

Chapter 2

Consolidating macroeconomic adjustment

Brazil has made considerable progress in recent years towards consolidating macroeconomic stability, which is a key framework condition for sustained growth. Monetary policy continues to respond swiftly to changes in the inflation outlook, anchoring expectations. Fiscal policy has been guided by debt sustainability considerations, delivering primary budget surpluses that have often exceeded the end-year targets. Nevertheless, while the public debt-to-GDP has been reduced, it remains high, especially in comparison with other emerging-market economies. Brazil's overarching macroeconomic challenge is therefore to continue to reduce the public debt overhang while improving the quality of fiscal adjustment, which has so far been underpinned by revenue hikes, rather than a retrenchment of expenditure commitments. To do so, measures will need to be taken to arrest the increase in current spending, especially on pensions, paving the way for subsequently removing distortions and reducing the tax burden over the medium to longer term, once the debt-to-GDP ratio has been reduced in a sustainable manner. The favourable domestic macroeconomic environment, with falling inflation and improving growth prospects, appears propitious for reform towards the gradual phasing-out of directed credit and a reduction in compulsory reserve requirements.

Macroeconomic management has been sound. Guided by debt sustainability considerations, the end-year consolidated primary budget surplus targets continue to be met, and even exceeded, allowing most of the revenue windfalls to be saved. Monetary policy continues to be conducted in a forward-looking manner, responding swiftly to the emergence of inflationary pressures (Annex 1.A3, Chapter 1). The central bank (BCB) remains *de facto* independent, although it is yet to be granted *de jure* autonomy, and the monetary policy regime in place since 1999 – combining inflation targeting with a floating exchange rate – is working well. At the same time, favourable global financial-market conditions and an impressive external adjustment since 1999 on the back of solid foreign trade and external current account surpluses have made the economy more resilient to adverse shocks. External vulnerability indicators, including those related to external public indebtedness, have improved markedly. These developments are welcome, and expectations appear well anchored due to the authorities' commitment to macroeconomic discipline. Nevertheless, further reform should be pursued by the next administration so as to consolidate and move beyond the achievements made to date.

This chapter argues that Brazil's overarching macroeconomic challenge is to reduce the public debt overhang. In doing so, it underscores the urgency to improve the quality of the fiscal adjustment that will be required over the medium-to-longer term by containing the increase in current spending, including on pensions, and subsequently removing distortions and reducing the tax burden, once the debt-to-GDP ratio has been reduced in a sustained manner. The consolidated tax-to-GDP ratio reached nearly 37.5% of GDP in 2005, a historical high. To improve the quality of fiscal adjustment, further reform of the social security system will be unavoidable. On monetary policy, efforts to expand credit are welcome, especially to the extent that it benefits the underserved population, such as low-income individuals and small and medium-sized enterprises (SMEs), and are likely to make the credit channel of the monetary transmission mechanism more potent over time. But further structural reform will be needed to gradually liberalise the credit market and to reduce compulsory reserve requirements – an implicit form of taxation – which are onerous in Brazil. Liberalisation in this area, as well as continued commitment to fiscal discipline, is likely to contribute to reducing Brazil's high real interest rates and intermediation costs, which have long acted as a drag on growth. The favourable economic outlook, domestic and external, as well as the on-going monetary easing, appears propitious for making headway on these policy initiatives.

Trends in fiscal policy

Recent fiscal performance

Brazil has maintained its strong track record in meeting the end-year consolidated primary budget surplus targets (Table 2.1). As discussed in the 2005 *Survey*, the targets have been raised since 1999 to ensure the sustainability of the public debt dynamics. These were exceeded by wide margins in both 2004, benefiting from strong GDP growth, and 2005,

Table 2.1. **Macroeconomic targets and outturns, 1999-2006**

	Fiscal policy (% of GDP)		Monetary policy (%)			
	Consolidated primary surplus target ¹	Outturn	Inflation target (current year)			Outturn (IPCA)
			Lower bound	Central target	Upper bound	
1999	3.1	3.2	6.0	8.0	10.0	8.9
2000	3.4	3.5	4.0	6.0	8.0	6.0
2001	3.35	3.6	2.0	4.0	6.0	7.7
2002	3.75	3.9	1.5	3.5	5.5	12.5
2003	4.25	4.3	...	8.5 ²	...	9.3
2004	4.5	4.6	3.0	5.5 ³	8.0	7.6
2005	4.25	4.8	2.0	4.5	7.0	5.7
2006	4.25	4.5 (August) ⁴	2.5	4.5	6.5	3.8 (August)

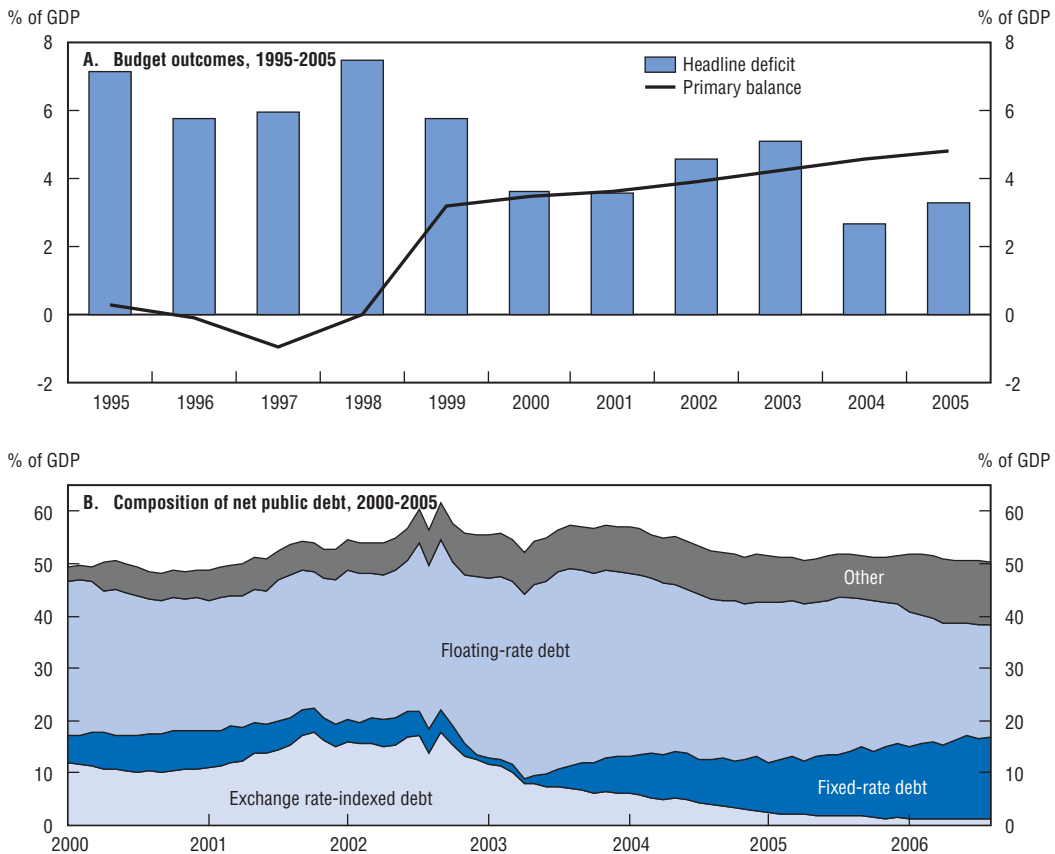
1. The targets refer to those set for the central government and its public enterprises in the Budget Guidelines Laws (LDOs) since 1999, together with the expected outturn for the regional governments (states and municipalities) and their public enterprises, and used as performance criteria under the arrangements with the IMF. When targets have been changed during the year, the latest target is considered.
2. Refers to the adjusted target set in January 2003. The 2003 target was set at 3.25% in 2001 with the confidence bands at ± 2 percentage points and then raised to 4% in 2002 with the confidence bands at ± 2.5 percentage points.
3. The target for 2004 was set in 2002 at 3.75% with the confidence bands at ± 2.5 percentage points.
4. Cumulative 12-month flow.

Source: National Treasury and Central Bank of Brazil.

given the impact of strong growth in the previous year on revenue and the timing of tax collections. As a result, revenue windfalls have been saved and the debt-to-GDP ratio fell sharply in 2004, also aided by favourable financial market conditions, before stabilising in 2005 at 51.5% of GDP. Attainment of a higher primary budget surplus was necessary to achieve stability in the debt-to-GDP ratio in 2005 in view of the monetary tightening that took place over the year through September (which resulted in an increase in interest payments, given the high share of floating-rate securities in the traded debt stock). Consonant with this preponderance of floating-rate instruments, the headline budget deficit remains volatile, although it has fallen over time in tandem with the rising primary surpluses (Figure 2.1). Further reductions in the headline budget deficit will ultimately be needed to achieve a sustained fall in the debt-to-GDP ratio.

However, the strong fiscal performance – measured by the consolidated primary budget surplus outturns – continues to be based on revenue hikes, rather than a containment of current expenditure commitments. Revenue performance remains solid, and the tax take rose by about 5% of GDP during 2000-05 – a period of volatile, lacklustre growth – to nearly 37.5% of GDP in 2005, a historical peak. At the same time, there are structural impediments to further expenditure restraint, including the surge in spending on pensions over the years (discussed in Chapter 1 and below). These trends underscore the need for improving the quality of the fiscal adjustment that will be required over the medium-to-longer term to put the public debt-to-GDP ratio on a sustained downward trajectory and to break the spend-and-tax cycle that has characterised fiscal adjustment to date (Figure 2.2), which is detrimental to long-term growth. Empirical evidence suggests that about two-thirds of changes in federal primary spending are offset by higher revenue over the longer term (de Mello, 2006). While federal spending on pensions has trended upwards, outlays on personnel appear to be contained, although pressures for raising civil servants' compensation are emerging. Expenditure on non-mandatory programmes, including

Figure 2.1. Fiscal performance indicators



Source: Central Bank of Brazil, National Treasury and OECD calculations.

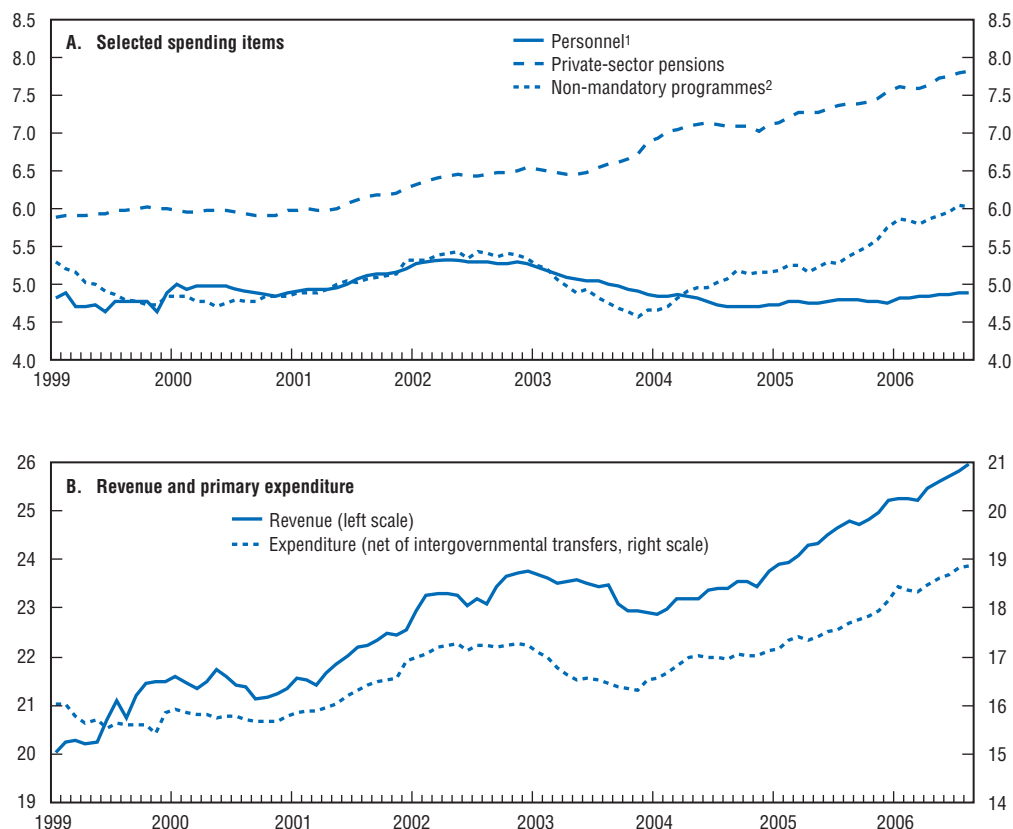
capital outlays, has risen recently, but remains volatile. Of particular concern is the decline in public investment over the years (Figure 2.3).

An important source of fiscal vulnerability is the sensitivity of public finances, especially spending on pensions, to minimum-wage policy. As noted in Chapter 1, this is because the government is required to set the minimum wage, to which the minimum pension is linked, every year at a level that preserves its purchasing power, but has chosen to increase it in real terms. There is no cap on increases in the minimum wage/pension above inflation, which, coupled with the downward rigidity associated with the requirement to preserve its purchasing power, puts upward pressure on spending. This is important because private-sector pensions account for approximately one-third of central government primary expenditure.

Fiscal stance over the business cycle

The fiscal stance has been predominantly countercyclical since 1999. The sensitivity of public finances to the business cycle depends on the size of government, the progressivity of the direct tax system and the comprehensiveness of unemployment insurance, among other factors. Brazil's budget balance is less sensitive to the business cycle than most OECD countries', essentially because of a lower primary spending-to-GDP ratio, although some taxes are fairly responsive to fluctuations in economic activity (Box 2.1). In addition, a comparatively low elasticity of the unemployment rate to business-cycle fluctuations makes

Figure 2.2. **Trends in federal spending and revenue, 1999-2006**
Cumulative 12-month flows, in per cent of GDP



1. Includes pensions to retired civil servants.

2. Refers to "Other OCCs" in Brazilian budget documentation and includes selected mandatory spending on means-tested social assistance transfers to the elderly and the disabled (RMV and LOAS).

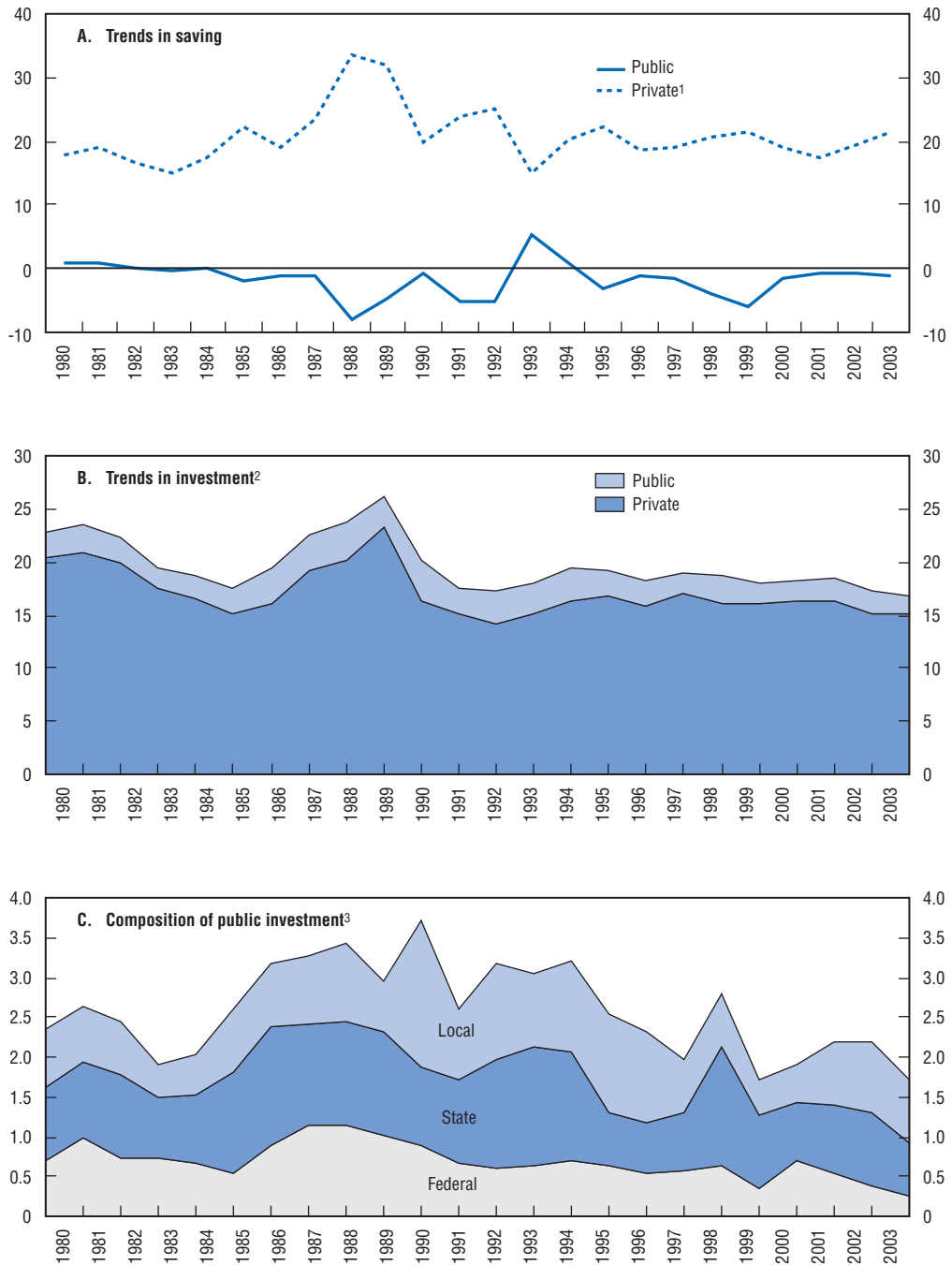
Source: National Treasury and OECD calculations.

government spending relatively less cyclical in Brazil than the OECD average.¹ In any case, when the effect of the business cycle on public finances is taken into account, given the size of the stabilisers built into the tax code, the social security system and unemployment insurance, Brazil's actual primary budget surplus exceeded its cyclically-adjusted level slightly during 2000-01, but fell short of it modestly in 1999 and again in 2002-04 (Figure 2.4). This is consistent with a counter-cyclical fiscal stance, given that the output gap is estimated to have been positive during 2000-01 and negative in 1999 and 2002-04. The increase in the primary surplus target by 0.25 percentage point to 4.5% of GDP in mid-2004, in line with better-than-expected growth towards year-end and the closing of the output gap, is illustrative of efforts towards greater policy counter-cyclical when the economic outlook is auspicious.

Trends in government spending over the business cycle have been guided predominantly by debt sustainability considerations. Discretionary policy action (i.e. changes in the fiscal stance that are not associated with the business cycle through built-in stabilisers) may amplify or thwart the effect of automatic stabilisers on public finances, making the fiscal stance pro-cyclical when expenditure is cut (raised) during a cyclical downturn (upturn). Pro-cyclical in downturns is consistent with the fact that, when the public debt-to-GDP ratio is high, or perceived to be unsustainable, there is little scope for counter-cyclical

Figure 2.3. **Trends in saving and investment, 1980-2003**

In per cent of GDP



1. Calculated as the difference between gross domestic saving and government saving.
2. Refers to buildings and machinery and equipment. Public investment excludes State-owned enterprises.
3. Excludes State-owned enterprises.

Source: IBGE.

Box 2.1. Calculating Brazil's fiscal stance over the business cycle

The improvement in Brazil's budget balance since the floating of the *real* in 1999 has been impressive, even in periods of slow growth. It is therefore important to assess the evolution of Brazil's fiscal stance by distinguishing changes in the budget balance that are due to discretionary policy action from those that are associated with the automatic stabilisers built into the tax code, the social security system and unemployment insurance. The main budget aggregates therefore need to be re-calculated on a cyclically-adjusted basis; that is, controlling for the impact of business cycle-related fluctuations in economic activity on public finances based on unchanged policies. To do so, the methodology used by the OECD for cyclically adjusting the budget aggregates of its Member countries was applied to Brazil.*

The results of the exercise suggest that, although the sensitivity of Brazil's budget balance to changes in the business cycle is relatively low compared to the OECD average (Table 2.2), it is likely to be high for an emerging-market economy. This is because, at about 31% in 2004, against 40% on average in the OECD area, Brazil's primary general government spending accounts for an already high, and rising, share of GDP by emerging-market standards. It is known that the budget's sensitivity to the business cycle increases with the size of government (OECD, 1999). At the same time, although the share in total revenue of business cycle-sensitive tax bases, such as income and consumption, is lower than in the OECD area on average, the personal income tax is fairly progressive. The high personal income tax elasticity is essentially due to a relatively high exemption threshold, as discussed in the 2005 Survey.

Table 2.2. Revenue and expenditure elasticities:
Brazil and OECD countries

	Revenue				Expenditure (current primary expenditure)	Total ¹
	Corporate income tax	Personal income tax	Indirect taxes	Social security contributions		
Brazil	1.17	2.70	1.00	0.67	-0.06	0.32
United States	1.53	1.30	1.00	0.64	-0.09	0.34
Japan	1.65	1.17	1.00	0.55	-0.05	0.33
Germany	1.53	1.61	1.00	0.57	-0.18	0.51
France	1.59	1.18	1.00	0.79	-0.11	0.53
Italy	1.12	1.79	1.00	0.86	-0.04	0.53
United Kingdom	1.66	1.18	1.00	0.91	-0.05	0.45
Canada	1.55	1.10	1.00	0.56	-0.12	0.38
Australia	1.45	1.04	1.00	0.00	-0.16	0.39
Austria	1.69	1.31	1.00	0.58	-0.08	0.47
Belgium	1.57	1.09	1.00	0.80	-0.14	0.52
Czech Republic	1.39	1.19	1.00	0.80	-0.02	0.39
Denmark	1.65	0.96	1.00	0.72	-0.21	0.59
Finland	1.64	0.91	1.00	0.62	-0.18	0.48
Greece	1.08	1.80	1.00	0.85	-0.04	0.47
Hungary	1.44	1.70	1.00	0.63	-0.03	0.47
Iceland	2.08	0.86	1.00	0.60	-0.02	0.37
Ireland	1.30	1.44	1.00	0.88	-0.11	0.38
Korea	1.52	1.40	1.00	0.51	-0.04	0.22
Luxembourg	1.75	1.50	1.00	0.76	-0.02	0.47

* See de Mello and Moccero (2006) for more information on the methodology and the calculation of the cyclically-adjusted series.

Box 2.1. **Calculating Brazil's fiscal stance over the business cycle (cont.)**Table 2.2. **Revenue and expenditure elasticities: Brazil and OECD countries (cont.)**

	Revenue				Expenditure (current primary expenditure)	Total ¹
	Corporate income tax	Personal income tax	Indirect taxes	Social security contributions		
Netherlands	1.52	1.69	1.00	0.56	-0.23	0.53
New Zealand	1.37	0.92	1.00	0.00	-0.15	0.37
Norway (mainland)	1.42	1.02	1.00	0.80	-0.05	0.53
Poland	1.39	1.00	1.00	0.69	-0.14	0.44
Portugal	1.17	1.53	1.00	0.92	-0.05	0.46
Slovak Republic	1.32	0.70	1.00	0.70	-0.06	0.37
Spain	1.15	1.92	1.00	0.68	-0.15	0.44
Sweden	1.78	0.92	1.00	0.72	-0.15	0.55
Switzerland	1.78	1.10	1.00	0.69	-0.19	0.37
<i>Memorandum item</i>						
OECD average	1.50	1.26	1.00	0.71	-0.10	0.44

1. Refers to the elasticity of the budget balance to changes in the business cycle and is calculated as the difference between the sensitivity of the four revenue items and that of expenditure, weighted by their respective 2003 shares in GDP.

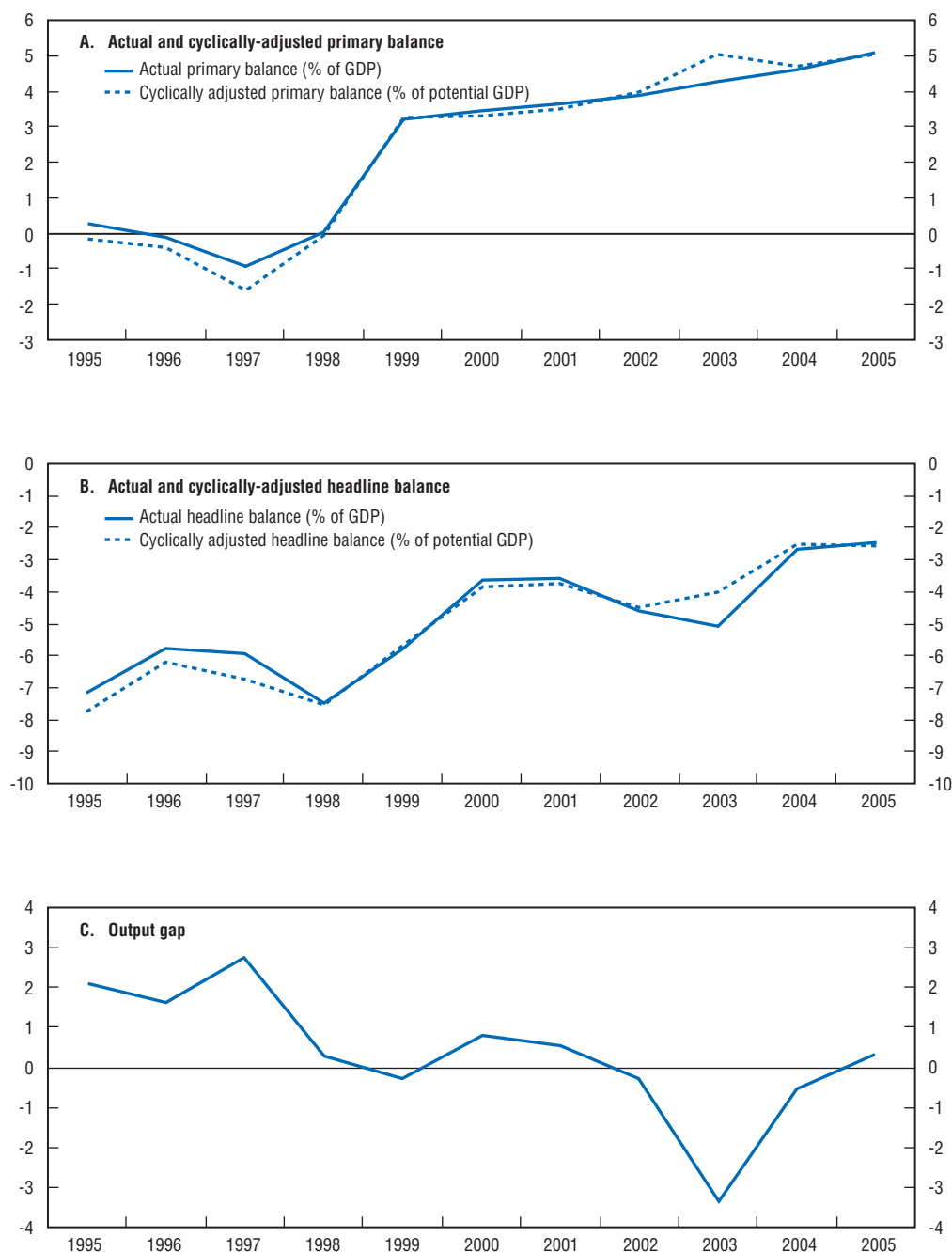
Source: de Mello and Moccerro (2006) for Brazil and Girouard and Andre (2005) for the OECD countries.

policymaking. The empirical evidence reported in Annex 2.A1 suggests that federal spending on mandatory items, such as personnel, was pro-cyclical in downturns during 1997-2005 and, to a lesser extent, in upturns too. In the case of non-mandatory programmes, federal spending was estimated to have been pro-cyclical, but only in downturns. This underscores the federal government's use of policy discretion in support of its fiscal retrenchment efforts, even in bad times. This was clearly the case in 2003, when the primary budget surplus target was raised amid unfavourable economic conditions.

Nevertheless, in line with the experience of the OECD countries that have engaged in successful fiscal consolidation, the Brazilian case suggests that retrenchment in a downturn need not be destabilising, so long as it restores confidence in the policy framework by putting the debt dynamics back on a sustainable path.² There is now ample empirical evidence that fiscal contractions may be expansionary in heavily indebted OECD countries and that the composition of adjustment, *via* tax increases and/or expenditure cuts, affects the expansionary potential of fiscal retrenchment.³ In this respect, the experience of OECD countries suggests that public indebtedness is a key determinant of the fiscal stance over the business cycle, with the need to rein in the rise in indebtedness often calling for pro-cyclical remedial action, even when growth is below potential (OECD, 2003, Chapter IV). This makes fiscal consolidation, rather than short-term demand management, the overriding objective of fiscal policymaking in countries, such as Brazil, where public indebtedness is considered to be a source of macroeconomic vulnerability.

Figure 2.4. **Fiscal stance over the business cycle, 1995-2005**

In per cent



Source: de Mello and Moccerro (2006).

Public debt management

The reduction in the public debt's exposure to foreign exchange risk has considerably curtailed the economy's vulnerability to external and domestic confidence shocks. The share of government securities indexed to the exchange rate (including foreign exchange swaps) fell from a peak of nearly 40% of the net debt stock at the height of the confidence crisis that preceded the presidential election in 2002 to about 1% at end-2005. Over this

Box 2.2. Developments in public debt management

Public debt management continues to aim at reducing debt refinancing risk and costs over the longer term. To this end, it seeks: i) to lengthen the average maturity of the traded debt stock through a reduction of the share of short-term instruments (*i.e.* debt falling due in less than 12 months) and ii) to reduce interest-rate risk by reducing the share of securities paying floating interest rates (Table 2.3). Based on stress tests for the real exchange and the policy interest rates, the improvement in the composition of the traded debt stock since 2002 has significantly reduced refinancing risk. The stress tests suggest that an increase in the real interest rate and in the real exchange rate by three standard deviations for a period of one year would increase the debt stock by 5.6% of GDP in 2006, against 18.6% of GDP in 2002.

Foreign investors held only less than 1% of the stock of domestic public debt at end-2005. However, access by non-residents to domestic equity and fixed-income markets has been facilitated on the premise that it would reduce budget financing and debt roll-over costs and could therefore contribute to a faster reduction in real interest rates.* Legislation introduced in February 2006 exempted foreign investors from the withholding tax on capital gains on fixed-income investments in local markets (except for repo operations), regardless of the investment's maturity and duration. If the investment is carried out through a local mutual fund, government securities must account for at least 98% of the fund's assets under management. The withholding tax rate used to be 15% for non-residents and has remained unchanged for residents at 15-22.5%. The bank debit tax (CPMF) will continue to be levied on fixed-income operations, but IPOs and venture capital transactions have been exempted from CPMF taxation, as discussed in Chapter 3. The share of domestic public debt held by non-residents rose following the introduction of this legislation to nearly 2.2% at end-June 2006.

Over the longer term, the short-term losses incurred by foregoing tax revenue are expected to be more than offset by higher revenue accruing from a larger base for other taxes on fixed-income transactions and by the savings on debt service associated with a reduction in long-term interest rates and the second-round price effects on the domestic bond market. The possibility that foreign investors may swap sovereign debt for domestic instruments denominated in *reais* would also reduce exposure to exchange rate, and hence sovereign credit risk.

Table 2.3. Traded public debt indicators, 2005-06

	2005	2006 targets	
		Lower bound	Upper bound
Traded debt stock (in billions of <i>reais</i>)	1 157.1	1 280	1 360
Average maturity (in months)	32.9	35	41
Average duration (in months)	56.3	60	70
Share of debt falling due in less than 12 months (in per cent)	38.2	28	33
Composition (in per cent):			
Fixed-rate securities	23.6	25	33
Inflation-indexed securities	13.1	16	22
Floating-rate securities	43.9	35	43
Exchange rate-indexed securities	17.6	11	15
Other	1.8	1	3

Source: National Treasury (2006a).

* See National Treasury (2006b) for more information.

period, foreign exchange-indexed debt was replaced by securities paying floating interest rates, which accounted for nearly 44% of the stock of outstanding liabilities at end-2005, and increasingly by inflation-indexed instruments. The increase in the share of fixed-rate securities has also been noticeable since end-2004, in line with the authorities' debt management strategy for 2006-07 (Box 2.2).

The gradual reduction in the public debt's exposure to exchange-rate risk, particularly in the course of 2005, coupled with a marked contraction in external public indebtedness, have laid the foundations for greater resilience in the run-up to the 2006 election. This has made the debt dynamics less vulnerable to short-term changes in market sentiment, including the concomitant withdrawal of monetary stimulus in the world economy. Public debt management has benefited from favourable external financial conditions, and the National Treasury began to issue *real*-denominated bonds abroad in 2005. External public debt, particularly that with shorter-term maturities, is being repaid, including through the buyback of the remaining stock of Brady bonds and the early repayment of outstanding liabilities to the International Monetary Fund and the Paris Club. In addition, Brazil continues to fare well in relation to other emerging-market economies in the transparency with which information on public finances and indebtedness is communicated to markets. Nevertheless, despite the maintenance of high and rising primary budget surpluses and the reduction in external public indebtedness, the debt-to-GDP ratio remains comparatively high by emerging-market standards, underscoring the need for greater policy effort towards reducing the overhang.

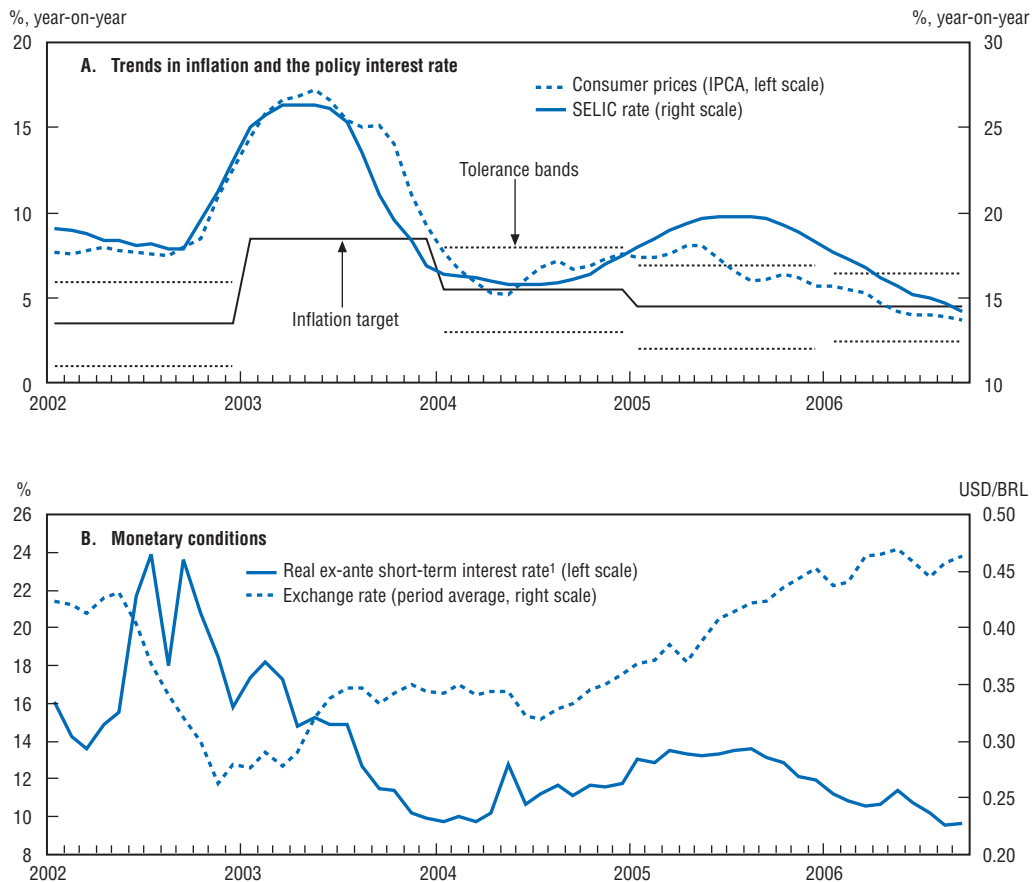
Trends in monetary policy

Monetary conditions and trends in credit

Monetary policy continues to be conducted within a framework combining inflation targeting and a flexible exchange-rate regime. The cycle of monetary tightening, which had lasted one year, came to an end in September 2005 (Figure 2.5). Actual and expected consumer price inflation have trended down – and wholesale price disinflation has been particularly pronounced – laying the groundwork for attaining the 4.5% target in 2006. Monetary conditions nevertheless remained tight from 2005 to mid-2006. The real *ex ante* interest rate began to fall in mid-2005, but the appreciation of the *real* in the course of 2005 and through May 2006 – which owes much to the robust trade surpluses and foreign direct investment inflows, as well as monetary restraint – tightened monetary conditions.

The monetary tightening cycle coincided with a rapid expansion in consumer credit. The ongoing credit boom is desirable over the longer term, given the policy objective of tackling financial exclusion for individuals and businesses alike, especially small enterprises, which often operate in the informal sector, and Brazil's comparatively low credit-to-GDP ratio (discussed in the 2005 *Survey*). Nevertheless, it weakens the effect of monetary policy on activity in the short term. At the same time, the composition of the stock of outstanding credit is changing. The expansion in consumer credit has outpaced that of credit to enterprises – a process that has been facilitated by financial innovation, including through the introduction of new credit types, which has led to the surge in payroll-backed operations (*crédito consignado*) (Figure 2.6).

Interest rates are also coming down for personal credit, especially for the payroll-backed modality. Directed credit to enterprises is likely to expand as a result of the announcement in February 2006 of new credit lines by BNDES, which are targeting selected

Figure 2.5. **Monetary stance, 2002-06**

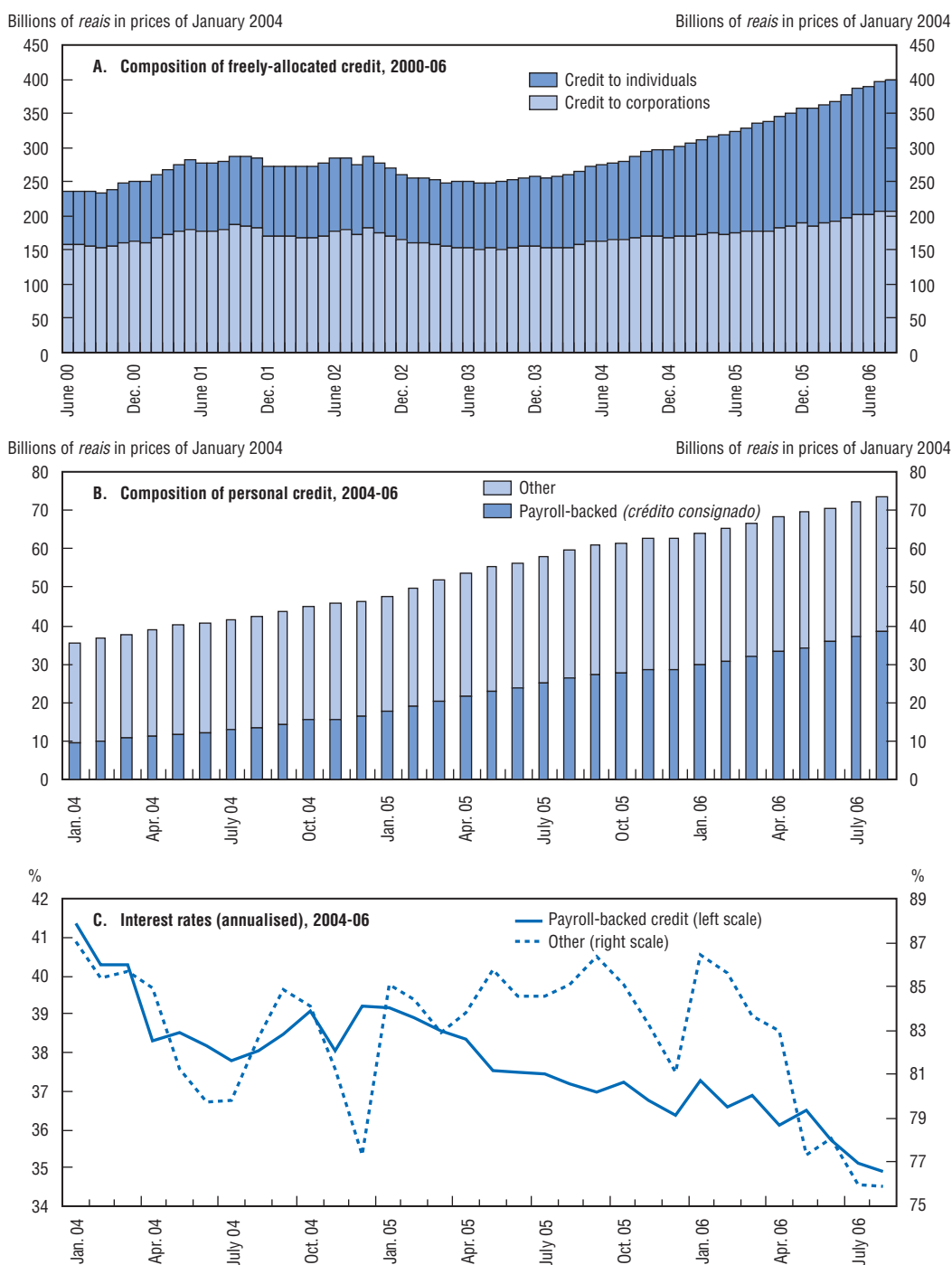
1. Defined as the difference between the 360-day Pre-DI swap rate and 12-month-ahead expected inflation.

Source: Central Bank of Brazil and OECD calculations.

activities, including innovation (as discussed in Chapter 3), and the reduction of intermediation fees. These trends, coupled with the magnitude of the swings in Brazil's monetary stance since 2003, call for continued assessment of the monetary transmission mechanism's speed of adjustment and lag structure – a challenge that has been acknowledged by the authorities.

Compulsory reserve requirements have remained high and unchanged throughout the latest monetary easing cycle. Currently, these requirements include 53% of sight deposits (to be held in cash, of which 45% is unremunerated and 8% is remunerated at the SELIC rate), 23% of time deposits (to be held in government bonds, of which 8% is remunerated at the SELIC rate) and 30% of savings deposits (to be held in cash, of which 20% is remunerated at a long-term regulated (TR) rate and 10% at the SELIC rate). These statutory rates, which have not changed since 2003, overestimate the effective level of compulsory reserve requirements, because there are nominal deductions to the deposit base used for calculating compulsory reserves, as well as exemption thresholds based on the level of deposits. The average effective rate, which takes account of these deductions and thresholds, is in the neighbourhood of 30% of deposits. In any case, total compulsory reserves held at the central bank amounted to nearly 8% of GDP at end-2005, including about 2.2% of GDP in unremunerated reserves.

Figure 2.6. Trends in personal credit and interest rates



Source: Central Bank of Brazil.

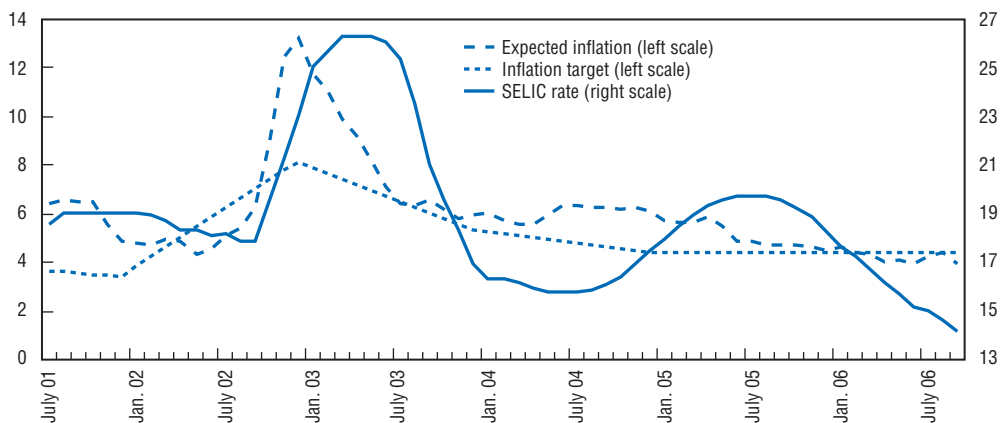
Although they are not used as a short-run monetary policy instrument in Brazil, the extant reserve requirements are operationally complex and stringent by international comparison, including among emerging-market economies. Most countries that now use short-term interest rates as the main instrument for monetary policymaking have reduced or eliminated compulsory reserve requirements. As discussed in Chapter 1, unremunerated

reserve requirements act as an implicit tax on income and financial intermediation, against a background of an already relatively high tax burden on financial transactions, including that of the bank debit tax (CPMF).

Monetary policy and macroeconomic volatility

A more pro-active monetary policy stance contributes to anchoring expectations at low, stable levels of inflation (Figure 2.7). This achievement has been associated with the adoption of inflation targeting in many countries. The empirical evidence reported in Chapter 1 (Annex 1.A3) suggests that this is also the case in Brazil. In addition, the post-June 1999 policy regime, which combines inflation targeting with a floating exchange rate, has been associated with a more stable, forward-looking monetary stance, at least as gauged by the fact that the policy interest rate has become less volatile and monetary policy increasingly responsive to inflation expectations (Annex 2.A2). This is not surprising because of the abandonment of the exchange rate peg, which allows monetary policy to pursue price stability unencumbered by the need to defend a pre-announced target for the nominal exchange rate.

Figure 2.7. **Monetary stance and trends in expected inflation, 2001-06¹**
In per cent



1. The definition of 12-month-ahead expected inflation and the derivation of the corresponding 12-month-ahead implicit inflation targets are provided in Annex 1.A3.

Source: Central Bank of Brazil and OECD calculations.

However, a less volatile monetary stance appears to be associated with lower volatility in expectations, which is crucial under inflation targeting.⁴ On the basis of the empirical evidence reported in Annex 2.A3, interest-rate smoothing, whereby the monetary authority avoids sudden changes in the policy interest rate, is associated with less volatile inflation expectations. In sum, the post-1999 monetary regime has been characterised by greater interest-rate smoothing and, in turn, lower volatility in the monetary stance seems to be associated with less volatile expected inflation. The current policy regime is therefore facilitating the anchoring of expectations around the pre-announced targets.

Policy recommendations

Brazil's progress in strengthening the institutional foundations for macroeconomic policymaking since the mid-1990s is unquestionable, delivering historically low – and falling – rates of inflation and entrenching fiscal responsibility. Nevertheless, the public

debt-to-GDP ratio remains high, and fiscal adjustment has been achieved predominantly through revenue hikes, rather than a retrenchment of current expenditure commitments. The main policy challenge in the macroeconomic area is therefore to improve the quality of the fiscal adjustment that will be needed to further reduce the public debt overhang, paving the way for alleviating the tax burden over the longer term, which is high by emerging-market standards. In doing so, the authorities will be taking the necessary steps to fulfil an important framework condition for sustained growth, while at the same time freeing monetary policy from the constraints that currently impede a faster reduction in real interest rates. Given the composition and average maturity of the traded public debt stock, despite recent improvements, only a sustained reduction in indebtedness will make the economy more resilient to shocks and permit the channelling of domestic saving to finance growth-enhancing investment in the private sector. At the same time, fiscal policy is likely to be more stabilising in a low-debt environment, allowing the automatic stabilisers to work unimpeded over the business cycle, leading to lower macroeconomic volatility.

Improving the quality of fiscal adjustment

A sustained reduction in public indebtedness depends on the containment of current expenditure commitments. This is particularly important in the case of social security, given Brazil's already high level of public spending on pensions against the background of a relatively young population, as noted in the 2005 Survey and in Chapter 1. Because outlays on pensions paid to private-sector workers account for about one-third of federal primary spending, there is much to gain from further parametric changes in the social security system, while recognising that most benefits of reform will materialise only over the longer term. Nevertheless, little progress has been made in this area since publication of the 2005 Survey. Of particular importance from the point of view of fiscal management is the link between the minimum pension and the minimum wage, which should be severed. Reform options should include introduction of a minimum retirement age in the regime for private-sector workers, preferably the same for males and females; and an increase in the period of contribution for old-age pensions (Box 2.3).

The containment of current expenditure growth, which is essential for raising government saving, would benefit from the introduction of an expenditure cap in the fiscal rule. The inclusion of a ceiling on federal primary current expenditure in relation to GDP in the 2006-08 Budget Guidelines Law (LDO) was a considerable step forward. It signalled the authorities' commitment to tackling this problem. The ceiling was maintained in the draft 2007-09 LDO, submitted to Congress in May 2006, which calls for a small reduction of 0.1% of GDP in federal current spending in 2007 relative to 2006 to 17.6% of GDP. A cap on non-wage benefits paid to civil servants and restrictions on the creation of new careers in the civil service were also included in the draft 2007-09 LDO. It would be advisable to keep these ceilings in the 2007-09 and in the 2007 budget law, when approved by Congress, because these measures reflect an on-going effort on the part of the authorities to arrest the rise in this category of spending, which has accounted for most of the increase in primary expenditure in recent years. In this regard, the option of re-defining the expenditure cap in nominal terms, rather than in relation to GDP, could be considered, because inflation is now well anchored around the target. In any case, the introduction of an expenditure ceiling consistent with a more ambitious, yet attainable, retrenchment of current outlays would be advisable in the draft 2008-10 LDO, to be submitted to Congress in mid-2007.

Box 2.3. Further pension reform: Summary of recommendations*

The 2005 Survey proposed a number of elements that should be taken into account in further pension reform. Nevertheless, little progress has been made in this policy area. Important elements in future reform of the regime for private-sector workers would include measures to:

- Sever the link between the minimum pension and the minimum wage, while maintaining the purchasing power of pensions, preferably through the indexation of pension benefits to a price index that best reflects the consumption basket of pensioners. In doing so, the government would be able to set minimum wage policy independently of its short-term budgetary constraints and in line with labour market developments and demands.
- Introduce a minimum retirement age in the regime for private-sector workers, preferably equal for males and females. The effective retirement age has increased since the 1998 reform, but remains low, whereas life expectancy at retirement is comparable in Brazil to the OECD average.
- Increase in a phased manner the period of minimum contribution required for old-age pensions for male private-sector urban workers aged 65 (60 for females) from the current level of 15 years.
- Phase out the remaining special pension entitlements, including for teachers, who have lower retirement age and years of contributions requirements. The special regime for teachers affects public finances more adversely at the sub-national than the federal level, given that teachers account for a major share of the sub-national, especially municipal, civil service.

With regard to the social-security regime for public-sector workers, further reform should focus on the creation of complementary pension funds for civil servants, preferably of the defined-contribution type, and on standardising entitlements between the private- and public-sector regimes. Reform in this area is important because outlays on pensions to retired civil servants are accounting for an increasing share of spending at the sub-national levels of government.

* See Giambiagi and de Mello (2006) for more information.

At the same time, the need for alleviating expenditure rigidity, which is noticeable in Brazil, should not be underestimated. Budgetary flexibility is essential for durable retrenchment. Also, it may allow for a reprioritisation of budgetary allocation in favour more cost-effective programmes, such as those focused on improving human and physical capital accumulation. Ideally, policy should be focused on the gradual reduction of revenue earmarking and the elimination of aggregate minimum spending floors, a task that would require a considerable legislative effort, including through amendments to the Constitution. As recommended in the 2005 Survey, a comprehensive assessment of existing revenue earmarking and mandated spending requirements against the achievement of their intended policy objectives would be an important first step. In the interim, the mechanism for withholding part of the earmarked spending at the federal level (DRU), should be extended beyond 2007, when it is due to expire, preferably for at least another four years. The withholding coefficient, currently at 20%, could be raised to 30% and subsequently reduced as the policy effort to reduce expenditure rigidity yields results. It should be recognised that this measure would not tackle the root causes of budget rigidity, but would

be instrumental in facilitating fiscal management until further structural reform comes to fruition.

A reduction in the tax burden would be appropriate, but only once the public debt-to-GDP ratio has been lowered in a sustained manner and the ratio of current expenditure to GDP has been stabilised. Brazil has a high tax-to-GDP ratio for a country of its income level, and a sustained alleviation of the tax burden, which has risen over time, would render fiscal policy more growth-enhancing. In the interim, tax policy could be geared towards minimising the existing distortions in the tax code. The experience of gradually converting the cascading federal taxes on enterprise turnover – PIS and Cofins – into value added taxes since 2002 has yielded positive results (Annex 1.A1, Chapter 1). The exemption of initial public offerings from bank debit (CPMF) taxation, announced in February 2006, is another step in the right direction and can contribute to fostering innovation in the business sector, as discussed in Chapter 3, coupled with the elimination of taxation on capital gains on venture capital investment. Further policy effort could focus on the gradual lowering of the statutory rate of the CPMF, currently at 0.38%, over the medium term. It has been argued that maintenance of the tax at a symbolic rate of 0.01-0.05% would be useful as a collection enforcement tool, allowing the cross-checking of CPMF and income tax liabilities for the purpose of tackling tax evasion. In addition, efforts to make the state-level VAT (ICMS) legislation homogeneous across the states, with uniform rates and bases, would be essential to reduce predatory tax competition among the states, which has arisen from the use of the ICMS as an industrial policy instrument by the states. The option of subsequently replacing the ICMS and the federal VATs (PIS/Cofins and IPI) by a single VAT could be considered in future tax reform.

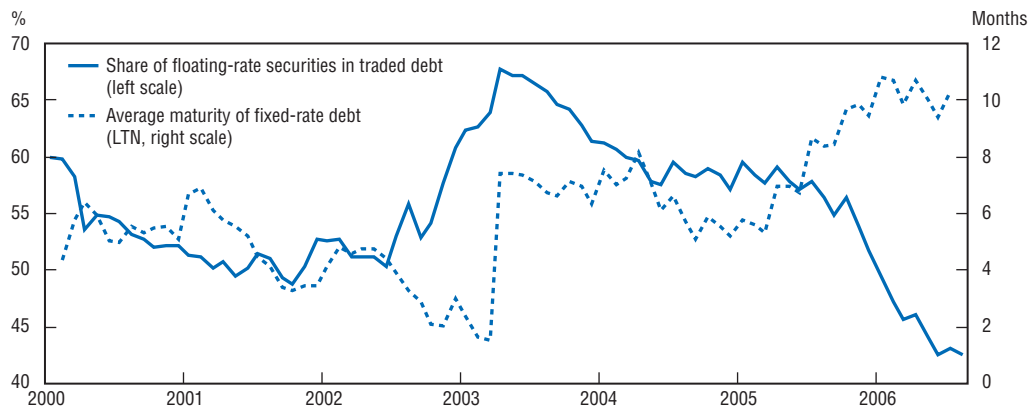
Strengthening public debt management

Considerable progress has been made to date to reduce the public debt's exposure to exchange-rate risk. Favourable international financial conditions have facilitated this task, coupled with Brazil's impressive external adjustment in recent years, which has been buttressed by sustained high foreign trade and current-account surpluses. Public debt management should now focus on consolidating these gains, while working towards increasing the share of fixed-rate and inflation-indexed securities in the public debt stock. It should be recognised that an increase in the share of fixed-rate securities when the policy interest rate is coming down could raise future debt service costs. However, these costs are likely to be outweighed by the longer-term benefit of improving the composition of the outstanding domestic debt.

Recent efforts to reduce the tax burden on foreign investment in the domestic fixed-income and equity markets is laudable. It can make for a reduction in the cost of debt re-financing and an increase in the average maturity of the debt stock. This is important because previous attempts to reduce reliance on floating-rate securities have been constrained by a composition-maturity trade-off: demand for fixed-rate instruments tends to be strongest for relatively shorter maturities (Figure 2.8). Acceptance of long-dated, fixed-rate instruments denominated in *reais*, rather than indexed to the exchange and the policy interest rates, is the ultimate test of confidence in the policy framework. Steps should also be taken to create a yield curve for *real*-denominated bonds in foreign markets, financial conditions permitting, and to foster the development of hedge instruments for investment in long-dated securities as a means of facilitating risk management and boosting liquidity in this market segment.

On external public debt management, the authorities should continue to unwind their outstanding liabilities. The announcement in February 2006 of the intended buyback of up to USD 20 billion of sovereign liabilities coming due by 2010, including the Brady bonds, was welcome, as well as the early repayment of debt to the International Monetary Fund (December 2005) and the Paris Club (January 2006). As a result of these operations, the stock of net external public debt (taking international reserves into account) declined from 7.5% of GDP at end-2004 to 2.6% of GDP at end-2005 and to about 0.5% of GDP at end-April 2006. Consistent with this strategy, the National Treasury announced in early June its intention to buy back up to USD 4 billion of sovereign bonds denominated in USD and EUR maturing during 2007-30, while setting a maximum clearing spread as a means of improving confidence in their ability to maintain a liquid market for those bonds. This debt-reduction strategy is a sensible use of Brazil's large external current account surpluses and is complementary to the on-going effort to reduce the exposure of the public sector's debt to exchange-rate risk, including through the retirement of domestic debt indexed to the exchange rate. At the same time, greater access by foreign investors to the domestic fixed-income market, as discussed above, should facilitate the exchange of external bonds for a range of domestic fixed-rate securities, which should contribute to lengthening maturities and reducing refinancing costs. The authorities would be advised to increase the debt buyback programme, should market conditions improve further.

Figure 2.8. **Public debt management: Composition-maturity trade-off, 2000-06**



Source: Central Bank of Brazil.

A durable reduction in public indebtedness would serve to facilitate a swifter fall in real interest rates and to permit the channelling of domestic saving to finance growth-enhancing investment. It would lay the groundwork for removing distortions in the tax system, including by broadening tax bases, and is likely to result in better credit ratings for the sovereign and a reduction in country risk. An event analysis of Brazil's latest sovereign credit upgrades and downgrades suggests that the authorities' efforts to reduce external vulnerability, benefiting from the still auspicious global financial environment, are warranted (Box 2.4). But further progress is needed in fiscal consolidation because Brazil's public debt-to-GDP ratio remains above-average in comparison with the other sovereigns in Brazil's credit class. Attainment of investment grade for Brazil's sovereign debt placements will therefore be the ultimate reward for fiscal consolidation.

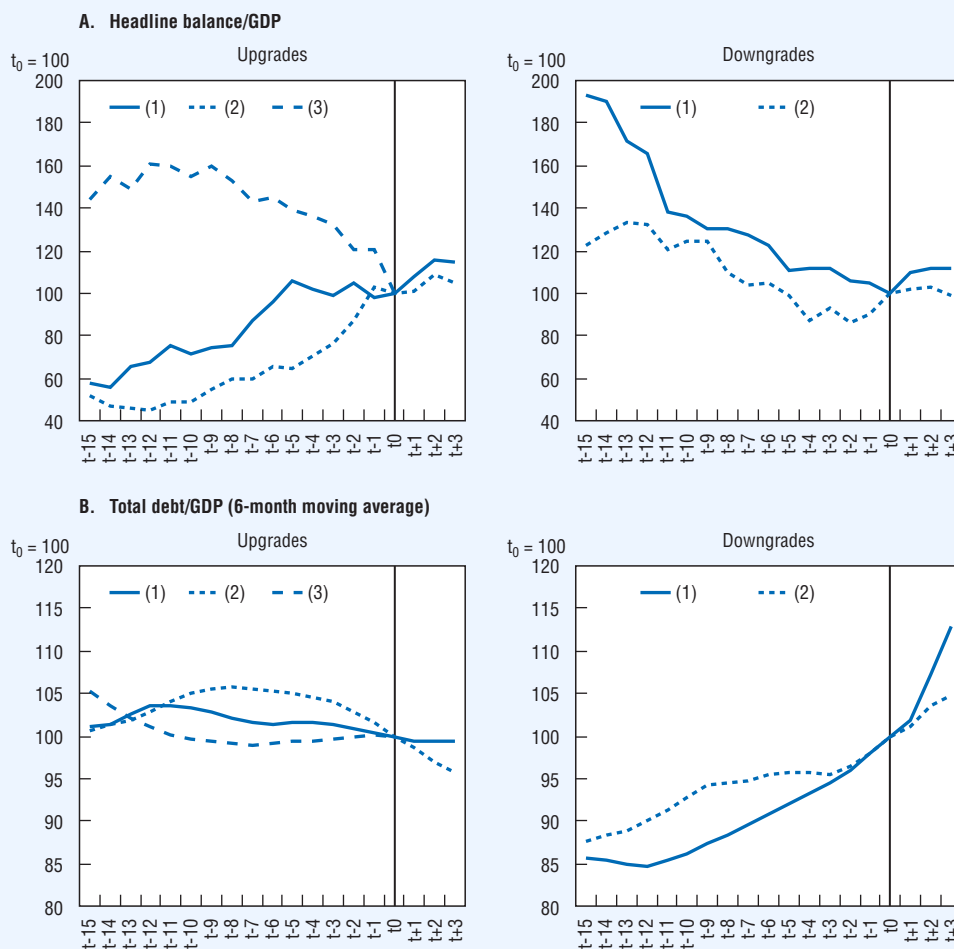
Box 2.4. Sovereign credit risk: An event analysis of recent upgrades and downgrades

Upgrades and downgrades of a country's sovereign credit rating are closely associated with changes in sovereign risk premia, which in turn have a bearing on macroeconomic outcomes, particularly private investment and the monetary stance.¹ Because causality in the relationship between credit rating and risk premia goes both ways, changes in these indicators tend to be mutually reinforcing. For example, Brazil's latest upgrades have been associated with a reduction in risk premia, which came down by about 200 basis points between October 2004 (15 months prior to the latest upgrade) and May 2006 (3 months after the latest upgrade).

A conventional event analysis can be used to shed more light on the relationship between changes in sovereign credit rating and in the macroeconomic indicators that are most likely to affect creditworthiness. The dating of sovereign (foreign currency) credit upgrades and downgrades was set as the mid-point of the period spanned by changes in ratings (excluding changes in outlook) by Standard and Poor's and Moody's.² The selection of the macroeconomic indicators used in the analysis was guided by the empirical literature, based on the sovereign's ability and willingness to repay debt obligations on time and in full. The analysis focuses on the 15-month period leading

Figure 2.9. **Event analysis: Sovereign credit rating and fiscal outcomes**

Upgrades: t_0 = October 2000, for event 1; September 2004, for event 2; and February 2006, for event 3.
Downgrades: t_0 = November 1998, for event 1; and July 2002, for event 2.



Source: Standard and Poor's, Moody's, Central Bank of Brazil and OECD calculations.

Box 2.4. Sovereign credit risk: An event analysis of recent upgrades and downgrades (cont.)

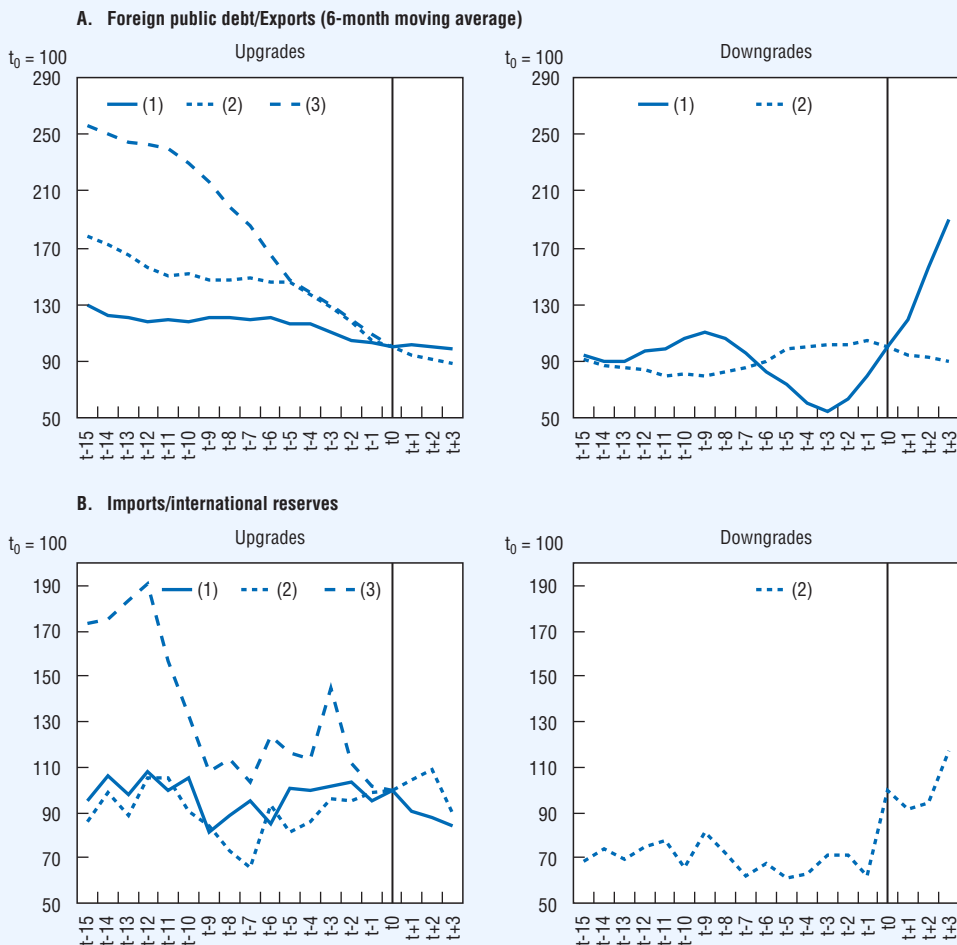
to an upgrade/downgrade and also presents the evolution of the main indicators in the three-month period following changes in ratings.

The event analysis for Brazil suggests that sovereign credit upgrades are becoming more closely associated with improvements in external solvency indicators than in fiscal outcomes. Previous upgrades followed more sizeable reductions in the debt-to-GDP ratio and improvements in the budget balance than the latest one (Figure 2.9). This probably reflects greater confidence in the conduct of fiscal policy, given the government's commitment to fiscal responsibility and strong track record in meeting its fiscal targets.

But credit downgrades seem to be strongly associated with deteriorating public finances. As already mentioned, policy effort to improve external solvency indicators in recent years, through the reduction in external public indebtedness in relation to exports and that of imports in relation to international reserves, has been rewarded (Figure 2.10). In the post-1999 floating exchange-rate regime, upgrades/downgrades have been closely associated with real exchange rate appreciations/depreciations.³

Figure 2.10. Event analysis: Sovereign credit rating and external vulnerability

Upgrades: t_0 = October 2000, for event 1; September 2004, for event 2; and February 2006, for event 3.
Downgrades: t_0 = November 1998, for event 1; and July 2002, for event 2.



Source: Standard and Poor's, Moody's, Central Bank of Brazil and OECD calculations.

Box 2.4. Sovereign credit risk: An event analysis of recent upgrades and downgrades
(cont.)

In comparison with the other countries in the same credit-rating class (based on the Standard and Poor's classification and Moody's), Brazil has a lower headline budget deficit but a higher gross debt-to-GDP ratio (Table 2.4). The level of the gross public debt in relation to GDP is also high in comparison with the countries that have a credit rating one notch above that of Brazil, suggesting again that the benefits of reducing public indebtedness are likely to be large. It should be acknowledged that Brazil's gross debt includes securities held in the central bank's portfolio, accounting for 14% of GDP (July 2006). These securities are used for the conduct of monetary policy purposes, given that the BCB is not allowed to issue securities in the domestic market in accordance with the Fiscal Responsibility Law.

**Table 2.4. Indebtedness and external solvency indicators:
Brazil and emerging-market economies**

Unweighted averages, most recent end-year observations during 2002-05

	Number of countries	Headline balance (% of GDP)	Gross public debt ¹ (% of GDP)	Foreign public debt/exports	Imports/international reserves
Brazil	1	-3.3	74.7	0.3	1.6
Countries with the same credit rating as Brazil ²					
Standard and Poor's (BB)	5	-4.4	64.2	1.9	2.3
Moody's (B1)	5	-3.5	71.9	1.0	3.1
Countries with credit rating one notch above that of Brazil ³					
Standard and Poor's (BB+)	5	-4.5	69.4	1.4	1.8
Moody's (Ba3)	3	-3.9	43.1	1.1	2.6

1. Brazil's gross debt includes securities held in the central bank's portfolio, which amounts to about 14% of GDP (July 2006).
2. Includes Colombia, Costa Rica, Jordan, Panama and Peru (Standard and Poor's) and Jamaica, Papua New Guinea, Philippines, Surinam and Ukraine (Moody's).
3. Includes Egypt, El Salvador, India, F.Y.R. of Macedonia and Morocco (Standard and Poor's) and Peru, Turkey and Vietnam (Moody's).

Source: Standard and Poor's, Moody's, Central Bank of Brazil, IMF (Article IV Reports, various issues) and OECD calculations.

1. See Reisen and von Maltzan (1999) and Reisen (2002) for more information.
2. The exception is the latest change in rating in which only Standard and Poor's upgraded Brazil's sovereign credit in February 2006.
3. No distinctive pattern between upgrades and downgrades was found for other macroeconomic variables which have been identified as important determinants of sovereign credit ratings in the empirical literature, such as economic activity (measured by seasonally-adjusted industrial production), consumer price inflation, external current account balance (measured as a share of GDP), consolidated primary budget balance (measured as a share of GDP) and rate of growth of monetary aggregates. While it is not closely associated with changes in credit ratings in this event analysis, the current account balance correlates strongly with the EMBI+ spread. See Ferreira (2005) for more information.

Once the composition of the traded domestic debt stock has improved further and the share of floating-rate securities has been reduced, the option of targeting the headline budget balance, instead of the primary budget surplus, should be considered. Despite progress in recent years, fiscal policy remains overly sensitive to the monetary stance and short-term developments in financial markets because floating-rate securities account for the lion's share of the traded debt stock. Under these circumstances, a fiscal rule that targets the primary budget surplus excludes from the assessment of fiscal performance the short-term impact of monetary policy on public finances. But the public debt dynamics depends ultimately on trends in the *headline* budget balance over time. As a result, a fiscal rule that targets the headline balance would allow for a more direct link between fiscal performance and debt sustainability. To make this policy option operational, a target for

the nominal budget balance could be set and the corresponding primary surplus could be calculated (and enshrined in the three-year LDO and the annual budget laws) on the basis of market projections for GDP growth, inflation and monetary policy parameters. The use of market, rather than government, projections to set these key macroeconomic parameters would strengthen credibility in the policy regime. However, it should be recognised that a change in the target would need to be communicated clearly and transparently to the public to avoid any loss of confidence in the fiscal regime.

Meanwhile, the primary budget surplus target could be re-defined as a floor, at least for the central government. This would allow higher-than-targeted primary surpluses to be saved and used to retire debt, when economic conditions permit, instead of financing further increases in expenditure. Another consideration is that the accumulation of primary budget surpluses has traditionally been frontloaded within fiscal years. This is essentially due to prudence in financial management as a means of ensuring that unforeseen circumstances towards year-end, including revenue shortfalls and weaker-than-expected fiscal performance at the sub-national government level, for example, do not put the achievement of the consolidated fiscal target in jeopardy. As a result, when these contingencies do not materialise, attainment of the fiscal target leads to sometimes undesirable fiscal expansions towards the end of the year. The possibility of saving these above-target balances would therefore facilitate financial management within the year.

Making monetary policy more effective

Brazil has a good track record among inflation targeters. This is despite the fact that since inflation targeting was introduced in 1999 the targets have been missed in three years (2001-03), when adverse supply shocks led to sizeable exchange-rate depreciations. Attainment of the targets in those years would have entailed significant output losses. Nevertheless, transparency and effective communication underscoring the monetary authority's commitment to price stability in a forward-looking manner – by tackling the secondary effects of price shocks while absorbing their first-round inflationary pressures – contributed to boosting credibility in the policy regime, despite the breach of the targets. Although it does not enjoy *de jure* operational autonomy, the BCB is perceived as being *de facto* independent, an achievement that should not be underestimated. Moreover, the swift convergence of inflation expectations to the targets in 2004-06 suggests that the conduct of monetary policy within the inflation-targeting framework has contributed to reducing inflation inertia.

Notwithstanding these achievements, the effectiveness of monetary policy in short-term demand management can be improved. Further fiscal adjustment would be essential. A sustained reduction in public indebtedness would lighten the burden of debt service on the domestic fixed-income market, reducing re-financing risk and allowing for an improvement in the composition of the traded public debt, with further reductions in the share of instruments paying floating interest rates and a lengthening of maturities. The fiscal stance would become less vulnerable to short-term financial developments, reducing the scope for “fiscal dominance” in the conduct of monetary policy, which is a pre-requisite for effective inflation targeting. Central to the idea of fiscal dominance is the hypothesis that monetary policy may have perverse effects in a situation of financial stress when the public debt-to-GDP ratio is high and the debt dynamics are perceived as unsustainable. Accordingly, an increase in the policy interest rate to prevent a depreciation of the exchange rate in response to a negative external shock or confidence crisis would weaken the currency further, instead of strengthening it, because it would aggravate the debt overhang.

Also, liberalisation of directed credit requirements would probably strengthen the credit channel of the monetary transmission mechanism. The authorities are committed to an expansion of credit targeted to the underserved population, predominantly low-income individuals and SMEs. Financial innovation, with the introduction of new credit modalities, including payroll-backed credit (*crédito consignado*) is a case in point, as noted above. This can do much to tackle financial exclusion – a policy area which was discussed in detail in the 2005 Survey – but also thwarts the short-term effect of monetary tightening on activity, as during the 2004-05 episode. It can be argued that the magnitude of the monetary tightening required for disinflation could have been lower had domestic credit not risen concomitantly, as was the case at the time. Nevertheless, over the longer term, a more potent credit channel will likely make monetary policy more effective, delivering inflation stability with lower volatility in the policy stance and leading to a fall in the equilibrium real rate of interest. Against this background, a careful analysis of the effectiveness of existing directed credit, also discussed in Chapter 1, against its policy objectives would pave the way for reform in this area. It will be easier to carry out reform in this area once monetary conditions have eased further, because the gap between the policy rate and the regulated interest rates is likely to have narrowed.

At the same time, this measure is likely to contribute to a fall in the cost of capital and interest spreads.⁵ There is a link – which is nevertheless difficult to validate empirically – between the extent of directed credit and the cost of capital because a high share of such operations in total credit reduces the resource pool for extending loans to the unregulated market segments. This has a bearing on investment and hence long-term growth. For example, based on the World Bank's Investment Climate Survey of 2003 (World Bank, 2003), cost-related factors, including high interest rates, are among the main obstacles to the extension of credit, especially for small firms. Application procedures and collateral requirements are next in importance. Because any sudden elimination of directed credit requirements would probably reduce the amount of credit currently available for activities such as housing and agriculture financing, a gradual reform would be advisable, preferably by raising the rates of interest on the programmes that are more heavily subsidised, so as to close the gap between the rates of return on saving and market interest rates. In the case of housing credit, for example, which accounts for approximately 15% of the stock of directed credit outstanding, the option of further liberalisation could be considered, especially in view of the effort since the late 1990s to restructure previously unrecorded liabilities and removing non-performing loans from the relevant federal banks' balance sheets.⁶

Compulsory reserve requirements could be simplified and reduced in line with international trends. The current process of monetary easing could pave the way for a gradual reduction in compulsory reserve requirements, possibly starting with the phasing out of the "additional requirements" (i.e. those compulsory reserves on sight and time deposits, as well as savings accounts, that are currently remunerated by the SELIC rate). This would facilitate the conduct of monetary policy during the process of reduction of reserve requirements. At a later stage, the compulsory holdings of reserves that are currently unremunerated could be eliminated, once the effects of the elimination of the additional requirements on the economy have been assessed.

These measures are likely to also entail a reduction of financial intermediation costs, which are exceedingly high in Brazil, by reducing the implicit tax burden on financial income. Although the relationship between interest spreads and the level of compulsory reserves is empirically weak – depending on how the implicit tax burden is shared between lenders and

borrowers – an increase in the supply of free credit is likely to follow the reduction in compulsory reserve requirements, leading to a compression of interest spreads. To the extent that financial liberalisation – through the gradual elimination of directed credit and the reduction in reserve requirements – results in lower real interest rates, it will have a bearing on fiscal management, reducing the cost of debt service. It would also probably generate substantial allocative efficiency gains in the economy, as the subsidy that is currently extended to the sectors/activities that benefit from directed credit would gradually be reduced.

An additional important policy question concerns the level of the inflation rate to be targeted by the central bank over the medium term. The current target of 4.5% was maintained for 2007-08 by the National Monetary Council (CMN), as well as the ± 2 percentage-point tolerance band. It can be argued that stability of the inflation target over the next two years, following a path of targeted disinflation since 2003, could contribute to lower volatility in the monetary stance and to consolidating the disinflation achieved to date. However, although the 4.5% mid-point of the inflation target is not too high by emerging-market standards, this is not the case of the ceiling of the tolerance band, currently at 6.5%. Over time, once actual and expected inflation has been safely anchored at the current level, the monetary authority could pursue a narrower band around a lower mid-point.

Summary of recommendations

This chapter's main policy recommendations are presented in Box 2.5.

Box 2.5. Summary of policy recommendations: Macroeconomic area

Improve the quality of fiscal adjustment

- Implement further parametric changes in the social security system (see Box 2.3).
- Redefine the expenditure cap in nominal growth terms, rather than in relation to GDP.
- Increase budget flexibility by gradually reducing revenue earmarking and eliminating aggregate spending floors.
- Extend the extant revenue withholding mechanism (DRU) beyond 2007, when it is due to expire, preferably for another four years, and consider the option of raising the withholding coefficient to 30% of shared revenue.
- Make the rates and bases of the state-level VAT (ICMS) uniform across the states.

Strengthen public debt management

- Foster the development of hedge instruments for investment in long-dated securities as a means of facilitating risk management and boosting liquidity in this market segment.
- Continue to reduce external public indebtedness when market conditions permit.
- Consider the option of targeting the nominal budget balance. The corresponding primary surplus could be calculated (and enshrined in the three-year LDO and the annual budget laws) on the basis of market projections for GDP growth, inflation and monetary policy parameters.

Make monetary policy more effective

- Pursue further financial liberalisation by gradually removing the existing directed credit and compulsory reserve requirements.
- Over time, reduce the inflation target and the width of the tolerance band.

Notes

1. This is due to low coverage, given the extent of labour informality, and the fact that the data used in the analysis includes expenditure on the Salary Bonus, which is not sensitive to the business cycle. See de Mello and Moccerro (2006) for more information.
2. In addition, the results reported by de Mello and Moccerro (2006) suggest that the floating of the *real* was followed by greater fiscal prudence, as evidenced by a higher responsiveness of discretionary fiscal action to changes in indebtedness after February 1999 than before.
3. See de Mello, Kongsrud and Price (2004) for more information and evidence for OECD countries.
4. The empirical analysis carried out to date for Brazil has focused on how expected inflation enters the central bank's policy reaction function and on how inflation expectations are formed (Minella *et al.*, 2003). There has been relatively little emphasis on testing for the existence of volatility spillovers between the monetary stance and inflation expectations.
5. See Central Bank of Brazil (2006), Chapter 3, for more information and empirical evidence in the case of directed credit to agriculture and housing.
6. See the 2005 Survey, Chapter 2, for more information on housing and agriculture financing.

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ANNEX 2.A1

Fiscal activism over the business cycle

This Annex assesses the sensitivity to the business cycle of primary federal spending on personnel and on non-mandatory spending (identified in budget documentation as “other current and capital outlays”, “other OCCs”). These spending items may be sensitive to short-term fluctuations in economic activity, not through built-in stabilisers, but as a result of fiscal activism.¹

The methodology

The estimations use monthly data for the period 1997:1 to 2005:10 as follows:

$$\log\left(\frac{G_i}{G_i^{HP}}\right)_t = a_0 + \sum_{j=1}^{11} a_{1j} Dum_j + \sum_{j=1}^{12} a_{2j} \log\left(\frac{G_i}{G_i^{HP}}\right)_{t-j} + \sum_{j=0}^{12} a_{3j} \log\left(\frac{IPI}{IPI^{HP}}\right)_{t-j}, \quad (2.A1.1)$$

where G_i denotes real federal spending on personnel (PW) and on non-mandatory programmes (NMS), and IPI is the industrial production index. The HP superscript identifies the HP-filtered series.

Estimation of Equation (2.A1.1), reported in Table 2.A1.1, yields a long-term elasticity of 2.3 for PW and 1.6 for NMS (Columns A and C), suggesting that both spending categories are pro-cyclical. In addition, fiscal activism may be asymmetrical over the business cycle. The estimated closed-form elasticities may therefore differ between upturns and downturns, a hypothesis that can be tested as follows:

$$\log\left(\frac{G_i}{G_i^{HP}}\right)_t = a_0 + \sum_{j=1}^{11} a_{1j} Dum_j + \sum_{j=1}^{12} a_{2j} \log\left(\frac{G_i}{G_i^{HP}}\right)_{t-j} + \sum_{j=0}^{12} a_{3j} \log\left(\frac{IPI}{IPI^{HP}}\right)_{t-j} + \sum_{j=0}^{12} a_{4j} D_{t-j} * \log\left(\frac{IPI}{IPI^{HP}}\right)_{t-j} \quad (2.A1.2)$$

where D is a dummy variable which takes the value of 1 for positive changes in the 6-month moving average of $\log\left(\frac{IPI}{IPI^{HP}}\right)$ relative to the previous period, and zero otherwise.

Estimation of Equation (2.A1.2), also reported in Table 2.A1.1, suggests that discretionary policy action was more pro-cyclical in downturns over the period of analysis. This is the case for both expenditure categories – PW and NMS – for which the implied long-term elasticities are higher for downturns than for upturns (Columns B and D).²

The case of non-mandatory spending is particularly interesting, because it was found to be pro-cyclical in downturns while exhibiting no sensitivity to the business cycle during upturns. This suggests that the government was able to resist pressure for destabilising activism in good times, while retrenching non-mandatory programmes in bad times as a

Table 2.A1.1. **Elasticity of PW and NMS with respect to the business cycle**¹

	PW		NMS	
	No asymmetry	Asymmetric responses	No asymmetry	Asymmetric responses
	A	B	C	D
Sum of lagged values of $\log\left(\frac{PW}{PW_{HP}}\right)$	-0.01	-0.21		
Sum of lagged values of $\log\left(\frac{NMS}{NMS_{HP}}\right)$			0.52	0.55
Sum of contemporaneous and lagged values of $\log\left(\frac{IPI}{IPI_{HP}}\right)$	2.34	3.55	0.77	1.42
Sum of contemporaneous and lagged values of $D \cdot \log\left(\frac{IPI}{IPI_{HP}}\right)$		-1.72		0.00
Implied long-term elasticities	2.31	..	1.60	..
In upturns		1.51		0.00
In downturns	..	2.93	..	3.18
R^2	0.75	0.74	0.83	0.85
F Test	9.74***	10.96***	28.53***	24.03***
LB(6)	2.29	3.00	6.43	4.87
ARCH(6)	7.51	15.6**	2.6652	0.964

1. All variables are statistically significant at the 10% level. The F statistic tests the overall significance of the model; LB(X) is the Ljung-Box test of the absence of autocorrelation of order X; ARCH(X) is the LM test of the absence of ARCH disturbances of order X. (***), (**) and (*) denote significance at the 1%, 5% and 10% levels, respectively. Seasonal dummies are included in the regressions but not reported. The sample spans the period 1997:1 to 2005:10.

Source: de Mello and Moccerro (2006).

result of the need to ensure debt sustainability. By contrast, outlays on personnel were found to be pro-cyclical, albeit by a smaller amount, during upturns too, which may be due to the government's inability to resist pressure for more generous wage increases in good years (Talvi and Vegh, 2000; Lane, 2003). Unlike pensions, the government is under no obligation to preserve the purchasing power of civil servants' compensation, which probably explains to a large extent greater pro-cyclicality in downturns than in upturns.

In this regard, the experience of Brazil is at odds with that of the OECD countries, where fiscal tightening during downturns is somewhat less likely to occur in the presence of expenditure rigidities (OECD, 2003, Chapter IV). This is the case when, for example, outlays on personnel, which are harder to retrench than capital spending, account for a large share of government spending and when the government is a sizeable employer relative to the private sector. In any case, OECD experience also suggests that the benefits for short-term stability that arise from expenditure being inflexible in a downward direction have to be set against the fact that there is no evidence of corresponding counter-cyclicality in upturns in the OECD area. Pro-cyclicality in the upturn may lead to the "ratcheting up" of aggregate public spending over the longer term, an issue that is of relevance to the Brazilian experience of stabilisation based on revenue hikes against a background of rising current expenditure over the years. This is consistent with recent empirical evidence suggesting that the federal government has followed a spend-and-tax policy to ensure the sustainability of public indebtedness since the late 1990s (de Mello, 2006).

Notes

1. This Annex is based on de Mello and Moccerro (2006).
2. The results are reasonably robust to alternative definitions of upturns other than the 6-month moving average. The estimated elasticity remains lower in upturns than in downturns when 3- and 12-month moving averages are used in the case of PW outlays but not when the level of $\log\left(\frac{IPI}{IPI^{HP}}\right)$ is used. For discretionary spending, however, the asymmetry is reversed with 3- and 12-month moving averages, but remains unchanged with the level of $\log\left(\frac{IPI}{IPI^{HP}}\right)$.

ANNEX 2.A2

Monetary policy and macroeconomic volatility

This Annex reports the results of the estimation of a simple structural macroeconomic model for Brazil to assess changes in the central bank's monetary reaction function across monetary regimes, including the period prior to 1999, when the *real* was allowed to float in January, and after the adoption of inflation targeting in June 1999.

The structural model

The new Keynesian framework has become the conventional framework for analysing the relationship between inflation, monetary policy and the business cycle (Clarida, Gali and Gertler, 1999; Boivin and Giannoni, 2002). In its simplest form, it consists of three equations:

$$\pi_t = \delta E_t \pi_{t+1} + (1 - \delta) \pi_{t-1} + \lambda y_t + u_{\pi_t}, \quad (2.A2.1)$$

$$y_t = \mu E_t y_{t+1} + (1 - \mu) y_{t-1} - \phi (r_t - E_t \pi_{t+1}) + u_{y_t}, \quad (2.A2.2)$$

$$r_t = \rho r_{t-1} + (1 - \rho) (\beta E_t \pi_{t+1} + \gamma y_t) + \varepsilon_t + u_{r_t}, \quad (2.A2.3)$$

where π_t , y_t , r_t and e_t denote, respectively, inflation, the output gap, the nominal interest rate and the nominal exchange rate at time t ; E_t is the expectations operator conditional on information available at time t ; and u_{π_t} , u_{y_t} and u_{r_t} are structural errors.

Equation (2.A2.1) is a Phillips curve, including price stickiness, Equation (2.A2.2) is an aggregate demand function, and Equation (2.A2.3) is an exchange rate-augmented Taylor-type monetary reaction function.

The estimation results

System (2.A2.1)-(2.A2.3) is estimated jointly by FIML using monthly data for the period prior to the 1999 foreign-exchange regime change (1996:1-1998:12) and after inflation targeting was formally adopted (1999:7-2006:2). The dating of the monetary regime change therefore excludes the transition period between January-June 1999. Inflation is measured by the IPCA (cumulative 12-month rates), the interest rate is the nominal annualised SELIC rate, and the output gap is computed as the per cent difference between the seasonally-adjusted industrial production index and its HP-filtered trend. The exchange rate is the period-average rate defined as *reais* per US dollar. Expected inflation/output gap is measured as actual inflation/output gap one period ahead. All series are available from the Central Bank of Brazil. On the basis of unit root tests, both the inflation and the interest rate series appear to have unit roots when the variables are defined in levels. They

therefore enter the model in first differences. The output gap was nevertheless found to be stationary in levels.

The results of the estimation of the structural model, reported in Table 2.A2.1, suggest a relative stability across monetary regimes in the parameters of the Phillips curve and of the aggregate demand equations. Estimation of the Phillips curve suggests that agents seem to put equal weight on past and expected inflation in both monetary regimes. Estimation of the aggregate demand curve shows that agents tend to put slightly more weight on past than expected future output gaps, a finding that did not change significantly across monetary regimes. The coefficients of the real interest rate in the aggregate demand curve (ϕ) and that of the output gap in the Phillips curve (λ) are not statistically significant, a finding that is consistent with the estimation of a similar structural model for the United States for the period 1957-2001 (Moreno, 2004).

Monetary policy appears to have become increasingly persistent and forward-looking over time, given that the coefficients of the lagged interest rate (ρ) and inflation expectations (β) became statistically significant in the current (post-June 1999) policy regime. Moreover, there is increasing evidence of counter-cyclicality in the monetary stance, as evidenced by a statistically significant coefficient of the output gap (γ) in the current policy regime. These findings are consistent with the results reported by Minella et al. (2003) for a reduced-form monetary reaction function for Brazil over the period 1999-2002. Those authors nevertheless find a stronger reaction by the monetary authority to deviations of expected inflation from the target and to the exchange rate.

Table 2.A2.1. **Structural model estimations**¹

Parameters	Monetary regime 1	Monetary regime 2
δ	0.49 ** (0.235)	0.54 *** (0.083)
λ	0.00 (0.008)	0.00 (0.004)
μ	0.44 *** (0.122)	0.46 *** (0.066)
ϕ	1.85 (5.960)	1.20 (2.168)
ρ	0.03 (0.299)	0.61 *** (0.057)
β	0.54 (1.883)	0.19 ** (0.088)
γ	0.01 (0.031)	0.01 ** (0.003)
τ	5.08 (22.921)	0.02 (0.080)

1. The sample is 1996:1-2006:2. Monetary regime 1 refers to the sub-sample 1996:1-1998:12 and monetary regime 2 spans the period 1999:7-2006:2. (***) and (**) denote, respectively, statistical significance at the 1 and 5% levels.

Source: Data available from the Central Bank of Brazil and OECD estimations.

ANNEX 2.A3

Monetary policy and inflation expectations: are there volatility spillovers?

This Annex tests for the presence of volatility spillovers between the policy interest rate and inflation expectations using monthly data over the period after 2001:7, when data on inflation expectations began to be collected by the BCB.¹

The model

Previous empirical literature on Brazil has focused on the determinants of inflation expectations and the estimation of Taylor rule-type monetary reaction functions (Minella *et al.*, 2003; Schmidt-Hebbel and Werner, 2002), while ignoring the possibility of volatility spillovers between the interest rate and inflation expectations. A change in the policy interest rate may affect expected inflation and *vice versa*, but the hypothesis that greater volatility in the monetary stance may lead to greater volatility in expected inflation (and *vice versa*) has not yet been tested empirically for Brazil.

The presence of volatility spillovers can be tested in a system defined as follows:

$$r_t = a_{10} + a_{11}r_{t-1} + a_{12}(E_t\pi_{t+12} - \pi_{t+12}^*)_{t-1} + a_{13}e_{t-1} + a_{14}y_{t-1} + \varepsilon_{1t}, \quad (2.A3.1)$$

$$(E_t\pi_{t+12} - \pi_{t+12}^*)_{t-1} = a_{20} + a_{21}r_{t-1} + a_{22}(E_{t-1}\pi_{t+12} - \pi_{t+12}^*)_{t-1} + a_{23}e_{t-1} + a_{24}y_{t-1} + \varepsilon_{2t}, \quad (2.A3.2)$$

where r_t is the SELIC rate, $(E_t\pi_{t+12} - \pi_{t+12}^*)_{t-1}$ denotes deviations of 12 month-ahead expected inflation from the target, e_t is the exchange rate, y_t is the output gap, and μ_{it} ($i=1,2$) are error terms.

The exchange rate and the output gap enter the system in lagged form to deal with potential endogeneity problems. The SELIC rate and inflation deviations are treated as endogenous, while the other variables are predetermined.

The volatility spillover hypotheses can be tested using a multivariate model (M-GARCH) with different specifications for the conditional variances and co-variances of the random errors $\mu_t = (\mu_{1t}, \mu_{2t})$. In particular, the BEKK model, which is a generalisation of univariate GARCH models, will be used.² It is defined as follows:

$$\varepsilon_t / F(t-1) \sim N(0, H_t),$$

where $F(t-1)$ is the information set up to period $t-1$, and H_t denotes the conditional covariance matrix associated with the bivariate vector of random errors $\mu_t = (\mu_{1t}, \mu_{2t})$. This matrix is defined as $H_t = c_0'c_0 + B'\varepsilon_{t-1}\varepsilon_{t-1}'B$, where C_0 and B are parameter matrices of the

form: $c_0 = \begin{bmatrix} C_{11} & C_{12} \\ 0 & C_{22} \end{bmatrix}$ and $B = \begin{bmatrix} b_{11} & b_{12} \\ b_{21} & b_{22} \end{bmatrix}$. The elements of H_t can be represented in univariate form as:³

$$h_{11,t} = c_1 + b_{11}^2 \varepsilon_{1,t-1}^2 + 2b_{11}b_{21} \varepsilon_{1,t-1} \varepsilon_{2,t-1} + b_{21}^2 \varepsilon_{2,t-1}^2 \quad (2.A3.3)$$

$$h_{12,t} = h_{21,t} = c_2 + b_{11}b_{21} \varepsilon_{1,t-1}^2 + (b_{12}b_{21} + b_{11}b_{22}) \varepsilon_{1,t-1} \varepsilon_{2,t-1} + b_{12}b_{22} \varepsilon_{2,t-1}^2 \quad (2.A3.4)$$

$$h_{22,t} = c_3 + b_{12}^2 \varepsilon_{1,t-1}^2 + 2b_{12}b_{22} \varepsilon_{1,t-1} \varepsilon_{2,t-1} + b_{22}^2 \varepsilon_{2,t-1}^2 \quad (2.A3.5)$$

Spillover effects exist if b_{21} and/or b_{12} are estimated to be different from zero.

The data

The expected inflation gap is calculated as the difference between the 12 month-ahead inflation expectation, available from the market surveys conducted by the BCB since July 2001, and the end-year inflation target, defined in Annex 1.A3 (Chapter 1). The exchange rate is defined as the 12-month percentage change in the nominal exchange rate. The output gap is computed as log difference between the actual and the HP-filtered seasonally-adjusted industrial production index.⁴ Data are available from the Central Bank of Brazil for the period spanning 2001:7-2006:1.

The series were first tested for unit roots. The Phillips-Perron test was applied in the case of the SELIC rate, expected inflation and the output gap, which exhibit no trend, and the Schmidt-Phillips test was used for the exchange rate, which exhibits a trend. All variables were found to have unit roots over the period of analysis, except for the expected inflation gap, which seems to be stationary in levels. As one endogenous variable (the SELIC rate) has a unit root but the other (expected inflation gap) does not, there is no need to test for co-integration between these variables.

The results

The results of the estimation of Equations (2.A3.1)-(2.A3.2) using the BEKK specification are presented in Table 2.A3.1, and suggest that both the SELIC rate and expected inflation exhibit a relatively high degree of persistence. Over the period of analysis, the SELIC rate was estimated to respond positively to the lagged changes in both the exchange rate and the output gap, but not to expected inflation. This is not surprising, because expected inflation enters the SELIC rate equation in lagged, rather than contemporaneous, values, while monetary policy should be conducted in a forward-looking basis. With regard to the expected inflation equation, the SELIC rate was found to be negatively signed, and the exchange rate and the output gap seem to be positively signed, as expected.

The estimated coefficients of Equations (2.A3.3)-(2.A3.5), allowing for the analysis of volatility spillover effects, are reported in the lower panel of Table 2.A3.1. The estimation results suggest that volatility spillovers are unidirectional, running from the SELIC rate to expected inflation. This implies that volatility in the monetary stance is conducive to volatility in inflation expectations. By implication, interest-rate smoothing is likely to reduce volatility in inflation expectations. This seems to be the case in Brazil, where the reduction in volatility in the SELIC rate has been associated with lower volatility in expected inflation, particularly since the beginning of 2004 (Figure 2.A3.1).

Table 2.A3.1. **Monetary reaction function: M-GARCH analysis of volatility spillover effects**¹

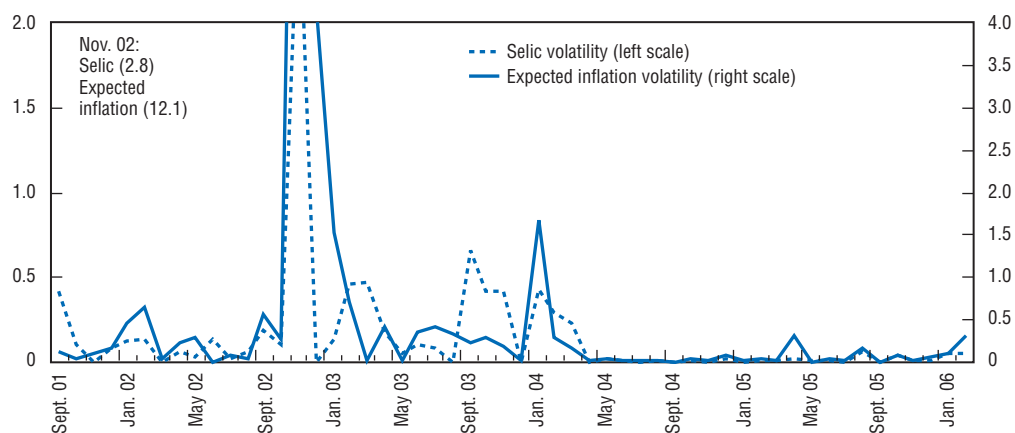
	Dependent variables	
	SELIC rate	Expected inflation
Lagged SELIC rate	0.79 (24.12) ***	-0.43 (-6.19) ***
Lagged expected inflation	-0.03 (-1.1)	0.86 (33.6) ***
Lagged exchange rate	0.01 (2.81) ***	0.03 (6.21) ***
Lagged output gap	0.07 (4.04) ***	0.16 (6.15) ***
Variance equations		
C_{11}	0.41 (4.15) ***	
C_{12}	0.48 (9.37) ***	
C_{22}	0.10 (0.35)	
B_{11}	0.48 (1.43)	
B_{21}	0.07 (0.54)	
B_{12}	-1.28 (-5.33) ***	
B_{22}	-0.59 (-2.32) ***	
Diagnostic tests		
Log-likelihood		-42.83
AIC		-3.04
SBC		-2.74

1. The numbers in parentheses are t statistics. (*), (**) and (***) denote statistical significance at the 10%, 5% and 1% levels, respectively. AIC and SBC are the Akaike and Schwarz Bayesian information criteria, respectively. LB (12) is the multivariate Ljung-Box (white noise) test for 12 lags. The sample spans the period 2001:7-2006:1.

Source: Data available from the Central Bank of Brazil and OECD estimations.

Figure 2.A3.1. **Volatility spillovers**

In per cent



Source: OECD calculations based on Equations (2.A2.3) and (2.A2.5).

Notes

1. For tests of volatility spillovers, see the financial econometric literature linking co-movements in asset returns and volatilities over time and across assets and markets (Kim *et al.*, 2005; Ng, 2000; Savva *et al.*, 2005, among others).
2. See Bauwens *et al.* (2006) for more information.
3. Note that c_i ($i = 1, 2, 3$) are combinations of the elements in C_0 . Also note that only the ARCH specification is retained in order to save degrees of freedom.
4. All percentage changes were multiplied by 100 to facilitate convergence in the estimation algorithms.

List of acronyms

ABDI	Brazilian Agency for Industrial Development <i>Agência Brasileira de Desenvolvimento Industrial</i>
AEB	Brazilian Space Agency <i>Agência Espacial Brasileira</i>
APEX	Export Promotion Agency <i>Agência de Promoção de Exportações</i>
BB	Bank of Brazil <i>Banco do Brasil</i>
BCB	Central Bank of Brazil <i>Banco Central do Brasil</i>
BIOTA	Virtual Institute of Biodiversity <i>Instituto Virtual da Biodiversidade</i>
BNDES	National Development Bank <i>Banco Nacional de Desenvolvimento Econômico e Social</i>
CAPES	Post-Graduate Development Agency <i>Coordenação de Aperfeiçoamento de Pessoal de Nível Superior</i>
CCFS	Sectoral Funds' Coordination Committee <i>Comitê de Coordenação dos Fundos Setoriais</i>
GCT	National Council for Science and Technology <i>Conselho Nacional de Ciência e Tecnologia</i>
CEF	Federal Savings Bank <i>Caixa Econômica Federal</i>
CGEE	Centre for Management and Strategic Studies <i>Centro de Gestão e Estudos Estratégicos</i>
CMN	National Monetary Council <i>Conselho Monetário Nacional</i>
CNDI	National Council for Industrial Development <i>Conselho Nacional de Desenvolvimento Industrial</i>
CNPq	National Council for Scientific and Technological Development <i>Conselho Nacional de Desenvolvimento Científico e Tecnológico</i>
EMBRAPA	Brazilian Agricultural Research Corporation <i>Empresa Brasileira de Pesquisa Agropecuária</i>
FAPESP	State of São Paulo Research Foundation <i>Fundação de Amparo à Pesquisa do Estado de São Paulo</i>
FAT	Workers' Fund <i>Fundo de Amparo ao Trabalhador</i>
FGTS	Severance Insurance Fund <i>Fundo de Garantia por Tempo de Serviço</i>

FINEP	Financing Agency for Studies and Projects <i>Financiadora de Estudos e Projetos</i>
FNDCT	National Science and Technology Fund <i>Fundo Nacional de Desenvolvimento Científico e Tecnológico</i>
IBGE	Brazilian Institute of Geography and Statistics <i>Instituto Brasileiro de Geografia e Estatística</i>
INOVA	Agency for Innovation – University of Campinas <i>Agência de Inovação da Universidade de Campinas</i>
INPI	National Institute of Intellectual Property <i>Instituto Nacional de Propriedade Industrial</i>
IPEA	Institute for Applied Economic Research <i>Instituto de Pesquisa Econômica Aplicada</i>
LDO	Budget Guidelines Law <i>Lei de Diretrizes Orçamentárias</i>
RGPS	Social-Security Regime for Private-Sector Workers <i>Regime Geral da Seguridade Social</i>
RPPS	Social-Security Regime for Public-Sector Workers <i>Regime Próprio de Previdência Social</i>
SEBRAE	Support Agency for Small and Medium-Sized Enterprises <i>Serviço Brasileiro de Apoio às Micro e Pequenas Empresas</i>
SENAC	National Commercial Training Service <i>Serviço Nacional de Aprendizagem Comercial</i>
SENAI	National Industrial Training Service <i>Serviço Nacional de Aprendizagem Industrial</i>
SENAR	National Rural Training Service <i>Serviço Nacional de Aprendizagem Rural</i>
SENAT	National Transport Training Service <i>Serviço Nacional de Aprendizagem do Transporte</i>
SESC	Retail Trade Social Service <i>Serviço Social do Comércio</i>
SESI	Industry Social Service <i>Serviço Social da Indústria</i>
SEST	Transport Social Service <i>Serviço Social dos Transportes</i>
SINE	National Employment System <i>Sistema Nacional de Emprego</i>

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This Survey was prepared in the Economics Department by Luiz de Mello and Diego Moccerro, under the supervision of Peter Jarrett.

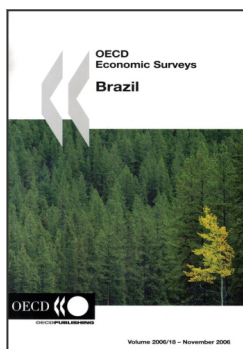
Consultancy support was provided by Carlos Brito Cruz, Naércio Menezes Filho and Luiz Guilherme Scorzafave.

Technical assistance was provided by Anne Legendre and secretarial assistance by Mee-Lan Frank.

The Survey was discussed at a meeting of the Economic and Development Review Committee on 10 October 2006.

BASIC STATISTICS OF BRAZIL (2005 UNLESS NOTED)

Area (thousands sq. km)	8 515
POPULATION	
Total (million)	184.2
Inhabitants per sq. km	22
Net average annual increase over previous 10 years, per cent	1.5
EMPLOYMENT	
Total employment (thousands, PNAD)	77 159
In %: Agriculture	12.8
Industry (including construction)	23.3
Services and other	63.8
GROSS DOMESTIC PRODUCT (GDP)	
GDP at current prices and current exchange rate (USD billion)	795.7
Per capita GDP at current prices and current exchange rate (USD)	4 320
Average annual volume growth over previous 5 years (in %)	2.2
In % of GDP : Agriculture	8.4
Industry (including construction)	40.0
Services and other	51.6
INVESTMENT	
Gross fixed capital formation (GFCF) as % of GDP	19.9
Average annual growth of ratio over previous 5 years (%)	0.6
CONSOLIDATED PUBLIC SECTOR (as % of GDP)	
Revenue	37.4
Primary balance	4.8
Nominal balance	-3.3
Net debt	51.5
INDICATORS OF LIVING STANDARDS	
Internet users, per 1 000 inhabitants (2004)	119.6
Doctors, per 1 000 inhabitants (2004)	1.6
Infant mortality per 1 000 live births (2004)	26.6
FOREIGN TRADE	
Exports of goods (USD billion)	118.3
As % of GDP	14.9
Average annual growth over previous 5 years (%)	16.5
Imports of goods (USD billion)	73.6
As % of GDP	9.2
Average annual growth over previous 5 years (%)	5.7
Total official reserves (million SDRs)	37 484
As ratio of average monthly imports of goods	8.7



From:
OECD Economic Surveys: Brazil 2006

Access the complete publication at:
https://doi.org/10.1787/eco_surveys-bra-2006-en

Please cite this chapter as:

OECD (2006), "Consolidating macroeconomic adjustment", in *OECD Economic Surveys: Brazil 2006*, OECD Publishing, Paris.

DOI: https://doi.org/10.1787/eco_surveys-bra-2006-4-en

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