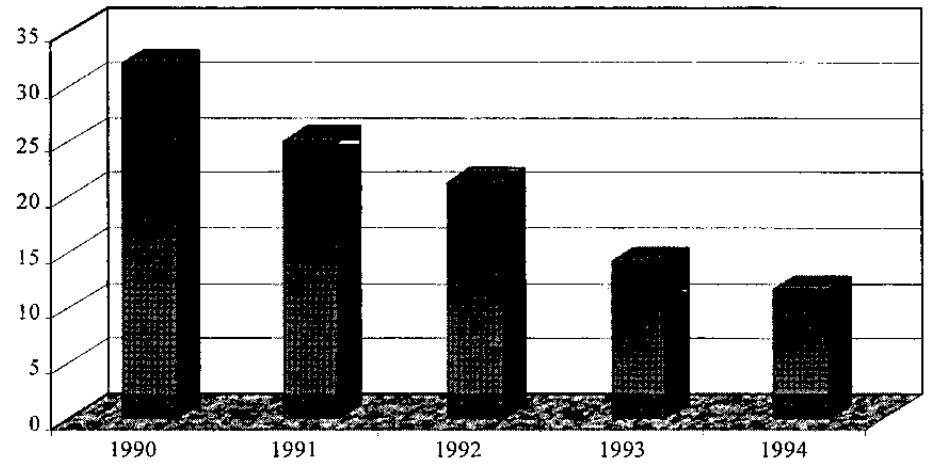
[1] Prepared by Claudio Paiva.

Several measures were adopted to reduce the red tape for investment registration and profit repatriation, increase transparency, eliminate restrictions on some types of foreign investment, and reduce the discriminatory treatment against foreign capital in some areas of taxation.[2] In addition, a privatization program was introduced and import tariffs were reduced substantially (Figure 9.1).

Figure 9.1. Brazil: Average import tariffs



4. The immediate impact of these reforms was to spur a process of restructuring and modernization carried out by transnational enterprises already established in Brazil that worked to improve their competitive position in the domestic market as well as in the recently created Mercosur.[3] In this regard, the reduction of tariffs was particularly important to the extent that it lowered the cost of imported capital goods while simultaneously signaling the threat of greater competition from foreign products.[4] The success of this modernization strategy and the increased emphasis on the external market is attested by the fact that the

[2] For a detailed list of the measures and legislation introduced, see SM/98/27.

[3] For details on the characteristics of FDI investment in the period, see Bielschowski and Stumpo (1995).

[4] A qualitative poll published by Sobeet (2000) showed that 85 percent of the transnational enterprises surveyed mentioned cost reduction via technological modernization as the main motivation to invest during periods of sluggish demand growth. Also, the majority of transnational enterprises indicated that restrictions on access to foreign new technology and tariff barriers are among the leading factors that affect their competitive position.

value of manufactured exports of transnational enterprises increased by 65 percent during the first half of the 1990s, against only 36 percent for Brazilian enterprises.[5]

5. The aforementioned restructuring of existing transnational enterprises was the dominant force driving FDI inflows to Brazil in 1990–94, since the macroeconomic instability rooted on extremely high inflation rates discouraged the establishment of new transnational enterprises. Privatization-related foreign inflows were also comparatively small, as the privatization program began under severe restrictions to foreign capital participation. For example, foreigners could only buy a maximum of 40 percent of a company's voting shares, foreign capital had to remain in Brazil for a minimum of 12 years, and shares purchased in privatization auctions could not be sold for two years. Thus, because transnational enterprises already established in Brazil were responsible for the bulk of FDI flows in 1990–94, these inflows reinforced the historic dominance of manufacturing as the main sector of destination, and the United States, Germany, Switzerland, and Japan as the main origin of FDI flowing into Brazil until the mid-1990s.

C. The Characteristics of the Stock of FDI in Brazil in 1995

6. The central bank published in 1998, for the first time, a comprehensive *Census of Foreign Capital in Brazil* (hereafter "the census") with detailed information on the stock of FDI and the characteristics of transnational enterprises in Brazil based on data collected until 1995. The census shows that the presence of transnational enterprises until 1995 was stronger in manufacturing, where 55 percent of the total stock of FDI was concentrated, followed by the service sector with 44 percent, and agriculture with less than 2 percent of the total stock of FDI.[6] Within the manufacturing sector, chemicals, automobile, and steel production were among the main activities. The origin of foreign investments was broadly diverse, with the United States being responsible for approximately one-fourth of the total, followed by Germany, Japan, and Switzerland; interestingly, countries considered to be "fiscal havens" accounted for about 7 percent of the total stock of FDI in Brazil in 1995 (Figure 9.2).[7]

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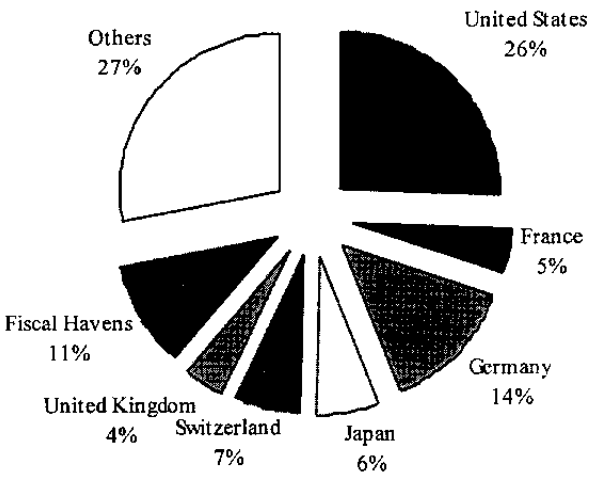
[5] Sobeet, 1998.

[6] It is recognized that the method of registration of FDI until 1995 biased the composition of investments in favor of the service sector, since investments of enterprises that are part of a "holding" were classified under "enterprise services," even though these companies performed manufacturing activities. Using disaggregated census data, Sobeet (1998) shows that manufacturing accounted for about 70 percent of total liquid assets and total operating revenues of transnational enterprises.

[7] Fiscal havens here refer to Virgin Islands, Cayman Islands, Bermudas, Panama, and The Bahamas.

Figure 9.2. Brazil: stock of FDI by country of origin, 1995



7. It is estimated that transnational enterprises owned about 11 percent of the total stock of capital and were responsible for 13½ percent of total Brazilian output in 1995.[8] Another measure of the participation of transnational enterprises in the economy, in a sample of more than 200,000 companies registered with the Tax Administration Bureau, revealed that transnational enterprises accounted for 16 percent of total operating revenues of all companies together—considering the manufacturing sector alone, this share increases to 34 percent. Some activities in the Brazilian economy stood out for the strong presence of transnational enterprises, such as the tobacco industry (where 98 percent of total operating revenues were generated by transnational enterprises), the automobile industry (88 percent), office and computer equipment (69 percent), chemicals (56 percent), and electric equipment (50 percent).[9]

8. The output of transnational enterprises is fairly concentrated, with the largest 10 companies accounting for 20 percent of total revenues obtained by all transnational enterprises operating in Brazil in 1995. Also, due to the predominance of manufacturing as the main sector of destination of FDI and accompanying the heavy concentration of the Brazilian industrial production in the State of São Paulo, 60 percent of the total assets of transnational enterprises were in that state in 1995. Finally, transnational enterprises were responsible for almost 28 percent of the total tax revenue and for about 17 percent of Brazil's total stock of external debt in 1995.

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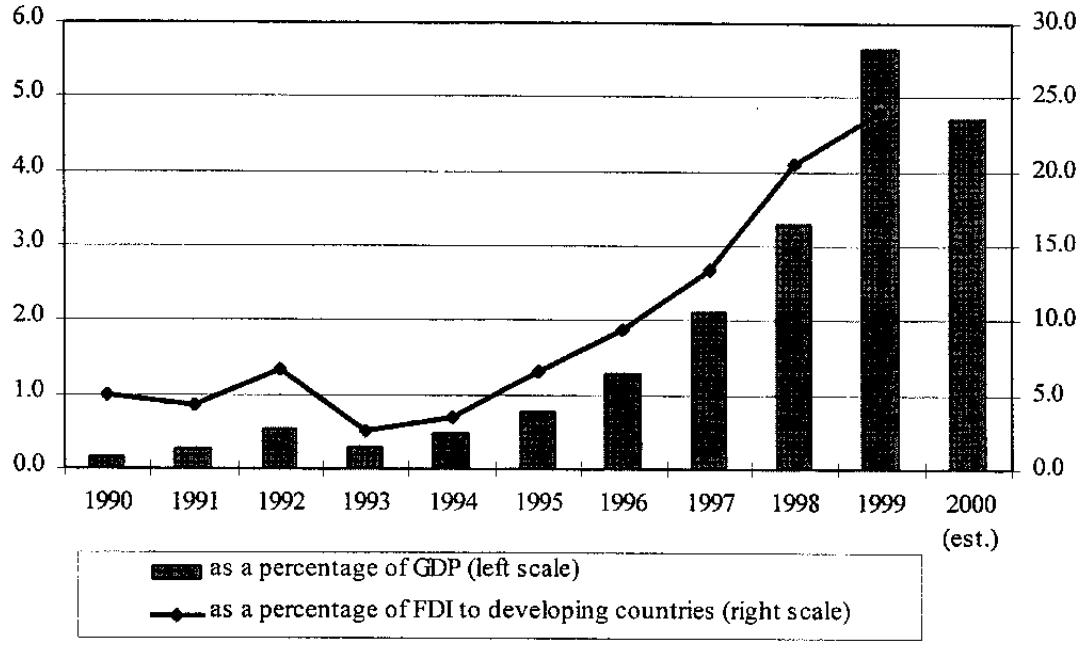
[8] See Cepal (1998) and Zockun (1999).

[9] Sobeet (1998).

D. The Boom of FDI in the Period 1995–99

During the second half of the 1990s, FDI inflows to Brazil soared, rising from US$5.5 billion or 0.8 percent of GDP in 1995 to US$30 billion or about 5.7 percent of GDP in 1999 (Figure 9.3). Although this result is partially associated with the general increase of FDI to developing nations during the period, flows to Brazil grew more than proportionally, taking Brazil from fifth to second place among the largest recipients of FDI in the developing world. Brazil's success in attracting foreign investors in this period can be attributed mainly to the continuation of the reforms, which further reduced the tax burden on foreign capital and expanded the privatization process, and the economic stabilization after the *Real Plan*. The consolidation of Mercosur also stimulated transnational enterprises to establish or increase production capacity in Brazil, thereby taking advantage of economies of scale to compete in the domestic and external markets.

Figure 9.3. Brazil: Foreign Direct Investment



9. A substantial amount of FDI was attracted to Brazil to participate in the privatization program during the second half of the 1990s. Instrumental for these capital inflows was the approval, in 1995, of legislation eliminating public monopolies and regulating the granting of concessions to private companies in some key utility sectors, which allowed the privatization program to be extended to areas such as telecommunications and the generation, transmission, and distribution of energy. The elimination of limits to foreign ownership in privatized companies was another fundamental step toward increasing FDI inflows. In addition to privatization, competition in the sectors previously dominated by state monopolies has been fostered by granting concessions to new private companies, which has spurred a new round of FDI inflows, notably in telecommunications. Reflecting the heavy

participation of foreign capital in the privatization of public utilities, the sectoral distribution of FDI has been changed considerably from its historical pattern, with the recent predominance of inflows into the service sector (Table 9.1).

Table 9.1. Brazil: FDI Composition by Sector

	1995		1996-99		1999 (Sept.)	
	Stock	%	Flows	%	Stock	%
Agriculture	**689**	**1.6**	**709**	**1.5**	**1,398**	**1.6**
Manufacturing	**23,402**	**55.0**	**6,543**	**14.1**	**29,945**	**33.7**
Of which:						
Chemicals	4,748	11.2	945	2.0	5,692	6.4
Steel	2,566	6.0	148	0.3	2,714	3.1
Machinery and equipment	2,072	4.9	561	1.2	2,633	3.0
Automotive	2,851	6.7	1,569	3.4	4,420	5.0
Services	**18,439**	**43.4**	**38,995**	**84.3**	**57,434**	**64.7**
Of which:						
Electricity and gas	0	0.0	7,382	16.0	7,383	8.3
Wholesale	2,105	5.0	1,987	4.3	4,092	4.6
Telecommunications and Post	195	0.5	4,007	8.7	4,203	4.7
Financial intermediation	1,255	3.0	7,892	17.1	9,147	10.3
Total	**42,530**	**100**	**46,247**	**100.0**	**88,777**	**100**

10. This is not to say, however, that the performance of the traditional manufacturing sector has suffered. To the contrary, strong flows into manufacturing raised the sector's stock of FDI by approximately 40 percent between 1995–99.[10] Even though many new foreign companies installed production units in Brazil, notably in the automobile sector, foreign investment in manufacturing continued to be dominated by previously established transnational enterprises, which accounted for at least 60 percent of total manufacturing FDI in the period.[11] Most of these investments went into the production of durable goods (automakers alone were responsible for 26 percent of total FDI in manufacturing) stimulated

[10] Stocks in 1999 are estimated as the sum of the flows in 1996–99 that is added to the stocks of 1995.

[11] See Laplane and Sarti (1997) and Sobeet (1999).

by buoyant demand and competitive pressures from imports which were intensified by the real exchange rate appreciation after 1994.[12]

E. The Performance of FDI in 2000

11. The latest data available indicate that foreign direct investment in Brazil remained strong through August 2000, with accumulated inflows of US$20.1 billion or about 5 percent of estimated GDP. Most of these flows continue to go into the service sector, although the share of services in total recent FDI inflows has declined accompanying a decrease in privatization-related inflows which responded for only 10 percent of total FDI inflows during the first semester of 2000. Within services, telecommunications and energy are still the main destination of FDI, which probably reflects the substantial followup investments of the companies privatized in the last three years. Internet services have also attracted a substantial amount of new investments, as foreign companies try to establish themselves in the large and relatively incipient Brazilian market. The United States continue to be the main origin of FDI coming to Brazil.

F. The Sustainability of Foreign Direct Investment Inflows

12. The substantial amount of FDI that came to Brazil because of foreign participation in the privatization process during the last few years raises the question of how sustainable FDI inflows will be as the bulk of the privatization program is concluded. This section describes the direct impact of privatization on FDI, showing that it has not been the main source of FDI inflows, and argues that the main impact of privatization on foreign direct investment (as on investment in general) is an indirect one that should last beyond the duration of the privatization program.

13. Privatization-related FDI inflows have amounted to approximately US$23 billion since 1996, which is equivalent to a little more than one-third of total FDI in the period. Excluding privatization inflows, the amount of FDI is therefore still high and, perhaps more importantly, has been rising continuously (Figure 9.4). During the first eight months of 2000, for example, FDI, excluding privatization, amounted to a record US$17.6 billion or approximately 4½ percent of estimated GDP, a level more than sufficient to cover the entire current account deficit in the period.

14. The fact that FDI inflows excluding privatization have always been greater than privatization-related inflows and have increased continuously since 1996 suggests that the main impact of the privatization program on foreign investments is not a direct one. Instead, by signaling greater economic efficiency, especially in the recently privatized and strategic areas of public utilities and telecommunications, the privatization program has improved the

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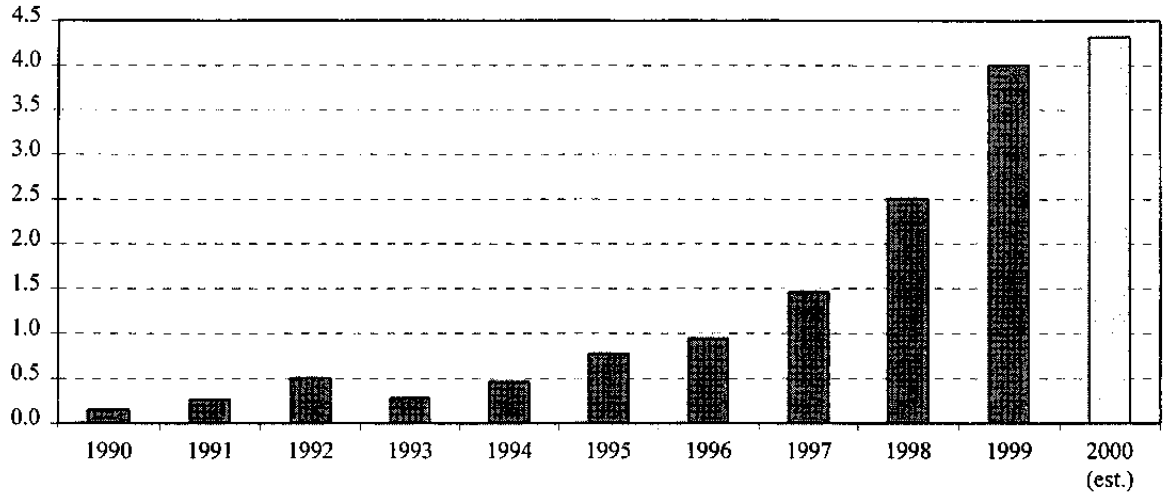
[12] The ratio of imports to GDP averaged 3½ percent between 1990–94 and 7½ percent in 1995–99; the average share of durable goods in total imports increased from 6 percent to 9 percent between the two periods.

Figure 9.4 Brazil: FDI Excluding Privatization-Related Inflows
(in Percent of GDP)



outlook for economic growth and profitability, thus stimulating investment. Empirical evidence supporting this argument is provided by Sader (1993), who used a sample of 21 low and middle income countries to estimate a model in which nonprivatization FDI is positively (and significantly) affected by privatization. Therefore, to the extent that it increases potential GDP growth, privatization should continue to attract foreign investments beyond the duration of the privatization program.[13]

G. Transnational Enterprises and the External Accounts

15. The impact of transnational enterprises on the external accounts has traditionally been a source of intense debate in Brazil.[14] The subject has deserved increasing attention in the wake of the record FDI inflows observed in the last few years. Some critics of the internationalization of the Brazilian economy have argued that transnational enterprises weigh negatively in the country's external accounts because of their profit remittances, greater propensity to import, and the low export coefficient which would follow from the fact that the large domestic market has been the main motivation for these enterprises to establish in Brazil. These concerns, however, are not supported by the data available.

16. According to the census, transnational enterprises had a positive trade balance amounting to some US$2.3 billion in 1995, being responsible for 41 percent of Brazil's total exports and 39 percent of total imports. The relevance of these numbers increases when compared to an overall trade deficit of about US$3.5 billion posted by Brazil that year. Also in 1995, profit remittances amounted to US$3.1 billion (the equivalent to 7½ percent of the

[13] Barnett (2000) also shows that privatization increases GDP growth beyond the horizon of implementation of the privatization program according to a model estimated for 18 countries.

[14] See Moraes (1999), Cepal (1998), and Furtado (1973).

total estimated stock of FDI), and considering the net FDI inflows of about US$4 billion, the overall contribution of transnational enterprises to the Brazilian external accounts in 1995 was positive.

17. While the same detailed data are not available for more recent years, some general trends of the impact of transnational enterprises on the external accounts can be inferred from other sources. Profit remittances increased sharply until 1998, when they reached US$7.6 billion, partially reflecting the real appreciation of the exchange rate, but have decreased since then, registering US$5.5 billion in 1999 and US$2.4 billion in the first half of 2000 (against US$2.7 billion in the first half of 1999). On the other hand, profit remittances as a proportion of FDI have declined continuously from 64 percent in 1995 to only 18 percent in 1999 and 14 percent in the first half of 2000. Even excluding privatization-related FDI inflows, the ratio of profit remittance to FDI decreased to 26 percent in 1999 and 15 percent in 2000 (Figure 9.5). This ratio is still below the levels observed in the 1970s, suggesting that the favorable trend could continue as the performance of the Brazilian economy improves, as expected, in the years ahead.

18. The recent growth of manufacturing exports has been stronger in activities where the presence of foreign capital is stronger (listed in Paragraph 7), suggesting a positive direct contribution of manufacturing FDI to the latest dynamism of Brazilian exports. For example, the value of exports of automobiles, electric equipment, chemicals, and telecommunications equipment increased by 28 percent, 30 percent, 26 percent, and 160 percent, respectively, during the first half of 2000 compared to the first half of 1999, against an average of 16 percent for all export products. In addition, export activities have been growing in importance within the overall strategy of transnational enterprises in the manufacturing sector, as shown by a qualitative survey in which 76 percent of the transnational enterprises contacted indicated that export expansion is one of their most important strategies for the years ahead.[15] The latest data obtained show an increased propensity to export in sectors with heavy participation of foreign capital: between 1990 and 1996, the share of exports in total production rose from 2.2 percent to 16.6 percent in the tobacco industry, from 9.2 percent to 13.6 percent in electric and office equipment, from 5 percent to 7 percent in electronic and telecommunications equipment, and from 6.3 percent to 6.6 percent in transport equipment. Also, the share of export revenues in total revenues of transnational enterprises in Brazil rose from about 8 percent in the 1970s to more than 12 percent in 1995.[16]

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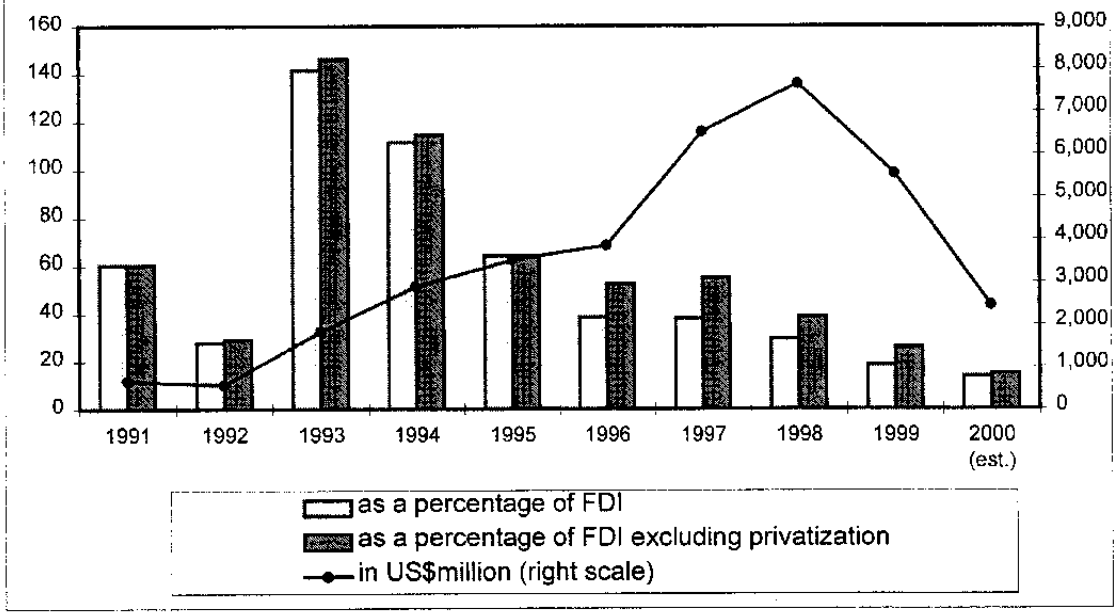
[15] Sobeet (2000).

[16] Moraes (1999). It is worth noting that the period 1995–96 may underestimate the average export to revenue ratio of transnational enterprises, as suggested by the poor export performance and buoyant domestic demand observed in those two years, when the export to GDP ratios of the Brazilian economy were the lowest in two decades.

Figure 9.5. Brazil: Profit and Dividend Remittances



19. On the other hand, the increased participation of foreign capital in nontradable sectors, notably telecommunications, is indeed expected to raise the average coefficient of import penetration while reducing the coefficient of export to revenues of transnational enterprises, thus generating a negative *direct* impact on the Brazilian current account. This is not to say, however, that the larger flows of FDI into nontradable sectors will exert an *overall* negative impact on the external accounts. While impossible to quantify, the indirect effect of these investments will be that of significantly raising efficiency and reducing costs in these key sectors, contributing to the reduction of the "Brazil cost," increasing the competitiveness of the entire economy, and thereby stimulating exports. Some of these effects are already being felt, as described in the following section.

H. Privatization, Foreign Capital, and Efficiency Gains in the Telecommunications and Energy Sectors

20. Foreign capital has become a major participant in the privatization program, being responsible for about 45 percent of total sale proceeds up to date and more than half of the proceeds from privatizations in the telecommunications and energy sectors. Despite the limited availability of data, some indicators obtained provide a general idea of the increased efficiency in these two important sectors that was brought about by the privatization process with significant participation of foreign capital. Between 1997–99, for example, the number of fixed telephone lines and public telephones increased by 50 percent and 60 percent, respectively; the startup cost for a regular phone line was reduced by 60 percent; and the size of the fiber-optic network (key for data transmission) nearly tripled in the same period. In the energy sector, electricity companies privatized until 1998 increased their investments, on

average, by approximately 60 percent in the year immediately following privatization; total interruption time of energy supply decreased by 36 percent and the number of consumers affected by these interruptions was 30 percent smaller in 1999 than in 1996.[17]

I. Transnational Enterprises and the Labor Market

21. A study by Zockun (1999) shows that although transnational enterprises were responsible for less than 2 percent of total employment in Brazil in 1995, these companies paid about 12 percent of the total wages and salaries in the economy. In that same year, the average salary in transnational enterprises was about six times greater and the productivity of labor 7½ times higher than the national average in 1995. Above-average productivity gains were observed in sectors with heavy foreign capital participation during the 1990s. While the productivity of labor in the Brazilian economy increased by about 20 percent from 1990–98, productivity increased by approximately 88 percent in automobile production, 51 percent in the tobacco industry, 83 percent in the chemical industry, 63 percent in the production of electric equipment, and 102 percent in telecommunication services.[18]

[17] When these data were collected, privatized companies accounted for 72 percent of the energy distribution and 22 percent of energy generation in Brazil.

[18] Ipea (2000) and Sobeet (2000).

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X. Medium- and Long-term Current Account Sustainability[1]

A. Introduction

1. Over most of the last 30 years, Brazil has run current account deficits of over 3 percent of GDP on average. Since 1980, rather sticky service account deficits—stemming mainly from a heavy external debt service burden—have offset trade surpluses averaging about 2 percent of GDP. This, together with public sector borrowing requirements of above 4 percent of GDP on average, have contributed to Brazil's external vulnerability, in particular during periods of adverse movements in the terms of trade and/or heightened international concern about emerging market economies.

2. The adoption of a flexible exchange rate regime in early 1999 and strengthened macroeconomic management, however, have helped Brazil reduce external vulnerabilities and improve its terms of access to international capital markets. In this context, although the external current account is likely still to post a considerable deficit in 2000 (about 4.2 percent of GDP), concerns about short-term sustainability have abated, as foreign direct investments and other long-term capital inflows continue to be strong, and more than sufficient to meet Brazil's external financing requirements. Concerns remain, however, about the persistence of large current account deficits and the sustainability of capital inflows in the medium and longer term, and their implications for the value of the *real*, macroeconomic performance, and the scope for policy makers to pursue growth-enhancing economic and structural policies.

3. This section investigates the relationship between current account balances and those variables (domestic and international) that are expected to influence the current account in the medium and long run through their impact on savings and investment. The prospects for Brazil's external current account in the medium and long run are explored through macroeconomic simulations using the IMF's multicountry dynamic model (MULTIMOD), which was modified to integrate Brazil.[2] The dynamic reaction of the current and trade accounts to structural and macroeconomic shocks with different degrees of persistence are discussed.

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[1]Prepared by Marco Rossi. Hamid Faruqee and Susanna Mursula adapted MULTIMOD to incorporate Brazil and generated the simulations.

[2] MULTIMOD is a dynamic multicountry macro model of the world economy, which has been developed mainly for G7 and smaller industrial countries. The core model has been modified to include Brazil, including by using specific estimates for parameters such as the intertemporal elasticity of substitution (interest rate sensitivity of private savings) and the share of liquidity-constrained households in total households. The former is taken from Ogaki et al. (1996), while for the latter a slightly lower coefficient than that estimated in Amadeo and Neri (1999) is used. For more details on MULTIMOD, see Laxton et al. (1998); in particular Box 10 on the various steps necessary to integrate additional countries into MULTIMOD.

4. According to the medium-term baseline scenario, fiscal discipline, a gradual improvement in the terms of trade, continued import substitution, and increased confidence toward Brazil in international financial markets would lead to a gradual reduction in Brazil's current account deficit. Its share of the rest-of-the-world private savings would decrease and stabilize to about 0.2 percent by 2006—against an average of 0.5 percent over the period 1995–99—suggesting that future current account deficits would continue to be financeable. The simulations show, however, that Brazil remains vulnerable to domestic and international shocks as these tend to affect both the trade account and the debt service burden, through higher risk premia. They underscore the need for Brazil to run a prudent fiscal policy, to continue improving access to international financial markets, and to carry on with the necessary structural reforms to foster competitiveness—in particular by reducing fiscal, transportation and handling costs for exports—hence ensuring a sustainable current account position over the medium and long run.[3]

5. Section A summarizes the baseline medium-term external scenario and presents some alternative scenarios. Section B assesses the impact on the baseline scenario of specific domestic and international shocks in a small open-country setup, whereas Section C examines some of these shocks in a multicountry context. Finally, a possible extension to this line of analysis is briefly discussed in Section D.

B. The Baseline Medium-Term External Outlook and Alternative Scenarios

6. Figure 10.1 presents the baseline medium-term external outlook for Brazil for the period 2001–25. This is predicated on the basis of the general macroeconomic assumptions, including continued fiscal discipline and a declining domestic public debt-to-GDP ratio, as discussed in Chapter 2 on fiscal sustainability.

7. Specifically with regard to the external sector, the trade account should perform increasingly, though not sharply, better, mainly because of: (i) a gradual recovery in the terms of trade after the large drop in 1998–99; (ii) improvements in nonprice export competitiveness as a result of further structural public sector reforms, including a reduction of distortions in the tax system, and productivity-enhancing investments in infrastructure; (iii) continued import substitution as the industrial structure of the economy expands and deepens; and (iv) a smaller impact of crude oil on the total cost of imports as a result of somewhat lower imported crude oil, which should also help mitigate the impact of oil price

[3] Brazil has gradually opened its economy during the 1990s. It would benefit from its further integration into the world economy, including through enhancing access to foreign markets as trade barriers on those productions in which Brazil is highly competitive are reduced.

volatility.[4]

8. Developments in the service account, however, will continue over the next few years to offset in part the marginal gains in the trade account. Active management of Brazil's external liabilities, with a view to establishing a benchmark yield curve in several currencies and to lengthening the debt profile, including through further debt exchanges, should continue to contribute to a steady reduction of the country risk premium in the context of sustained domestic and international economic and financial stability. The related positive impact on the service account will, however, continue to be somewhat compensated for by other factor and nonfactor service items. After a period of higher reinvestment, dividends and profit remittances will slightly increase in the outer years as these go back to their trend level as a share of the outstanding stock of foreign direct investments. Expenditures on services for transportation and travel will increase as trade and real wages recover amid foreign exchange stability.[5]

9. The current account deficit is, accordingly, expected to improve only gradually over the next few years to about 3 percent of GDP in 2006, and to reach its long-term level of 2 percent of GDP by 2011.[6] The further opening of the telecommunication, energy, and financial sectors will continue to attract substantial foreign direct investments from leading international multinationals wishing to establish and/or to strengthen their foothold in the region. Similarly, the deepening of the domestic financial system will foster portfolio, in particular, equity capital inflows. Accordingly, foreign investments are projected to continue to finance most of the overall current account.

10. Private savings are projected to decrease somewhat to about 18 percent of GDP by 2006, partially compensating for increasing public savings (partial Ricardian offset), and to stabilize at around that level in the long term. Private investments are projected to follow a similar path; to rise to above 19 percent of GDP by 2005 and to remain at about that level thereafter. Both are consistent with the average historical ratios.

11. **Scenario I** explores the impact of higher public debt as a result of higher public sector liabilities, including previously unregistered liabilities, in the financial and

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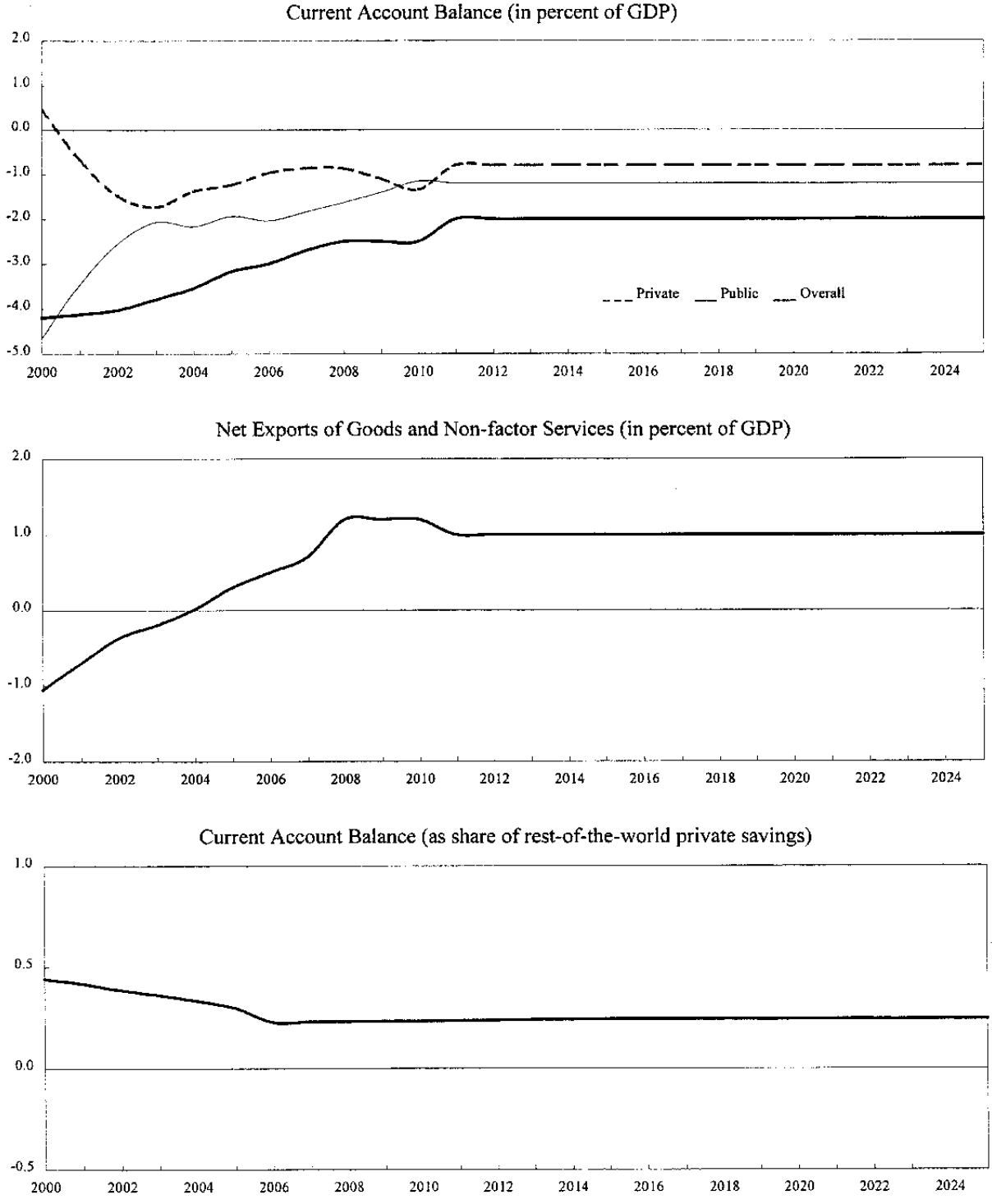
[4] Since 1996, domestic production of crude oil has increased by more than 50 percent. Domestic production increased from 64 percent of total oil consumption in 1997 to 80 percent in 2000. In the future, domestic and foreign investments in the exploration and exploitation of existing oil fields should continue to reduce Brazil's dependence on imported crude oil.

[5] Foreign trade and transport costs are correlated given the relatively small national shipping fleet.

[6] Long-term in the sense that it appears to be sustainable for an emerging market country that is further integrating in the global economy and able to attract substantial long-term foreign financing. As noted, it will absorb about 0.2 percent of rest-of-the-world private savings. Net foreign liabilities will stabilize at about 37 percent of GDP.

Figure 10.1. Brazil: Baseline Scenario



Source: Fund staff estimates.

nonfinancial sector. These additional liabilities—about 0.5 percent of GDP higher than in the fiscal baseline over the period 2001–10—are modeled as transfers to the nonhousehold sector; they do not, therefore, directly impact on household permanent income, hence, not directly affecting the path of consumption/savings. **Scenario II** considers the impact of higher public consumption (goods and wages) that is financed by additional debt. Current expenditure as a share of GDP is projected to be 1 percent higher than in the fiscal baseline over the period 2001–07 and to gradually fall to the baseline level by 2012. The weaker fiscal discipline, which could also reflect the political cycle in Brazil, would also adversely impact the confidence of international financial markets, and, hence, the risk premium.[7] The different assumptions about risk premia in Scenarios I and II stem from the fact that, whereas in the former higher public debt results from the recognition of specific liabilities, in the latter higher public debt is the consequence of larger government absorption (on goods and wages), which could call into question the authorities' commitment to fiscal discipline.

12. **Scenario III** assumes higher debt-neutral (tax financed) public social expenditure on health and education. The size and pattern of the shock to fiscal expenditure is the same as in Scenario II, but the expenditure mix and its financing is different. The improvements of the safety net provision and human capital, which these social expenditures are expected to have over the medium term, would also positively affect productivity in the economy. Accordingly, productivity is assumed to be 1 percent higher than in the baseline over the period 2005–10, and to fall gradually to its baseline level in the long run.[8] **Scenario IV** explicitly explores the impact of a monetary shock (hard landing) in the United States, assuming a gradual contraction in the stock of money supply over the period 2001–03. This last scenario is best examined in the richer multicountry framework of Section C.

13. In some of these scenarios, more than one control variable is shocked at the same time to take account of the intertwined nature of their economic effects. For instance, as noted, higher debt-financed public consumption (Scenario II) is likely to impact negatively the country's risk premium, including by weakening the likelihood for a debt upgrade. In this context, uncertainty about a country's willingness/capacity to meet its debt service obligations can impinge upon the sustainability of a country's current account beyond the constraints imposed by pure intertemporal solvency.

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[7] In this scenario, and contrary to the baseline, the risk premium is assumed not to decline over time.

[8] In MULTIMOD, productivity is expressed as total factor productivity (TFP) in the standard revenue function of the representative firm.

C. The Small Open-Country Framework

14. Figures 10.2, 10. 3, and 10.4 summarize illustrative simulations for the period 2001–25, expressed as deviations from the baseline, under Scenarios I, II, and III, using the open small-country version of MULTIMOD for Brazil.[9]

15. In **Scenario I**, higher public sector borrowing requirements would have the usual crowding-out effect on private investments through higher interest rates and a more appreciated real effective exchange rate. Lower government savings—as taxes are not raised initially to offset the higher interest bill—would more than compensate the increase in private savings during the period of the shock—reflecting an expectation of higher taxes in the future.[10] The impact on the current account would be mild overall. The appreciated real effective exchange rate would impact negatively on net exports of goods and nonfactor services well beyond 2010. After 2010, the higher public debt is reduced mainly through increases in taxation, resulting in lower private savings-to-GDP ratios. The current account would deteriorate and net foreign liabilities would be about 2 percent of GDP higher by 2025.[11] The current account as a share of rest-of-the-world private savings would, however, remain substantially unchanged.

16. **Scenario II** is a case of laxer fiscal discipline. The channels through which laxer fiscal discipline affect private savings and investment, and the current account are higher government absorption and risk premia on Brazilian financial instruments.[12] The impact of debt-financed higher spending on the current account are similar to those discussed in Scenario I, but substantially stronger overall. In this case, higher risk premia, for the duration of the shock, would point toward a more depreciated currency than in the baseline scenario, offsetting the real appreciation generated by higher public sector absorption and public sector borrowing requirements. The initial impact on net exports of goods and nonfactor services, and the current account would therefore be positive. After 2005, the positive impact on net exports would start to fade away and the current account would begin to deteriorate by up to more than 1 percent of GDP in 2009 and remain worse than in the baseline scenario for several years. Net foreign liabilities would be higher from the outset, reflecting the valuation impact of a depreciated currency, and about 8.5 percent of GDP higher than in the baseline by 2020. In terms of share of rest-of-the-world private savings, Brazil's external financing requirements would increase by almost 0.2 percent by 2010, reaching a share that is double that in the baseline.

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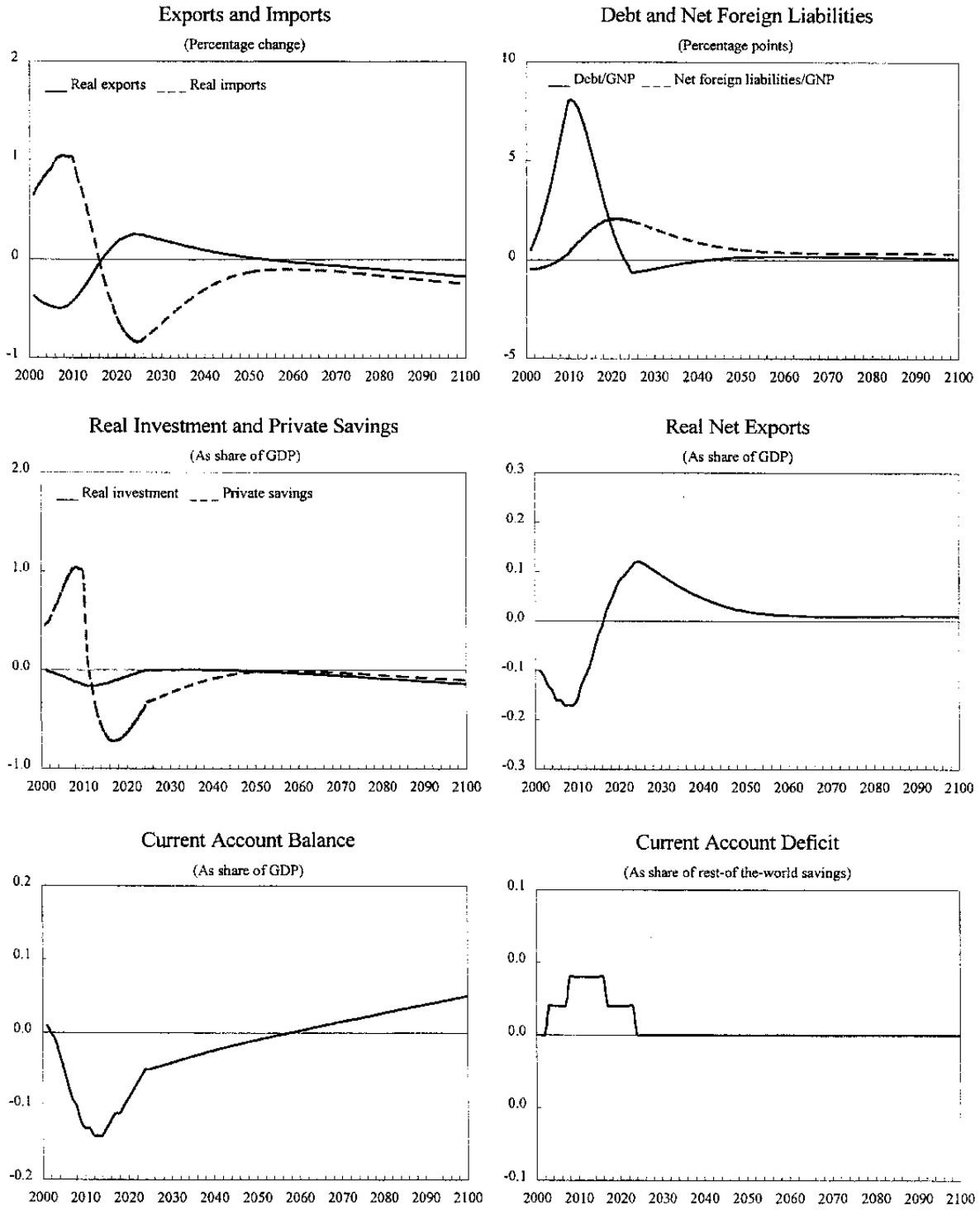
[9] The small open economy model assumes that the country is a price-taker in the world market for goods and capital.

[10] In Scenarios I and II, the assumption is that the debt-to-GDP ratio is reduced to its baseline level by 2025.

[11] Initially (2001–07) net foreign liabilities will be slightly lower than in the baseline scenario because of the valuation impact of an appreciated currency.

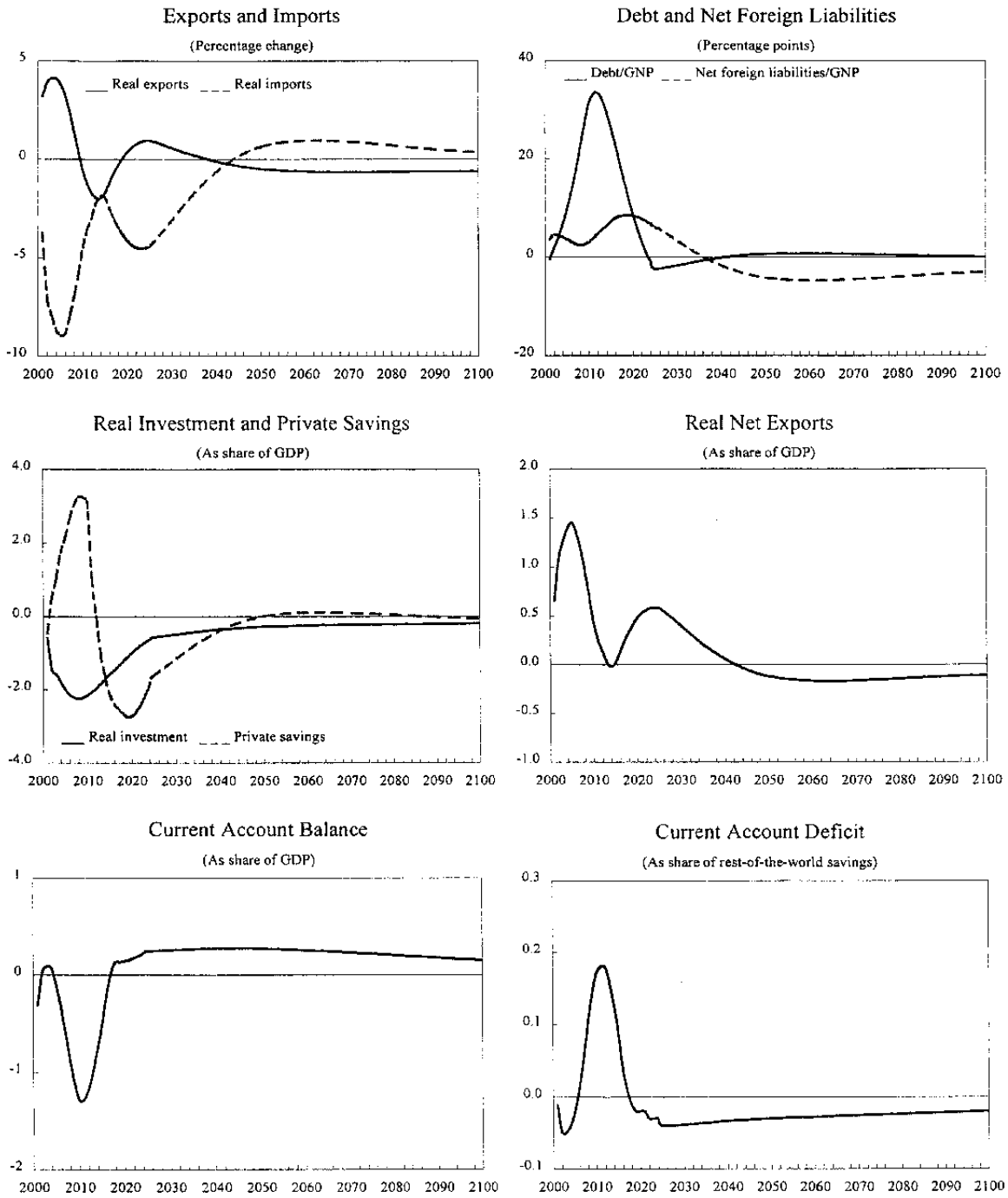
[12] Risk premia start to come down in 2010 rather than in 2002 as in the baseline scenario.

Figure 10.2. Brazil: Scenario I



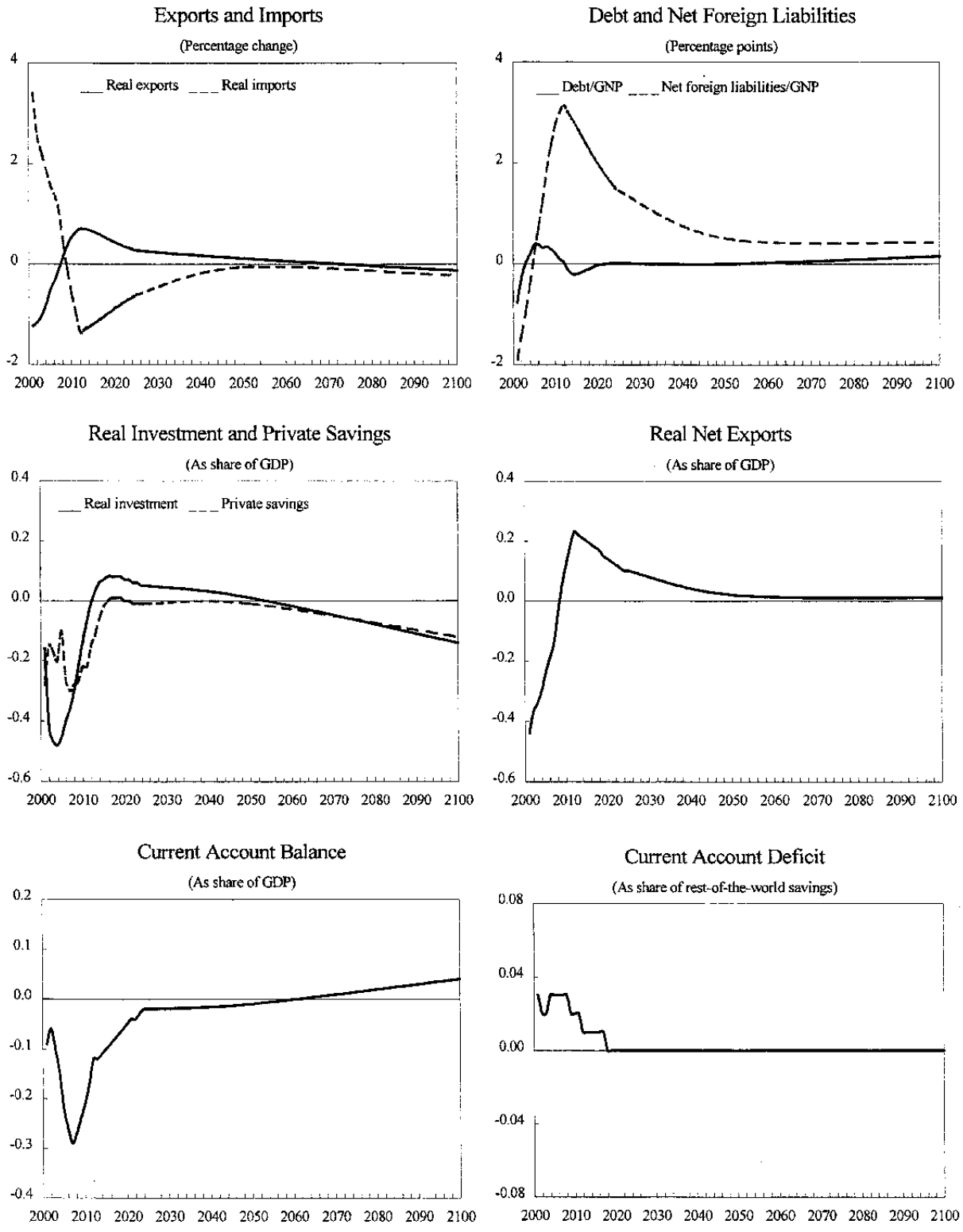
Source: Fund staff estimates.

Figure 10.3. Brazil: Scenario II



Source: Fund staff estimates.

Figure 10.4. Brazil: Scenario III



Source: Fund staff estimates.

17. In **Scenario III**, debt-neutral higher government spending on health and education is financed through higher taxes, leaving the public sector borrowing requirement unchanged. Higher government absorption would not be matched by higher private savings, as taxes would increase from the start. Accordingly, the current account would deteriorate somewhat—up to about 0.3 percent of GDP in 2007—before returning to its baseline level by 2025. The deterioration of the current account would be explained mainly through smaller net exports of goods and nonfactor services as a result of real appreciation due to larger government absorption. Compared to Scenarios I and II, however, economic activity would grow substantially stronger, reflecting the envisaged increase in productivity triggered by the improvement in human capital. Net foreign liabilities would be at most about 3 percent of GDP higher than in the baseline by 2012, while the current account as share of rest-of-the-world private savings would remain substantially unchanged.

D. The Multicountry Framework

18. To assess the impact on Brazil's external balance of Scenario IV, illustrative simulations were generated using the multicountry version of MULTIMOD.[13] This richer multicountry setting provides additional information on the likely international feedback to domestic shocks in Brazil, but, more importantly, given Brazil's relative small share of the world economy, on the first- and second-round effects on Brazil external balance of a shock in a major G7 country.[14] Such a shock to the international outlook is explicitly considered in Scenario IV. Figure 10.5 summarizes the simulation results, expressed as deviations from the baseline.

19. **Scenario IV** shows the impact of a strong tightening of monetary policy in the United States.[15] The shock to Brazil's economy come through three main channels: domestic consumption and savings, the trade account, and interest payments on net foreign liabilities.[16] Given a certain level of fiscal balanced, higher interest payments on net foreign public debt would require higher taxes, and therefore reduce disposable income. Private consumption,

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[13] Simulation results under Scenarios I, II, and III in the multicountry version of MULTIMOD are very similar to those run in the small open economy version because of Brazil's small weight in the global economy.

[14] First-round effects are those stemming directly from the shocked country. For example, the impact of a shock in the United States on Brazil's trade balance. Second-round effects are those stemming from the shocked country, via third countries. For example, the impact of a shock in the United States on Brazil's trade balance, via its effects on another G7 country.

[15] Tighter monetary policy is assumed to generate an increase in United States short-term interest rates of up to 150 basis points by 2003.

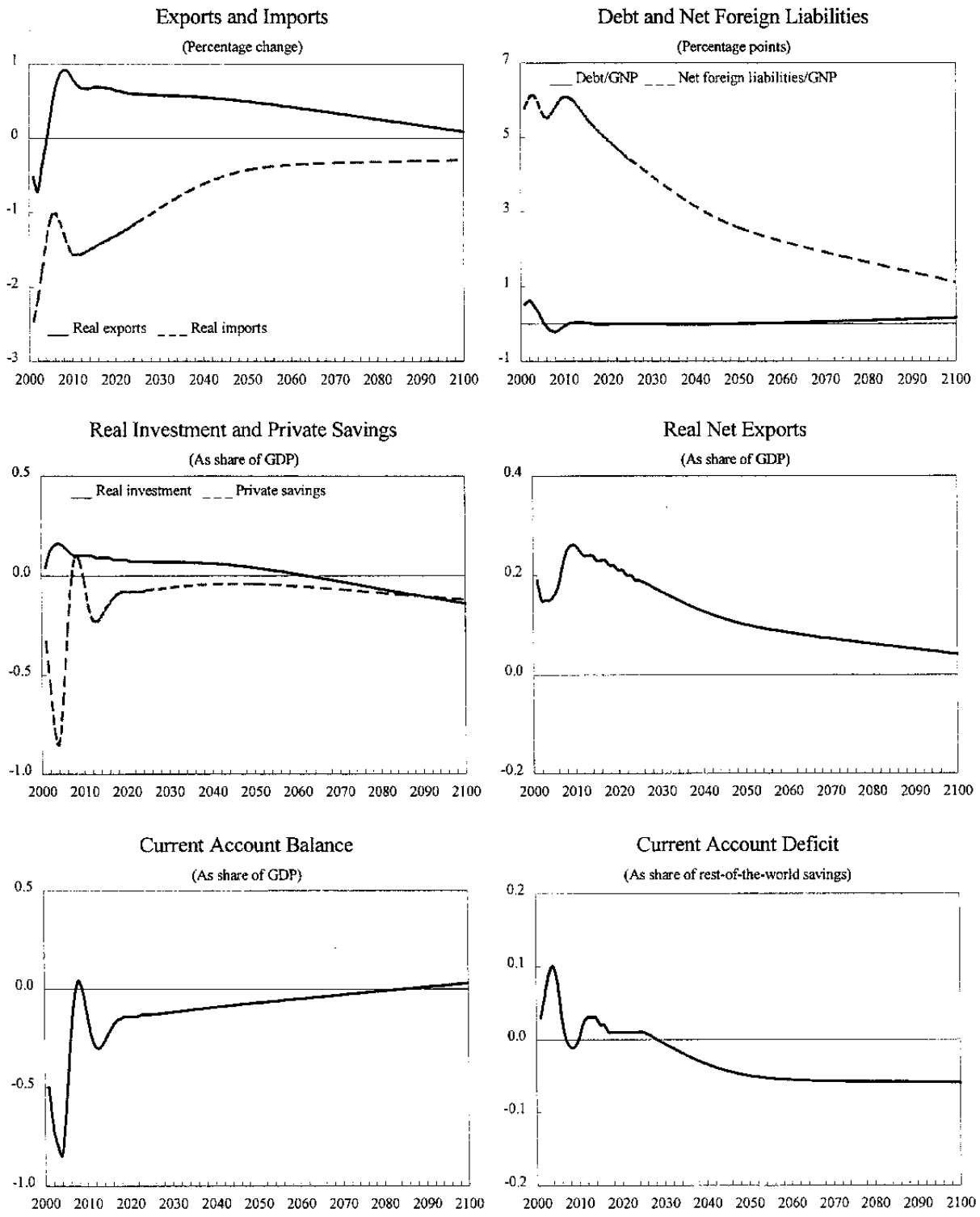
[16] The market value of these net foreign liabilities would also be higher because of the appreciated U.S. dollar.

and hence real GDP, would decrease amid a contraction in private savings. The depreciation of the real effective exchange rate would curb imports and somewhat offset the drop in exports generated by the slowdown in the U.S. Despite the improvement in net exports of goods and services, the Brazilian current account would deteriorate by about 0.7 percent of GDP on average in the period 2001–05. However, the impact on Brazil's required external financing as a share of rest-of-the-world private savings would be smaller than 0.1 percent on average. From the outset, net foreign liabilities would increase by about 6 percent of GDP relative to baseline, before gradually falling back to the baseline level in the long run.

E. Further Research

20. In this section we explored the impact of alternative scenarios about public sector policy and international developments on Brazil's external balance through macroeconomic simulations using MULTIMOD modified to integrate Brazil. Promising future research could further extend MULTIMOD to incorporate other important Latin American economies so that spillover effects of domestic, regional, and international economic and financial developments on both a single country and the region more widely could be examined in a fully interactive multicountry dynamic framework.

Figure 10.5. Brazil: Scenario IV



Source: Fund staff estimates.

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Table 1. Brazil: Macroeconomic Flows and Balances

	1994	1995	1996	1997	1998	1999
	(In percent of GDP)					
Total domestic expenditure	**99.6**	**101.8**	**101.9**	**102.4**	**102.0**	**101.1**
Consumption	**77.5**	**79.5**	**81.0**	**80.9**	**80.8**	**80.7**
General government	17.9	19.6	18.5	18.2	18.8	18.9
Private sector	59.6	59.9	62.5	62.7	62.1	61.8
Investment	**22.1**	**22.3**	**20.9**	**21.5**	**21.2**	**20.4**
General government	3.6	2.5	2.3	2.2	2.2	1.7
Private sector and public enterprises 1/	18.5	19.8	18.6	19.3	19.0	18.7
Saving	**22.1**	**22.3**	**20.9**	**21.5**	**21.2**	**20.4**
Gross national saving	21.8	19.7	17.9	17.7	16.9	15.7
External saving	0.3	2.6	3.0	3.8	4.3	4.7

Sources: Brazilian Institute of Geography and Statistics (IBGE); and Fund staff estimates.

1/ Includes changes in stocks.

Table 2. Brazil: GDP and Real GDP per Capita

	GDP in current reais	GDP in millions of 1999 reais	Real GDP per capita in 1999 reais	Implicit GDP deflator (per-cent change)	Population (millions)	Real GDP annual percent changes			
						Agriculture & livestock	Industry	Services	Total
1986	1,274	755,861.6	5,613.4	149.2	134,653	-8.0	11.7	8.1	7.5
1987	4,038	782,316.8	5,699.2	206.2	137,268	15.0	1.0	3.1	3.5
1988	29,376	781,534.4	5,589.6	628.0	139,819	0.8	-2.6	2.3	-0.1
1989	425,595	806,543.5	5,667.6	1,304.4	142,307	2.8	2.9	3.5	3.2
1990	11,548,795	771,458.9	5,354.0	2,737.0	144,091	-3.7	-8.2	-0.8	-4.3
1991	60,285,999	779,404.9	5,323.5	416.7	146,408	1.4	0.3	2.0	1.0
1992	640,958,768	775,196.1	5,213.7	969.0	148,684	4.9	-4.2	1.5	-0.5
1993	14,097,114,182	813,335.8	5,388.7	1,996.2	150,933	-0.1	7.0	3.2	4.9
1994	349,204,679,000	860,915.9	5,621.6	2,240.2	153,143	5.5	6.7	4.7	5.9
1995	646,191,517,000	897,246.6	5,776.8	77.6	155,319	4.1	1.9	4.5	4.2
1996	778,886,727,000	921,113.3	5,849.0	17.4	157,482	3.1	3.3	2.3	2.7
1997	870,743,034,000	951,233.7	5,958.8	8.3	159,636	-0.4	4.7	2.5	3.3
1998	913,735,044,000	953,326.5	5,892.4	4.7	161,790	1.1	-1.4	1.0	0.2
1999	960,857,736,000	960,857.7	5,860.8	4.3	163,948	9.9	-1.6	1.5	0.8

Source: Brazilian Institute of Geography and Statistics (IBGE).

Table 3. Brazil: National Accounts at Current Prices

(In millions of *reais*)

	1994	1995	1996	1997	1998	1999
Consumption expenditure	**270,644**	**513,562**	**630,814**	**704,200**	**738,747**	**775,098**
General government	62,388	126,652	144,001	158,502	171,746	181,160
Private sector	208,256	386,910	486,813	545,698	567,001	593,938
Gross capital formation	**77,333**	**144,027**	**162,953**	**187,187**	**193,435**	**196,452**
General government	12,609	16,382	17,973	19,198	19,919	16,524
Private sector and public enterprises	64,725	127,645	144,981	167,989	173,516	179,928
Total domestic expenditure	**347,978**	**657,589**	**793,767**	**891,387**	**932,182**	**971,550**
Net exports of goods and nonfactor services	**1,227**	**-11,397**	**-14,880**	**-20,644**	**-18,447**	**-10,692**
Exports	33,220	49,917	54,430	65,356	69,727	101,809
Imports	31,993	61,314	69,311	86,000	88,174	112,501
GDP at market prices	**349,205**	**646,192**	**778,887**	**870,743**	**913,735**	**960,858**
Net factor payments abroad	**-4,051**	**-7,490**	**-9,213**	**-11,199**	**-13,863**	**-27,521**
GNP at market prices	**345,153**	**638,701**	**769,674**	**859,544**	**899,872**	**933,337**
Net unrequited transfers received from abroad	**1,658**	**3,648**	**2,913**	**2,388**	**2,064**	**3,687**
Gross national income at market prices	**346,811**	**642,349**	**772,587**	**861,932**	**901,935**	**937,024**

Sources: Brazilian Institute of Geography and Statistics (IBGE); and Fund staff estimates.

Table 4. Brazil: National Accounts at Constant Prices

(In 1994 millions of *reais*)

	1994	1995	1996	1997	1998	Prel. 1999
Consumption expenditure	**270,644**	**289,627**	**298,981**	**308,295**	**308,628**	**305,069**
Percent change		7.0	3.2	3.1	0.1	-1.2
Gross capital formation	**77,333**	**83,592**	**85,961**	**93,074**	**92,519**	**86,586**
Percent change		8.1	2.8	8.3	-0.6	-6.4
Total domestic expenditure	**347,978**	**373,219**	**384,942**	**401,370**	**401,147**	**391,655**
Percent change		7.3	3.1	4.3	-0.1	-2.4
Net exports of goods and nonfactor services	**1,227**	**-9,265**	**-11,311**	**-15,518**	**-14,446**	**-1,899**
Percent change 1/		-855.0	-22.1	-37.2	6.9	86.9
Exports of goods and nonfactor services	**33,220**	**32,545**	**32,752**	**36,403**	**38,796**	**43,469**
Percent change		-2.0	0.6	11.1	6.6	12.0
Imports of GNFS	**31,993**	**41,810**	**44,063**	**51,921**	**53,242**	**45,368**
Percent change		30.7	5.4	17.8	2.5	-14.8
GDP at market prices	**349,205**	**363,954**	**373,630**	**385,852**	**386,701**	**389,756**
Percent change		4.2	2.7	3.3	0.2	0.8
Net factor payments abroad	**-4,051**	**-7,490**	**-9,213**	**-11,199**	**-13,863**	**-27,521**
GNP at market prices	345,153	356,464	364,417	374,653	372,838	362,235
Percent change	6.8	3.3	2.2	2.8	-0.5	-2.8

Sources: Brazilian Institute of Geography and Statistics (IBGE); and Fund staff estimates.

1/ Contribution to growth.

Table 5. Brazil: Industrial Production

(Annual percentage change)

	1994	1995	1996	1997	1998	1999	2000 1/
Total	**7.6**	**1.8**	**1.7**	**3.9**	**-2.1**	**-0.7**	**6.8**
Mineral extraction	**4.7**	**3.3**	**9.8**	**7.2**	**12.4**	**9.1**	**8.4**
Manufacturing industry	**7.8**	**1.7**	**1.1**	**3.6**	**-3.3**	**-1.7**	**6.6**
Nonmetallic minerals	3.1	4.1	6.3	7.4	-0.4	-3.2	2.9
Metallurgy	10.2	-1.8	1.6	6.0	-3.8	-1.1	9.1
Machinery	21.1	-4.5	-12.8	7.2	-4.0	-7.2	14.7
Electrical and communications equipment	19.0	14.6	4.7	-1.8	-9.8	-11.5	10.4
Transportation equipment	13.4	4.1	-0.3	10.7	-14.6	-5.1	18.6
Wood	-2.6	-3.4	2.1	3.9	-6.2	6.9	8.3
Furniture	1.2	6.2	13.7	-1.5	-8.2	-3.0	8.6
Paper and cardboard	2.8	0.4	2.9	2.9	0.4	4.8	4.7
Rubber	4.0	-0.3	-0.5	4.1	-7.6	4.5	15.3
Leather and hides	-4.3	-16.7	-1.9	-1.7	-13.6	-3.6	-2.3
Chemicals	6.6	-0.5	5.0	5.1	3.9	0.9	3.6
Pharmaceuticals	-2.5	18.1	-8.6	11.4	4.0	-0.4	-7.3
Perfumes, soaps and candles	2.5	5.3	4.1	5.2	3.2	7.2	1.4
Plastics	4.1	9.7	11.3	3.6	-2.4	-6.2	-4.7
Textiles	3.8	-5.8	-5.8	-6.5	-6.8	2.1	8.8
Clothing, footwear and cloth goods	-2.1	-6.9	-2.5	-6.7	-4.6	-3.4	7.5
Food products	2.2	7.7	5.3	1.0	1.4	3.1	-1.2
Beverages	10.4	17.2	-3.3	-0.3	-2.2	0.1	5.5
Tobacco	-14.8	-5.1	12.5	22.2	-22.7	-7.4	-8.8
Memorandum items:							
Capital goods	18.7	0.3	-14.1	4.8	-1.6	-9.1	8.5
Intermediate goods	6.5	0.2	2.9	4.6	-0.7	1.8	7.8
Consumer goods	4.4	6.2	5.3	1.2	-5.4	-2.9	3.5
Durable	15.1	14.5	11.2	3.5	-19.6	-9.3	22.1
Semidurable and nondurable	1.9	4.2	3.7	0.5	-1.1	-1.3	-0.8

Source: Brazilian Institute of Geography and Statistics (IBGE).

1/ Production in the January-June 2000 period compared to that of the same period of the previous year.

Table 6. Brazil: Real Retail Sales in the São Paulo Metropolitan Area 1/

(Seasonally Adjusted)

(1992 average = 100)

	General Commerce	Consumer Goods 2/	Durable Goods	Semidurables	Nondurables	Automobile	Construction Materials
1999							
January	159.0	194.2	190.8	122.7	206.5	91.2	98.2
February	152.0	192.1	180.4	128.3	207.5	55.9	94.0
March	156.5	192.1	180.3	125.9	210.8	77.2	99.3
April	151.3	184.8	178.0	131.2	200.8	75.3	94.6
May	155.4	192.0	187.7	136.8	205.4	70.0	102.0
June	154.2	191.8	189.1	129.3	202.0	68.0	103.3
July	154.8	194.8	200.9	124.8	200.1	67.5	102.8
August	157.3	196.1	195.9	119.9	206.9	69.9	100.9
September	156.2	196.6	196.3	121.5	207.5	68.8	103.6
October	161.4	204.1	213.8	117.1	208.3	68.3	106.1
November	162.4	202.4	212.3	120.6	206.5	71.8	104.4
December	172.5	211.8	231.2	117.5	210.6	73.7	105.2
2000							
January	165.0	205.2	209.3	114.1	217.3	78.1	105.7
February	170.8	206.8	214.5	110.9	217.5	95.5	107.7
March	160.4	201.7	215.4	99.5	211.0	69.3	102.5
April	181.7	222.8	230.7	78.3	249.8	80.0	105.1
May	171.3	213.2	217.0	79.4	238.9	79.8	100.6
June	173.3	216.1	219.5	78.2	241.4	83.1	103.9
July	178.7	221.7	224.4	81.7	247.8	84.4	103.6
August	174.2	216.9	221.0	73.0	242.5	81.2	102.4
September	178.6	221.3	223.5	70.5	245.8	83.7	104.2

Source: State of São Paulo Commerce Federation.

1/ Deflated by IPCA.
2/ Includes durable, semidurable and nondurable goods.

Table 7. Brazil: Price Statistics

(Monthly percentage change)

	General Price Index 1/ (IGP-DI)	Wholesale Price Index (IPA-DI)	Construction Cost Index (INCC)	Consumer Price Index (INPC)	Consumer Price Index (IPCA)
1995					
January	1.36	0.87	3.50	1.44	1.70
February	1.15	0.58	2.09	1.01	1.02
March	1.81	1.08	3.30	1.62	1.55
April	2.30	1.99	2.30	2.49	2.43
May	0.40	-2.03	8.77	2.10	2.67
June	2.62	1.55	3.12	2.18	2.26
July	2.24	2.24	1.09	2.46	2.36
August	1.29	1.73	0.62	1.02	0.99
September	-1.08	-2.42	0.67	1.17	0.99
October	0.23	-0.14	0.86	0.63	1.41
November	1.33	1.49	0.73	1.51	1.47
December	0.27	-0.61	0.86	1.65	1.56
1996					
January	1.79	1.31	1.52	1.46	1.34
February	0.76	0.47	0.11	0.71	1.03
March	0.22	-0.07	0.98	0.29	0.35
April	0.70	0.41	0.25	0.93	1.26
May	1.68	1.34	2.16	1.28	1.22
June	1.22	0.94	1.54	1.33	1.19
July	1.09	1.38	0.75	1.20	1.11
August	0.00	-0.05	0.23	0.50	0.44
September	0.13	0.41	0.22	0.02	0.15
October	0.22	0.24	0.26	0.38	0.30
November	0.28	0.24	0.58	0.34	0.32
December	0.88	1.21	0.59	0.33	0.47
1997					
January	1.58	1.67	0.32	0.81	1.18
February	0.42	0.34	0.48	0.45	0.50
March	1.16	1.59	0.73	0.68	0.51
April	0.59	0.53	0.23	0.60	0.88
May	0.30	0.14	0.86	0.11	0.41
June	0.70	0.24	1.11	0.35	0.54
July	0.09	-0.09	0.51	0.18	0.22
August	-0.04	-0.15	1.18	-0.03	-0.02
September	0.59	0.92	0.27	0.10	0.06
October	0.34	0.41	0.15	0.29	0.23
November	0.83	1.08	0.54	0.15	0.17
December	0.69	0.87	0.23	0.57	0.43
1998					
January	0.88	0.75	0.33	0.85	0.71
February	0.02	-0.15	0.48	0.54	0.46
March	0.23	0.13	0.47	0.49	0.34
April	-0.13	-0.28	-0.50	0.45	0.24
May	0.23	0.13	0.98	0.72	0.50
June	0.28	0.17	0.39	0.15	0.02
July	-0.38	-0.61	0.34	-0.28	-0.12
August	-0.17	-0.04	0.22	-0.49	-0.51
September	-0.02	0.06	0.01	-0.31	-0.22
October	-0.03	-0.19	0.01	0.11	0.02
November	-0.18	-0.20	-0.05	-0.18	-0.12
December	0.98	1.74	0.05	0.42	0.33

Table 7. Brazil: Price Statistics

(Monthly percentage change)

	General Price Index 1/ (IGP-DI)	Wholesale Price Index (IPA-DI)	Construction Cost Index (INCC)	Consumer Price Index (INPC)	Consumer Price Index (IPCA)
1999					
January	1.15	1.58	0.55	0.65	0.70
February	4.44	6.99	0.98	1.29	1.05
March	1.98	2.84	0.55	1.28	1.10
April	0.03	-0.34	0.52	0.47	0.56
May	-0.34	-0.82	0.86	0.05	0.30
June	1.02	1.35	0.41	0.07	0.19
July	1.59	2.03	0.46	0.74	1.09
August	1.45	2.15	0.69	0.55	0.56
September	1.47	2.30	0.86	0.39	0.31
October	1.89	2.58	1.01	0.96	1.19
November	2.53	3.59	0.91	0.94	0.95
December	1.23	1.60	1.04	0.74	0.60
2000					
January	1.02	1.02	1.07	0.61	0.62
February	0.19	0.17	0.77	0.05	0.13
March	0.18	-0.05	0.56	0.13	0.22
April	0.13	-0.02	0.60	0.09	0.42
May	0.67	0.69	1.35	-0.05	0.01
June	0.93	1.45	0.73	0.30	0.23
July	2.26	2.79	0.30	1.39	1.61
August	1.82	2.56	0.39	1.21	1.31
September	0.69	1.09	0.26	0.43	0.23

Sources: Brazilian Institute of Geography and Statistics (IBGE); and Getulio Vargas Foundation.

1/ A weighted average of the IPA-DI (weight of 0.6), INCC (weight of 0.1), and the IPC-DI consumer price index (weight of 0.3).

Table 8. Brazil: Consumer Price Index (IPCA)[1/]

(Monthly percentage change)

	General	Food & Drink	Housing	Residential Items	Clothing	Transpor-tation	Health & Personal Care	Personal Expenses	Education	Communi-cation
1995										
January	1.70	0.73	2.17	3.15	0.99	0.40	2.26	4.71	1.37	0.00
February	1.02	(0.06)	3.65	2.99	(1.19)	0.99	3.10	0.80	1.80	0.00
March	1.55	1.44	3.82	1.65	(0.69)	0.78	2.66	2.14	1.26	0.00
April	2.43	1.99	4.24	2.36	2.62	0.76	2.14	4.08	7.36	0.00
May	2.67	0.51	2.94	2.05	2.64	1.35	3.55	8.51	6.11	0.00
June	2.26	(0.25)	4.32	1.56	1.21	4.31	4.19	3.47	6.30	0.00
July	2.36	0.98	4.83	0.55	0.91	3.49	4.44	2.64	3.41	0.00
August	0.99	0.57	4.46	(0.57)	(2.62)	0.80	2.46	1.88	3.19	0.00
September	0.99	(0.03)	4.51	(0.22)	0.11	0.86	1.03	1.38	1.56	0.00
October	1.41	0.32	4.58	(0.36)	0.82	2.14	1.03	1.50	0.60	0.00
November	1.47	1.07	6.13	(0.14)	0.20	0.16	0.84	1.60	2.35	1.73
December	1.56	0.86	6.22	0.93	(0.34)	(0.13)	1.97	0.90	0.72	23.06
1996										
January	1.34	1.28	2.16	0.61	(0.28)	0.84	2.08	2.15	5.24	2.45
February	1.03	0.11	1.98	0.28	(3.28)	0.71	1.29	2.07	9.04	65.16
March	0.35	(0.02)	1.96	0.00	(2.50)	0.92	1.19	0.33	2.27	0.00
April	1.26	0.50	1.81	0.26	0.90	3.82	0.82	0.43	1.53	0.00
May	1.22	0.67	1.94	0.03	1.42	0.78	1.03	2.57	0.81	0.00
June	1.19	0.67	2.19	(0.27)	1.09	2.50	1.21	0.50	0.19	0.00
July	1.11	0.52	1.89	(0.02)	0.29	2.48	2.12	0.30	0.60	0.00
August	0.44	(0.68)	2.24	(0.04)	(0.66)	0.88	1.18	0.48	(0.13)	0.00
September	0.15	(0.58)	1.54	(0.13)	(0.48)	0.18	0.56	0.13	0.33	0.00
October	0.30	0.11	1.47	(0.09)	0.82	0.13	0.27	(0.54)	0.07	0.00
November	0.32	(0.37)	1.36	0.42	0.27	0.48	0.48	0.11	(0.14)	0.00
December	0.47	(0.48)	1.22	0.89	0.88	1.07	0.80	(0.04)	0.04	0.00
1997										
January	1.18	0.97	1.06	0.73	0.21	2.77	1.08	0.82	2.04	0.00
February	0.50	0.72	0.94	0.18	(0.83)	0.50	0.60	0.58	5.10	0.00
March	0.51	1.22	1.13	(0.70)	(0.50)	0.75	0.35	(0.29)	0.18	0.00
April	0.88	(0.16)	1.60	(0.39)	0.10	0.47	0.52	0.20	(0.03)	46.16
May	0.41	(0.92)	0.92	(0.85)	1.28	0.26	0.79	0.58	0.27	13.73
June	0.54	(0.34)	0.60	(0.40)	(0.10)	1.13	0.60	0.36	0.08	14.06
July	0.22	(0.52)	0.41	(0.39)	0.08	0.94	0.51	0.55	0.19	0.00
August	-0.02	(0.57)	0.42	(0.20)	(0.98)	0.51	0.38	0.14	(0.05)	0.00
September	0.06	(0.21)	0.25	(0.42)	0.05	0.20	0.41	0.14	(0.06)	0.00
October	0.23	0.27	0.27	(0.53)	0.56	0.14	0.18	0.44	0.32	0.00
November	0.17	0.17	0.29	(0.28)	(0.34)	0.86	0.02	(0.17)	(0.38)	0.00
December	0.43	0.59	0.31	0.35	0.38	0.62	0.34	0.31	0.84	0.00
1998										
January	0.71	1.24	0.30	0.35	(0.79)	0.47	0.57	1.59	1.75	2.00
February	0.46	0.62	0.26	0.36	(0.64)	0.64	0.39	1.02	3.20	0.00
March	0.34	0.79	0.38	1.15	(0.68)	0.15	0.57	(0.04)	(0.67)	0.00
April	0.24	0.85	0.29	(0.20)	(0.24)	(0.09)	0.45	(0.05)	0.12	0.00
May	0.50	1.38	0.13	(0.06)	0.58	(0.07)	0.50	0.40	(0.02)	0.00
June	0.02	0.13	0.05	0.37	0.38	(0.11)	0.03	(0.41)	0.01	0.00
July	-0.12	(0.99)	0.00	(0.52)	(0.15)	0.36	0.52	0.35	0.47	0.00
August	-0.51	(1.20)	(0.06)	(0.36)	(0.81)	(0.90)	0.25	0.11	(0.23)	0.00
September	-0.22	(0.47)	(0.02)	(0.37)	(0.07)	(0.13)	0.26	(0.55)	0.02	0.00
October	0.02	(0.02)	(0.09)	0.05	0.80	(0.26)	0.23	(0.09)	0.21	0.00
November	-0.12	(0.46)	(0.20)	(0.55)	0.17	(0.24)	0.16	0.43	0.26	0.00
December	0.33	0.10	0.44	(0.90)	0.35	0.97	0.47	0.31	1.33	0.00
1999										
January	0.70	0.90	0.06	0.27	(0.25)	1.03	0.43	1.63	4.46	0.58
February	1.05	2.71	0.41	1.50	(1.23)	2.17	0.48	(0.57)	(3.90)	0.26
March	1.10	2.01	0.79	1.63	(0.07)	0.98	1.32	0.55	0.56	0.01
April	0.56	(0.23)	0.66	1.13	1.12	1.13	1.48	0.02	(0.04)	(0.16)
May	0.30	(0.95)	0.18	0.68	0.76	1.23	1.27	0.33	(0.12)	0.00
June	0.19	(1.28)	0.75	0.45	0.74	0.80	0.50	0.31	0.29	2.23
July	1.09	(0.24)	1.21	0.08	0.47	3.91	0.42	0.16	0.44	6.52
August	0.56	0.13	0.84	0.08	(0.12)	1.41	0.93	(0.13)	0.40	0.00
September	0.31	0.34	0.20	0.13	0.35	0.55	0.69	(0.09)	0.07	(0.24)
October	1.19	1.77	0.02	0.34	1.04	3.24	0.40	0.18	0.00	(0.06)
November	0.95	1.35	0.43	0.91	0.61	2.15	0.29	0.04	0.16	(0.07)
December	0.74	1.57	0.42	0.58	0.70	0.29	0.21	0.28	0.44	(0.03)
2000										
January	0.61	0.90	0.20	0.40	0.23	0.72	0.62	0.00	2.26	0.99
February	0.05	(0.46)	(0.01)	0.53	(0.53)	0.42	0.29	0.29	2.60	0.06
March	0.13	(0.58)	0.09	0.30	(1.48)	1.96	0.29	0.07	0.00	0.19
April	0.09	(0.49)	0.02	0.19	0.61	0.47	0.03	1.56	(0.16)	(0.14)
May	-0.05	(0.79)	0.61	0.28	0.23	0.18	0.16	(0.10)	0.06	(0.01)
June	0.30	0.18	0.06	0.34	0.84	0.15	0.67	0.25	0.09	2.62
July	1.61	1.78	1.29	0.33	0.79	2.98	0.48	0.20	(0.25)	7.61
August	1.21	2.33	0.53	0.93	0.31	1.51	0.46	0.37	0.33	(0.08)
September	0.23	0.53	0.14	0.61	0.57	(0.01)	(0.11)	0.18	0.26	0.19

Source: IBGE.

1/ Consumer price index of 11 major cities in Brazil.

Table 9. Brazil: Relative Public Sector Prices and Tariffs
(Janaury 2000=100)

			Petroleum Products						
		Telecommu-	Consumer Prices		Refinery Prices				
	Electricity	nication	Gasoline	Diesel	Gasoline	Diesel	Natural Gas	Alcohol	Mail
1996									
January	72.9	28.2	35.0	...	43.5	57.5	...	77.6	..
February	72.9	46.5	34.9	...	43.5	57.5	...	77.4	...
March	72.9	46.5	34.9	...	43.5	57.5	...	77.4	...
April	72.9	46.5	39.9	...	49.8	57.5	...	89.0	...
May	72.9	46.5	40.2	...	49.8	57.5	...	89.4	...
June	72.9	46.5	40.4	...	49.8	57.5	...	90.2	...
July	72.9	46.5	40.6	...	49.8	57.5	...	90.4	...
August	72.9	46.5	40.7	...	49.8	57.5	...	90.6	...
September	72.9	46.5	40.7	...	49.8	57.5	...	90.8	...
October	72.9	46.5	40.9	...	49.8	57.5	...	91.4	...
November	73.6	46.5	41.1	...	49.8	57.5	...	91.9	...
December	73.8	46.5	43.0	...	55.5	62.9	...	96.2	...
1997									
January	73.8	46.5	47.2	...	55.5	62.9	...	108.6	...
February	73.8	46.5	47.3	...	55.5	62.9	...	108.4	...
March	73.8	46.5	47.4	...	55.5	62.9	...	109.0	...
April	77.8	68.0	47.4	...	55.5	62.9	...	109.2	...
May	80.1	77.3	47.2	...	53.8	62.9	...	108.3	...
June	80.4	88.2	47.2	...	53.8	62.9	...	108.4	...
July	80.4	88.2	47.0	...	53.8	62.9	...	108.1	...
August	81.0	88.2	46.7	...	53.8	62.9	...	107.4	...
September	81.1	88.2	46.8	...	53.8	62.9	...	107.9	...
October	81.1	88.2	46.8	...	53.8	62.9	...	107.7	...
November	81.2	88.2	48.4	...	58.7	66.1	...	109.7	...
December	81.2	88.2	50.0	...	58.7	66.1	...	112.0	...
				...					...
1998				...					...
January	82.1	89.9	50.4	...	58.7	66.1	62.4	113.0	...
February	82.1	89.9	50.3	...	58.7	66.1	62.4	112.4	...
March	82.1	89.9	50.3	..	58.7	66.1	62.4	112.6	...
April	82.3	89.9	50.3	...	58.7	66.1	62.4	112.1	...
May	83.0	89.9	50.3	...	58.7	66.1	62.4	111.7	...
June	83.0	89.9	49.8	...	58.7	66.1	62.4	110.4	...
July	83.0	89.9	49.8	...	58.7	66.1	62.4	109.6	...
August	83.0	89.9	48.5	...	56.1	62.6	62.4	104.4	...
September	83.0	89.9	48.3	...	56.1	62.6	62.4	102.8	...
October	83.0	89.9	47.9	...	56.1	62.6	62.4	101.2	...
November	83.3	89.9	47.5	...	56.1	62.6	62.4	99.5	...
December	83.4	89.9	49.8	...	61.7	62.6	62.4	95.8	...
1999									
January	83.4	90.5	50.7	...	61.7	62.6	62.4	93.8	...
February	83.4	90.7	52.4	...	62.5	63.4	63.1	96.7	...
March	83.4	90.7	55.0	...	69.7	70.7	71.4	95.2	...
April	84.4	90.6	58.1	...	77.7	78.8	80.3	91.3	...
May	85.1	90.6	60.0	...	77.7	78.8	84.1	84.3	...
June	91.0	92.6	60.5	...	91.7	93.0	84.1	83.1	...
July	96.0	98.6	68.0	...	100.0	100.0	84.1	90.1	100.0
August	97.4	98.6	65.3	98.0	100.0	100.0	91.7	93.9	100.0
September	97.8	98.4	66.3	98.0	100.0	100.0	91.7	94.3	100.0
October	97.8	98.3	73.3	98.0	100.0	100.0	91.7	95.2	100.0
November	99.4	98.3	95.5	99.5	100.0	100.0	91.7	99.6	100.0
December	100.0	98.2	99.9	100.1	100.0	100.0	91.7	100.4	100.0
2000									
January	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
February	100.0	100.0	99.7	99.6	100.0	100.0	106.0	98.5	100.0
March	100.0	100.1	100.0	103.8	107.0	107.0	106.0	103.3	100.0
April	100.2	99.8	99.1	104.8	107.0	107.0	106.0	103.0	106.8
May	102.0	100.0	98.4	104.7	107.0	107.0	106.0	103.0	122.7
June	101.8	102.7	96.9	104.7	107.0	107.0	106.0	102.1	122.7
July	106.8	111.5	106.9	112.3	123.0	123.0	125.1	115.8	122.7
August	106.9	111.5	114.9	116.9	123.0	123.0	125.1	135.2	122.7
Memorandum items:									
			12-month percentage changes (end of period)						
End-1995	...	...	7.6	...	3.5	4.0	...	12.3	...
End-1996	1.6	69.2	21.3	...	27.6	9.3	...	22.7	...
End-1997	10.1	89.6	16.3	...	5.8	5.1	...	16.4	...
End-1998	2.7	2.0	-0.3	...	5.1	-5.2	...	-14.4	...
End-1999	19.9	9.2	100.5	...	62.2	59.6	47.0	4.8	...
August 2000	9.7	13.1	75.9	19.3	23.0	23.0	36.3	44.0	22.7

Sources: IBGE e ANP.

Table 10. Brazil: Open Unemployment Rate 1/

(In Percent)

	1994	1995	1996	1997	1998	1999	2000
Annual average	**5.1**	**4.6**	**5.4**	**5.7**	**7.6**	**7.6**	...
January	5.5	4.4	5.3	5.2	7.3	7.7	7.6
February	5.4	4.3	5.7	5.6	7.4	7.5	8.2
March	5.9	4.4	6.4	6.0	8.2	8.2	8.1
April	5.4	4.4	6.0	5.8	7.9	8.0	7.8
May	5.2	4.5	5.9	6.0	8.2	7.7	7.8
June	5.4	4.6	5.9	6.1	7.9	7.8	7.4
July	5.5	4.8	5.6	6.0	8.0	7.5	7.2
August	5.5	4.9	5.5	5.9	7.8	7.7	7.1
September	5.1	5.2	5.2	5.7	7.6	7.4	6.7
October	4.5	5.1	5.1	5.7	7.5	7.5	...
November	4.0	4.7	4.6	5.4	7.0	7.3	...
December	3.4	4.4	3.8	4.8	6.3	6.3	...

Source: Brazilian Institute of Geography and Statistics (IBGE).

1/ Survey data from six metropolitan areas (Belo Horizonte, Porto Alegre, Recife, Rio de Janeiro, Salvador, São Paulo), using a seven-day reference period.

Table 11. Brazil: Employment and Real Wages in Industry

		(Average 1992 = 100)		(Monthly Percent Change)		(Annual Percentage Change)	
		Industrial Employment	Average Real Wage	Industrial Employment	Average Real Wage	Industrial Employment	Average Real Wage
1992	December	97.3	116.1	...	...	-8.3	13.7
1993	December	97.2	127.3	...	...	-0.1	9.6
1994	December	97.4	147.0	...	...	0.2	15.5
1995	December	87.9	162.3	...	...	-9.7	10.4
1996	December	81.2	163.5	...	...	-7.7	0.7
1997	December	75.1	171.7	-1.6	11.0	-7.4	5.0
1998	January	74.7	151.0	-0.6	-12.1	-8.0	3.3
	February	74.1	151.1	-0.8	0.1	-8.4	3.9
	March	73.5	147.6	-0.7	-2.3	-8.6	4.9
	April	72.8	142.3	-1.0	-3.6	-9.1	0.7
	May	72.4	141.2	-0.6	-0.8	-8.8	-4.4
	June	71.8	146.8	-0.8	3.9	-9.4	-0.6
	July	71.0	145.8	-1.1	-0.7	-9.8	-3.3
	August	70.6	152.1	-0.6	4.3	-9.8	0.4
	September	70.2	152.2	-0.5	0.1	-9.8	0.8
	October	69.6	151.5	-1.0	-0.5	-9.9	-1.3
	November	69.1	156.6	-0.6	3.4	-9.4	1.3
	December	68.5	168.2	-0.9	7.4	-8.8	-2.0
1999	January	67.8	146.2	-1.1	-13.1	-9.3	-3.2
	February	67.2	144.1	-0.9	-1.4	-9.3	-4.6
	March	66.8	137.7	-0.6	-4.4	-9.2	-6.7
	April	66.5	139.2	-0.4	1.1	-8.7	-2.2
	May	66.0	140.7	-0.7	1.1	-8.8	-0.3
	June	65.5	141.0	-0.8	0.2	-8.7	-3.9
	July	65.8	137.4	0.5	-2.5	-7.3	-5.7
	August	65.8	134.5	-0.1	-2.2	-6.8	-11.6
	September	65.7	130.5	-0.1	-2.9	-6.4	-14.3
	October	65.8	130.5	0.2	0.0	-5.3	-13.9
	November	66.3	136.4	0.6	4.6	-4.2	-12.9
	December	66.5	152.9	0.3	12.1	-2.9	-9.0
2000	January	66.5	142.1	0.1	-7.1	-1.8	-2.8
	February	66.6	135.8	0.1	-4.4	-0.8	-5.7
	March	66.7	134.5	0.2	-0.9	0.0	-2.3
	April	66.8	129.5	0.0	-3.8	0.5	-7.0
	May	66.9	133.0	0.2	2.8	1.4	-5.4
	June	66.8	136.4	-0.2	2.5	1.9	-3.2
	July	66.7	130.1	0.0	-4.6	1.4	-5.3

Sources: Central Bank of Brazil; and Fund staff estimates.

Table 12. Brazil: Minimum Wage Statistics

		Nominal (R$ per month)	Real Index (May 2000=100) 1/	Percentage Change in Real Terms 2/
Annual averages				
1995		91.3	83.9	13.1
1996		108.0	86.2	2.7
1997		117.3	88.4	2.5
1998		126.7	91.9	4.0
1999		134.0	92.8	0.9
2000		147.7	95.0	2.5
Quarterly averages				
1995	I	75.0	75.3	-6.0
	II	90.0	84.9	25.3
	III	100.0	89.4	19.3
	IV	100.0	85.8	16.5
1996	I	100.0	82.8	9.9
	II	108.0	87.1	2.5
	III	112.0	87.8	-1.8
	IV	112.0	87.0	1.4
1997	I	112.0	85.6	3.3
	II	117.3	88.4	1.6
	III	120.0	90.0	2.5
	IV	120.0	89.4	2.8
1998	I	120.0	87.8	2.6
	II	126.7	91.3	3.3
	III	130.0	94.1	4.6
	IV	130.0	94.3	5.5
1999	I	130.0	92.3	5.1
	II	134.0	93.5	2.3
	III	136.0	93.6	-0.5
	IV	136.0	91.5	-3.0
2000	I	141.0	90.2	-2.3
	II	151.0	99.9	6.9

Sources: IPEA; and Central Bank of Brazil.

1/ Deflated by the National Consumer Price Index (INPC).

2/ With respect to the corresponding period of the preceding year.

Table 13. Brazil: Nominal, Operational, and Primary Balances of the Nonfinancial Public Sector 1/2/

(In percent of GDP)

	1994	1995	1996	1997	1998	1999
Total borrowing requirement	**44.2**	**7.1**	**5.9**	**6.1**	**7.9**	**10.0**
Central government 3/	16.8	2.3	2.6	2.6	5.4	6.9
States and municipalities	19.0	3.5	2.7	3.0	2.0	3.2
Public enterprises	8.5	1.3	0.6	0.5	0.5	-0.1
Monetary correction	44.8	2.3	2.1	1.8	0.5	6.6
Operational balance (deficit -)	**0.5**	**-4.8**	**-3.8**	**-4.3**	**-7.4**	**-3.4**
Central government	1.6	-1.6	-1.6	-1.8	-5.1	-3.2
States and municipalities	-1.0	-2.3	-1.8	-2.3	-1.8	-0.5
Public enterprises	-0.1	-0.8	-0.3	-0.3	-0.5	0.3
Interest payments (net) 4/	**3.8**	**5.1**	**3.7**	**3.3**	**7.4**	**6.7**
Central government	1.5	2.2	2.0	1.4	5.7	5.5
States and municipalities	1.5	2.1	1.3	1.5	1.6	0.7
Public enterprises	0.9	0.8	0.4	0.3	0.2	0.4
Primary balance (deficit -)	**4.3**	**0.3**	**-0.1**	**-1.0**	**0.0**	**3.2**
Central government	3.1	0.6	0.4	-0.3	0.6	2.4
States and municipalities	0.5	-0.2	-0.6	-0.7	-0.2	0.2
Public enterprises	0.8	-0.1	0.1	0.1	-0.4	0.7

Sources: Central Bank of Brazil; Ministry of Finance; and Fund staff estimates.

1/ Figures from 1992 to 1994 have been adjusted to eliminate the end-of-period bias.
2/ Proceeds from privatization, not included in revenue.
3/ Includes federal administration, central bank, decentralized agencies and social security system.
4/ Interest payments on external debt plus the real portion of interest payments on domestic debt.

Table 14. Brazil: Summary Operations of the Public Sector 1/

(In percent of GDP)

	1994	1995	1996	1997	1998 4/	1999 4/
Nonfinancial revenue	**33.2**	**32.9**	**29.9**	**30.8**	**30.8**	**34.0**
Tax revenue	**24.2**	**24.3**	**21.9**	**23.2**	**23.6**	**27.6**
Direct taxes	3.8	4.2	4.0	3.9	4.7	4.9
Federal VAT (IPI)	2.1	2.0	2.0	1.9	1.7	1.7
State VAT (ICMS)	6.8	7.2	7.1	6.7	6.5	6.9
IOF	0.8	0.5	0.4	0.4	0.4	0.5
Financial transactions tax (CPMF)	--	--		0.8	0.9	0.8
Trade taxes	0.5	0.7	0.5	0.6	0.7	0.8
Earmarked social taxes	4.1	4.1	4.1	4.0	3.7	5.1
Social security contributions	5.3	4.9	5.2	5.1	5.1	5.1
Other tax revenue	3.1	2.2	0.5	2.1	2.2	1.9
Minus: public enterprise taxes	-2.2	-1.8	-1.9	-2.2	-2.3	-0.2
Nontax revenue	**9.0**	**8.7**	**8.1**	**7.6**	**7.1**	**6.4**
Value added federal enterprises	5.3	4.2	4.5	4.8	4.3	3.4
Sales	8.7	7.0	7.6	7.4	6.8	6.4
Minus: purchases	-3.4	-2.8	-3.0	-2.6	-2.5	-3.1
Other revenue from federal enterprises	1.3	0.9	1.2	1.0	0.5	0.6
Other	2.4	3.6	2.4	1.8	2.3	2.4
Nonfinancial expenditure	**28.9**	**32.6**	**30.0**	**31.8**	**30.8**	**30.8**
Current expenditure	22.2	25.6	**27.1**	**26.0**	**26.1**	**28.2**
Wages and salaries	12.7	13.6	12.5	13.4	12.1	11.8
Transfers	5.1	5.9	6.1	6.3	6.7	6.9
Pension benefits	4.7	4.9	5.3	5.4	5.8	6.1
Subsidies, grants, BNDES	0.5	0.9	0.8	0.9	0.9	0.8
Other current	4.3	6.1	8.5	6.4	7.3	9.4
Capital expenditure	**4.6**	**4.1**	**3.9**	**4.6**	**4.2**	**3.0**
Investment	4.2	3.8	2.9	3.5	3.3	2.1
Other	0.4	0.3	1.0	1.0	0.9	0.9
Primary deficit state and municipal enterprises	**0.9**	**0.5**	**0.2**	**0.2**	**0.1**	**0.0**
Float and adjustment	**1.2**	**2.4**	**-1.3**	**1.0**	**0.4**	**-0.5**
Of which:						
FAT adjustment	-0.4	-0.5	-0.4	-0.1	-0.2	-0.3
Adjustment and float	1.5	3.0	-0.9	1.1	0.5	-0.2
Primary balance (deficit -) 2/	**4.3**	**0.3**	**-0.1**	**-1.0**	**0.0**	**3.2**
Federal government	3.0	0.6	0.4	-0.3	0.6	2.4
State and municipal governments	0.5	-0.2	-0.6	-0.7	-0.2	0.2
Public sector enterprises	0.8	-0.1	0.1	0.1	-0.4	0.7
Net financial expenditure 3/	**3.8**	**5.1**	**3.7**	**3.3**	**7.4**	**6.7**
Domestic	3.1	4.6	3.2	3.0	7.1	5.6
Foreign	0.7	0.5	0.5	0.3	0.3	1.0
Operational balance (deficit -)	**0.6**	**-4.8**	**-3.8**	**-4.3**	**-7.4**	**-3.4**
Federal government	1.6	-1.6	-1.6	-1.8	-5.1	-3.2
State and municipal governments	-1.0	-2.3	-1.8	-2.3	-1.8	-0.5
Public sector enterprises	-0.1	-0.8	-0.3	-0.3	-0.5	0.3
PSBR	**44.2**	**7.1**	**5.9**	**6.1**	**7.9**	**10.0**

Sources: Central Bank of Brazil; Ministry of Finance; and Fund staff estimates.

1/ Comprises federal government (including the operational result of the central bank), state and municipal governments, and public sector enterprises. Figures from 1992 to 1994 have been adjusted to eliminate the end-of-period effect.

2/ Excludes proceeds from privatization.

3/ Comprises interest payments on external debt, plus the real component of interest payments on domestic debt.

4/ Preliminary. Data for the municipalities only available for the below-the-line primary balance.

Table 15. Brazil: General Government 1/
(In percent of GDP)

	1994	1995	1996	1997	1998 3/	1999 3/
Nonfinancial revenue	**28.8**	**29.6**	**26.1**	**28.5**	**28.2**	**30.2**
Tax revenue	**26.4**	**26.0**	**23.8**	**26.7**	**25.9**	**27.8**
Direct taxes	3.8	4.2	4.0	3.9	4.7	4.9
Value-added taxes	8.9	9.2	9.1	9.3	8.2	8.6
Social security taxes	5.3	4.9	5.2	5.1	5.1	5.1
Trade taxes	0.5	0.7	0.5	0.6	0.7	0.8
Other tax revenue	8.0	6.9	4.9	7.9	7.2	8.4
Nontax revenue	**2.4**	**3.6**	**2.4**	**1.8**	**2.3**	**2.4**
Nonfinancial expenditure	**25.3**	**29.2**	**26.3**	**29.5**	**27.8**	**27.7**
Current expenditure	**24.0**	**26.7**	**24.9**	**26.5**	**25.6**	**26.3**
Wages and salaries	11.0	12.2	12.4	12.2	11.2	11.2
Transfers	5.3	6.2	6.3	6.4	6.9	7.1
Pension benefits	4.7	4.9	5.3	5.4	5.8	6.1
Subsidies and grants	0.6	1.2	1.0	1.0	1.0	1.0
Other current expenditures	7.7	8.3	6.1	7.9	7.6	8.1
Capital expenditure	**2.9**	**2.7**	**2.3**	**2.6**	**2.6**	**1.7**
Float and statistical adjustment	**-1.6**	**-0.2**	**-0.9**	**0.4**	**-0.4**	**-0.4**
Primary balance (deficit -)	**3.5**	**0.4**	**-0.2**	**-1.1**	**0.4**	**2.6**
Real net interest payments 2/	**2.9**	**4.3**	**3.3**	**3.0**	**7.3**	**6.3**
Operational balance (deficit -)	**0.6**	**-3.9**	**-3.4**	**-4.0**	**-6.9**	**-3.7**
Public sector borrowing requirement	**35.8**	**5.8**	**5.3**	**5.7**	**7.4**	**10.1**

Sources: Central Bank of Brazil; Ministry of Finance; and Fund staff estimates.

1/ Comprises federal government (including the operational result of the central bank), and state and municipal governments.
2/ Comprises interest payments on external debt, plus the real component of interest payments on domestic debt.
3/ Preliminary. Data for the municipalities only available for the below-the-line primary balance.

Table 16. Brazil: Central Government Operations 1/

(In percent of GDP)

	1994	1995	1996	1997	1998	1999
Revenue 2/	**18.6**	**19.2**	**17.8**	**18.4**	**20.1**	**22.0**
Taxes	**17.9**	**17.0**	**16.7**	**17.2**	**17.8**	**19.6**
Direct	3.8	4.2	4.0	3.9	4.7	4.9
Individual	2.6	2.8	2.3	2.4	3.3	3.5
Corporate	1.2	1.5	1.7	1.5	1.4	1.5
Indirect	3.8	2.5	2.3	3.1	3.0	3.0
IPI	2.1	2.0	2.0	1.9	1.7	1.7
IOF	0.8	0.5	0.4	0.4	0.4	0.5
IPMF/CPMF	1.0	0.0	0.0	0.8	0.9	0.8
Taxes on trade	0.5	0.7	0.5	0.6	0.7	0.8
Earmarked social taxes	4.1	4.1	4.1	4.0	3.7	5.1
Social security contributions	5.3	4.9	5.2	5.1	5.1	5.1
Other taxes	0.4	0.4	0.5	0.5	0.7	0.6
Nontax revenues	**0.7**	**2.2**	**1.2**	**1.2**	**2.3**	2.4
Expenditure	**15.6**	**18.6**	**17.5**	**18.7**	**19.6**	**19.6**
Current expenditure	**15.9**	**18.6**	**17.6**	**17.4**	**18.7**	**19.2**
Wages and salaries	5.1	5.2	5.0	4.9	5.0	5.1
Social security benefits	4.7	4.9	5.3	5.4	5.8	6.1
Transfers	3.9	4.2	3.7	3.6	3.9	4.2
States and Municipalities transfers.	3.4	3.2	3.0	2.9	3.1	3.5
Regional funds	0.2	0.3	0.2	0.2	0.2	0.2
Public enterprises	0.0	0.0	0.0	0.0	0.0	0.0
BNDES, regional funds	0.3	0.6	0.6	0.6	0.6	0.6
Subsidies and grants	0.1	0.3	0.3	0.3	0.3	0.2
Other current expenditure	2.1	4.0	3.3	3.3	3.6	3.5
Capital expenditure	**1.0**	**0.8**	**0.8**	**0.9**	**1.1**	**0.8**
Direct	1.0	0.8	0.8	0.9	1.1	0.8
Capital transfers to public enterprises	0.0	0.0	0.0	0.0	0.0	0.0
Float and adjustment	**-1.3**	**-0.7**	**-0.9**	**0.4**	**-0.1**	**-0.4**
Of which:						
FAT adjustment	-0.4	-0.55	-0.4	-0.1	-0.2	-0.3
Float	-0.9	-0.18	-0.6	0.6	0.0	-0.1
Primary balance (deficit -)	**3.0**	**0.6**	**0.4**	**-0.3**	**0.6**	**2.4**
Net interest payments 3/	**1.5**	**2.2**	**2.0**	**1.4**	**5.7**	**5.5**
Operational balance (deficit -)	**1.6**	**-1.6**	**-1.6**	**-1.8**	**-5.1**	**-3.2**
Nominal balance (deficit -)	**-16.8**	**-2.3**	**-2.6**	**-2.6**	**-5.4**	**-6.9**

Sources: Central Bank of Brazil; ministry of finance; and Fund staff estimates.

1/ Includes the central administration, social security system, and central bank.

2/ Excludes proceeds from privatization.

3/ Comprises interest payments on external debt, plus the real component of interest payments on the domestic debt.

Table 17. Brazil: State and Municipal Governments

(In percent of GDP)

	1994	1995	1996	1997	1998	1999
Revenue 1/	**13.6**	**13.6**	**13.0**	**12.9**	**10.9**	**11.2**
Tax revenue	8.5	9.0	9.3	9.2	8.1	8.3
VAT and nonsales tax	6.8	7.2	7.5	7.4	6.5	6.9
Other	1.7	1.8	1.8	1.8	1.6	1.3
Nontax revenue	1.7	1.4	0.5	0.5	0.0	0.0
Transfers	3.4	3.2	3.3	3.3	2.8	2.9
Expenditure 1/	**13.1**	**13.8**	**13.6**	**13.6**	**11.1**	**11.0**
Current expenditure	11.5	11.4	12.1	11.9	9.8	10.1
Wages and salaries	5.9	7.0	7.4	7.3	6.2	6.0
Other current expenditure	5.60	4.36	4.62	4.5	3.4	4.0
Capital expenditure	1.9	1.9	1.55	1.8	1.5	0.9
Float and adjustment 2/	-0.3	0.6	0.0	0.0	-0.2	-0.1
Primary Balance (deficit -)	**0.5**	**-0.2**	**-0.56**	**-0.7**	**-0.2**	**0.2**
Net real interest payments 3/	**1.4**	**2.1**	**1.3**	**1.5**	**1.6**	**0.7**
Operational balance (deficit -)	**-1.0**	**-2.3**	**-1.9**	**-2.3**	**-1.8**	**-0.5**
Nominal balance (deficit -)	**-19.0**	**-3.5**	**-2.7**	**-3.0**	**-2.0**	**-3.2**

Sources: Central Bank of Brazil; Ministry of Finance; and Fund staff estimates.

1/ The 1998 and 1999 figures reflect exclusively data for the States as no above-the-line data is yet available for t municipalities.

2/ For 1998 and 1999 it includes the below-the-line primary surplus (-) /deficit (+) of the municipalities.

3/ Comprises interest payments on external debt, plus the real component of interest payments on the domestic debt.

Table 18. Brazil: Nonfinancial Public Sector Enterprises

(In percent of GDP)

	1994	1995	1996	1997	1998	Est. 1999
			I. Federal Enterprises			
Revenue	**9.9**	**7.9**	**9.0**	**8.7**	**7.8**	**7.5**
Sales of goods and services	8.7	7.0	7.8	7.5	6.9	6.7
Transfer receipts	0.0	0.0	0.0	0.1	0.0	0.0
Current	0.0	0.0	0.0	0.0	0.0	0.0
Capital	0.0	0.0	0.0	0.0	0.0	0.0
Other	1.3	0.9	1.2	1.1	0.8	0.8
Expenditure	**8.2**	**7.5**	**8.3**	**8.4**	**8.0**	**6.8**
Current expenditure	7.2	6.0	6.5	5.9	5.6	5.6
Wages and salaries	1.7	1.4	1.4	1.1	0.9	0.7
Materials and supplies	2.0	1.5	1.9	1.4	1.2	1.7
Services	0.9	0.8	0.8	0.7	0.7	0.6
Taxes	2.2	1.8	2.0	2.2	2.3	1.7
Other	0.5	0.5	0.4	0.4	0.5	0.9
Capital expenditure	1.7	1.5	2.0	1.9	1.7	1.3
Investment	1.6	1.3	1.6	1.6	1.3	0.8
Other	0.1	0.2	0.4	0.4	0.4	0.5
Float	-0.8	0.0	-0.2	0.6	0.7	0.0
Primary (deficit -)	**1.8**	**0.4**	**0.7**	**0.3**	**-0.2**	**0.7**
			II. Local Enterprises			
Primary (deficit -) 1/	**-0.9**	**-0.5**	**-0.6**	**-0.2**	**-0.1**	**0.0**
			III. Total			
Primary (deficit -)	**0.8**	**-0.1**	**0.1**	**0.1**	**-0.4**	**0.7**
Net interest payments 2/	**0.9**	**0.8**	**0.4**	**0.3**	**0.2**	**0.4**
Operational (deficit -)	**-0.1**	**-0.8**	**-0.3**	**-0.3**	**-0.5**	**0.3**
Nominal balance (deficit -)	**-8.4**	**-1.3**	**-0.6**	**-0.5**	**-0.5**	**0.1**

Sources: Central Bank ; Ministry of Finance; Ministry of Planning and Budget; and Fund staff estimates.

1/ Includes statistical discrepancy for data prior to 1997.

2/ Comprises interest payments on external debt plus the real component of interest payments on domestic debt.

Table 19. Brazil: Federal Treasury Cash Operations

	1994	1995	1996	1997	1998	1999
			(In millions of reais)			
Cash revenue	**48,180.0**	**86,294.0**	**97,132.0**	**116,033.4**	**139,051.7**	**158,778.6**
Cash expenditures 1/	**46,810.0**	**90,256.0**	**106,257.0**	**121,675.1**	**148,333.4**	**163,706.6**
Earmarked	12,534.0	24,586.0	27,187.0	32,190.8	38,462.7	40,062.6
Transfers of earmarked receipts	3,481.0	6,266.0	6,357.0	8,784.4	11,452.0	10,533.7
State and local government participation of funds	9,053.0	18,320.0	20,830.0	23,406.4	27,010.7	29,528.9
Non-earmarked	32,307.0	62,227.0	76,707.0	86,963.4	107,477.8	121,229.4
Wages	17,935.0	35,497.0	40,505.0	42,849.0	47,298.0	50,167.5
Interest 2/	5,466.0	11,739.0	15,992.0	17,973.4	27,713.2	35,937.5
Other	8,906.0	14,991.0	20,216.0	26,141.0	32,466.6	35,124.4
Net lending	1,969.0	3,443.0	2,288.0	2,520.9	2,392.9	2,414.6
Cash surplus or deficit (-)	**1,370.0**	**-3,962.0**	**-9,125.0**	**-5,641.7**	**-9,281.7**	**-4,928.0**
			(As a percent of revenue)			
Cash expenditures 1/	**97.2**	**104.6**	**109.4**	**104.9**	**106.7**	**103.1**
Earmarked	26.0	28.5	28.0	27.7	27.7	25.2
Transfers of earmarked receipts	7.2	7.3	6.5	7.6	8.2	6.6
State and local government participation funds	18.8	21.2	21.4	20.2	19.4	18.6
Non-earmarked	67.1	72.1	79.0	74.9	77.3	76.4
Wages	37.2	41.1	41.7	36.9	34.0	31.6
Interest 2/	11.3	13.6	16.5	15.5	19.9	22.6
Other	18.5	17.4	20.8	22.5	23.3	22.1
Net lending	4.1	4.0	2.4	2.2	1.7	1.5
			(As percent of GDP)			
Cash revenue	**13.8**	**13.4**	**12.5**	**13.3**	**15.2**	**16.5**
Cash expenditures 1/	**13.4**	**14.0**	**13.6**	**14.0**	**16.2**	**17.0**
Earmarked	3.6	3.8	3.5	3.7	4.2	4.2
Transfers of earmarked receipts	1.0	1.0	0.8	1.0	1.3	1.1
State and local government participation of funds	2.6	2.8	2.7	2.7	3.0	3.1
Non-earmarked	9.3	9.6	9.8	10.0	11.8	12.6
Wages	5.1	5.5	5.2	4.9	5.2	5.2
Interest 2/	1.6	1.8	2.1	2.1	3.0	3.7
Other	2.6	2.3	2.6	3.0	3.6	3.7
Net lending	0.6	0.5	0.3	0.3	0.3	0.3
Cash surplus or deficit (-)	**0.4**	**-0.6**	**-1.2**	**-0.6**	**-1.0**	**-0.5**
Memorandum item:						
GDP (R$ million)	349,205	646,192	778,887	870,743	913,735	960,858

Sources: Ministry of Finance; and Fund staff estimates.

1/ Excluding amortization.

2/ Includes gross interest payments on federal government bonded debt and other domestic and external debt.

Table 20. Brazil: Net Domestic Debt of the Public Sector 1/

(In percent of GDP, end-of-period stocks)

	1994	1995	1996	1997	1998	1999	May 2000
Total	**20.7**	**24.9**	**29.4**	**30.2**	**36.0**	**37.0**	**37.6**
By instrument							
Securities	16.2	21.4	27.8	32.7	37.8	38.7	40.9
Bank debt	3.4	4.8	4.9	0.6	1.4	0.4	-3.3
Other (net)	1.1	-1.3	-3.3	-3.1	-3.2	-2.1	0.0
By debtors							
Federal government 2/	6.4	9.8	14.3	16.8	21.1	21.1	21.8
Securities 3/	11.5	15.6	21.4	28.2	35.4	37.6	40.7
Other	-5.1	-5.8	-7.1	-11.4	-14.3	-16.5	-19.0
States and municipalities	9.4	10.3	11.2	12.5	13.7	14.6	14.7
Securities	4.7	5.8	6.4	4.5	2.4	1.1	0.2
Other	4.7	4.5	4.8	8.0	11.3	13.5	14.5
Public enterprises	5.0	4.9	3.9	0.9	1.3	1.2	1.2

Source: Central Bank of Brazil.

1/ Gross domestic debt minus domestic financial assets.
2/ Defined to include the federal government and the central bank.
3/ Includes only the bonded federal debt outside the central bank from 1991 until 1996.

Table 21. Brazil: Federal Government Bonded Debt Outstanding (End-of-Period) 1/

	December					June
	1995	1996	1997	1998	1999	2000
	(In millions of *reais*, end-of-period stocks)					
Total by issuer	**133,942**	**197,880**	**290,970**	**448,529**	**527,526**	**596,464**
Issued by the treasury	84,596	114,775	225,732	343,820	464,507	527,534
Held by the central bank	25,456	21,669	35,461	124,670	112,625	91,943
Held by the public	59,140	93,106	190,271	219,151	351,881	435,590
Issued by the central bank	49,346	83,105	65,238	104,709	63,020	68,931
Total held by the public	**108,473**	**176,211**	**255,509**	**323,860**	**414,901**	**504,521**
Nonindexed instruments	46,319	107,491	104,527	11,383	86,242	69,935
Indexed instruments	62,154	68,720	150,982	312,477	328,659	434,586
Indexed to the overnight interest rate	40,979	32,789	88,874	223,634	205,345	277,111
Indexed to the foreign exchange rate	5,728	16,532	39,239	68,006	100,550	103,690
Indexed to other indicators	15,448	19,399	22,868	20,836	22,764	53,785
	(In percent of total federal government bonded debt)					
Issued by the treasury	63.2	58.0	77.6	76.7	88.1	88.4
Issued by the central bank	36.8	42.0	22.4	23.3	11.9	11.6
Held by the central bank	19.0	11.0	12.2	27.8	21.3	15.4
Held by the public	81.0	89.0	87.8	72.2	78.7	84.6
	(In percent of total federal government bonded debt held by the public)					
Nonindexed instruments	42.7	61.0	40.9	3.5	20.8	13.9
Indexed instruments	57.3	39.0	59.1	96.5	79.2	86.1
Indexed to the overnight interest rate	37.8	18.6	34.8	69.1	49.5	54.9
Indexed to the foreign exchange rate	5.3	9.4	15.4	21.0	24.2	20.6
Indexed to other indicators	14.2	11.0	9.0	6.4	5.5	10.7
	(In percent of GDP)					
Total	20.7	25.4	33.4	49.1	54.9	58.7
Total held by the public	16.8	22.6	29.3	35.4	43.2	49.6
Memorandum item:						
GDP over four quarters	646,192	778,887	870,743	913,735	960,858	1,016,806

Sources: Central Bank of Brazil; and Fund staff estimates.

1/ Federal government is defined here as the treasury plus the central bank.

Table 22. Brazil: Outstanding Domestic Bonded Debt of the State and Municipal Governments

	December					June
	1995	1996	1997	1998	1999	2000
	(In millions of *reais*, end-of-period stocks)					
Total outstanding	**39,512**	**51,720**	**41,036**	**23,020**	**12,569**	**2,086**
State governments 1/	**34,396**	**45,149**	**32,880**	**12,529**	**2,059**	**1,640**
Minas Gerais	6,882	8,773	10,912	0	0	0
Rio de Janeiro	4,656	5,935	7,383	9,474	0	0
Rio Grande do Sul	5,133	6,543	8,143	0	0	45
São Paulo	14,603	18,723	0	0	0	0
Others	3,122	5,175	6,442	3,055	2,059	1,594
Municipal governments	**5,116**	**6,571**	**8,156**	**10,491**	**10,511**	**446**
Rio de Janeiro	1,165	1,338	1,658	2,124	0	0
São Paulo 2/	3,951	5,021	6,242	8,041	10,102	0
Others	0	212	256	326	409	446
	(As a percent of total state and municipal government bonded debt)					
State governments 1/	**87.1**	**87.3**	**80.1**	**54.4**	**16.4**	**78.6**
Minas Gerais	17.4	17.0	26.6	0.0	0.0	0.0
Rio de Janeiro	11.8	11.5	18.0	41.2	0.0	0.0
Rio Grande do Sul	13.0	12.7	19.8	0.0	0.0	2.2
São Paulo	37.0	36.2	0.0	0.0	0.0	0.0
Others	7.9	10.0	15.7	13.3	16.4	76.4
Municipal governments	**12.9**	**12.7**	**19.9**	**45.6**	**83.6**	**21.4**
Rio de Janeiro	2.9	2.6	4.0	9.2	0.0	0.0
São Paulo 2/	10.0	9.7	15.2	34.9	80.4	0.0
Others	0.0	0.4	0.6	1.4	3.3	21.4
	(Percent of GDP)					
Total outstanding	**6.1**	**6.6**	**4.7**	**2.5**	**1.3**	**0.2**
State governments 1/	**5.3**	**5.8**	**3.8**	**1.4**	**0.2**	**0.2**
Minas Gerais	1.1	1.1	1.3	0.0	0.0	0.0
Rio de Janeiro	0.7	0.8	0.8	1.0	0.0	0.0
Rio Grande do Sul	0.8	0.8	0.9	0.0	0.0	0.0
São Paulo	2.3	2.4	0.0	0.0	0.0	0.0
Others	0.5	0.7	0.7	0.3	0.2	0.2
Municipal governments	**0.8**	**0.8**	**0.9**	**1.1**	**1.1**	**0.0**
Rio de Janeiro	0.2	0.2	0.2	0.2	0.0	0.0
São Paulo 2/	0.6	0.6	0.7	0.9	1.1	0.0
Others	0.0	0.0	0.0	0.0	0.0	0.0
Memorandum item:						
GDP over four quarters	646,192	778,887	870,743	913,735	960,858	1,016,806

Source: Central Bank of Brazil.

1/ Reductions of state debt in 1997-99 reflect the effects of the state debt accords with the federal government.

2/ Reflects debt of the municipalities of Campinas, Guarulhos, and Osasco.

Table 23. Brazil: Monetary Aggregates

(In millions of *reais*, end-of-period)

		Base Money 1/	M1 2/	Savings and Time Deposits 3/	M2 4/	FIF FRF-CP DER 5/	Public Sector Securities 6/	M4 7/
1995	Jan.	16,737	18,217	110,282	128,499	15,780	34,413	178,692
	Feb.	15,821	19,886	112,856	132,742	16,480	35,545	184,767
	Mar.	15,582	17,082	116,855	133,937	16,556	34,394	184,887
	Apr.	13,828	17,142	118,471	135,613	16,437	35,302	187,352
	May	13,812	16,078	120,106	136,184	16,635	36,709	189,528
	Jun.	13,943	17,622	122,594	140,216	16,900	39,407	196,523
	Jul.	15,034	17,879	126,824	144,703	17,660	46,238	208,601
	Aug.	15,614	17,776	130,757	148,533	18,456	52,657	219,646
	Sep.	13,454	19,069	134,176	153,245	15,047	57,720	226,012
	Oct.	15,352	19,755	136,840	156,595	11,573	61,885	230,053
	Nov.	15,559	21,912	137,476	159,388	13,549	65,187	238,124
	Dec.	21,682	28,493	139,862	168,355	13,200	65,463	247,018
1996	Jan.	22,434	23,482	145,783	169,265	14,958	70,271	254,494
	Feb.	17,007	23,095	146,241	169,336	15,785	75,281	260,402
	Mar.	16,186	22,985	146,703	169,688	16,071	79,216	264,975
	Apr.	15,002	23,276	145,735	169,011	16,543	83,176	268,730
	May	16,272	22,762	144,775	167,537	16,921	90,371	274,829
	Jun.	16,807	23,513	145,497	169,010	17,534	93,075	279,619
	Jul.	18,748	23,107	144,137	167,244	18,082	99,274	284,600
	Aug.	15,687	23,477	143,741	167,218	18,889	101,996	288,103
	Sep.	20,638	25,143	145,978	171,121	19,385	104,308	294,814
	Oct.	15,565	23,171	149,676	172,847	19,743	107,359	299,949
	Nov.	15,676	24,383	151,749	176,132	21,505	111,312	308,949
	Dec.	19,796	29,807	152,305	182,112	22,832	114,048	318,992
1997	Jan.	23,860	30,115	148,027	178,142	14,271	126,076	318,489
	Feb.	20,285	33,027	148,239	181,266	10,115	131,818	323,200
	Mar.	22,324	34,030	150,236	184,266	8,318	135,443	328,027
	Apr.	27,291	33,235	150,280	183,515	7,191	140,830	331,535
	May	21,740	33,350	152,968	186,318	6,567	142,355	335,240
	Jun.	24,688	34,331	158,107	192,438	6,015	144,195	342,649
	Jul.	24,216	32,845	159,308	192,153	5,595	151,522	349,270
	Aug.	21,868	34,684	162,782	197,466	5,412	151,399	354,277
	Sep.	24,700	35,842	168,165	204,007	5,464	154,875	364,346
	Oct.	26,147	36,333	174,393	210,726	6,567	154,141	371,433
	Nov.	22,972	36,596	180,767	217,363	6,772	148,754	372,888
	Dec.	31,828	43,077	183,721	226,798	6,262	148,808	381,868

Table 23. Brazil: Monetary Aggregates

(In millions of *reais*, end-of-period)

		Base Money 1/	M1 2/	Savings and Time Deposits 3/	M2 4/	FIF FRF-CP DER 5/	Public Sector Securities 6/	M4 7/
1998	Jan.	30,564	39,158	189,703	228,861	7,083	150,805	386,749
	Feb.	29,091	38,864	191,567	230,431	7,094	157,236	394,760
	Mar.	29,985	38,288	193,623	231,911	7,459	167,472	406,842
	Apr.	30,655	38,594	193,555	232,149	7,834	171,356	411,339
	May	31,099	38,826	195,239	234,065	8,157	175,674	417,896
	Jun.	37,221	40,775	196,995	237,770	7,840	178,704	424,314
	Jul.	32,986	40,483	197,204	237,687	7,997	185,681	431,365
	Aug.	35,413	41,192	196,801	237,993	8,109	185,826	431,927
	Sep.	32,002	40,971	194,287	235,258	7,735	172,980	415,973
	Oct.	32,826	40,263	196,410	236,673	7,389	177,083	421,145
	Nov.	39,738	43,020	197,501	240,521	7,768	187,211	435,501
	Dec.	39,184	46,782	196,494	243,276	7,441	193,875	444,592
1999	Jan.	39,635	46,517	197,212	243,729	7,462	204,157	455,347
	Feb.	37,856	44,392	204,134	248,526	7,326	208,066	463,918
	Mar.	37,232	42,264	208,209	250,473	6,915	213,163	470,550
	Apr.	36,352	40,854	205,918	246,772	6,537	218,196	471,504
	May	40,435	40,907	206,786	247,693	6,539	224,000	478,232
	Jun.	33,178	45,940	207,454	253,394	5,943	235,171	494,508
	Jul.	41,162	48,012	205,606	253,618	6,117	240,904	500,639
	Aug.	33,870	47,509	205,534	253,043	115,670	147,862	516,575
	Sep.	35,971	46,989	204,467	251,456	124,533	145,136	521,125
	Oct.	35,850	48,581	204,549	253,130	130,801	146,792	530,723
	Nov.	37,337	51,580	205,107	256,687	137,803	147,679	542,169
	Dec.	48,430	62,744	205,454	268,198	143,146	142,462	553,806
2000	Jan.	41,893	56,633	206,783	263,416	151,245	149,806	564,467
	Feb.	41,920	54,038	200,413	254,451	156,654	157,984	569,089
	Mar.	39,094	53,255	201,193	254,448	161,499	157,803	573,750
	Apr.	37,721	53,669	199,091	252,760	168,104	158,483	579,347
	May	35,876	52,976	198,010	250,986	172,080	163,682	586,748
	Jun.	32,316	54,285	196,651	250,936	181,912	164,546	597,394
	Jul.	36,452	56,564	197,729	254,293	185,333	163,772	603,398
	Aug.	39,122	56,414	199,148	255,562	192,000	160,936	608,498
	Sep.	37,521	59,146	196,966	256,112	196,831	159,989	612,932

Sources: Central Bank of Brazil; and Fund staff estimates.

1/ Currency issues plus bank reserves on demand deposits.
2/ Currency in circulation plus sight deposits.
3/ Excludes deposits in the own portfolios of financial institutions, FIFs and FRF-CPs.
4/ Equals M1 plus savings and time deposits.
5/ Short-term Financial Investment Funds (FIF), Short-Term Fixed-Income Funds (FRF-CP), and Special Remunerated Deposits (DER). Excludes demand deposits held in FIFs.
6/ Includes securities of the federal, state, and municipal governments. Excludes securities in the portfolios of financial institutions, FIFs and FRF-CPs.
7/ Equals M2 plus FIFs, FRP-CPs, DERs, and public sector securities.

Table 24. Brazil: Summary Accounts of the Financial System 1/

(In millions of *reais*, end-of-period)

	1995	1996	1997	1998	1999
	I. Central Bank				
Net foreign assets	**53,176**	**68,024**	**59,731**	**45,247**	**53,194**
Net international reserves	49,080	62,093	53,219	37,461	44,229
Net other foreign assets	4,096	5,931	6,512	7,785	8,965
Net domestic assets	**52,427**	**76,863**	**80,988**	**133,983**	**94,337**
Net claims on public sector	8,982	2,570	98	86,513	45,684
Net central administration	8,982	2,570	98	86,513	45,684
Net state and local governments	0	0	0	0	0
Net social security	0	0	0	0	0
Net official enterprises	0	0	0	0	0
Credit to deposit money banks	34,576	67,642	68,012	40,368	31,151
Credit to rest of banking system	5	3	902	0	0
Credit to nonbanking institutions	0	6	7	1,926	2,036
Credit under repurchase agreements	3,227	1	1,051	0	2,604
Blocked financial assets	-190	-125	-12	-10	-13
Credit to private sector	5	5	5	0	0
Nonmonetary international organizations	639	801	962	1,125	-427
Official capital and surplus	-890	-3,654	-3,658	-3,199	5,376
Net unclassified assets	6,073	9,614	13,621	7,260	7,926
Counterpart unrequited foreign exchange	-2,533	-3,144	-3,807	-3,717	-5,065
Medium- and long-term foreign liabilities	4,442	2,631	2,448	7,301	8,806
Mutual funds deposits	5,154	11,632	3,726	4,545	0
Liabilities to deposit money banks	22,370	22,275	43,549	33,453	37,813
Liabilities to rest of banking system	382	379	1,211	22	48
Liabilities to nonbanking institutions	2	31	4	3	5
Central bank securities outstanding	52,457	83,106	65,724	104,709	62,468
Liabilities under repurchase agreements	5,741	6,368	2,104	4,290	7,343
Liabilities to private sector	**12,522**	**15,321**	**18,146**	**21,190**	**25,983**
Currency in circulation	12,515	15,314	18,139	21,182	25,974
Other liabilities	7	7	7	8	9

Table 24. Brazil: Summary Accounts of the Financial System 1/

(In millions of *reais*, end-of-period)

	1995	1996	1997	1998	1999
	II. Deposit Money Banks				
Net foreign assets	**-10,050**	**-16,311**	**-16,729**	**-10,690**	**-19,118**
Assets	18,159	21,130	21,810	21,284	29,716
Liabilities	28,209	37,441	38,539	31,974	48,834
Monetary reserves and currency holdings	22,126	22,035	42,494	32,716	38,024
Other claims on monetary authorities	6,578	18,932	11,603	37,545	28,845
Net domestic assets	**241,287**	**285,321**	**321,075**	**331,938**	**360,077**
Net claims on public sector	25,046	84,356	115,191	92,795	129,783
Net central administration	7,764	22,574	83,852	65,241	108,873
Net state and local governments	17,967	53,239	36,419	16,852	7,222
Net social security	-6,316	-9,424	-9,730	-1,095	-770
Net official enterprises	5,631	17,967	4,650	11,797	14,458
Credit to rest of banking system	770	1,078	3,353	3,284	2,903
Blocked financial assets	0	0	0	0	0
Credit to private sector	199,138	204,681	225,197	259,983	272,575
Official capital and surplus	-21,478	-33,069	-50,966	-50,986	-58,101
Net unclassified assets	37,811	28,275	28,300	26,862	12,917
Medium- and long-term foreign liabilities	13,095	15,976	22,547	29,122	24,601
Liabilities to monetary authorities	23,407	39,025	30,272	11,623	521
Liabilities to rest of banking system	9,396	22,017	21,973	26,774	28,473
Liabilities to private sector	**213,932**	**232,899**	**283,417**	**323,831**	**353,965**
Demand deposits	11,255	10,871	24,132	25,148	32,292
Quasi-monetary liabilities	159,901	173,714	203,992	225,619	238,503
Savings deposits	58,562	68,856	90,804	102,915	110,063
Time deposits	78,438	78,848	84,236	89,374	92,877
Other deposits	22,901	26,010	28,952	33,330	35,563
Other liabilities	6,550	7,256	10,283	8,936	9,627
Private capital and surplus	36,226	41,058	45,010	64,128	73,543

Table 24. Brazil: Summary Accounts of the Financial System 1/

(In millions of *reais*, end-of-period)

	1995	1996	1997	1998	1999
	III. Monetary System				
Net foreign assets	**43,126**	**51,713**	**43,002**	**34,557**	**34,076**
Assets	71,813	89,297	81,708	74,254	98,852
Liabilities	28,687	37,584	38,706	39,698	64,776
Net domestic assets	**218,443**	**252,377**	**314,511**	**382,107**	**413,138**
Net claims on public sector	34,028	86,926	115,289	179,308	175,467
Net central administration	16,746	25,144	83,950	151,754	154,557
Net state and local governments	17,967	53,239	36,419	16,852	7,222
Net social security	-6,316	-9,424	-9,730	-1,095	-770
Net official enterprises	5,631	17,967	4,650	11,797	14,458
Credit to rest of banking system	775	1,081	4,255	3,284	2,903
Credit to nonbanking institutions	0	6	7	1,926	2,036
Blocked financial assets	-190	-125	-12	-10	-13
Credit to private sector	199,143	204,686	225,202	259,983	272,575
Nonmonetary international organizations	639	801	962	1,125	-427
Official capital and surplus	-22,368	-36,723	-54,624	-54,185	-52,725
Net unclassified assets	-11,087	-51,584	-24,856	-74,877	-46,364
Net interbank float	17,503	47,309	48,288	65,553	59,686
Counterpart unrequited foreign exchange	-2,533	-3,144	-3,807	-3,717	-5,065
Medium- and long-term foreign liabilities	17,537	18,607	24,995	36,423	33,407
Mutual funds deposits	5,154	11,632	3,726	4,545	0
Liabilities to rest of banking system	9,778	22,396	23,184	26,796	28,521
Liabilities to nonbanking institutions	113	91	238	162	273
Liabilities to private sector	**226,454**	**248,220**	**301,563**	**345,021**	**379,948**
Monetary liabilities	23,770	26,185	42,271	46,330	58,266
Currency in circulation	12,515	15,314	18,139	21,182	25,974
Demand deposits	11,255	10,871	24,132	25,148	32,292
Quasi-monetary liabilities	159,901	173,714	203,992	225,619	238,503
Savings deposits	58,562	68,856	90,804	102,915	110,063
Time deposits	78,438	78,848	84,236	89,374	92,877
Other deposits	22,901	26,010	28,952	33,330	35,563
Other liabilities	6,557	7,263	10,290	8,944	9,636
Private capital and surplus	36,226	41,058	45,010	64,128	73,543

Table 24. Brazil: Summary Accounts of the Financial System 1/

(In millions of *reais*, end-of-period)

	1995	1996	1997	1998	1999
IV. Rest of Banking System					
Net foreign assets	**339**	**0**	**0**	**0**	**0**
Assets	382	0	0	0	0
Liabilities	43	0	0	0	0
Monetary reserves and currency holdings	611	0	0	0	0
Other claims on monetary authorities	459	184	159	89	117
Net domestic assets	**13,232**	**17,297**	**23,333**	**25,083**	**20,998**
Net claims on public sector	-6,372	-8,256	-7,432	-5,722	-16,816
Net central administration	-10,675	-12,963	-12,643	-11,445	-21,797
Net state and local governments	931	1,160	2,400	2,524	3,112
Net social security	0	0	0	0	0
Net official enterprises	3,372	3,547	2,811	3,199	1,869
Credit to deposit money banks	15,624	19,438	22,749	26,983	37,447
Blocked financial assets	0	0	0	0	0
Credit to private sector	27,332	31,802	41,440	51,742	58,542
Official capital and surplus	-16,461	-12,624	-14,397	-14,984	-16,790
Net unclassified assets	-6,891	-13,063	-19,027	-32,936	-41,385
Medium- and long-term foreign liabilities	2,141	2,636	4,356	10,964	10,417
Liabilities to monetary authorities	1,035	1,065	2,020	354	385
Liabilities to deposit money banks	1,162	1,152	3,804	1,279	1,197
Liabilities to private sector	**10,303**	**12,628**	**13,312**	**12,575**	**9,116**
Demand deposits	0	0	0	0	0
Quasi-monetary liabilities	5,298	6,339	7,281	7,505	4,528
Savings deposits	3,305	3,807	5,208	5,542	1,384
Time deposits	1,692	2,228	1,824	1,434	2,518
Other deposits	301	304	249	529	626
Other liabilities	143	563	497	357	442
Private capital and surplus	4,862	5,726	5,534	4,713	4,146

Table 24. Brazil: Summary Accounts of the Financial System 1/

(In millions of *reais*, end-of-period)

	1995	1996	1997	1998	1999
	V. Banking System				
Net foreign assets	**43,465**	**51,713**	**43,002**	**34,557**	**34,076**
Assets	72,195	89,297	81,708	74,254	98,852
Liabilities	28,730	37,584	38,706	39,698	64,776
Net domestic assets	**220,770**	**245,245**	**308,995**	**378,850**	**404,150**
Net claims on public sector	27,656	78,670	107,857	173,586	158,651
Net central administration	6,071	12,181	71,307	140,309	132,760
Net state and local governments	18,898	54,399	38,819	19,376	10,334
Net social security	-6,316	-9,424	-9,730	-1,095	-770
Net official enterprises	9,003	21,514	7,461	14,996	16,327
Credit to nonbanking institutions	0	6	7	1,926	2,036
Blocked financial assets	-190	-125	-12	-10	-13
Credit to private sector	226,475	236,488	266,642	311,725	331,117
Nonmonetary international organizations	639	801	962	1,125	-427
Official capital and surplus	-38,829	-49,347	-69,021	-69,169	-69,515
Net unclassified assets	-17,978	-64,647	-43,883	-107,813	-87,749
Net interbank float	22,997	43,399	46,443	67,480	70,050
Counterpart unrequited foreign exchange	-2,533	-3,144	-3,807	-3,717	-5,065
Medium- and long-term foreign liabilities	19,678	21,243	29,351	47,387	43,824
Mutual funds deposits	5,154	11,632	3,726	4,545	0
Liabilities to nonbanking institutions	113	91	238	162	273
Liabilities to private sector	**236,757**	**260,848**	**314,875**	**357,596**	**389,064**
Monetary liabilities	23,770	26,185	42,271	46,330	58,266
Currency in circulation	12,515	15,314	18,139	21,182	25,974
Demand deposits	11,255	10,871	24,132	25,148	32,292
Quasi-monetary liabilities	165,199	180,053	211,273	233,124	243,031
Savings deposits	61,867	72,663	96,012	108,457	111,447
Time deposits	80,130	81,076	86,060	90,808	95,395
Other deposits	23,202	26,314	29,201	33,859	36,189
Other liabilities	6,700	7,826	10,787	9,301	10,078
Private capital and surplus	41,088	46,784	50,544	68,841	77,689

Table 24. Brazil: Summary Accounts of the Financial System 1/

(In millions of *reais*, end-of-period)

	1995	1996	1997	1998	1999
VI. Nonbank Financial Institutions					
Net foreign assets	**87**	**71**	**-131**	**-138**	**-526**
Assets	87	93	45	44	104
Liabilities	0	22	176	182	630
Monetary reserves and currency holdings	6	31	14	3	4
Other claims on monetary authorities	154	350	364	667	333
Net domestic assets	**16,349**	**22,520**	**26,892**	**31,069**	**31,946**
Net claims on public sector	380	1,511	1,344	1,665	2,298
Net central administration	42	1,089	1,227	1,100	2,149
Net state and local governments	330	408	103	552	142
Net social security	0	0	0	0	0
Net official enterprises	8	14	14	13	7
Credit to deposit money banks	1,709	3,062	2,810	4,064	3,402
Credit to rest of banking system	5	12	35	20	9
Blocked financial assets	0	0	0	0	0
Credit to private sector	2,458	3,599	3,601	18,825	16,075
Official capital and surplus	0	0	0	0	0
Net unclassified assets	11,797	14,336	19,102	6,495	10,162
Medium- and long-term foreign liabilities	2,293	2,972	3,552	4,041	4,401
Liabilities to monetary authorities	0	0	0	0	0
Liabilities to deposit money banks	0	0	0	0	0
Liabilities to rest of banking system	1,619	3,670	4,093	5,176	4,324
Liabilities to private sector	**12,684**	**16,330**	**19,494**	**22,384**	**23,032**
Demand deposits	0	0	0	0	0
Quasi-monetary liabilities	0	0	0	0	0
Savings deposits	0	0	0	0	0
Time deposits	0	0	0	0	0
Other deposits	0	0	0	0	0
Other liabilities	3,901	5,482	8,307	9,243	7,000
Private capital and surplus	8,783	10,848	11,187	13,141	16,032

Table 24. Brazil: Summary Accounts of the Financial System 1/

(In millions of *reais*, end-of-period)

	1995	1996	1997	1998	1999
VII. Financial System					
Net foreign assets	**43,552**	**51,784**	**42,871**	**34,419**	**33,550**
Assets	72,282	89,390	81,753	74,298	98,956
Liabilities	28,730	37,606	38,882	39,880	65,406
Net domestic assets	**235,547**	**264,385**	**331,934**	**405,251**	**431,836**
Net claims on public sector	28,036	80,181	109,201	175,251	160,949
Net central administration	6,113	13,270	72,534	141,409	134,909
Net state and local governments	19,228	54,807	38,922	19,928	10,476
Net social security	-6,316	-9,424	-9,730	-1,095	-770
Net official enterprises	9,011	21,528	7,475	15,009	16,334
Blocked financial assets	-190	-125	-12	-10	-13
Credit to private sector	228,933	240,087	270,243	330,550	347,192
Nonmonetary international organizations	639	801	962	1,125	-427
Official capital and surplus	-38,829	-49,347	-69,021	-69,169	-69,515
Net unclassified assets	-6,181	-50,311	-24,781	-101,318	-77,587
Net interbank float	23,139	43,099	45,342	68,822	71,237
Counterpart unrequited foreign exchange	-2,533	-3,144	-3,807	-3,717	-5,065
Medium- and long-term foreign liabilities	21,971	24,215	32,903	51,428	48,225
Mutual funds deposits	5,154	11,632	3,726	4,545	0
Liabilities to private sector	**249,441**	**277,178**	**334,369**	**379,980**	**412,096**
Monetary liabilities	23,770	26,185	42,271	46,330	58,266
Currency in circulation	12,515	15,314	18,139	21,182	25,974
Demand deposits	11,255	10,871	24,132	25,148	32,292
Quasi-monetary liabilities	165,199	180,053	211,273	233,124	243,031
Savings deposits	61,867	72,663	96,012	108,457	111,447
Time deposits	80,130	81,076	86,060	90,808	95,395
Other deposits	23,202	26,314	29,201	33,859	36,189
Other liabilities	10,601	13,308	19,094	18,544	17,078
Private capital and surplus	49,871	57,632	61,731	81,982	93,721

Sources: Central Bank of Brazil; and Fund staff estimates.

1/ Beginning with end-1994, the data exclude information on the state banks of São Paulo and Rio de Janeiro and some small financial institutions.

Table 25. Brazil: Financial System Loans

	1995	1996	1997	1998	1999	September 2000
	(In millions of *reais*, end of period)					
Provisions	**22,395**	**19,843**	**26,543**	**32,097**	**32,828**	**23,909**
Total loans outstanding	**244,543**	**260,709**	**265,609**	**281,437**	**286,794**	**301,874**
Lent to public sector 1/	54,045	63,617	36,781	34,763	27,032	13,118
Lent to private sector	190,498	197,092	228,828	246,674	259,762	288,756
Loans less than 60 days overdue 2/	**221,982**	**243,734**	**247,041**	**254,783**	**262,502**	**263,060**
Lent to public sector 1/	50,918	61,408	37,302	33,080	25,724	10,314
Lent to private sector	171,064	182,326	209,739	221,703	236,778	252,746
Industry	45,489	50,220	56,627	59,872	71,282	72,493
Housing	51,485	51,625	55,820	60,884	57,364	50,296
Rural sector	21,359	18,220	22,009	20,645	21,930	20,387
Commerce	20,145	21,242	21,741	18,086	21,026	24,858
Consumer loans	12,077	19,558	29,749	30,194	34,707	47,836
Other services	20,509	21,461	23,793	32,022	30,469	36,876
	(In percent of total loans outstanding)					
Loans less than 60 days overdue 2/	**90.8**	**93.5**	**93.0**	**90.5**	**91.5**	**87.1**
Lent to public sector 1/	20.8	23.6	14.0	11.8	9.0	3.4
Lent to private sector	70.0	69.9	79.0	78.8	82.6	83.7
Industry	18.6	19.3	21.3	21.3	24.9	24.0
Housing	21.1	19.8	21.0	21.6	20.0	16.7
Rural sector	8.7	7.0	8.3	7.3	7.6	6.8
Commerce	8.2	8.1	8.2	6.4	7.3	8.2
Consumer loans	4.9	7.5	11.2	10.7	12.1	15.8
Other services	8.4	8.2	9.0	11.4	10.6	12.2

Sources: Central Bank of Brazil; and Fund staff estimates.

1/ Shifts in the sectoral composition, reflect, among others, the effects of the state debt accords, in the context of which outstanding state liabilities were federalized, and paid off with federal debt titles.

2/ Data for 1994 to 1999 are normal credits under the old credit classification system; data for September 2000 are credit with level C or above according to the new credit risk assessment framework. Under the old system, delay in payments was the only criterion used in credit classification, and loans were considered "normal" if they were less than 60 days overdue. Under the new system, loans are classified into nine different levels based on an *ex-ante* evaluation of credit risk in addition to taking into account the existence of loans overdue. Loans are classified as level C or above if they are less than 60 days overdue, before taking into account other factors such as the existence of collateral or the overall creditworthiness of the borrower.

Table 26. Brazil: Provisioning Under the New Credit Rating System 1/

Loan Risk Categories 2/	Credit Volume (R$ million)						Actual Provisions (R$ million)						Loan Provisioning (Percent of Credit Volume)						
													Actual Rate						Minimum
	1995	1996	1997	1998	1999	September 2000	1995	1996	1997	1998	1999	September 2000	1995	1996	1997	1998	1999	September 2000	Statutory Rate
Financial system	**244,543**	**260,709**	**265,609**	**281,437**	**286,794**	**301,874**	**22,395**	**19,843**	**26,543**	**32,097**	**32,828**	**23,909**	**9.2**	**7.6**	**10.0**	**11.4**	**11.4**	**7.9**	...
AA	...	...	...	...	...	80,540	...	...	...	...	...	609	...	...	...	...	...	0.8	0.0
A	...	...	...	...	...	119,247	...	...	...	...	...	772	...	...	...	...	...	0.6	0.5
B (15-30 days overdue)	...	...	...	...	...	43,386	...	...	...	...	...	500	...	...	...	...	...	1.2	1.0
C (31-60 days overdue)	...	...	...	...	...	19,887	...	...	...	...	...	930	...	...	...	...	...	4.7	3.0
D (61-90 days overdue)	...	...	...	...	...	9,198	...	...	...	...	...	1,213	...	...	...	...	...	13.2	10.0
E (91-120 days overdue)	...	...	...	...	...	4,643	...	...	...	...	...	1,298	...	...	...	...	...	28.0	30.0
F (121-150 days overdue)	...	...	...	...	...	3,081	...	...	...	...	...	1,490	...	...	...	...	...	48.4	50.0
G (151-180 days overdue)	...	...	...	...	...	2,148	...	...	...	...	...	1,205	...	...	...	...	...	56.1	70.0
H (180+ days overdue)	...	...	...	...	...	19,744	...	...	...	...	...	15,892	...	...	...	...	...	80.5	100.0
Private sector institutions 3/	...	**98,316**	**110,802**	**108,279**	**125,366**	**155,820**	...	...	...	...	...	**9,733**	...	...	...	...	...	**6.2**	...
AA	...	...	...	...	...	58,211	...	...	...	...	...	443	...	...	...	...	...	0.8	0.0
A	...	...	...	...	...	55,608	...	...	...	...	...	616	...	...	...	...	...	1.1	0.5
B (15-30 days overdue)	...	...	...	...	...	16,931	...	...	...	...	...	207	...	...	...	...	...	1.2	1.0
C (31-60 days overdue)	...	...	...	...	...	12,108	...	...	...	...	...	713	...	...	...	...	...	5.9	3.0
D (61-90 days overdue)	...	...	...	...	...	3,621	...	...	...	...	...	524	...	...	...	...	...	14.5	10.0
E (91-120 days overdue)	...	...	...	...	...	1,751	...	...	...	...	...	594	...	...	...	...	...	33.9	30.0
F (121-150 days overdue)	...	...	...	...	...	1,353	...	...	...	...	...	821	...	...	...	...	...	60.7	50.0
G (151-180 days overdue)	...	...	...	...	...	1,189	...	...	...	...	...	862	...	...	...	...	...	72.5	70.0
H (180+ days overdue)	...	...	...	...	...	5,048	...	...	...	...	...	4,953	...	...	...	...	...	98.1	100.0
Public sector institutions 3/	...	**145,418**	**136,239**	**146,504**	**137,136**	**146,054**	...	...	...	...	...	**14,176**	...	...	...	...	...	**9.7**	...
AA	...	...	...	...	...	22,329	...	...	...	...	...	166	...	...	...	...	...	0.7	0.0
A	...	...	...	...	...	63,639	...	...	...	...	...	156	...	...	...	...	...	0.2	0.5
B (15-30 days overdue)	...	...	...	...	...	26,455	...	...	...	...	...	293	...	...	...	...	...	1.1	1.0
C (31-60 days overdue)	...	...	...	...	...	7,779	...	...	...	...	...	217	...	...	...	...	...	2.8	3.0
D (61-90 days overdue)	...	...	...	...	...	5,577	...	...	...	...	...	689	...	...	...	...	...	12.4	10.0
E (91-120 days overdue)	...	...	...	...	...	2,892	...	...	...	...	...	704	...	...	...	...	...	24.3	30.0
F (121-150 days overdue)	...	...	...	...	...	1,728	...	...	...	...	...	669	...	...	...	...	...	38.7	50.0
G (151-180 days overdue)	...	...	...	...	...	959	...	...	...	...	...	343	...	...	...	...	...	35.8	70.0
H (180+ days overdue)	...	...	...	...	...	14,696	...	...	...	...	...	10,939	...	...	...	...	...	74.4	100.0
Memorandum items: 4/:																			
Category H loans (percent of all loans)	...	...	...	...	...	6.5	...	...	...	...	...	...	...	...	...	...	...	...	...
Private sector	...	...	...	...	...	3.2	...	...	...	...	...	...	...	...	...	...	...	...	...
Public sector	...	...	...	...	...	10.1	...	...	...	...	...	...	...	...	...	...	...	...	...
Financial system provisions relative to category H loans (percent) 5/	...	...	...	...	...	...	...	152.0	175.9	160.9	152.6	121.1	...	...	...	...	...	...	...
Private sector	...	...	...	...	...	...	...	...	...	...	...	192.8	...	...	...	...	...	...	...
Public sector	...	...	...	...	...	...	...	...	...	...	...	96.5	...	...	...	...	...	...	...

Source: Central Bank.

1/ Based on information from the monthly press release on Monetary Policy.

2/ See BCB Resolution 2682 of December 21, 1999 for details.

3/ Data for 1996 to 1999 reflect only normal credits (loans less than 60 days overdue) under the previous loan classification system.

4/ Reported for comparison purposes; this approximates the reporting under the previous loan classification system that was replaced by the new system in March 2000.

5/ Data for 1996 to 1999 are financial system provisions relative to credits in liquidation (loans more than 180 days overdue) under the previous loan classification system.

Table 27. Brazil: Monthly Rates of Return on Selected Financial Instruments

(In percent)

	Nominal interest rates			Real rates 1/		
	Overnight	Time deposits	Savings deposits	Overnight	Time deposits	Savings deposits
1990 average	**25.4**	**25.9**	**26.6**	**-2.3**	**-1.9**	**-1.4**
1991 average	**17.0**	**18.4**	**15.6**	**0.9**	**2.1**	**-0.3**
1992 average	**26.3**	**26.2**	**24.1**	**2.3**	**2.2**	**0.5**
1993 average	**33.4**	**33.3**	**31.8**	**1.0**	**0.9**	**-0.2**
1994 average	**25.2**	**26.0**	**24.0**	**1.8**	**2.4**	**0.8**
1995 average	**3.6**	**3.5**	**2.8**	**1.9**	**1.8**	**1.1**
Jan	3.4	3.6	2.6	1.6	1.9	0.9
Feb	3.3	3.1	2.4	2.2	2.1	1.3
Mar	4.3	4.6	2.8	2.7	3.0	1.2
Apr	4.3	4.3	4.0	1.8	1.8	1.5
May	4.2	4.1	3.8	1.5	1.4	1.1
Jun	4.0	4.1	3.4	1.7	1.8	1.1
Jul	4.0	3.9	3.5	1.6	1.5	1.1
Aug	3.8	3.5	3.1	2.8	2.5	2.1
Sep	3.3	3.1	2.4	2.3	2.1	1.4
Oct	3.1	2.9	2.2	1.7	1.4	0.7
Nov	2.9	2.9	1.9	1.4	1.4	0.5
Dec	2.8	2.5	1.8	1.2	1.0	0.3
1996 average	**2.0**	**2.0**	**1.3**	**1.3**	**1.2**	**0.5**
Jan	2.6	2.6	1.8	1.2	1.2	0.4
Feb	2.4	2.3	1.5	1.3	1.3	0.4
Mar	2.2	2.1	1.3	1.9	1.8	1.0
Apr	2.1	2.0	1.2	0.8	0.7	-0.1
May	2.0	2.0	1.1	0.8	0.8	-0.1
Jun	2.0	1.9	1.1	0.8	0.7	-0.1
Jul	1.9	1.8	1.1	0.8	0.7	0.0
Aug	2.0	1.9	1.1	1.5	1.5	0.7
Sep	1.9	1.8	1.2	1.8	1.6	1.0
Oct	1.9	1.8	1.2	1.6	1.5	0.9
Nov	1.8	1.8	1.3	1.5	1.5	1.0
Dec	1.8	1.6	1.4	1.3	1.2	0.9
1997 average	**1.9**	**1.8**	**1.3**	**1.3**	**1.2**	**0.7**
Jan	1.7	1.7	1.2	0.5	0.6	0.1
Feb	1.7	1.9	1.2	1.2	1.3	0.7
Mar	1.6	1.6	1.1	1.1	1.1	0.6
Apr	1.7	1.6	1.1	0.8	0.7	0.2
May	1.6	1.6	1.1	1.2	1.2	0.7
Jun	1.6	1.6	1.2	1.1	1.0	0.6
Jul	1.6	1.6	1.2	1.4	1.4	0.9
Aug	1.6	1.6	1.1	1.6	1.6	1.2
Sep	1.6	1.6	1.2	1.5	1.5	1.1
Oct	1.7	1.7	1.2	1.4	1.4	0.9
Nov	3.0	2.9	2.0	2.9	2.7	1.9
Dec	3.0	2.6	1.8	2.5	2.1	1.4

Table 27. Brazil: Monthly Rates of Return on Selected Financial Instruments

(In percent)

	Nominal interest rates			Real rates 1/		
	Overnight	Time deposits	Savings deposits	Overnight	Time deposits	Savings deposits
1998 average	**2.1**	**2.0**	**1.1**	**2.0**	**1.9**	**1.0**
Jan	2.7	2.7	1.7	1.9	1.9	0.9
Feb	2.1	2.0	0.9	1.7	1.6	0.5
Mar	2.2	2.1	1.4	1.9	1.8	1.1
Apr	1.7	1.6	1.0	1.5	1.4	0.7
May	1.6	1.6	1.0	1.1	1.1	0.5
Jun	1.6	1.6	1.0	1.6	1.6	1.0
Jul	1.7	1.7	1.1	1.8	1.8	1.2
Aug	1.5	1.5	0.9	2.0	2.1	1.4
Sep	2.5	2.3	1.0	2.7	2.5	1.2
Oct	2.9	2.7	1.4	2.9	2.7	1.4
Nov	2.6	2.2	1.1	2.8	2.3	1.2
Dec	2.4	2.3	1.2	2.1	2.0	0.9
1999 average	**1.9**	**1.9**	**1.0**	**1.2**	**1.2**	**0.2**
Jan	2.2	2.4	1.0	1.5	1.7	0.3
Feb	2.4	2.6	1.3	1.3	1.5	0.3
Mar	3.3	3.2	1.7	2.2	2.1	0.6
Apr	2.4	2.1	1.1	1.8	1.5	0.5
May	2.0	1.8	1.1	1.7	1.5	0.8
Jun	1.7	1.6	0.8	1.5	1.4	0.6
Jul	1.7	1.6	0.8	0.6	0.6	-0.3
Aug	1.6	1.6	0.8	1.0	1.0	0.2
Sep	1.5	1.5	0.8	1.2	1.2	0.5
Oct	1.4	1.4	0.7	0.2	0.2	-0.5
Nov	1.4	1.4	0.7	0.4	0.4	-0.2
Dec	1.6	1.6	0.8	1.0	1.0	0.2
2000 average	**1.4**	**1.4**	**0.7**	**0.9**	**0.9**	**0.2**
Jan	1.5	1.4	0.7	0.8	0.8	0.1
Feb	1.5	1.4	0.7	1.3	1.3	0.6
Mar	1.4	1.4	0.7	1.2	1.2	0.5
Apr	1.3	1.3	0.6	0.9	0.8	0.2
May	1.5	1.5	0.8	1.5	1.5	0.7
Jun	1.4	1.4	0.7	1.2	1.1	0.5
Jul	1.3	1.3	0.7	-0.3	-0.3	-0.9
Aug	1.4	1.4	0.7	0.1	0.0	-0.6
Sep	1.2	1.2	0.6	1.0	1.0	0.4

Sources: Central Bank of Brazil; and Fund staff estimates.

1/ Real interest rates are nominal rates deflated by the Consumer Price Index (IPCA).

Table 28. Brazil: Loans Outstanding of the Banking System

		Total Loans Out-standing 1/	Freely Allocated Loans 2/			Other 3/	Total Loans Out-standing 1/	Freely Allocated Loans 2/			Other 3/
			Total	To Legal Entities	To Private Persons			Total	To Legal Entities	To Private Persons	
		(in R$ million)					(12-month rate of change, in percent)				
1995	Dec	244,543	...	...	...	...	...	...	...	...	...
1996	Dec	260,709	77,475	59,404	18,071	183,234	6.6	...	...	...	...
1997	Dec	265,609	85,531	63,270	22,261	180,078	1.9	10.4	6.5	23.2	-1.7
1998	Jan	265,252	84,628	62,192	22,436	180,624	7.5	6.9	5.1	12.1	7.8
	Feb	269,887	84,838	62,445	22,393	185,049	8.0	7.3	7.7	6.0	8.3
	Mar	269,624	84,648	62,495	22,153	184,976	6.7	1.9	1.9	2.0	9.0
	Apr	271,551	85,095	63,048	22,047	186,456	6.1	0.9	2.9	-4.5	8.7
	May	273,727	84,350	63,048	21,302	189,377	5.1	-2.2	0.0	-8.1	8.8
	Jun	272,822	84,498	63,491	21,007	188,324	2.4	-3.5	0.2	-13.2	5.3
	Jul	273,020	83,942	63,202	20,740	189,078	0.9	-3.9	0.6	-15.3	3.2
	Aug	274,434	84,039	63,423	20,616	190,395	-0.3	-4.5	0.4	-17.0	1.7
	Sep	275,540	82,581	62,508	20,073	192,959	-1.6	-6.3	-2.7	-16.1	0.6
	Oct	275,510	81,841	62,307	19,534	193,669	-2.7	-7.8	-3.4	-19.3	-0.4
	Nov	281,074	81,676	62,342	19,334	199,398	-1.6	-7.3	-3.8	-17.0	0.9
	Dec	281,437	79,892	60,910	18,982	201,545	6.0	-6.6	-3.7	-14.7	11.9
1999	Jan	291,621	80,927	61,733	19,194	210,694	9.9	-4.4	-0.7	-14.4	16.6
	Feb	294,142	82,023	63,195	18,828	212,119	9.0	-3.3	1.2	-15.9	14.6
	Mar	285,945	81,593	62,733	18,860	204,352	6.1	-3.6	0.4	-14.9	10.5
	Apr	282,714	82,645	63,515	19,130	200,069	4.1	-2.9	0.7	-13.2	7.3
	May	281,329	82,196	62,843	19,353	199,133	2.8	-2.6	-0.3	-9.1	5.2
	Jun	284,270	83,229	63,838	19,391	201,041	4.2	-1.5	0.5	-7.7	6.8
	Jul	285,562	85,471	65,492	19,979	200,091	4.6	1.8	3.6	-3.7	5.8
	Aug	286,231	86,107	65,400	20,707	200,124	4.3	2.5	3.1	0.4	5.1
	Sep	288,886	89,120	67,706	21,414	199,766	4.8	7.9	8.3	6.7	3.5
	Oct	293,422	91,510	69,736	21,774	201,912	6.5	11.8	11.9	11.5	4.3
	Nov	296,138	94,019	71,144	22,875	202,119	5.4	15.1	14.1	18.3	1.4
	Dec	286,794	92,528	70,107	22,421	194,266	1.9	15.8	15.1	18.1	-3.6
2000	Jan	286,548	93,945	69,746	24,199	192,603	-1.7	16.1	13.0	26.1	-8.6
	Feb	286,701	94,690	68,851	25,839	192,011	-2.5	15.4	9.0	37.2	-9.5
	Mar	284,416	96,751	69,675	27,076	187,665	-0.5	18.6	11.1	43.6	-8.2
	Apr	289,067	103,151	74,260	28,891	185,916	2.2	24.8	16.9	51.0	-7.1
	May	296,705	124,979	84,033	40,946	171,726	5.5	52.0	33.7	111.6	-13.8
	Jun	299,073	127,179	84,743	42,436	171,894	5.2	52.8	32.7	118.8	-14.5
	Jul	302,084	129,326	86,316	43,010	172,758	5.8	51.3	31.8	115.3	-13.7
	Aug	303,027	132,197	86,269	45,928	170,830	5.9	53.5	31.9	121.8	-14.6
	Sep	301,874	137,549	90,518	47,031	164,325	4.5	54.3	33.7	119.6	-17.7

Source: Central Bank of Brazil.

1/ Includes both private and public institutions, as well as normal and impaired credits.

2/ Only includes freely allocated credit; excludes all forms of directed lending, including rural credit, and housing credit, and other onlending of public resources by private or public financial institutions. Also ignores substitution of sources; e.g., from suppliers credits (which are excluded) to bank lending (which is included).

3/ Includes directed lending operations (mainly to agriculture and housing), and leasing.

Table 29. Brazil: Bank Lending Rates and Intermediation Spreads 1/

(Annualized rates, in percent)

	Average Lending Rates 2/				Average Intermediation Spreads		
	Total	Loans to Enterprises	Loans to Private Persons	Average Cost of Funds 3/	Total	Loans to Enterprises	Loans to Private Persons
1994 Dec	186.8	164.9	256.1	50.0	136.8	114.9	206.1
1995 Dec	151.2	137.7	206.5	36.3	114.9	101.4	170.2
1996 Jan	120.9	106.0	189.5	34.5	86.4	71.5	155.0
Feb	110.8	95.6	185.1	31.9	78.8	63.6	153.2
Mar	106.3	87.9	179.8	29.1	77.2	58.9	150.7
Apr	101.6	83.5	174.7	26.3	75.2	57.1	148.4
May	98.8	79.1	155.6	26.3	72.5	52.9	129.4
Jun	91.9	74.2	146.8	24.6	67.4	49.7	122.3
Jul	87.7	71.5	135.4	22.8	64.8	48.7	112.6
Aug	86.9	69.8	130.0	24.1	62.8	45.7	105.9
Sep	85.0	68.3	127.2	23.5	61.5	44.9	103.8
Oct	79.5	66.7	110.9	23.6	55.9	43.1	87.3
Nov	78.9	65.6	109.6	23.6	55.2	42.0	85.9
Dec	77.9	65.6	105.1	22.3	55.6	43.3	82.8
1997 Jan	77.0	64.3	102.1	22.7	54.3	41.6	79.4
Feb	81.2	67.0	105.5	23.4	57.8	43.6	82.1
Mar	78.3	65.0	101.1	21.3	57.1	43.8	79.8
Apr	74.5	62.5	94.3	21.0	53.5	41.5	73.3
May	75.7	60.2	101.6	21.3	54.4	38.9	80.3
Jun	72.9	57.2	99.6	20.1	52.8	37.0	79.5
Jul	70.7	55.5	96.6	20.0	50.6	35.5	76.6
Aug	71.8	56.0	99.1	20.2	51.7	35.8	78.9
Sep	70.5	54.6	98.1	19.9	50.5	34.7	78.2
Oct	70.8	55.6	97.6	21.4	49.4	34.2	76.2
Nov	98.5	80.9	129.8	36.9	61.5	44.0	92.9
Dec	96.4	79.7	127.7	34.6	61.8	45.0	93.1

Table 29. Brazil: Bank Lending Rates and Intermediation Spreads 1/

(Annualized rates, in percent)

	Average Lending Rates 2/				Average Intermediation Spreads		
	Total	Loans to Enterprises	Loans to Private Persons	Average Cost of Funds 3/	Total	Loans to Enterprises	Loans to Private Persons
1998 Jan	96.1	77.9	129.8	34.4	61.7	43.5	95.4
Feb	99.0	79.0	135.9	30.1	68.9	48.8	105.8
Mar	88.8	69.7	123.3	24.5	64.3	45.2	98.8
Apr	88.9	68.6	126.4	22.3	66.6	46.3	104.1
May	82.3	62.5	119.8	22.1	60.2	40.4	97.7
Jun	79.8	59.8	118.9	21.0	58.7	38.8	97.9
Jul	74.7	57.0	109.2	19.5	55.2	37.5	89.7
Aug	73.2	56.5	106.4	19.3	53.9	37.2	87.1
Sep	86.7	70.5	119.6	27.6	59.2	42.9	92.1
Oct	92.6	75.8	127.3	32.6	59.9	43.2	94.7
Nov	89.1	71.6	125.4	28.2	61.0	43.5	97.3
Dec	85.4	69.2	120.4	26.3	59.1	42.9	94.2
1999 Jan	92.0	76.7	124.3	29.8	62.2	46.8	94.4
Feb	103.1	86.2	137.8	34.5	68.6	51.7	103.2
Mar	98.0	82.9	128.8	32.9	65.1	50.0	95.9
Apr	94.6	78.0	129.2	26.6	68.0	51.4	102.7
May	83.9	68.2	116.7	21.8	62.1	46.4	94.9
Jun	77.2	61.2	110.2	19.6	57.7	41.6	90.6
Jul	72.9	56.1	107.8	19.4	53.6	36.7	88.4
Aug	71.9	55.6	105.2	18.3	53.5	37.3	86.9
Sep	71.7	55.3	105.3	18.3	53.3	37.0	87.0
Oct	70.6	54.8	103.0	17.9	52.7	36.9	85.0
Nov	67.3	52.5	97.7	18.1	49.2	34.4	79.6
Dec	62.3	49.2	89.4	18.1	44.1	31.0	71.3
2000 Jan	60.0	47.8	83.3	18.0	42.0	29.8	65.3
Feb	62.3	49.2	85.3	17.9	44.3	31.3	67.4
Mar	58.3	46.2	78.3	18.0	40.3	28.1	60.3
Apr	58.1	45.7	77.8	18.0	40.1	27.7	59.8
May	57.4	44.1	75.1	18.2	39.2	25.9	56.9
Jun	56.6	38.0	77.0	17.9	38.7	20.1	59.1
Jul	54.3	35.9	73.6	16.6	37.7	19.3	57.0
Aug	53.4	34.8	71.7	15.9	37.5	19.0	55.9
Sep	53.4	34.5	71.4	16.2	37.2	18.3	55.2

Source: Central Bank of Brazil.

1/ Only includes freely allocated credit from public and private institutions; excludes directed lending.
2/ Weighted average of different types of lending operations.
3/ Reflects the interbank deposit rate.

Table 30. Brazil: Exports by Principal Commodity Groups

	1995	1996	1997	1998	1999
	(In millions of U.S. dollars)				
Total exports	**46,506**	**47,747**	**52,994**	**51,140**	**48,011**
Primary products	**10,969**	**11,900**	**14,474**	**12,977**	**11,828**
Soybeans and soybran	2,767	3,749	5,133	3,929	3,097
Iron ore	2,548	2,695	2,846	3,253	2,746
Coffee beans	1,970	1,719	2,745	2,332	2,230
Tobacco leaf	769	1,029	1,091	940	884
Raw sugar 1/	408	0	0	0	0
Other	2,507	2,708	2,659	2,523	2,871
Industrial products	**34,711**	**35,026**	**37,672**	**37,507**	**35,311**
Semi-manufactures	**9,146**	**8,613**	**8,478**	**8,120**	**7,982**
Raw sugar 1/	1,042	1,191	1,045	1,096	1,162
Steel products	1,369	1,294	1,359	1,255	1,056
Paper paste	1,447	954	958	930	901
Iron products	838	871	876	888	730
Leather hides	566	678	739	657	595
Soybean oil	1,031	685	532	724	564
Cocoa products	92	115	108	131	90
Other	2,761	2,825	2,861	2,439	2,883
Manufactures	**25,565**	**26,413**	**29,194**	**29,387**	**27,329**
Transport equipment	3,211	3,721	5,620	8,203	7,119
Nonelectric machinery	3,904	4,180	4,531	4,339	3,970
Electric machinery	1,503	1,584	1,783	1,712	1,813
Airplanes	182	284	681	1,159	1,772
Footwear	1,499	1,650	1,594	1,387	1,342
Orange juice	1,132	1,453	1,058	1,262	1,235
Lamin.planos, tubos, barras e perfis de ferro/aço	1,809	1,723	1,397	1,465	1,204
Automobiles	1,040	1,247	2,488	1,619	1,138
Petroleum derivatives	839	949	988	865	1,118
Refined sugar	366	421	726	847	748
Processed beef	302	243	239	314	360
Soluble coffee	456	376	349	246	211
Cotton fabrics and yarn	299	278	246	224	197
Other textiles	1,142	1,014	1,021	889	813
Other	11,862	11,713	11,416	9,202	7,865
Other exports	**826**	**821**	**848**	**656**	**872**
	(Annual percentage change)				
Memorandum items:					
Total exports	6.8	2.7	11.0	-3.5	-6.1
Primary products	-0.8	8.5	21.6	-10.3	-8.9
Semi-manufactures	32.7	-5.8	-1.6	-4.2	-1.7
Manufactures	2.4	3.3	10.5	0.7	-7.0
Excluding automobiles and airplanes	4.0	2.2	4.6	2.2	-8.2
Total automobiles	-25.9	19.9	99.5	-34.9	-29.7

Source: Secex-MDIC.

1/ Raw sugar (primary) and crystal sugar (semi-manufactures), from 1996 and on, are included in raw sugar (semi-manufactures).

Table 31. Brazil: Imports by End-Use

	1995	1996	1997	1998	1999
	(In millions of U.S. dollars)				
Total Imports, f.o.b.	**49,972**	**53,346**	**59,745**	**57,734**	**49,224**
Consumer goods	**10,927**	**9,721**	**11,011**	**10,712**	**7,356**
Foodstuffs	2,659	3,155	2,797	2,040	2,951
Apparel	804	862	979	681	424
Automobiles	3,040	1,562	2,641	2,677	1,214
Others	4,424	4,142	4,594	5,314	2,767
Raw materials	**22,382**	**24,646**	**27,132**	**26,813**	**24,042**
Grains	1,665	2,103	1,583	1,865	1,411
Of which:					
Wheat	914	1,288	822	814	832
Fertilizers	661	860	1,021	954	864
Chemical products	6,287	7,150	8,111	8,357	8,223
Inorganic chemical products	638	562	553	543	504
Organic chemical products	2,987	3,185	3,488	3,446	3,267
Other chemical products	2,662	3,403	4,070	4,368	4,452
Cast iron and steel	699	793	1,254	1,375	871
Nonferrous metals	1,096	938	1,127	1,091	926
Coal	764	755	807	774	598
Others	11,210	12,047	13,229	12,397	11,149
Fuels and lubricants	**5,217**	**6,228**	**5,597**	**4,107**	**4,257**
Crude oil	2,587	3,459	3,220	1,965	2,169
Refined products	2,630	2,769	2,377	2,142	2,088
Capital goods	**11,446**	**12,706**	**16,098**	**16,098**	**13,555**
Transport equipment and components	5,940	4,510	6,456	6,793	4,651
Automotive vehicles, tractors etc.	5,567	3,979	5,409	5,666	3,440
Others	373	531	1,047	1,127	1,211
Machines and electric materials	5,729	6,876	8,505	7,758	7,443
	(In percent)				
Total imports	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**
Consumer goods	21.9	17.6	17.2	20.1	8.9
Automobiles	6.1	2.9	4.4	4.6	2.5
Other	15.8	14.6	12.7	15.5	6.5
Raw materials	44.8	46.2	45.4	46.4	48.8
Fuels and lubricants	10.4	11.7	9.4	7.1	8.6
Capital goods	23.4	21.3	25.0	25.2	24.6
Transport equipment and components	11.9	8.5	10.8	11.8	9.4
Machines and electric materials	11.5	12.9	14.2	13.4	15.1
	(Annual percentage change)				
Total imports	**51.1**	**6.8**	**12.0**	**-3.4**	**-14.7**
Consumer goods	97.2	-11.0	13.3	-2.7	-31.3
Automobiles	106.9	-48.6	69.1	1.4	-54.7
Other	93.7	-1.1	-2.4	17.5	-64.3
Raw materials	43.4	10.1	10.1	-1.2	-10.3
Fuels and lubricants	19.8	19.4	-10.1	-26.6	3.7
Capital goods	51.1	11.0	26.7	0.0	-15.8
Transport equipment and components	208.3	-24.1	43.1	5.2	-31.5
Machines and electric materials	1.4	20.0	23.7	-8.8	-4.1

Source: Secex - MICT.

Table 32. Brazil: International Reserves of the Central Bank 1/

(In millions of U.S. dollars)

	1993	1994	1995	1996	1997	1998	1999	End August 2000
Net reserves	**24,948**	**37,438**	**51,042**	**59,951**	**51,655**	**34,600**	**23,479**	**29,256**
Gross reserves	**31,711**	**38,487**	**51,533**	**60,089**	**51,729**	**43,971**	**35,725**	**31,043**
Gold	1,107	1,418	1,767	1,381	903	1,353	929	494
SDRs	2	7	1	1	1	40	10	0
Foreign exchange	30,602	37,062	49,765	58,707	50,825	42,578	34,786	30,549
Liabilities	**6,763**	**1,049**	**491**	**138**	**74**	**9,371**	**12,245**	**1,778**
Use of Fund credit	304	186	141	68	31	4,802	8,799	1,767
Arrears	6,449	796	286	0	0	0	0	0
Others liabilities	10	67	64	70	43	4,569	3,446	11

Source: Central Bank of Brazil.

1/ Adjusted liquidity ("reservas líquidas ajustadas") concept.

Table 33. Brazil: Detailed Balance of Payments

(In billions of U.S. dollars)

	1995	1996	1997	1998	1999
Current account balance	**- 18.09**	**- 23.12**	**- 30.92**	**- 33.62**	**- 25.06**
As a percentage of GDP	- 2.56	- 2.98	- 3.83	- 4.27	- 4.74
Trade balance (f.o.b.)	**- 3.47**	**- 5.54**	**- 6.85**	**- 6.59**	**- 1.21**
Exports	46.51	47.75	52.99	51.14	48.01
Imports	- 49.97	- 53.29	- 59.84	- 57.73	- 49.22
Services and transfers	**- 14.62**	**- 17.58**	**- 24.07**	**- 27.02**	**- 23.85**
Services (net)	**- 18.59**	**- 20.48**	**- 26.28**	**- 28.80**	**- 25.89**
Interest payments	- 8.16	- 9.17	- 10.39	- 11.95	- 15.27
Revenues	2.49	3.59	4.02	3.89	2.23
Expenditures	- 10.64	- 12.76	- 14.41	- 15.84	- 17.50
Other services	- 10.44	- 11.31	- 15.89	- 16.85	- 10.62
Revenues	6.22	6.79	7.87	9.33	9.31
Expenditures	- 16.66	- 18.10	- 23.76	- 26.18	- 19.92
International travel	- 2.42	- 3.60	- 4.38	- 4.15	- 1.46
Revenues	0.97	0.84	1.07	1.59	1.63
Expenditures	- 3.39	- 4.44	- 5.45	- 5.73	- 3.09
Transports	- 3.01	- 2.75	- 3.51	- 3.26	- 3.09
Revenues	1.72	1.43	1.41	1.86	1.26
Expenditures	- 4.73	- 4.19	- 4.92	- 5.12	- 4.36
Insurance	- 0.12	- 0.06	0.07	0.08	- 0.13
Revenues	0.19	0.24	0.41	0.39	0.16
Expenditures	- 0.31	- 0.30	- 0.34	- 0.31	- 0.29
Profits and dividends	- 2.97	- 2.90	- 5.75	- 7.30	- 4.10
Revenues	0.91	1.47	0.91	0.49	1.43
Expenditures (inludes reinvestments)	- 3.88	- 4.37	- 6.66	- 7.79	- 5.53
Government	- 0.34	- 0.30	- 0.35	- 0.39	- 0.50
Revenues	0.13	0.20	0.50	0.55	0.32
Expenditures	- 0.47	- 0.51	- 0.85	- 0.93	- 0.82
Other	- 1.57	- 1.69	- 1.98	- 1.84	- 1.33
Revenues	2.31	2.61	3.57	4.45	4.51
Expenditures	- 3.88	- 4.29	- 5.55	- 6.29	- 5.84
Unrequited transfers	**3.97**	**2.90**	**2.22**	**1.78**	**2.03**
Credits	4.23	3.17	2.54	2.22	2.33
Debits	- 0.25	- 0.27	- 0.33	- 0.44	- 0.30
Capital account balance	**31.57**	**32.27**	**22.97**	**15.89**	**14.54**
Investment (net)	**5.05**	**16.07**	**20.81**	**20.62**	**30.04**
Abroad by brazilians (net)	- 1.56	0.06	- 1.57	- 3.40	- 1.30
In Brazil by nonresidents	6.61	16.02	22.38	24.28	31.34
Debt conversion	0.31	0.29	0.66	2.17	1.20
FDI	3.61	9.98	17.08	25.87	29.99
Credit	4.78	10.50	18.74	28.48	31.36
Debit	- 1.16	- 0.52	- 1.66	- 2.61	- 1.38
Portfolio investments	2.29	6.04	5.30	- 1.85	1.35
Credit	24.84	26.08	39.55	31.83	18.29
Debit	- 22.54	- 20.04	- 34.25	- 33.68	- 16.94
Reinvested profits	0.38	0.53	0.15	0.12	...
Other	0.01	0.03	0.05	0.10	- 1.30

Table 33. Brazil: Detailed Balance of Payments

(In billions of U.S. dollars)

	1995	1996	1997	1998	1999
Long-term capital	**6.55**	**12.94**	**20.34**	**35.83**	**- 4.11**
Multilateral	- 0.13	1.16	1.63	2.71	2.97
Disbursement	1.65	2.87	3.15	4.17	4.59
Amortization	- 1.78	- 1.71	- 1.52	- 1.46	- 1.62
Bilateral	- 1.64	- 2.10	- 0.55	- 0.92	- 0.57
Inflow	0.40	0.39	1.26	1.14	1.12
Amortization	- 2.04	- 2.49	- 1.81	- 2.06	- 1.69
Suppliers/buyers	- 0.43	- 1.08	12.65	6.35	- 6.34
Disbursement	1.45	1.25	15.78	19.59	10.94
Amortization	- 1.89	- 2.32	- 3.13	- 13.24	- 17.28
Banks	- 0.03	- 3.08	- 0.14	3.15	- 2.40
Disbursement	1.43	- 3.08	- 0.14	3.15	- 2.40
Amortization	- 1.46	- 0.56	- 2.43	- 5.75	- 2.67
Intercompany	0.73	1.22	2.57	5.39	1.47
Disbursement	1.13	1.22	2.57	5.39	1.47
Amortization	- 0.40	- 1.58	- 3.06	- 6.27	- 3.28
Bonds and notes	7.88	15.77	3.84	20.09	3.28
Disbursement	10.41	16.01	11.72	22.76	3.69
Amortization	- 2.53	- 17.81	- 23.22	- 26.54	- 12.71
Other	0.53	0.00	0.00	0.00	0.00
Disbursement	1.45	1.11	0.54	- 0.76	- 0.32
Amortization	- 0.92	- 1.94	- 2.79	- 3.21	- 3.06
Refinancing	0.31	0.00	0.00	0.00	0.00
Brazilian lending abroad	- 0.68	- 0.21	- 0.57	- 2.75	- 0.67
Short-term capital (net)	**18.83**	**5.75**	**- 17.53**	**- 27.29**	**- 0.24**
Other (including errors and omissions)	**1.14**	**- 2.40**	**1.22**	**- 3.74**	**0.00**
Overall balance	**13.48**	**9.14**	**- 7.95**	**- 17.72**	**- 10.52**
Gross reserves (- = increase)	**- 12.92**	**- 8.67**	**7.95**	**17.72**	**10.52**
Liabilities	- 0.56	0.00	0.00	- 8.39	0.00
IMF	- 0.04	- 0.07	- 0.04	9.33	3.05
Bilateral support	0.00	-0.07	-0.04	4.79	4.01
Monetary authority and short-term liabilit	- 0.52	0.15	0.07	- 22.52	- 7.06

Source: Central Bank of Brazil.

Table 34. Brazil: Direction of Trade 1/

	1994	1995	1996	1997	1998	1999
	(In millions of U.S. dollars)					
Total exports f.o.b.	**43,545**	**46,506**	**47,747**	**52,986**	**51,120**	**48,011**
Latin America 2/	10,163	10,399	11,322	14,210	13,873	10,561
MERCOSUL	5,921	6,154	7,306	9,044	8,877	6,778
Argentina	4,136	4,041	5,170	6,767	6,747	5,364
Paraguay	1,054	1,301	1,325	1,406	1,249	744
Uruguay	732	812	811	870	881	670
Other	4,242	4,245	4,016	5,166	4,996	3,783
EU 3/	12,202	12,912	12,836	14,513	14,744	13,736
United States 4/	8,951	8,798	9,312	9,407	9,865	10,849
Japan	2,574	3,102	3,047	3,068	2,202	2,193
Oil exports 5/	847	1,078	1,142	1,281	1,611	2,269
Eastern Europe 6/	534	985	1,056	1,313	1,163	1,175
Other	8,274	9,232	9,032	9,194	7,662	7,228
Total imports f.o.b.	**33,079**	**49,972**	**53,301**	**59,838**	**57,711**	**49,222**
Latin America 2/	6,411	10,039	11,661	13,178	12,413	9,458
MERCOSUL	4,583	6,831	8,267	9,517	9,427	6,721
Argentina	3,662	5,581	6,784	8,032	8,033	5,814
Paraguay	352	514	551	518	351	260
Uruguay	569	737	932	967	1,042	647
Other	1,827	3,208	3,394	3,661	2,986	2,737
EU 3/	8,972	13,754	14,120	15,874	16,831	14,984
United States 4/	6,787	10,513	11,865	13,902	13,688	11,872
Japan	2,412	3,296	2,761	3,534	3,274	2,576
Oil exporters 5/	2,534	2,248	2,665	2,775	2,132	3,745
Eastern Europe 6/	810	1,044	978	838	810	704
Other	5,153	9,078	9,252	9,737	8,563	5,883
	(In percent)					
Total exports f.o.b.	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**
Latin America 2/	23.3	22.4	23.7	26.8	27.1	22.0
MERCOSUL	13.6	13.2	15.3	17.1	17.4	14.1
Argentina	9.5	8.7	10.8	12.8	13.2	11.2
Paraguay	2.4	2.8	2.8	2.7	2.4	1.5
Uruguay	1.7	1.7	1.7	1.6	1.7	1.4
Other	9.7	9.1	8.4	9.7	9.8	7.9
EC 3/	28.0	27.8	26.9	27.4	28.8	28.6
United States 4/	20.6	18.9	19.5	17.8	19.3	22.6
Japan	5.9	6.7	6.4	5.8	4.3	4.6
Oil exporters 5/	1.9	2.3	2.4	2.4	3.2	4.7
Eastern Europe 6/	1.2	2.1	2.2	2.5	2.3	2.4
Other	19.0	19.9	18.9	17.4	15.0	15.1
Total imports f.o.b.	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**
Latin America 2/	19.4	20.1	21.9	22.0	21.5	19.2
MERCOSUL	13.9	13.7	15.5	15.9	16.3	13.7
Argentina	11.1	11.2	12.7	13.4	13.9	11.8
Paraguay	1.1	1.0	1.0	0.9	0.6	0.5
Uruguay	1.7	1.5	1.7	1.6	1.8	1.3
Other	5.5	6.4	6.4	6.1	5.2	5.6
EC 3/	27.1	27.5	26.5	26.5	29.2	30.4
United States 4/	20.5	21.0	22.3	23.2	23.7	24.1
Japan	7.3	6.6	5.2	5.9	5.7	5.2
Oil exporters 5/	7.7	4.5	5.0	4.6	3.7	7.6
Eastern Europe 6/	2.4	2.1	1.8	1.4	1.4	1.4
Other	15.6	18.2	17.4	16.3	14.8	12.0

Source: Central Bank of Brazil.

1/ Imports are shown by country of origin.

2/ Including ALADI, Central American Common Market and others from Latin America.

3/ As from 1995, Austria, Finland, and Sweden joined the European Union. The series was rearranged in accordance with the present composition.

4/ Including Puerto Rico.

5/ Algeria, Iran, Iraq, Kuwait, Lybia, Nigeria, Qatar, and Saudi Arabia.

6/ Includes: Albania, Bulgaria, Czech Republic, Hungary, Poland, Romenia, Slovak Republic, and former Soviet Union countries.

Table 35. Brazil: Total External Debt

(In millions of U.S. dollars)

	1995	1996	1997	1998	1999	End-May 2000
Registered debt	**129,313**	**144,092**	**167,760**	**220,350**	**219,196**	**220,470**
Public sector 1/	87,168	84,229	76,205	92,021	97,448	98,189
Banks	6,138	5,642	5,348	7,055	6,179	5,931
Brazilian	1,967	910	954	1,216	1,167	1,166
Foreign	4,171	4,732	4,394	5,839	5,011	4,765
Multilateral	8,837	8,880	9,236	20,552	26,211	25,888
Bilateral (Paris Club included)	18,480	15,089	12,518	12,702	11,696	11,539
Debt bond from banks	51,451	51,239	41,930	40,418	35,324	30,458
Others	2,262	3,379	7,173	11,293	18,038	24,374
Private sector	42,145	59,863	91,555	128,329	121,748	122,282
Banks	30,252	46,673	67,759	87,068	84,741	85,242
Brazilian	3,808	5,448	8,863	9,937	10,849	11,358
Foreign	26,444	41,225	58,896	77,131	73,892	73,884
Multilateral	1,984	2,513	3,150	3,835	4,318	4,317
Bilateral	700	916	1,996	4,973	3,531	3,486
Others	9,209	9,761	18,650	32,452	29,158	29,236
Nonregistered debt	**29,943**	**35,843**	**32,238**	**21,294**	**22,272**	**22,061**
Public sector 1/	3,708	5,232	5,737	3,383	3,318	3,921
Arrears	286	0	0	0	0	0
Banks	286	0	0	0	0	0
Others	0	0	0	0	0	0
Paris Club	0	0	0	0	0	0
Credit lines	3,421	5,162	5,695	3,355	3,318	3,921
Banco Central do Brasil	1	70	42	28	0	0
New money trade	0	0	0	0	0	0
Others	1	70	42	28	0	0
Private sector	26,235	30,611	26,501	17,911	18,954	18,140
Credit lines	0	0	0	0	0	0
Commercial banks (liabilities)	26,235	30,611	26,501	17,911	18,954	18,140
Total external debt	**159,256**	**179,935**	**199,998**	**241,644**	**241,468**	**242,531**
Public sector 1/	87,455	84,299	76,247	95,404	100,766	102,110
Private sector	71,801	95,636	123,751	146,240	140,702	140,422
International reserves	51,840	60,110	52,173	44,556	36,342	39,200
Commercial banks assets	8,930	11,675	9,639	7,380	7,534	5,943
Net total external debt	98,486	108,150	138,186	189,708	197,591	197,388
Memorandum items:						
Total external debt (percent of exports of goods and nonfactor services)	285.1	310.9	307.3	377.6	422.4	442.4
Total external debt (percent of GDP)	30.7	45.6	40.0	38.2	37.6	41.2
Short-term debt (percent of gross international reserves	57.8	62.9	70.4	59.3	75.4	70.0
Foreign banks	57,510	78,106	92,267	102,109	98,919	98,475
Registered	30,615	45,957	63,290	82,970	78,903	78,649
Nonregistered	26,895	32,149	28,977	19,140	20,016	19,826
Brazilian banks	8,822	9,982	13,078	13,308	14,273	14,759
Registered	5,775	6,358	9,817	11,153	12,017	12,524
Nonregistered	3,047	3,624	3,261	2,154	2,256	2,235

Source: Central Bank of Brazil.

1/ Nonfinancial public sector. Excludes Petrobrás and Vale do Rio Doce.