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This Survey was prepared in the Economics Department by Annabelle Mourougane, Jens Arnold and Mauro Pisu, under the supervision of Peter Jarrett.

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BASIC STATISTICS OF BRAZIL (2010 unless noted)

Area (thousands sq. km)	8 515
POPULATION	
Total (millions)	190.8
Inhabitants per sq. km	22.0
Net average annual increase over previous 10 years (per cent)	1.2
Age distribution (% of total population)	
0-14	24.1
15-64	68.5
65+	7.4
EMPLOYMENT	
Total employment (thousands, PNAD, 2009)	92 689
In %: Agriculture	17.0
Industry (including construction)	22.1
Services	60.7
Unemployment rate (per cent)	6.7
GROSS DOMESTIC PRODUCT (GDP)	
GDP at current prices and current exchange rate (USD billion)	2 088.4
Per capita GDP at current prices and current exchange rate (USD)	10 948.0
Average annual growth over previous 5 years (in %)	4.4
In % of total value added: Agriculture	5.8
Industry (including construction)	26.8
Services	67.4
INVESTMENT	
Gross fixed capital formation (% of GDP)	19.7
Average annual growth of ratio over previous 5 years (%)	4.6
CONSOLIDATED PUBLIC SECTOR (in % of GDP)	
Revenue	38.4
Primary balance	2.8
Nominal balance	-2.6
Net debt	40.2
INDICATORS OF LIVING STANDARD	
Internet users, per 100 inhabitants (2009)	39.2
Doctors, per 1 000 inhabitants (2007)	1.72
Infant mortality per 1 000 live births (2009)	17.3
Income inequality (2009, Gini coefficient)	0.54
Poverty incidence (2009, national poverty line, % of population)	21.4
Literacy rate (2009, % of 10+ population)	80.4
FOREIGN TRADE	
Exports of goods (USD billion)	201.9
As % of GDP	9.7
Imports of goods (USD billion)	181.7
As % of GDP	8.7
Total official reserves billion (USD)	288.6
As ratio of average monthly imports of goods	19.1
Financial account (billion USD)	98.5
Of which: FDI (net inflows)	48.4

Executive summary

Since the mid-1990s, Brazil has enjoyed improved economic and financial stability largely owing to a strengthening of its macroeconomic framework. Social progress has also been impressive, with a marked fall in poverty and inequality. Increasing attention has been devoted to environmental sustainability. In order to quickly catch up with the group of high-income countries the overriding need is to achieve strong and sustainable growth. This will require continued good macroeconomic, social and environmental policies and structural reforms designed to boost savings and investment and foster infrastructure development. Higher international uncertainties and cross-country interdependence, rapid population ageing and a greater reliance on oil revenues will call for policymakers to expand their tool kit to respond to this challenge.

The key macroeconomic challenge is to damp inflation in a context of abundant global liquidity

The economy recovered rapidly from the 2008-09 global crisis thanks to a timely policy response. Annual growth in 2010 was the strongest in two decades. Driven by both structural factors and international financial conditions, the real *has steadily appreciated since 2003, except during the 2008 financial crisis and more recently when a flight from risk in the midst of financial-market turbulence weakened it. Inflation pressures have emerged. To prevent excessive currency fluctuations and safeguard financial stability the authorities initially combined increases in interest rates and reserve requirements with foreign exchange intervention and a temporary tax on short-term capital inflows (IOF). As the global outlook worsened, the policy mix was shifted toward easier monetary policy and some fiscal consolidation. If that proves insufficient in the current uncertain environment, policymakers can have recourse to macro-prudential measures or adjusting the IOF. However, they should rely more prominently on fiscal consolidation. The spending cuts announced earlier this year and the setting of primary surplus targets for the next three years in levels consistent with public debt reduction in the draft 2012 Budget Law are welcome and the government should continue in this direction. Over the medium term, moving to a headline budget target, introducing an expenditure ceiling while removing widespread revenue earmarking would foster sustainability of government and social security accounts. Further progress in poverty reduction could be made by directing more resources to the successful* Bolsa Familia *cash transfer programme.*

Removing obstacles to investment will be crucial to sustaining strong economic growth

A shortage of public and household saving appears to be a major barrier to higher investment rates. Parametric reforms to the pension system could restore its sustainability. Reduced expected pension benefits could also encourage people to save more during their working lives. Lower bank reserve requirements, the removal of directed lending obligations and a liberalisation of savings accounts would help to spur investment. Approval of the federal government's proposals to simplify the tax system would also strengthen investment incentives. The authorities have started to

implement measures to develop private long-term capital markets. Levelling the playing field between private-sector banks and the national development bank and providing an explicit tax credit independent of the lending institution could further facilitate private entry in long-term financial markets. Once private lenders have entered the segment, subsidies could be phased out progressively.

Faster infrastructure development would help to achieve better economic and social performance

For Brazil, returns to investment in infrastructure are likely to be substantial, especially if designed with environmental benefits in mind. The government is implementing a second large infrastructure programme, which has been rightly protected from fiscal cutbacks. A stronger focus on its most worthwhile projects would facilitate implementation. Attracting sufficient private investment will require streamlining the public-private partnership framework. Despite progress, frequent disputes around infrastructure projects often slow the licensing process. This could be addressed by adopting rules for financial compensation for residents harmed by projects. It is in water and sanitation that needs are greatest. The formation of local consortia needs to be encouraged to reap available economies of scale.

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Assessment and recommendations

The country has made a rapid recovery from the crisis

Brazil has achieved remarkable progress since the mid-1990s, largely owing to a strengthening of public institutions, in particular the inflation targeting framework coupled with exchange rate flexibility and the Fiscal Responsibility Law. Improvement in the social area has also been impressive, with a remarkable fall in poverty and inequality. Most product markets have been opened up, and labour market informality has receded. The country is now reaping the benefits of economic stability and increasing resilience, which, together with a timely macroeconomic policy response combining monetary easing, some fiscal stimulus and credit expansion, allowed Brazil to withstand the 2008-09 global financial crisis well. Real GDP growth of 7.5% in 2010 was the highest since 1986 and the fifth-best performance amongst the G20 countries (Table 1). This robust growth is estimated to have removed all remaining slack from the economy.

Over the next two years, real GDP growth is foreseen to slow to less than 4%, well below trend rates of around 4.5% per year. Domestic demand, spurred by strong investment, is likely to continue to sustain activity (Table 2). Inflation is projected to diminish gradually but to remain in the upper part of the target range of 2.5-6.5%. Risks surrounding this scenario are on the downside and good economic performance in Brazil remains contingent on a relatively benign scenario for the world economy.

Strong and inclusive growth will raise living standards

Robust economic growth and continued social progress will help Brazil to close its GDP per capita gap *vis-à-vis* OECD countries and join the ranks of high-income countries. There are several ways to boost output growth, while making it more inclusive and greener and thus more sustainable. Fostering productive investment will be crucial to achieving better economic outcomes. In particular, infrastructure development offers considerable potential to speed up growth and poverty reduction. Social and education policies can upgrade skills and raise long-term income gains. At the same time, sustaining high growth will require the authorities to persevere with their efforts to lower inequality and reduce greenhouse-gas emissions.

Over the next decade, greater reliance on oil resources and population ageing are going to modify the economic landscape. Oil production has been increasing steadily since 2003, but the discovery of massive oil reserves in offshore fields, known under the name pre-salt because the oil is located very deep underwater under a thick layer of salt, will place the country among the top ten countries in the world in terms of oil reserves. This will raise prosperity but also risks increasing tax revenue volatility and making fiscal policy more pro-cyclical. Although the fiscal framework is working well, it will need to be adjusted to adapt to this new environment.

A corrigendum has been issued for this page. See: http://www.oecd.org/dataoecd/58/4/48885088.pdf

Table 1. **Basic economic indicators**

Percentage change unless otherwise stated

	2000	2007	2008	2009	2010	Latest data in 2011[1]
Supply and demand						
GDP (current BRL billion)	1 179.5	2 661.3	3 031.9	3 185.1	3 675.0	4 087.0
GDP (current USD billion)	644.6	1 366.6	1 653.0	1 594.8	2 088.4	2 451.8
GDP per capita (current USD, PPP)	7 010.5	9 774.8	10 407.8	10 344.2	11 127.1	–
Real GDP	4.3	6.1	5.2	–0.6	7.5	3.1
Supply						
Agriculture	2.7	4.8	6.1	–4.6	6.5	–0.2
Industry	4.8	5.3	4.1	–6.4	10.1	0.9
Services	3.6	6.1	4.9	2.2	5.4	3.2
Demand						
Private consumption	4.0	6.1	5.7	4.2	7.0	3.9
Public consumption	–0.2	5.1	3.2	3.9	3.3	5.1
Gross fixed investment	5.0	13.9	13.6	–10.3	21.9	7.1
Exports	12.9	6.2	0.5	–10.2	11.5	9.6
Imports	10.8	19.9	15.4	–11.5	36.2	26.6
Public finances (public sector, in per cent of GDP)[2]						
Revenue	32.5	37.3	38.2	38.5	38.4	–
Primary balance	3.2	3.3	3.4	2.0	2.8	3.8
Headline balance	–3.4	–2.8	–2.0	–3.3	–2.6	–2.1
Net debt	45.5	45.5	38.5	42.8	40.2	39.2
Balance of payments (USD billions)						
Current account balance	–24.2	1.6	–28.2	–24.3	–47.4	–49.8
In per cent of GDP	–3.8	0.1	–1.7	–1.5	–2.3	–2.1
Trade balance	–0.7	40.0	24.8	25.3	20.2	28.6
International reserves (gross)	33.0	180.3	193.8	238.5	288.6	353.4
FDI (net inflows)	32.8	34.6	45.1	25.9	48.4	75.3
Outstanding external debt (in per cent of GDP)	33.7	14.1	12.0	12.4	12.2	–
Exchange rate and prices						
Exchange rate (BRL per USD, period average)	1.8	1.9	1.8	2.0	1.8	1.7
CPI inflation (IPCA, end-of-period)	6.0	4.5	5.9	4.3	5.9	7.3
GDP deflator	6.2	5.9	8.3	5.7	7.3	9.6
Labour market						
Unemployment rate (per cent)[3]	–	9.3	7.9	8.1	6.7	6.0

1. Data are for the latest available quarter or month. Data for the supply and demand blocks are for the first quarter of the year and annualised. Monthly CPI inflation is a year-on-year rate.
2. In 2000, includes *Petrobras* and *Eletrobrás*.
3. Refers to the Monthly Employment Survey (PME/IBGE).

Source: IBGE, Central Bank of Brazil, National Treasury.

Table 2. **Macroeconomic projections**

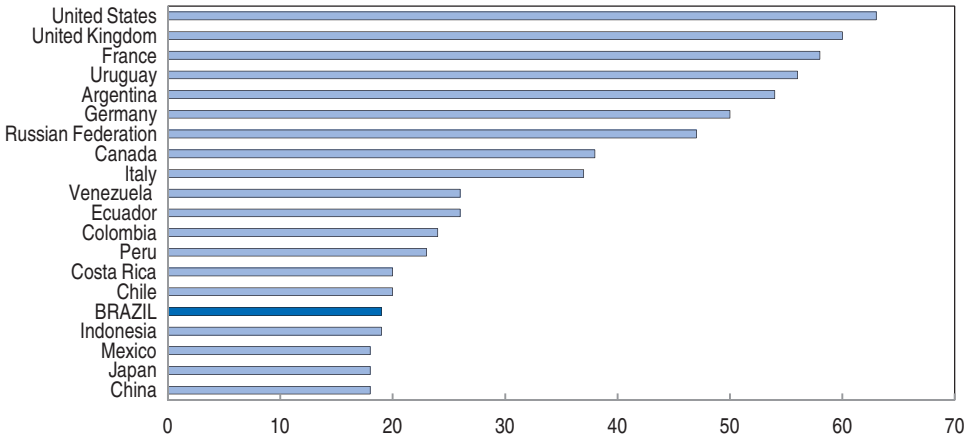
	2008	2009	2010	2011	2012	2013
Real GDP growth (per cent)	5.2	–0.7	7.5	3.6	3.5	4.0
Inflation (IPCA, end-of period)	5.9	4.3	5.9	6.5	6.2	5.1
Fiscal balance (per cent of GDP)	–2.0	–3.3	–2.5	–2.7	–2.9	–2.8
Primary fiscal balance (per cent of GDP)	3.4	2.0	2.8	2.9	2.5	2.5
Current account balance (per cent of GDP)	–1.7	–1.4	–2.3	–2.1	–2.5	–2.7

Source: OECD database (cut-off date: 12 October 2011).

Like many emerging-market economies, Brazil's population is going to age rapidly in the coming decade (Figure 1). The share of the elderly population is expected to double in less than 20 years, a transition that took around three times as long for today's advanced economies. These demographic changes will alter the macroeconomic environment. Assuming no policy changes, lower working-age population growth could lower potential output growth significantly by the middle of the century. This fall will most probably be partially compensated by the effect of the Growth Acceleration Programme (PAC) on productivity growth, but that impact is hard to estimate. Ageing is also likely to increase savings through life-cycle dynamics, although in Brazil's case prospects for aggregate savings will depend on the effectiveness of social and labour-market policies in continuing to lower the share of poor households, who traditionally save less. Ageing will also tilt public spending toward greater outlays on old-age pensions and health and long-term care and less on education, but the aggregate impact on public finance is likely to be negative.

Figure 1. **The speed of population ageing**

Number of years for the share of population 65+ to double from around 10% to around 20%



Note: United Nations population projections have been used. Numbers for France and the United Kingdom correspond to an increase from 12% to around 20%.
Source: OECD calculations.

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The authorities should take the opportunity to reform institutions to these prospective developments while the nation still enjoys a favourable demographic dividend. International experience also suggests that it will take time to formulate and implement structural reforms. These changes will need to be undertaken in an increasingly complex and uncertain international context that will require countries to expand their tool kit to respond to new challenges.

Restraining inflation without attracting volatile capital inflows is still the top macroeconomic challenge

Current domestic and international economic conditions present a challenge to monetary policy. Policy makers are faced with the "impossible trinity" (maintaining monetary policy independence, with a stable exchange rate and free capital movements), as raising the policy rate to cool the economy risks attracting short-term capital, fuelling economic expansion and exerting upward pressure on the *real*.

High returns have attracted capital inflows

Since 2009, Brazil has experienced a massive surge in capital inflows, boosted by increasing direct and portfolio investment (particularly in the form of equity securities), which accounted for most of the volatility. Abundant global liquidity and a high interest-rate differential with developed economies have contributed to these patterns (IMF, 2010). Internal factors such as financial-market deepening, increases in GDP per capita and improvement in regulatory quality have also helped to attract foreign investors (Furceri *et al.*, 2011). Looking forward, further progress in financial development and income convergence are likely to continue to attract capital inflows.

Such flows, together with strong domestic demand, have fuelled credit and asset-price increases. After a few months of stabilisation in the aftermath of the global financial crisis, credit growth has regained its pre-crisis momentum. However, the largest increases have taken the form of subsidised credit to the housing sector and credit supplied by the national development bank (*Banco Nacional do Desenvolvimento Econômico e Social*, BNDES), rather than from commercial banks (see below). After having massively expanded its lending in response to the global crisis, BNDES has started to scale back its operations. Robust labour income and the gradual implementation of the social programme My House My Life (*Minha Casa Minha Vida*), which aims at building new dwellings for low-income families, have boosted credit growth to housing. Nevertheless, households' debts have built up at sky high rates of interest, even though they remain below their pre-crisis levels. Consumer default rates have risen, and write-offs are expected to trend higher. Housing prices have soared in some metropolitan regions, such as Rio de Janeiro and São Paulo, but construction costs and the housing component of the consumer price index have increased at only a moderate pace. Overall, the risks of an asset price bubble remain contained thus far.

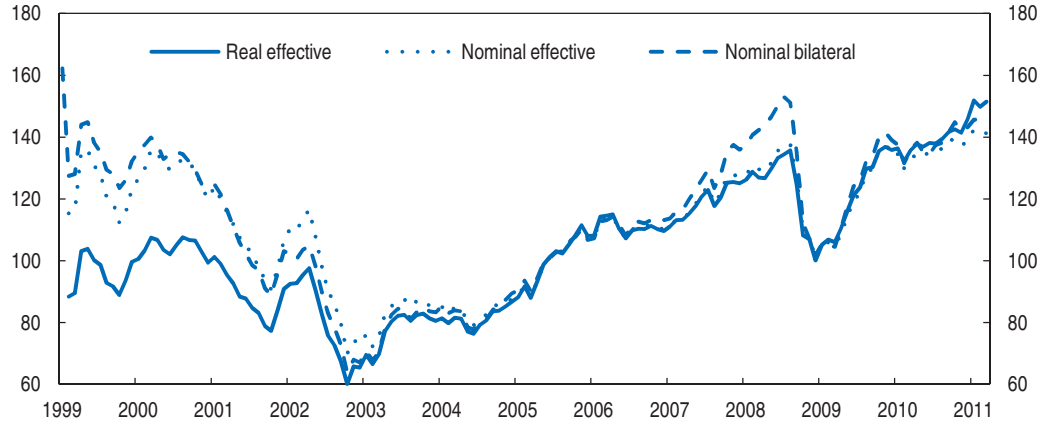
Making extensive use of foreign saving is an appropriate strategy to finance Brazil's large investment needs. In particular, foreign direct investment (FDI) is widely seen to be a source of technology transfers, bringing direct and indirect productivity benefits for host countries (Arnold and Javorcik, 2009; Keller and Yeaple, 2009). It also allows risk diversification and can help to deepen financial markets (Kose *et al.*, 2009). By contrast, excessive short-term capital inflows can lead to disproportionate exchange-rate movements and risk-taking, generating financial-market instability.

The currency has appreciated, in part reflecting structural changes in the economy

The *real* has appreciated steadily since 2003, apart from a temporary dip during the global economic crisis and a recent depreciation stemming from turbulence in financial markets (Figure 2). Capital inflows have contributed to currency strengthening, but their effect has been somewhat compensated by the favourable productivity differential between Brazil and its trading partners. New evidence reported in this Survey also suggests that growing oil production has pushed up the equilibrium exchange rate. This phenomenon is expected to gain prominence in the future with the exploitation of the pre-salt fields. Nevertheless, the *real* appeared to be overvalued in 2010, though the extent of its misalignment is hard to measure. Empirical estimates point to an overvaluation of 3 to 20% in 2010, depending on the approach. While estimates based on a Fundamental Equilibrium Exchange Rate (FEER) method (whereby the equilibrium exchange rate is the rate consistent with domestic and external balances) point to little overvaluation, those based on behavioural methods that

Figure 2. **Bilateral and effective exchange rate**

2005 = 100



Source: IFS and OECD calculations.

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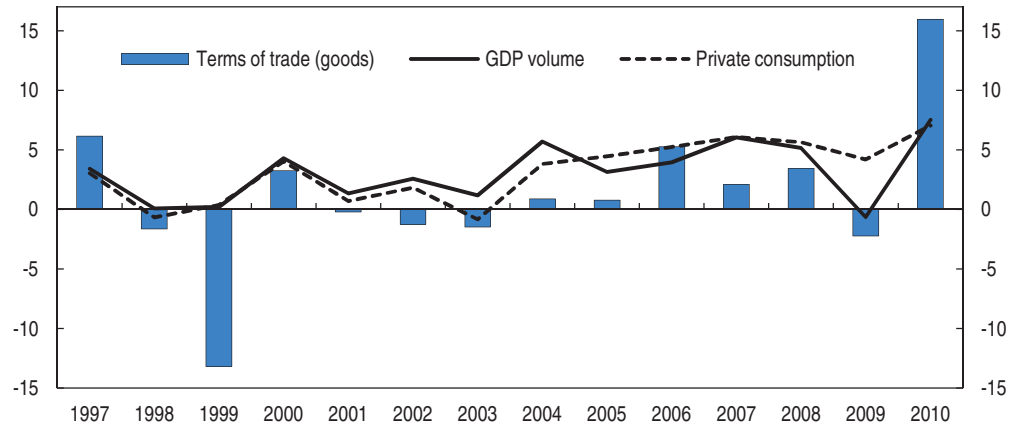
ascribe exchange rate movements to several factors including oil production and capital inflows suggest a more pronounced misalignment.

Thus far, however, there have been only limited signs that Brazil is starting to suffer from Dutch disease. The resource boom has generated significant wealth effects through sizeable increases in the terms of trade (Figure 3). Manufacturing production has declined but only in the aftermath of the financial crisis. Employment in the manufacturing sector has expanded, albeit at a slower pace than observed in the whole economy. Evidence is more conclusive on the trade side, as net exports of manufactures started to decline in 2005 while net exports of oil have continued to grow at a robust rate. But, other factors such as strengthening trade relationships between China and Brazil and Chinese and Asian competition in third markets may also explain some of these developments.

Figure 3. **Terms of trade, private consumption and GDP growth**

Per cent



Source: IBGE and Funcex.

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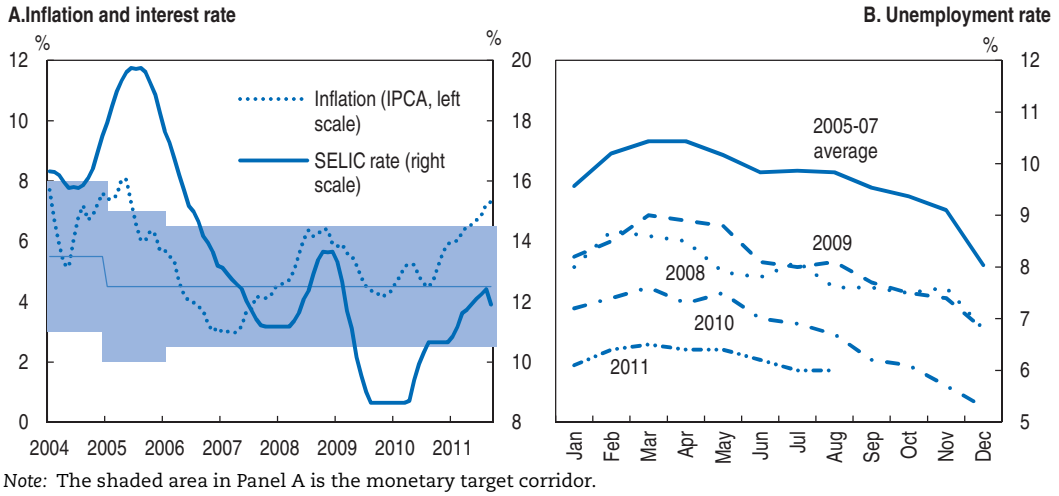
Inflation has temporarily moved up beyond the official target range

The rise in CPI inflation since late 2010 reflects a surge in food and beverages and energy components, but they have eased of late (Figure 4, Panel A). In the initial months of 2011, service prices experienced an upward trend, in particular for housing and transport. The currency appreciation has been tempering price increases since mid-2009, although financial turmoil exerted downward pressure on the currency in September. The positive output gap is also estimated to have allowed margins to expand somewhat. Inflation expectations have risen, and, given the carryover from late 2010, year-on-year inflation has surpassed the ceiling of the official monetary target since June. Inflationary tensions are expected to persist over the next few quarters even if commodity prices stabilise, as assumed in the projection, as currency weakness fuels price increases. Labour markets have remained extremely tight (Figure 4, Panel B). The unemployment rate has fallen to a record low, as robust job creation in most sectors, especially construction and services, has more than offset the rise in the labour force. The minimum wage is set to increase by 13.6% in 2012. Productivity growth in the industrial sector has been picking up, and average earnings have also accelerated.

Figure 4. **Inflation and the unemployment rate**

Per cent



Note: The shaded area in Panel A is the monetary target corridor.
Source: Central Bank of Brazil and IBGE.

StatLink http://dx.doi.org/10.1787/888932519909

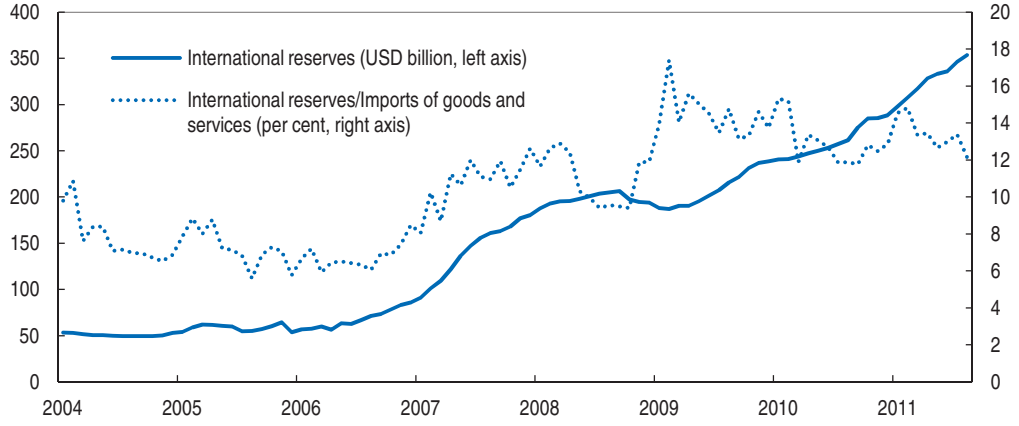
In this context, the Central Bank has relied on both changes in interest rates and macro-prudential measures. After having tightened commercial banks' reserve and capital requirements in December 2010 and lifted the interest rate by a total of 175 basis points since the beginning of 2011, the Central Bank eased the policy rate by 50 basis points to 12.0% in September in a context of increasing uncertainties on the global outlook. The Central Bank aims to achieve a gradual inflation convergence to the mid-point of the target range by end-2012.

In the current environment, it appears safe to use macro-prudential measures as a complement to traditional monetary tightening through increasing interest rates. The effectiveness of unconventional measures can be limited by financial innovation or regulatory arbitrage when transactions subject to prudential ratios are moved to

unregulated entities. Although, the effect of unconventional measures may be less clear in shaping expectations about the policy stance because market players are more familiar with signals sent by interest-rate tightening, they are increasingly being used in the context of plentiful global liquidity.

The Brazilian authorities have combined foreign exchange market interventions and a tax on some forms of capital inflows to discourage a speculative bubble in financial markets and reduce the appreciation of the *real*. International reserves were found to be only moderately in excess of their estimated warranted levels before the 2008-09 global crisis (Vujanovic, 2011). But they have risen dramatically since then and exceeded 15% of 2010 GDP in the second quarter of 2011, though this remains a moderate level in comparison with other large emerging-market economies (Figure 5). Despite its benefits in terms of building up a safety net, this policy appears to be particularly costly for Brazil, where the difference between what is paid by the Central Bank to commercial banks for draining their liquidity and the return on official reserves is large and the currency appreciation is likely to be in part a long-lasting phenomenon.

Figure 5. **International reserves**



Source: Central Bank of Brazil.

StatLink http://dx.doi.org/10.1787/888932519928

Accordingly, the government raised the rate of *Imposto sobre Operações Financeiras* (IOF) on foreign-income investment in October 2010 and made several adjustments to IOF in the months that followed. Although theoretical models show that it can be optimal to impose a tax on capital inflows under specific circumstances (Jeanne and Korinek, 2010), the empirical literature is much less conclusive, and it is difficult to estimate empirically the effects of the IOF tax on capital inflows. Nevertheless, past experience shows that capital controls have been successful in altering the composition of capital flows toward longer maturities. This seems to have been the case in Brazil. Portfolio investment, in particular in the form of equity securities, has been reduced considerably, while FDI remained broadly stable immediately after October 2010 and has even rebounded more recently. It remains to be seen whether this compositional effect stems entirely from the IOF tax and if it will persist over time. However, the increase in the IOF, if permanent, could distort resource allocation and lower the long-term attractiveness of investing in Brazil. It would thus be useful to remove existing restrictions on foreign and/or private equity in specific sectors such as fishing and transport, and also to reconsider recent legislative changes, whereby

the state-owned oil company *Petrobras* is granted a minimum 30% equity stake in any production-sharing contracts to exploit offshore reserves. International co-operation on capital flows on the basis of conclusions agreed by both developed and emerging-market economies, could help to protect open capital markets and to reconcile their advantages with the need to cope with short-term instability.

In the current macroeconomic situation in Brazil and elsewhere, mitigating the risks related to short-term capital inflows will require an array of policy instruments. Policy should not attempt to offset the exchange-rate appreciation to the extent that it reflects structural changes in the economy that have raised the equilibrium value of the *real*. Doing so would be ineffective, only pushing the real appreciation into the inflation column, hampering necessary economic adjustment and inviting further destabilising capital inflows. The current policy combination of exchange-rate flexibility that followed the abandonment of the peg in January 1999 with an inflation target is still the best choice to avoid abrupt adjustments, such as those observed in the past. These policies can be usefully complemented by additional counter-cyclical fiscal measures, which will reduce pressures on domestic demand and on inflation. Raising public saving is thus a priority. Structural reforms to strengthen the macro-prudential framework would further enhance the resilience of the economy to asset and credit bubbles. Short-term capital controls could also be used, especially if they manage to durably divert flows toward longer maturities. Over the medium term, measures to deepen financial markets would enlarge investment opportunities and allow capital inflows to be more easily assimilated and effectively utilised.

Refinement of the fiscal framework will help to improve public finances and sustain strong growth

Brazil strengthened its fiscal framework considerably with the adoption of the Fiscal Responsibility Law in 2000. The country has also enhanced the stability of its access to foreign capital and reduced exposure to exchange-rate shocks. Yet, changes to the framework could be beneficial to its growth prospects, without hampering its redistribution objectives.

Fiscal consolidation has started

Better policy institutions and prudent fiscal management has allowed the creation of a buffer that was used to cushion the 2008-09 downturn. However, public spending crept up in the second half of 2009 and during 2010, at a time when the recovery was well underway, fuelling already buoyant domestic demand. The fiscal impulse introduced during the crisis is being gradually reversed. In addition, the authorities announced a BRL 50 billion cut to the 2011 federal budget, corresponding to a cut in spending of about 0.5 percentage point of GDP compared to 2010 (after correcting for the recapitalisation of the state-owned oil enterprise, *Petrobras*). The announced budget cut is a first step toward fiscal consolidation, and available data for 2011 suggest the primary budget target is likely to be achieved. The government needs to keep moving in this direction. Lower budget financing needs would also help to ease inflationary pressures and avoid placing an excessive burden on monetary policy in the context of sizeable capital inflows and currency appreciation. In this sense, the government raised the surplus target for 2011 and, in the 2012 draft Budget Law, set primary surplus targets for the next three years at levels consistent with public debt reduction. One feature of that draft is the Greater Brazil Plan (*Plano Brasil Maior*), a

package of measures aiming at boosting competitiveness in key tradable sectors These measures amount to a total of some BRL 21 billion (0.6% of GDP). If economic growth in 2012 turns out lower than the 5% officially assumed, the authorities may have to restrict spending to meet the fiscal target.

Given Brazil's needs, it is important to direct spending to those areas that will have the most beneficial effects on its long-term growth or will achieve its social objectives. The government plans to focus restraint on mandatory spending but safeguard social and some infrastructure programmes. Such choices seem warranted. Spending on infrastructure, can, if allocated to more efficient uses, boost potential growth in the medium term. Well targeted social spending will also be crucial to improving social equity, in particular if support focuses on measures to help the young (see below). A 2.5% per year ceiling on the real growth of the federal government payroll and other outlays, currently under discussion in Congress, and severing the link between the minimum pension and the minimum wage (while maintaining the value of the pension in real terms) would help to restrain spending.

Oil revenues should be shared equitably across generations and among regions

Revenue-sharing mechanisms should ensure that future generations get their fair share of oil revenues, as petroleum reserves are a finite resource. The Brazilian authorities set up a Social Fund (*Fundo Social do Pre Sal*) in December 2010 where some of the oil revenues are to be saved. Details regarding the specifics of the fund are still under discussion. Current plans suggest that the real returns on it will be spent on non-earmarked yet mostly education measures, although some will be allocated to a broader range of social and environmental areas. According to the law, spending from the fund will be directed to the most cost-effective programmes. The establishment of the Social Fund will help to achieve inter-generational equity. Its assets should be invested in a diversified portfolio that maximises returns and should therefore include foreign holdings. This will also mitigate the risk of Dutch Disease. At the same time, international experience suggests that erecting firewalls against political interference would reduce the risk that natural resource revenues are spent for short-term political gains. This could be done by delegating the management of the fund to an agency whose good governance should be ensured by clearly spelling out its objectives set in a democratic fashion.

The redistribution of oil revenues also needs to be equitable across regions. In draft legislation the authorities plan to share the non-saved proceeds of oil production from the pre-salt areas among all states and municipalities, including those that have no involvement in the oil industry. In order for these revenues to be well used, local governments should be encouraged to seek efficiency gains, as experience from the past in Brazil and elsewhere shows that oil windfalls have often resulted in increased spending without commensurate improvements in socio-economic outcomes. The federal government could strengthen incentives for efficiency enhancement by introducing rewards for good sub-national government performance.

Counter-cyclicality could be increased

The current fiscal framework is working well. The country has managed to reach its primary surplus target in most years, and the public debt-to-GDP ratio has been declining. Nevertheless, the framework will need to be adapted over the medium term to a new configuration in which oil windfalls will represent a large share of tax revenue and

population ageing will weigh on public finances. The Brazilian authorities set up a Sovereign Wealth Fund (*Fundo Soberano do Brasil* – FSB) at end-2008, using fiscal resources, to be used as a counter-cyclical instrument. The fund also aims at smoothing exchange-rate volatility and promoting investment. However, no injection has been made to the fund since 2009, despite the strong economic performance in 2010, as priority was given to paying down the public debt and central government spending as a share of GDP also rose in 2010, due to the the fiscal stimulus being removed only gradually. Overall, as in many OECD countries, incentives embodied in the fiscal framework do not seem to be sufficient to put money aside during good times.

The fiscal target needs to be set in line with the long-term sustainability of government and social security accounts. At the moment, the target is defined in terms of the primary balance, which excludes interest payments. The target is expressed in levels and is binding for the first year, while targets (as a ratio of GDP) for the two following years are indicative. It was chosen at a time when securities paying floating interest rates and indexed to the exchange rate represented the bulk of traded public debt, and the net public debt-to-GDP ratio was extremely sensitive to interest- and exchange-rate changes. But improvements in debt management have lowered these vulnerabilities. Thus, although the current fiscal framework has been successful in reducing public debt, it would be beneficial over the medium term to switch to a fiscal target, expressed in terms of the headline fiscal balance and consistent with a long-term debt-to-GDP objective that reflects economic fundamentals and social preferences. The derivation of such a debt target and the associated fiscal balance path is fraught with difficulties, and the economic literature offers little specific guidance in this respect. Several options could be envisaged, such as maintaining nominal debt constant or stabilising the debt-to-GDP ratio. In any case, transparency and simplicity are important features for the credibility of any framework.

To improve budget management, the government should phase out recourse to one-off revenues and contingency measures, which have undermined the balance target and the predictability of fiscal policy. Examples in the past include discounting some investment spending and using "savings" from previous years to meet official targets. The authorities have signalled they will not use these facilities for 2011 and 2012 and should adhere to this pledge. In addition, a combination of commitments to reverse slippages relative to deficit or debt targets or specific escape clauses in the event of unpredictable events could be put in place.

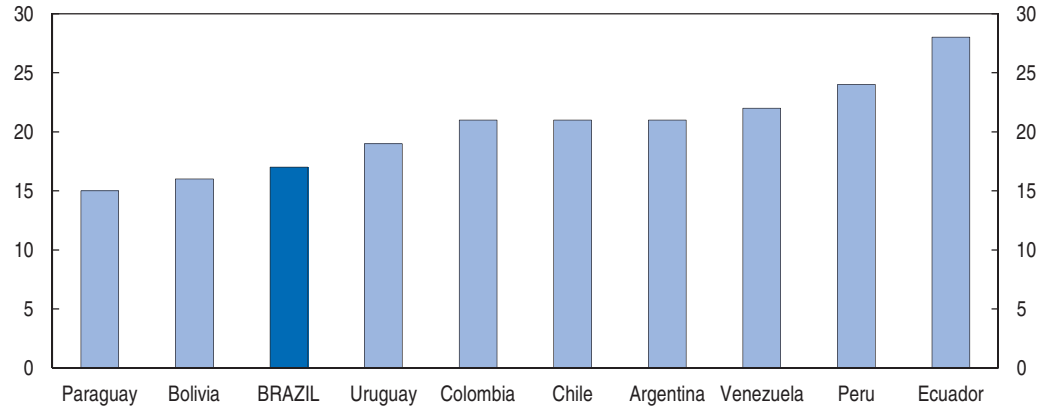
Within this fiscal framework, the introduction of an expenditure growth ceiling would strengthen fiscal control, as the experience of the Netherlands and Sweden has shown. A first step in this direction will be taken if the ceiling on public payroll spending growth is adopted. However, a precondition for an expenditure ceiling to be effective in the case of Brazil would be to substantially reduce widespread revenue earmarking, as was recommended in previous *OECD Economic Surveys*. Although earmarking was introduced in the Constitution to protect some items from cuts during periods of fiscal adjustment and make revenue streams more predictable for different jurisdictions, it has ended up preventing the reallocation of budget appropriations toward more beneficial uses and discouraging efficiency gains through cost-cutting measures. A phasing out of revenue earmarking would enhance budget flexibility.

Higher investment rates would allow faster long-term growth

Faster capital accumulation will help to counteract the impact of population ageing on potential output growth. At the moment, investment rates appear to be low by emerging-market standards, despite a slight improvement since 2000, mostly reflecting developments in the energy sector (Figure 6). In the aftermath of the global financial crisis, capital accumulation and a pick-up in total factor productivity has contributed to faster potential output growth. Further reforms will be needed for these trends to be sustained much less accelerate. In addition to those reforms, further improvements in human capital would also enhance incentives to invest.

Figure 6. **Investment rates in Latin American countries**

Per cent of GDP, 2009



Source: World Bank.

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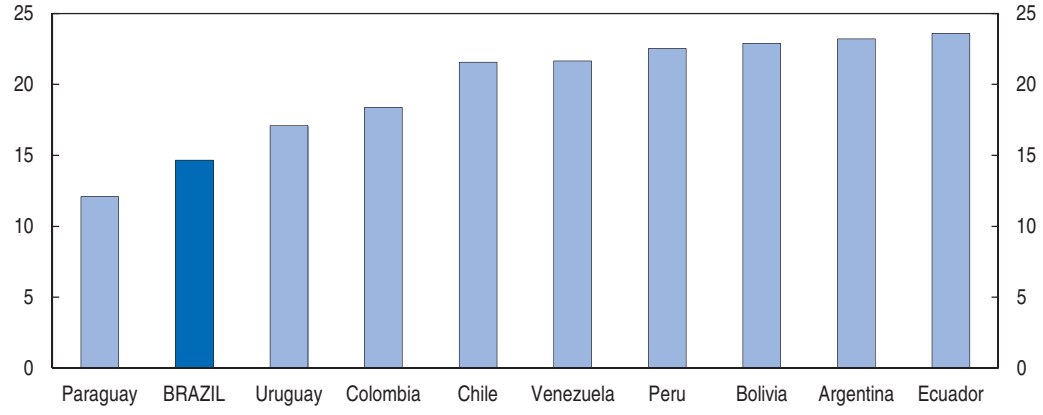
Reforming the pension system would support saving and investment

Insufficient domestic saving appears to be one of the most important restraints on investment. Brazil's national saving rate is lower than that observed in most other Latin American countries (Figure 7). Corporate saving already accounts for 90% of national

Figure 7. **Gross national saving in Latin American countries**

Per cent of GDP, 2009



Source: World Bank.

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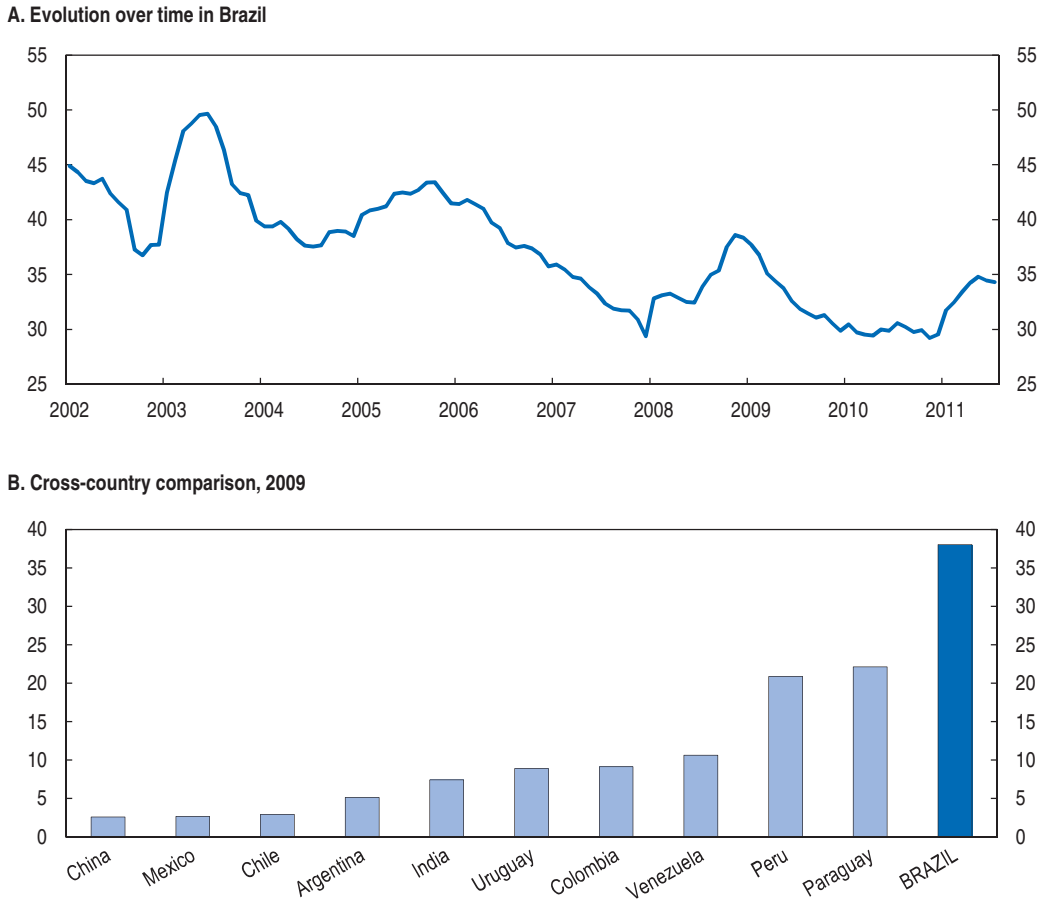
saving, and there is little scope for boosting it much further. By contrast, there is ample room to raise public and, to a lesser degree, household saving. Parametric reforms to Brazil's pension system could increase households' incentives to save for retirement and help to restore the sustainability of the system. Pension-related expenditure is currently around 9% of GDP but is expected to rise when the effects of population ageing start to kick in, adding to pressures from increasing public health spending. A specificity of the Brazilian system is that minimum pension benefits are indexed to the minimum wage, which has risen rapidly over the last decade. To contain pension costs, it would be preferable to index minimum pension benefits to an average of consumer price inflation and wage increases, as for instance in Switzerland. Sustainability could be further enhanced by indexing minimum pension benefits only to consumer prices over a transition period. In addition, fixing a minimum retirement age, possibly 65, which is currently under discussion within the government, or number of years of contribution, say 40, and removing the distinction based on gender, would bring Brazil's pension system more into line with current practice in OECD countries and other emerging economies. This, together with higher pension penalties for early retirement, would also help to bring the effective retirement age up. In the future, the retirement age could be linked to rising life expectancy so as to make adjustment automatic and thereby avoid using up political capital in a routine reform process. Such changes should be implemented gradually to avoid disruptive costs and increase public acceptance. Changes in federal civil servants' social security, proposed by the federal government, have been under discussion since 2003 in the National Congress. They would introduce a ceiling on the pensions of new civil servants and establish a complementary pension fund to which both the employer and the employee would contribute. These measures, if implemented, would be likely to increase household savings and reduce the burden of civil servant pensions on the social security budget in the long run.

Lower interest rates will foster investment

Real interest rates have declined markedly in Brazil, but remain extremely high by international standards (Figure 8). Corporate borrowers in Brazil paid an average annual nominal interest rate of 31% in March 2011, while personal loans were charged at an average rate of 45%. Beyond the scarcity of domestic saving as one candidate explanation, a comprehensive picture of the underlying factors behind these record levels is still missing. Nevertheless, addressing some of the issues that have been identified is likely to reduce lending rates and thereby support higher levels of investment.

History is clearly one reason behind the high level of interest rates, but other countries have managed to put behind them a turbulent economic past and achieve much lower rates. Although many market participants will remember hyperinflation and public debt defaults from the past, Brazil has enjoyed a decade of successful inflation targeting and primary fiscal surpluses, and the problems of the more distant past should not play a major role in forming expectations today. Another explanation can be linked to market perceptions of the government's ability to rein in or reduce the level of current public expenditures, and the interest rate might be reduced by further improving market confidence in the country's fiscal prospects. Indeed, the primary surpluses in recent years have been achieved mostly through increases in the tax burden rather than spending restraint, and that the debt reductions of the last decade have been more a result of GDP growth than fiscal effort (FUNDAP, 2011). Another factor that contributed to the debt

Figure 8. **Real interest rates facing borrowers**



Note: Real Interest rate is the average interest rate charged on credit contract for individual and corporate borrowers, adjusted for 12-months ahead inflation expectations (IPCA) in Panel A and the GDP deflator in Panel B.
Source: Central Bank of Brazil, World Bank.

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reduction was the lower level of real interest rate in the period, which also contributed to the decline of the ratio of public debt to GDP. Exchange-rate risks, which had played a role for Brazil's public debt in the past, have been eliminated, and Brazil is now a net creditor in foreign currency. Parametric reforms to the pension system, as mentioned above, would certainly send a useful signal and help to raise market confidence by reducing the future burden on public finances stemming from social security.

Lower intermediation spreads would reduce the cost of capital

Financial markets in Brazil are largely bank-based. Banks' intermediation spreads are elevated by international standards, adding to the cost of capital and creating a bias toward short-term high-risk investment, instead of the long-maturity investment that the country needs. High borrowing costs are particularly onerous for small and medium-sized firms whose access to foreign finance is limited. Although there is no agreement on the reasons behind these high spreads, a number of explanatory factors can be put forward:

- The high Central Bank's official interest rate, the Selic rate, which is a reasonable proxy for bank funding costs, is probably one of the major reasons why interest margins are so high in Brazil, and the two series are strongly correlated.

- Compulsory bank reserves are extremely high by international standards (up to 43% for demand deposits) and are either not remunerated at all or only at below-market rates. They are found to have a bearing on the interest spread between lending and borrowing rates and on credit volumes (Souza Rodrigues and Takeda, 2005; Montoro and Moreno, 2011; Mesquita and Toros, 2010). Although compulsory bank reserves may be helpful from a financial stability perspective, lowering the level of reserve requirements for banks would reduce the level of implicit taxation of financial intermediation and the cost of capital.
- The banking sector is also heavily taxed, and this adds to its costs. In addition to the high level of taxes on corporations, the banks are also subject to additional taxes. The pass-through of taxes on banks into lending rates is found to be almost complete, implying that these taxes are ultimately borne by borrowers (Cardoso, 2003). In this context aligning taxation of financial institutions to treatment applied to the rest of the economy would reduce intermediation spreads and spur higher levels of investment.
- Directed credit operations with regulated interest rates to priority sectors including rural credit and housing (which together account for around 13% of credit volumes), and price regulation on savings accounts may also contribute to high spreads on non-preferred lending. These schemes are costly to administer and lead to cross-subsidisation, whereby banks charge higher prices on non-regulated lending operations. In addition, extensive intervention in financial markets distorts both relative prices and credit allocation economy-wide. Directed lending schemes that commit banks' resources need to be phased out. During an inevitable transition period, remaining credit subsidies implicit in these schemes should be financed on a broader tax base, such as through general taxation. This would be less distortive than the current approach of earmarking a fixed share of deposits to these schemes, which results in only the financial sector bearing the costs.

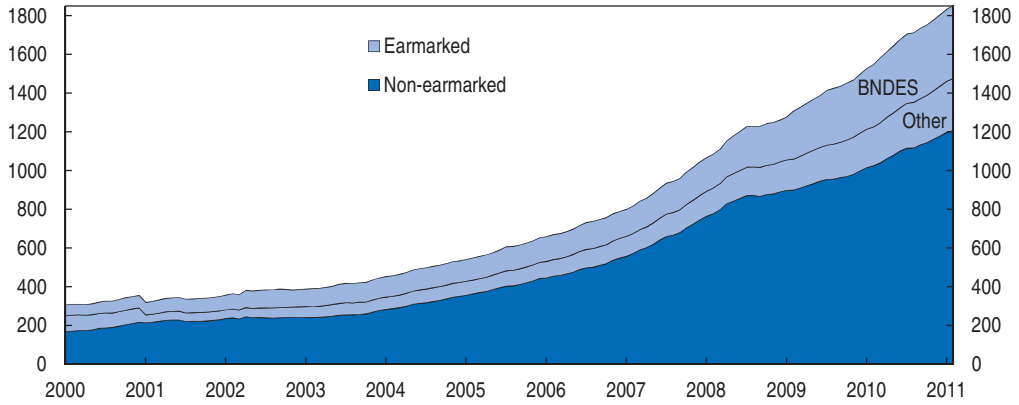
Without the development of long-term capital markets investment financing will remain stunted

The national development bank (BNDES) was originally created to resolve a market failure and has been helpful so far, as private lenders were unable to provide long-term financing. It is financed through compulsory saving via the workers' tax fund (FAT) and public transfers and supplies credit for long-term investment projects, at rates considerably below the short-term borrowing costs of the government. The volume of BNDES financing has recently increased rapidly in response to the 2008-09 global financial crisis (Figure 9). This liquidity injection was helpful in avoiding a credit crunch during the crisis but risks becoming an obstacle to private entry into this market segment now that the situation has normalised. BNDES has now appropriately started to withdraw from the provision of short-term working capital for firms.

Satisfying Brazil's financing needs as the country develops will require increasing private-sector participation in the long-term credit market, beyond acting merely as distributors of smaller BNDES loans. However, in the current context where most financial assets are short-term, private banks themselves are finding it difficult to get access to long-term financing. A way to facilitate banks' access to long-term funding is to lift current restrictions on savings accounts, in particular related to their uniform remuneration and maturity and the directed credit obligations that are attached to them. In addition, fostering the development of long-term capital markets would allow banks to get long-term bond financing. Accordingly, the

Figure 9. **Earmarked and non-earmarked credit flows**

BRL billions



Source: Central Bank of Brazil.

StatLink http://dx.doi.org/10.1787/888932520004

authorities started to implement a range of measures in December 2010, including an authorisation to create a liquidity fund aimed at increasing trading volumes of private bonds on secondary markets. The government also phased out restrictions on banks' direct marketing of long-term bonds (*letras financeiras*) to the general public and created tax incentives for investing in longer-maturity assets and trading such assets. Finally, BNDES has bought and issued long-term bonds that are not indexed to overnight interest rates with the aim of creating a market for such securities. These are welcome and promising initiatives that leverage BNDES' strong potential as a market maker.

However, even when the funding difficulties for private banks and the resulting maturity mismatch are solved, BNDES' unique access to comparatively cheap funding will hamper private supply of long-term credit. In a likely scenario, private banks' funding costs would be above BNDES' current lending rates. Private participants' entry into long-term financial markets could be facilitated by aligning private banks' funding costs with those of BNDES and providing an explicit tax credit for borrowers that would be independent of the choice of lender. In a second step, this tax credit could be phased out once private lenders have established a sufficient presence in this market, in order to avoid any abrupt reduction in credit supply.

A lower tax burden would also encourage investment

High levels of taxes by the standards of emerging-market economies, together with a complex and fragmented system, reduce after-tax returns and curb incentives to invest. Value-added taxes (ICMS), imposed at the state level, are assessed on an origin basis, adding enormously to compliance costs. In addition, these taxes are levied on enterprise turnover rather than value added in some sectors, which distorts firm decisions on internalisation and the organisation of the production chain. The government plans to try once again to rationalise the tax system. It intends to send a proposal to Congress to introduce some payroll tax relief and unify states' rate of VAT. State finance ministries have recently discussed a gradual harmonisation of interstate ICMS rates at 4% by 2012. The tax package proposal also envisages a consistent refunding of tax claims resulting from exports and investment. Currently, these refund claims are not always honoured or paid only with long delays. These recommendations are in line with what was suggested in the

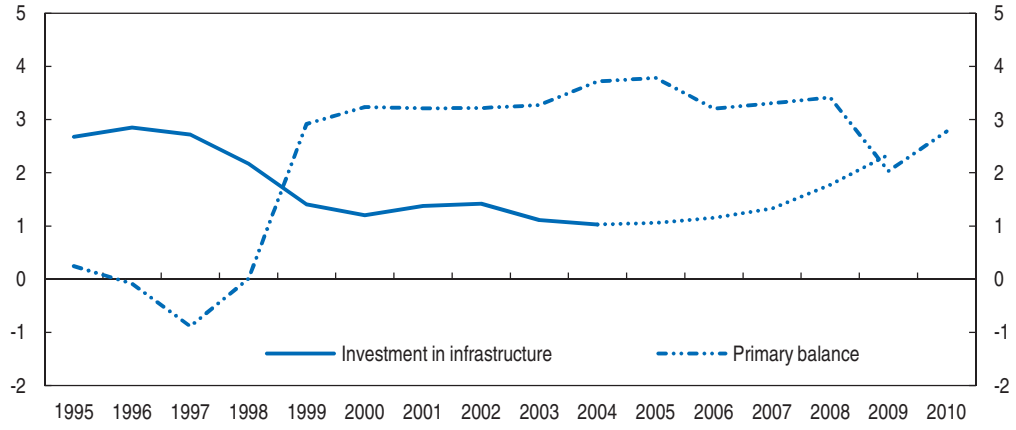
OECD's latest *Going for Growth* publication (OECD, 2011) and the last *Economic Survey* (OECD, 2009), which examines the tax system in more details. The government should follow through with the proposed reform package. Further improvements could be achieved by combining existing VATs with municipal taxes on selected services, the tax on industrial products and various federal contributions into a single value-added tax with full credit for exports and capital goods and intermediates purchases, and by a consistent choice of value added rather turnover as the tax base. If differences in tax rates across states are retained, taxes should be determined on a destination basis to avoid distortions in interstate trade and reduce the incentives for predatory tax wars among states. Budget permitting, investment incentives could be strengthened by raising depreciation allowances for corporate income taxes. Finally, it would be preferable to compensate currently envisaged decreases in states' VAT by commensurate increases in federal VAT, as consumption has been found to be one of the more growth-friendly bases for taxation in cross-countries analysis (Arnold *et al.*, 2011).

Greater investment in infrastructure would improve economic performance and social development

For Brazil, investment in infrastructure, if well designed, is likely to have high economic and social pay-offs. A lack of investment spending in Brazil has resulted in inadequate infrastructure provision. According to Morgan Stanley (2010), Brazil would need to invest about 4% of GDP per year over 20 years to catch up to the infrastructure levels of Chile, the infrastructure leader in South America. Since the late 1990s, private-sector participation has not offset the decline in public spending resulting from pressures for fiscal consolidation (Figure 10).

Figure 10. **Primary surplus and public infrastructure investment**

Per cent of GDP



Note: Sectors covered include transport, sanitation, communications and electricity. Given the lack of official data, total government investment in infrastructure has been extrapolated using data on federal investment in infrastructure after 2005.

Source: Afonso *et al.* (2005), IPEA (2010) and OECD calculations.

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The Growth Acceleration programme (PAC) is a laudable initiative

Infrastructure development is therefore one of the main priorities on the government's policy agenda. It launched a large infrastructure programme in 2007, followed in 2010 by a

second programme. The first stage met with positive outcomes. Despite some delays in project delivery and spending execution at the start, infrastructure outlays by the federal government and SOEs rose markedly to reach an estimated 3.2% of GDP in 2010. The programme helped to build up expertise and capacity at the central and local levels. Planned investment spending for the second stage (excluding oil and gas and housing) is estimated to reach BRL 394.9 billion over the next four years, representing an average of around 2.7% of 2010 GDP per year, with most investments expected in the electricity sector. The federal government also finances additional infrastructure programmes that are not included in PAC. It should continue to preserve PAC infrastructure spending related to network industries from budget cuts. PAC also increases spending on Operation and Maintenance (O&M) to rehabilitate the existing infrastructure stock. O&M expenditure has already been separated from other outlays in sectors such as railways, and a similar separation is planned in others. In addition, O&M costs are used as a criterion in PAC project selection. The government should go even further by setting specific rules to quantify the yearly O&M costs of existing and planned infrastructure and incorporating them in multi-year budgets. This will facilitate planning and help to protect O&M spending from budget cuts.

In 2005, the pilot programme that preceded PAC selected projects whose pay-offs were the highest, but given the state of infrastructure in Brazil, the coverage of PAC has since been expanded. The programme now includes a very wide range of projects, covering several aspects of infrastructure, but also social developments, and it involves many actors. In this context, increasing amounts of resources have been devoted to monitoring project implementation. In addition, the government focuses in its PAC reports on large or strategically important projects. Priority should be given to completing the most worthwhile projects within PAC. In early 2011, PAC management was transferred to the Ministry of Planning, which took charge of co-ordination. It will be useful to monitor whether this institutional change will overcome the co-ordination challenges.

In order to minimise PAC's budgetary cost, the government has sought to promote private participation in infrastructure projects. Historically, private participation in Brazil has mostly taken the form of concessions, which have been awarded for those projects that are financially viable without any public payment to the private operator. In 2004, the government put in place a legal framework to manage the use of Public Private Partnerships (PPPs) for projects requiring public subsidies to be financially viable. The law is well designed, improves transparency and is expected to limit excessive contract renegotiations, which have marred private participation in Latin America in the past (Calderón and Servén, 2010). But so far the programme has failed to generate the expected increase in the number of PPP projects, partly reflecting the very cautious approach chosen by the government. In this regard, the decision to make more use of PPPs, in particular in the road sector, is a step in the right direction. Slow take up may also be explained by the cumbersome process of project selection and evaluation, which involves many agencies and ministries. Improving the business environment is the first choice to attract further private investment in infrastructure sectors, but this may take time to materialise. There is also scope to streamline the selection process of infrastructure projects, while continuing to scrutinise project viability through rigorous value-for-money exercises. Consolidating responsibilities among the numerous institutions involved is also likely to speed up the process.

Environment licensing should be streamlined

Even though there has been some improvement of late, environmental licensing remains a significant source of investment delays, especially in the energy sector, because of the frequency of disputes around infrastructure projects. Brazil is one of the very few countries that employs a three-stage licensing process (involving Preliminary, Installation and Operating Licenses), with separate procedures and opportunities for third parties to initiate a dispute at all three stages. This approach has resulted in uncertainty, lengthy delays and high transaction costs. In 2005, a timeline for each step was established, with the main objective of reducing the time spent during the first phase. Further progress could be achieved by adopting comprehensive rules for financial compensation for residents affected by projects, and the authorities are currently working on this issue. In addition to increasing predictability, this would also speed up the process and lower the likelihood of challenges.

Barriers to investment in certain network sectors should be lifted

In different network industries, the country has undertaken several reforms over the past two decades to improve access. Efforts should be pursued to remove the remaining obstacles to investment.

Water and sanitation is the sector where investments are probably the most needed. The situation is particularly critical for sewerage, as only 47% of the population – concentrated in the South-Southeast region – benefit from sewage collection, and approximately 20% of collected sewage is treated. Service coverage varies widely across municipalities, which are responsible for provision. One reason for the lack of investment in the sector is the high level of debt of certain municipalities. To address this issue, the federal government can provide special loans to help municipalities in financial difficulty and has been doing so. The federal government could envisage making such loans conditional on reforming service providers' structures and making their operations financially viable, for instance by forming a consortium of municipalities to set up a single water supplier. This may provide the right incentives to exploit available scale economies.

The most important challenge in the electricity sector lies in raising generation capacity to meet the rapidly expanding demand in the coming years. Diversifying generation sources and making marginal prices for electricity more responsive to demand, as currently planned by the authorities, will help. The authorities should also look into the possibility of cross-subsidisation in the power sector and, depending on the results of the investigation, prohibit distribution and generation firms from belonging to the same group. Given the dominant role played by the state-owned company, *Eletrobrás*, it would also be useful to explore whether there is room to open up competition in the generation segment. Social tariffs that facilitate access for low-income households can distort investment decisions and lead to cross-subsidisation across customers, with prices for high-volume customers being above cost-recovery levels and, in the case of firms, hampering their competitiveness. A more cost-effective way to support such households would be to make greater use of existing cash transfer schemes, which target the poor.

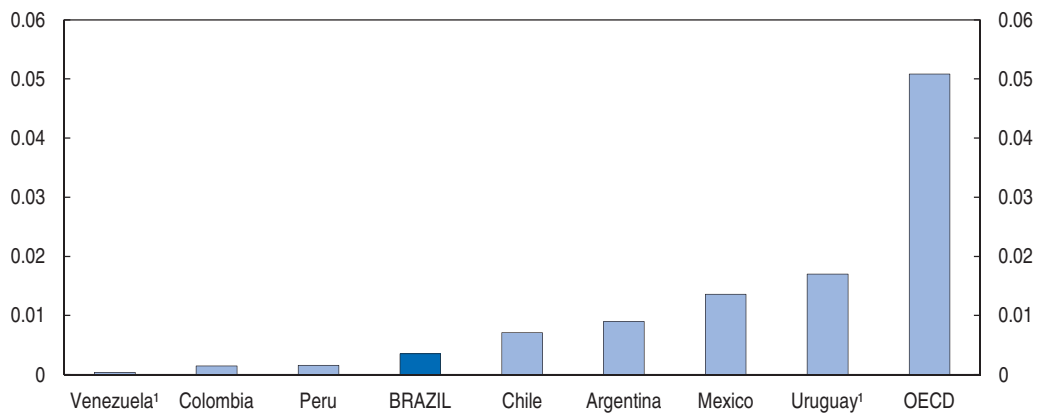
Turning to other network industries, there is still room to inject further competition into the market for fixed telephony, as firms enjoy monopoly positions in their concession areas by having full control over the use of their infrastructure network. At present, the sector is separated into two regimes. In the "public" regime, firms are required to achieve

universal service targets, comply with price caps and fulfil universal service obligations and accounting separation. There is usually one dominant player per state, and the regime is restricted to the fixed-line segment. This regime is set to expire by 2025 and should be reviewed by 2015. Under the "private" regime, firms operate under minimum intervention from the government, and prices are free. The authorities should take the opportunity of the 2015 deadline to review the costs and benefits of maintaining the current dual system, given the difficulty of injecting competition in market segments under concessions. If it is found useful to maintain the two regimes, the authorities should lower entry barriers and issue regulations that clarify the conditions under which a competitor can rent existing fixed-line infrastructure. Furthermore, the current regulatory framework seems ill-suited to deal with the process of telecommunications and broadcasting service convergence. The authorities should co-ordinate the regulatory settings of the communication and broadcasting sectors better to meet the requirements of service convergence. Such a strategy could prepare the sector for moving to a single telecommunications/broadcasting licence, which is likely to spur competition in different service markets, allow operators to reap economies of scope and increase the variety of services offered and thus consumers' welfare.

The Brazilian rail and road networks are underdeveloped (Figure 11). The decision to increase public investment in railways in a context of fiscal consolidation is welcome, given the long-term pay-off associated with this type of investment. The authorities should continue to protect investment in railways from budget cuts. Regarding roads, spelling out precise investment targets in concession contracts would encourage concessionaires to extend and improve the network over the entire life of the concession and not just to rehabilitate it, as is currently the case.

Figure 11. **Rail lines**

Total route-km over km^2 of land area, 2009



1. 2008.

Source: World Bank (*World Development Indicators*).

StatLink http://dx.doi.org/10.1787/888932520042

Other measures to achieve a sustainable rise in living standards

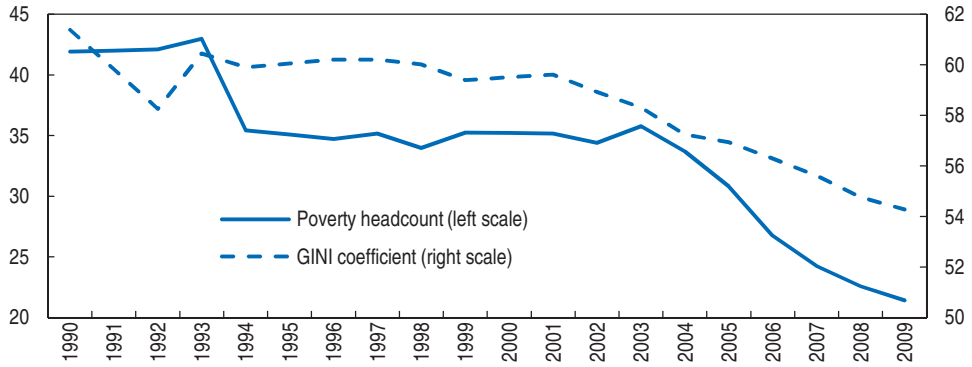
Two pre-requisites to make strong economic growth sustainable are to spread its benefits widely and to ensure that the development path is consistent with the protection of the environment.

Maintaining the momentum of poverty reduction is a high priority

The fight against extreme poverty has been put at the forefront of the government policy agenda. Since 1993, Brazil has experienced a sharp and continuous decline in inequality, reflecting good labour-market performance and successful redistribution policy (Figure 12). The poverty rate has declined by half. This remarkable progress must be continued to further reduce the still high levels of inequality and poverty. Further required action will involve an extension in scale and scope of the highly efficient conditional cash transfer programme *Bolsa Familia*, which has managed to relieve poverty at relatively low fiscal cost. The programme reached 12.7 million households in 2010 and cost 0.4% of GDP, whereas 11% of GDP was spent on social security benefits, most of which go to the middle class (Abrahão de Castro and Modesto, 2010). A noteworthy achievement of *Bolsa Familia* has been to set up an almost exhaustive registry of poor households in the country, which could be used to improve the targeting of other social policies, as planned in the recently launched government programme *Brasil sem Miseria*. These additional services could include care for children and elderly household members, training or loans, and would help to overcome poor families' informational barriers with respect to the social policies already on offer.

Figure 12. **Poverty and income distribution**

Per cent



Note: Poverty headcount refers to the number of persons below the poverty line, in per cent of total population.
Source: IPEA (IPEADATA).

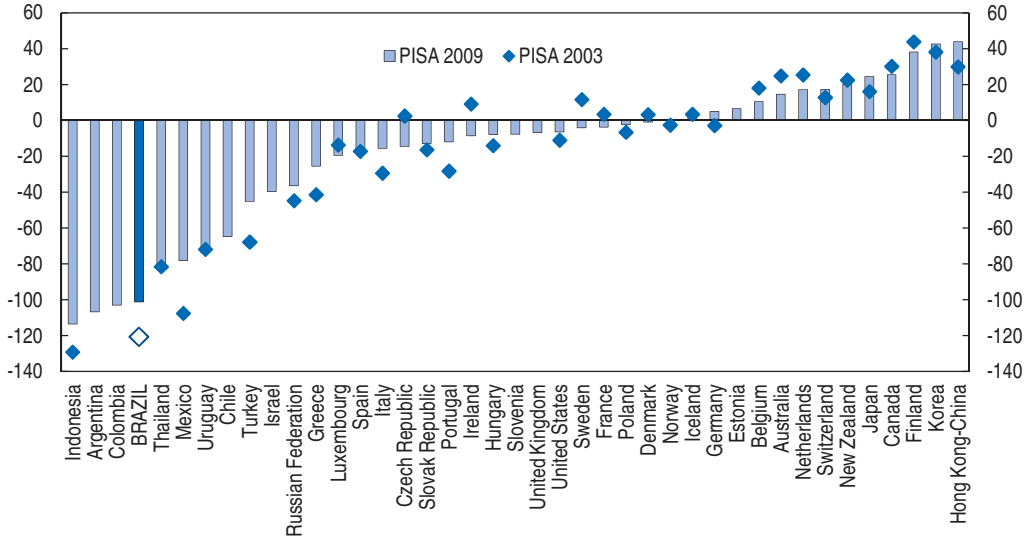
StatLink http://dx.doi.org/10.1787/888932520061

Although current transfer schemes have succeeded in reducing poverty rates among the elderly, considerable scope for improvement remains with respect to reducing poverty rates among youths. Recent years have seen substantial increases in the minimum wage, whose adjustment is linked to the sum of the real GDP growth of the year before last and CPI inflation. Still, minimum-wage increases fail to reach the neediest and are thus less effective in reducing poverty, and even more so extreme poverty, than *Bolsa Familia* transfers. In addition, a number of measures in the pension system do not appear to be cost-effective in fighting against poverty and would best be scaled back. These include granting a survivor pension to beneficiaries who already receives their own pension or providing additional free services to pension recipients through the Elderly Statute. By contrast, additional resources to enhance *Bolsa Familia* are warranted, given the major progress in reducing poverty achieved through this programme.

Education will help to build on recent successes in poverty reduction

Access to education has improved markedly in recent decades, and, as a result the traditionally very high wage premiums for education have come down. This, and the more even distribution of educational attainment, have been the main drivers of the reductions in inequality, accounting for more of the observed changes than social transfers (Barros *et al.*, 2010). Still, some challenges in the area of education remain, including the need to improve the quality of instruction and to reduce the high drop-out rates in secondary education. According to the OECD Programme for International Student Assessment (PISA), student performance in Brazil has improved in all subjects measured but remains significantly below the OECD country average (Figure 13). The continued willingness to measure, evaluate and benchmark school performance as well as lengthening school days will be paramount to ensuring quality improvements going forward, a goal that is underlined in the National Plan for Education 2011-2020. High drop-out rates, resulting in high-school enrolment of only about 70% of a given cohort, may be related to the inability of a one-size-fits-all education system to provide attractive options to some youths from disadvantaged backgrounds. The laudable *Pronatec* initiative, launched in April 2011, facilitates the access of the unemployed and beneficiaries of *Bolsa Familia* to technical schools. However, some of these measures are only available to graduates from the regular secondary curriculum, a condition that may place them out of reach for groups with a strong propensity to quit school. Enhancing technical education and labour training regardless of successful graduation from the regular curriculum will be important for up-scaling skills of disadvantaged students.

Figure 13. **PISA scores on reading and mathematics**



Note: Deviation in levels from the 500 OECD mean of the test. Average of scores in reading and in mathematics.

StatLink http://dx.doi.org/10.1787/888932520080

Continuing to protect forestry is key to achieve sustainable growth

Finally, growth will be sustainable in the longer run only if it is not at the expense of environmental degradation. Brazil has a crucial role to play globally, not only because it may be particularly vulnerable to climate change but also because of its importance as guardian

of so much of the world's forest cover and of biodiversity. Accordingly, the authorities have been active in climate-change debates both at the international level and domestically. A *National Climate Change Policy* was established just a few days after the 2009 United Nation Copenhagen Conference and set a national reduction target of between 36.1% and 38.9% compared to a business-as-usual scenario of projected greenhouse-gas emissions by 2020. Public action has focused on curtailing deforestation, which accounts for almost half of Brazil's emissions, most of it in the form of illegal logging. As a result, deforestation rates in the Amazon declined from 18 200 km^2 on average per year between 2000 and 2008 to 6 500 km^2 in 2010. The country is on track to achieve its emissions-reduction targets four years before the deadline. But progress has been uneven across regions. The authorities should persevere with their efforts. First, better enforcement of existing law could be achieved by increasing monitoring and controlling compliance in forestry. Second, further developing job opportunities and social protection in regions where the local economy depends on deforestation could lower the attractiveness of illegal logging. Third, the authorities should resist changes to the Forest Code, which currently limits deforestation in some areas on sound environmental grounds. Such changes could reverse the downward trend in deforestation rates observed over the last decade. PAC offers the Brazilian authorities an opportunity to introduce greener infrastructure and to improve the resilience of infrastructure to climate change. Given the potential high co-benefits of green investments, the authorities should ensure that investment decisions appropriately account for environment-related externalities in project selection within PAC.

Summary of recommendations

Box 1. **Summary of policy recommendations for Brazil**

Stabilisation policies

- Minimise the risks posed by abundant volatile capital flows primarily by increasing public saving through fiscal consolidation. If needed, this could be complemented by macro-prudential policies and a temporary tax on short-term capital flows such as the IOF. Measures to deepen long-term capital markets will also be useful but will have only an impact in the medium term. Restrain policy action to smooth fluctuations of the currency only when they are excessive, and do not try to prevent currency adjustments reflecting changes in economic fundamentals.
- Continue fiscal consolidation. Over the medium term, move from a primary to a headline budget target with a net debt endpoint. Remove existing recourse to one-off revenues and contingency measures to achieve the fiscal target. Introduce a public expenditure ceiling. Phase out existing revenue-earmarking requirements and aggregate spending floors.
- Maximise investment returns from the Social Fund by directing it to hold a diversified portfolio of assets, including foreign assets (to mitigate Dutch disease effects). Delegate the management of the fund to an agency whose good governance is ensured by clearly spelling out its objectives set in a democratic fashion.

Box 1. **Summary of policy recommendations for Brazil** *(cont.)*

Saving and investment

- Introduce a general minimum retirement age, with no distinction based on gender. Increase pension penalties for early retirement. Going forward, link the minimum retirement age to rising life expectancy. Index increases in minimum pension benefits to the average of consumer price inflation and wage increases, rather than changes in the minimum wage.
- Create a single value added tax with full credit for exports and capital goods and intermediates purchases.
- Gradually reduce reserve requirements for financial institutions in the medium term. Remove other forms of excess taxation of financial institutions.
- Align private banks' funding costs to those of the national development bank and provide an explicit business tax credit that would be independent of the choice of lender, and, in a second stage, phase out such tax credits. Phase out directed lending schemes to the rural sector and to housing.

Investment in infrastructure

Spending and regulatory framework

- Continue to protect spending on the Growth Acceleration Programme (PAC) from budget cuts. Focus on completing the most worthwhile projects within PAC. Set specific rules to quantify the yearly operation and maintenance costs of existing and planned infrastructure, and incorporate them in multi-year budgets.
- Adopt comprehensive rules for social compensation of those affected by infrastructure projects.

Sectoral developments

- *Water and sanitation:* Make loans to municipalities conditional on forming consortia where this would be cost-saving.
- *Electricity:* Evaluate the state of competition in the power sector and, if needed, follow up by actions to prevent cross-subsidisation. Investigate whether there is room to open up competition in generation.
- *Telecommunications:* Review the costs and benefits of having a dual system, whereby firms are subject to different price-setting regulations and service obligations depending on the regime to which they belong.
- *Land transport:* Specify clear investment targets in road concession contracts aiming at significantly extending and improving the network over the entire life of the contract.

Social and environmental sustainability

- Expand the conditional cash transfer programme *Bolsa Familia*.
- Increase opportunities for technical education and labour training unconditional on successful graduation from the regular academically oriented curriculum.
- Continue efforts to slow down deforestation rates and resist changes to the Forest Code. Ensure that investment decisions appropriately account for environment-related externalities in project selection within PAC.

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ANNEX A1

Progress in structural reform

This Annex reviews progress in the area of structural reform based on the policy recommendations made in previous *Surveys*. Recommendations that are new are listed in the relevant chapter.

***Survey* recommendations**	**Action taken**
FISCAL POLICY FRAMEWORK	
Re-introduce a nominal ceiling for expenditure growth in the federal budget.	No overall expenditure ceiling planned. A 2.5% per year ceiling for payrolls in the public sector is currently being discussed in Congress.
Gradually eliminate revenue-earmarking requirements and aggregate spending floors.	No action taken.
Set a desired level of public indebtedness and the corresponding budget balance targets in relation to GDP to be pursued over the longer term.	No action taken.
Re-define the fiscal target in terms of the *headline* rather than primary budget balance.	The President vetoed a proposal to move from a primary to a headline target in August 2011.
MONETARY POLICY FRAMEWORK	
Consider the option of lowering the central target, possibly around a narrower tolerance band.	No action taken.
PUBLIC DEBT MANAGEMENT	
Continue to reduce external public indebtedness.	Due to rising foreign reserves, Brazil has become a net external creditor and the currency risk of the public debt has been eliminated.
FINANCIAL SECTOR REFORM	
Continue to gradually eliminate the remaining compulsory reserve holding requirements, possibly starting with the "additional requirements" on sight and time deposits, and savings accounts.	Compulsory reserve requirements were raised, not decreased, in December 2010 and in July 2011.
Gradually ease existing directed credit requirements with a view to their eventual elimination.	The volume of the directed lending scheme to the rural sector has come down over the last 2 years, while the one to the housing sector has expanded. Directed credit by BNDES has increased markedly in 2009 and 2010 but has been scaled back slightly since then.
Assess the cost-effectiveness of government spending through BNDES financing to enterprises.	No action taken.
Foster the development of hedge instruments for investment in long-dated securities.	The government has enacted a reform package to foster the development of long-term capital markets (see Chapter 2 of this *Survey*).

***Survey* recommendations**	**Action taken**
TAX REFORM	
Make the rates and bases of the state-level VAT (ICMS) uniform across the states.	A proposal to unify and lower ICMS rates to 4% was discussed by State Finance Ministers in July 2011.
Shift all ICMS collection to destination, rather than allowing taxation at 2% at origin.	No action taken, but this point would be solved by unified ICMS rates (see point above).
Reduce the threshold eligibility for SIMPLES.	The threshold has been raised from BRL 2.4 million to BRL 3.6 million.
Move forward with tax reform on the basis of the government's draft legislation as submitted to Congress in Feburary 2008.	Beyond the items mentioned above, there has been no action taken on the remaining measures contained in the government's proposal, including the merger of three federal contributions into a federal VAT and merging the two corporate taxes CSLL and IRP.
Conduct regular impact assessments of the existing tax instruments, including those related to the Manaus Free Trade Zone; exempt the capital gains from the sale of venture company shares from income taxation.	No action taken.
PENSION REFORM	
Introduce additional changes to the pension system: sever the link between pension benefits and the minimum wage, introduce minimum age provisions in the private-sector regime (RGPS) for retirement on the basis of length of contribution, and create complementary pension funds for civil servants.	No action taken.
MANAGING OIL RESOURCES	
Clarify quickly the new regulatory regime for development of the new oil and gas fields in the pre-salt areas, including the role of the sector regulator in the new legal framework.	A new legal framework is being progressively introduced to govern oil reserves in the pre-salt area.
Introduce a mechanism for sharing the revenue from the new offshore oil and gas reserves among the different levels of government.	New legislation aims to share oil windfalls with all states and municipalities, including those that have no involvement in the oil industry.
Introduce a new mechanism for allocating the revenue associated with the new oil fields to ensure that it is saved and/or spent on investment programmes that would generate returns for future generations.	The government set up a "social fund" (*Fundo Social do Pre Sal*) in December 2010, in which some of oil revenues are to be saved.
ENHANCING GOVERNMENT EFFICIENCY	
Introduce greater conditionality in discretionary federal transfers to lower levels of government, as well as rewards for performance.	No action taken.
Make greater use of municipal consortia for management and service delivery.	Nine consortia have been created in the area of public sanitation. However, incentives for municipalities to form consortia remain weak.
EDUCATION AND TRAINING	
Focus efforts to improve the quality of educational services in primary and secondary education.	Incentives for good performance have been created at the local level, coupled with a uniform benchmarking mechanism across educational institutions that has allowed measuring student attainments and school performance. Some Brazilian states and municipalities have started paying a teacher bonus related to school performance.
Make curricula more attuned to market demands; update libraries and increase the availability of computers; increase the supply of shorter, more practically-oriented post-secondary education programmes.	The PRONATEC initiative, launched in April 2011, facilitates the access to technical schools.
Improve access to childcare and pre-school education.	Pre-school education has been included in FUNDEB, the mechanism for financing sub-national provision of education. As of 2009, pre-school education covers ages 3-5 while it previously covered ages 4-6.
Move gradually from part- to full-time schooling.	FUNDEP has provided funding incentives for states and municipalities to offer full-time schooling, and a number of municipalities are implementing full-time curricula.

Survey recommendations	Action taken
INNOVATION POLICIES	
Conduct regular impact assessments of the existing instruments for direct government support of innovation activities; focus sectoral-fund support on horizontal projects with counterpart financing from businesses; introduce alternative support instruments, such as risk-sharing, matching grants and loan subsidisation, which may be more applicable to start-ups; improve contestability in the allocation of sectoral-fund support by reducing emphasis on regional and sectoral earmarking.	No action taken.
Promote co-operation between federal and the state-level S&T and innovation promotion agencies to strengthen the national innovation system; assign CGEE a clear advisory role in long-term planning.	No action taken.
Reduce domestic tax burden on capital and ICT goods to improve the conditions for innovation; gradually eliminate import tariffs on capital goods and intermediate inputs.	The federal tax burden (IPI) was reduced on low-emission motor vehicles in 2011 and on domestically-produced tablet computers. Import duties were reduced for selected capital goods in mid-2010 and in early 2011.
LABOUR MARKET POLICIES	
Reduce social security contributions for low-paid workers to tackle labour market informality.	A simplified social security plan was introduced to lower social security contributions for the self-employed. This measure has formalised the work situation of over 1 million people since February 2010.
Raise the rate of return on FGTS balances.	No action taken.
Gradually phase out the severance indemnity in the event of unfair dismissal.	No action taken.

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Chapter 1

Refining macroeconomic policies to sustain growth

The macro-policy framework, established in the late 1990s and based on inflation targeting, a flexible exchange rate and rules-based fiscal policy, has worked well. Inflation, public debt and vulnerability to exchange-rate risks have come down markedly, and Brazil had the fiscal space to use counter-cyclical measures to cushion the 2008-09 downturn. Looking forward, sound stabilisation policies will help the country to achieve strong economic performance in a new environment in which population will age at a rapid pace, heavy reliance on oil resources will increase revenue volatility and uncertainties regarding the external environment are higher, possibly permanently.

More specifically, the country needs to pursue fiscal consolidation and remove existing rigidities in the budget process. Over the medium term, moving to a headline budget target would ensure long-term sustainability of public (including social security) accounts, and introducing an expenditure ceiling and removing widespread revenue earmarking would help restrain expenditure. Adopting the proposals to simplify the tax system currently under discussion would improve the business environment, and the government should persevere in its effort to secure political support for them from the states. A pressing challenge is to adapt current transfer mechanisms to ensure regional and inter-generational equity in sharing oil revenues. The establishment of the social fund, which is designed to save part of the oil windfalls and whose investment returns will be allocated to social spending, could help these equity objectives to be reached, so long as it is well designed.

The ongoing surge in capital inflows complicates the task of monetary policy and should be addressed through a range of policies, in which fiscal consolidation features prominently. Additional measures such as macro-prudential policies or a temporary tax on short-term capital inflows could also help to prevent the formation of asset price bubbles.

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Brazil reinforced its macroeconomic policymaking institutions in the late 1990s. The monetary policy framework combines inflation targeting with a flexible exchange rate. A Fiscal Responsibility Law also establishes limits and rules to conduct stabilisation policy without hampering long-term sustainability. These reforms have helped to achieve macroeconomic stability and to improve the capacity of policymakers to respond to adverse external shocks. In the future, these frameworks will need to be refined to help the country to continue to catch up the GDP per capita enjoyed by high-income countries and to cope with a rapidly changing economy, which will age rapidly and rely extensively on oil revenues in the context of an uncertain and fast changing global environment.

This chapter proposes refinements to achieve these goals and improve the efficiency of stabilisation policies. A first section examines changes to the fiscal framework that will help to foster economic growth and social inclusion. A second section turns to the conduct of monetary policy in the context of abundant capital inflows that may limit room for manoeuvre.

Fiscal policy

This section assesses recent fiscal performance and consolidation measures announced by the government. It highlights the importance of redirecting spending toward the most effective measures to achieve strong and sustainable growth. Relying on international experience, suggestions are put forward on how to adapt fiscal policy in the context of an increased sensitivity to non-renewable resource revenues.

Fiscal performance has been mixed

The fiscal framework was considerably strengthened with the adoption of the Fiscal Responsibility Law (FRL) in 2000. The law specified limits on debt and certain types of public expenditures relative to revenues, and set strict transparency requirements for all governmental operations while prohibiting intergovernmental bailouts. In addition, controls on the indebtedness of sub-national governments were tightened. The FRL also mandated the setting of three-year rolling targets for the primary surplus in the Budget guidelines (LDO). Moreover, fiscal policy relies on multi-year fiscal instruments, such as the four-year budget envelope (PPA), which lays out the government's long-term priorities, and the three-year budget guidelines law. In the latest four-year budget envelope (PPA 2012-2015), the government identifies social, infrastructure and environmental as the main spending priorities for the next four years.

Thanks to these reforms the country managed to keep the primary surplus at around 2-3% of GDP through most of the 2000s, and the headline balance improved (Table 1.1). From 2005 onwards, stronger economic performance leading to higher tax collection also contributed to these improvements. Net public debt (excluding the state-owned utilities *Petrobras* and *Eletrobrás*) declined steadily from its peak in 2002 of 60% of GDP to around 40% of GDP in 2010. The composition of debt also changed during the

Table 1.1. **Government fiscal account, per cent of GDP**

	2000	2005	2006	2007	2008	2009	2010
Central government							
Revenues	19.9	22.7	22.9	23.3	23.6	23.2	25.0
of which:							
Taxes	7.4	7.8	7.7	8.1	8.9	8.1	8.1
Contributions	6.6	8.5	8.1	8.2	7.1	6.7	6.8
Social security revenues	4.7	5.0	5.2	5.3	5.4	5.7	5.8
Expenditure	14.7	16.4	17.0	17.1	16.4	18.0	19.1
Personnel and payroll	4.6	4.3	4.5	4.4	4.3	4.8	4.5
Social security benefits	5.6	6.8	7.0	7.0	6.6	7.1	6.9
Funding and capital	4.5	5.2	5.4	5.7	5.4	6.0	7.5
of which:							
Expenses for the FAT	0.5	0.6	0.7	0.7	0.7	0.9	0.8
Subsidies and grants	0.3	0.5	0.4	0.4	0.2	0.2	0.2
Assistance benefits	0.0	0.4	0.5	0.5	0.5	0.6	0.6
Capitalisation of Petrobras	0.0	0.0	0.0	0.0	0.0	0.0	1.2
Other	3.7	3.7	3.9	4.1	4.0	4.4	4.7
Sovereign Fund	0.0	0.0	0.0	0.0	0.5	0.0	0.0
Transfers to states and municipalities	3.4	3.9	3.9	4.0	4.4	4.0	3.8
Public sector[1]							
Revenue	32.5	36.6	36.9	37.3	38.2	38.5	38.4
Expenditure	29.3	32.8	33.7	33.9	34.8	36.5	35.7
Primary balance	3.2	3.8	3.2	3.3	3.4	2.0	2.8
Interest payments	–6.6	–7.4	–6.8	–6.1	–5.5	–5.4	–5.3
Headline balance	–3.4	–3.6	–3.6	–2.8	–2.0	–3.3	–2.6
Net debt	45.5	48.4	47.3	45.5	38.5	42.8	40.2

1. Includes Petrobras and Eletrobrás in 2000.
Source: Treasury, Central Bank of Brazil.

period, with a reduction in the share of foreign currency debt, a lengthening in average maturity and a rise in the share of fixed-rate instruments. Lower public debt and the improvement in its structure allowed the government to inject fiscal stimulus in response to the 2008 global financial crisis, complementing monetary easing and credit expansion (OECD, 2009; Daude *et al.*, 2010). As a result, the Brazilian economy recovered rapidly from the downturn.

Despite this good performance, the overall tax burden, including on states and municipalities, is high by emerging-market standards, and Brazil's complex tax system are hurdles to doing business (OECD, 2009). At the same time, the central government primary spending as a share of GDP, excluding net interest payments, rose by 30% between 2000 and 2010. Looking at recent developments, social security outlays accounted for a large part of the increase in spending in the last two years. Capital spending has also accelerated since 2009, in line with the gradual implementation of the Growth Acceleration Programme (PAC).

Fiscal consolidation has started

Action is needed to take some of the pressure off monetary and exchange-rate policies and to create fiscal space and finance necessary growth-enhancing and social development programmes in the years to come. Some budgetary savings are expected from the projected fall in debt-service obligations over the medium to long term, even though such outlays are likely to rise in the short term. But further public savings are necessary. A

rapid ageing of the population suggests that the authorities need to start to implement changes now while the demographic situation is still favourable.

In February 2011 the authorities announced a BRL 50 billion cut to the 2011 federal government Budget, corresponding to a reduction in spending by about 0.5 percentage point of GDP compared to 2010 (after correcting for the *Petrobras* recapitalisation). About 70% of the cut will be on discretionary spending, but the government also plans to reduce mandatory spending, in particular personnel and payroll. A 2.5% per year ceiling for the increase in real terms of payrolls and charges in the federal sector is currently being discussed in Congress. At the same time, the government has committed to safeguarding social programmes and the PAC from pruning. These choices appear to be appropriate. In particular, it is important to increase spending on infrastructure, which if allocated to projects with the highest pay-offs, would boost potential growth in the medium term (Chapter 3). Well-targeted social spending will also be crucial to achieving social equity, in particular if support focuses on measures to help the young (Chapter 4). At the moment the money allocated to *Bolsa Familia* is around 15 times lower than interest payments.

The announcement of the spending cuts to the 2011 Budget and the increase in this year's primary fiscal surplus target for the federal government by about BRL 10 billion (USD 6.3 billion) to 91 billion are welcome first steps. Given the very good fiscal performance in the first half of the year, it is expected that the country will meet the new target. The authorities should pursue in this direction.

In the draft 2012 Budget Law sent to Congress on 31 August, the government sets a 2012 primary budget target for the general government of BRL 114.2 billion (2.5% of GDP), lower than 2011 revised target of 127.9 billion (some 3.0% of GDP). Discretionary spending is expected to increase to 5.1% of GDP in 2012 from 4.6% of GDP in 2011, with a particular marked increase in the *Brasil sem Miseria* programme and Growth Acceleration Programme (in particular in investment in the oil sector and in water and sanitation). Receipts are also expected to grow, despite tax cuts to firms in the tradable sectors and other measures announced in the Greater Brazil Plan (*Plano Brasil Maior*), aiming at boosting their competitiveness (Box 1.1). These measures amount to a total of some BRL 21 billion (0.6% of GDP). If economic growth in 2012 turns out lower than the 5% officially assumed, the authorities may have to restrict spending to meet the fiscal target.

In addition to spending cuts, the government has sought to improve fiscal flexibility in the Draft 2012 Budget Guidelines, in which the government envisages reducing the scope for parliamentarians to create expenses that have budget implications spread over several years (*despesas ressalvadas de contingenciamento*). These spending categories were introduced to finance parliamentary amendments and have to be executed or to be financed in the subsequent years. According to the Minister of Planning, these expenses have increased by 329% since they were first created in the 2003 Budget Guidelines law. Overall, all the proposed changes will help to rein in expenditure increases, but further efforts will be required to soften downward rigidities in the budget and restrain expenditure commitments.

Fiscal room could also be increased by severing the link between the minimum wage and the minimum public pension and indexing the latter to a simple average of price inflation and the increase in the average wage to preserve retirees' purchasing power. At the moment, the value of the minimum wage, which determines the minimum pension, is adjusted every year following an automatic rule linking the adjustment to the sum of the

Box 1.1. **The Greater Brazil Plan**

On 2 August 2012, President Rousseff launched a new industrial policy plan – called *Plano Brasil Maior* ("Greater Brazil Plan") – that aims to improve the competitiveness of national industries in the context of a strengthening currency and increased international competition. The plan sets several targets, including raising the total investment share of GDP by 3 percentage points to 22.4% of GDP from 2010 to 2014 and fostering innovation activities of Brazilian companies. To achieve these goals, the plan covers a wide range of areas. Some programmes, such as those aiming at enhancing human capital or ensuring that production is consistent with the protection of the environment, had been announced earlier. New measures provide financing and tax relief to domestic producers and seek to increase hiring incentives. Several of them are specifically geared to certain industries, sometimes defined at a very detailed level.

The main new measures announced are as follows:

- Corporate payroll contributions to social security will be reduced from 20 to 0% until December 2012 for companies in labour-intensive subsectors of the clothing, footwear and furniture manufacturing industries as well as software production. Companies will instead pay a tax of a minimum of 1.5% on gross revenues depending on the sector. The net benefit of this measure will vary substantially across individual firms according to their actual labour intensity and the degree to which they rely on outsourced production. The processing of some tax refunds will be made faster and investment goods producers will be exempt from the tax on manufactured goods (IPI). The new industrial policy also provides specific benefits to the automotive industry.
- Financing and investments from the national development bank (BNDES) to promote innovation will be increased. BNDES will also provide more working capital to SMEs, with such credit lines increasing from BRL 3.4 billion to BRL 10.4 billion.
- A preferential treatment of up to 25% price differential may be granted to domestic products in public procurement under conditions to be specified.
- A range of measures is aimed at encouraging Brazilian exports and protecting the domestic market. Anti-dumping cases will be processed faster. A reduction in the number of goods subject to automatic import licenses is envisaged. Finally, Brazilian exporters will be reimbursed for several taxes incurred along the value chain until end-2012.

real GDP growth of the previous to last year and most recent year-on-year CPI inflation. Although this has the advantage of removing minimum-wage settings from the policy debate, it also adds to existing downward rigidities in public spending and may prove unsustainable in the coming years. The minimum wage's spillover effects on the growth of pension benefits will lead to an extremely rapid rise in pension outlays (Chapter 4). In 2011, the government succeeded in moderating the increase in the minimum wage, but for the year 2012, the minimum wage is set to increase by 13.6%. The measure is estimated to cost BRL 22.5 billion to the budget in 2012.

Simplifying the tax system

There is also a need to address the main distortions and inequities created by the tax system and to simplify it. Brazil's indirect tax system is cumbersome due to its fragmentation, complexity and changing provisions (see Box 1.2 for an overview of the tax system). Onerous social security contributions and additional levies on enterprise payroll

Box 1.2. **An overview of the tax system**

The main features of the tax system in Brazil have been defined in the 1988 Federal Constitution, the 1966 National Tax Code and the federal Income tax Code. Taxes are levied by the federal, state and municipal governments.

Corporate taxation

Brazil has a complex system of corporate taxation in which the federal government imposes the following taxes:

- *Corporate income tax* (IRPJ): It is levied on a taxable profit at a rate of 15%. In addition, a 10% surtax is imposed on taxable income exceeding BRL 240 000 on an annual basis. Capital gains are in general treated the same as ordinary profits.
- *Social contribution tax on profits* (CSLL): It is levied on corporate profits with essentially the same tax base as the corporate income tax. The statutory rate is 9% in most sectors. The rate is 15% for financial institutions and 9% for other institutions.
- *Federal value-added or excise tax on manufactured goods* (IPI): It is a value-added-type tax levied on the basis of the invoice-credit method at each stage of production of industrial goods. But, unlike most VATs, the distributive margin is not taxed. The statutory rate structure ranges from 0 to nearly 365.6% for certain excisables, although effective rates are lower. Most essential goods are zero-rated. The IPI is often used as an industrial policy tool through the zero-rating or exemption of IPI-liable goods.
- *Financial transaction tax* (IOF): The tax is levied on selected financial transactions, such as bank loans, foreign-exchange transactions, insurance contracts and securities transactions. The rates vary considerably and change frequently (see below for information on recent changes).
- *Excise tax on cross border royalties and services* (CIDE): It is assessed on outbound royalties and service payments when there is a transfer of technology or when the services provided are considered technical assistance. The rate is 10%. The CIDE on software payments was abolished in 2007. The burden of CIDE falls on the Brazilian companies and is not creditable by the foreign beneficiary. The excise tax on fuels (CIDE-*Combustíveis*) is a nominal excise (introduced in 2001) levied on the domestic sales or imports of selected fuels.
- *Tax for social security financing* (COFINS): It is now levied on value added (on turnover until 2004) on the basis of the invoice-credit mechanism, except for a number of sectors, including most services and public utilities, where it is still levied on enterprise turnover. The statutory rate is 7.6%. The interest spread of financial institutions is also taxed. Revenues from exports, the sale of fixed assets and international freight are exempt, as well as sales by co-operatives and non-profit organisations. The base of the tax excludes payments of IPI, PIS/PASEP and, in some cases, the ICMS. All other taxes (ISS and ICMS) are included in the tax base. Special rates apply to most excisable goods (tobacco, fuels, cosmetics). Small enterprises may opt for paying Cofins as part of a presumptive tax regime (*Simples Nacional*) based on gross sales.
- *Social* integration *programme* (PIS/PASEP): It is now levied on value added (on turnover until 2002) in the case of private-sector firms (PIS) and on the turnover of public-sector enterprises, agencies and funds (PASEP). The tax rate is 1.65% for PIS and 1% for PASEP. As in the case of COFINS, PIS is still levied on enterprise turnover in a number of sectors, including most services and public utilities. It is estimated that about one-third of revenue from PIS and COFINS is collected on the basis of enterprise turnover. Special rates apply to producers/importers of excisable goods (tobacco, fuels and cosmetics). Presumptive taxation schemes are in place for small firms (*Simples Nacional*) based on gross sales.

Box 1.2. **An overview of the tax system** *(cont.)*

- *Employer social security contributions* (INSS): Employers are required to make a contribution of 8% of wages to each worker's deferred salary account to the Length of Service Guarantee Fund (FGTS). Employers should also contribute 20% of an employee's wage to the public pension system, and a maximum of 8.8% on other social security taxes. Employees contribute 8-11% depending on their salary.
- *Rural property tax*: It is an annual tax on the ownership of rural property at rate ranging from 0.03 to 20%, depending on the region and the utilisation of the property.
- *Import duties*: They are levied on a specific or *ad valorem* basis on the c.i.f. value of imports. Some imports are valued according to minimum valuation or base-price criteria.

There are additional levies on enterprise payroll, including para-fiscal contributions to finance educational/cultural activities for employees, labour training and apprenticeship programmes (*e.g.* the so-called "S" system), small-business support (SEBRAE) and agricultural development (INCRA), at 3.3% of payroll; and a specific levy to finance education (*Salário-Educação*), at 2.5% of payroll.

The States impose a value added tax (VAT) on the circulation of goods and services (ICMS) and taxes on inheritances and gifts and motor vehicles. Municipalities charge taxes on services (ISS), urban property and transfers of urban real estate.

Personal taxation

Individuals are subject to a number of taxes, including personal income tax, social security tax and gift and inheritance tax. Personal taxes, collected at the federal level, are calculated on the basis of earned income. Rates vary from 0 to 27.5%. There is no local or state income tax for individuals. Capital gains are subject to a flat 15% rate. Non residents are taxed at flat rate of 25% on earned income and 15% on other income, except for dividends paid from a Brazilian entity which are tax exempt.

Source: OECD (2009), Deloitte (2011).

imply a large burden on labour income with adverse effects on employment, especially in the formal sector, as documented in previous *Economic Surveys* (OECD, 2006). Reform packages were introduced in Congress in 2003 and 2008 to simplify the system and, among other objectives, to unify state-level VAT rates (ICMS) and bases and alleviate the burden on labour income. But these initiatives failed to secure support from state governments. Furthermore, there were some sporadic and isolated efforts aiming at modernising cascading taxes such as the funding for social security (COFINS) and the funding for retirement pensions (PIS/PASEP). In response to the financial crisis, a temporary reduction of tax burdens was also granted to support investment (Chapter 2).

The government plans to send a proposal to Congress aiming at introducing some payroll tax relief and unifying state ICMS indirect taxes. Recent discussions amongst state finance ministers focused on harmonising states VAT rate to 4%. The proposal also envisages a consistent refunding of tax claims resulting from exports and investment. Most of these suggestions are in line with what was suggested in the 2009 *Economic Survey*, which examines in detail the Brazilian tax system, and *Going for Growth* (OECD, 2011). The government should follow through with the proposed reform package and persevere in its efforts to secure support from state governments. It would be preferable to compensate the

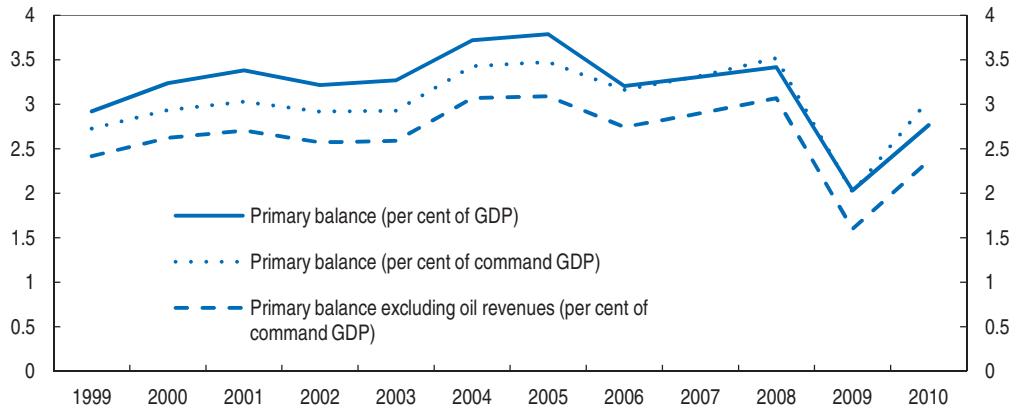
planned decrease in state VAT rates by a commensurate increase in the federal VAT rate, as this tax has been found to be an efficient means of raising revenues in cross-country analysis (Arnold *et al.*, 2011).

Adapting fiscal policy to growing revenue from natural resources, especially oil

The regime shift due to the exploitation of the pre-salt oil fields is going to have major implications for fiscal policy, by increasing the sensitivity of tax receipts to oil prices, leading to higher volatility and increasing the risk of pro-cyclical policy settings. Oil-price volatility transmitted to public expenditure can have undesirable consequences for the economy. Sharp changes in government spending add to fluctuations in aggregate demand and prices, abrupt swings in the exchange rate and increased risks faced by investors, which in turn have an adverse impact on investment and economic growth. Increased tax-receipt volatility also renders long-term projects such as infrastructure programmes more difficult to plan.

Conventional fiscal indicators, such as the headline or primary balances, can give a misleading indication of the fiscal stance in oil-producing countries. This is the case when oil prices are rising, the economy is already overheating and additional spending would fuel inflationary pressures. In such a situation, the fiscal balance could improve simply because spending is increasing less than oil-enriched revenues. At the moment, the reliance on oil revenue does not pose a major issue. Correcting for oil resources would lower the primary balance in terms of GDP, but would have little effect on its evolution (Figure 1.1). Switching from GDP to "command" GDP, which corrects the conventional measure for terms-of-trade gains and is used as a rough approximation of non-oil GDP, is estimated to lower the primary balance ratio by about 0.3 percentage point on average from 1999 to 2005, with no effect on average thereafter. The non-oil primary balance (expressed in terms of command GDP) is found to have been smaller by about 0.3-0.7 percentage point than the conventional indicator. Since 2003, the gap between the two measures has narrowed; it amounted to 0.4 percentage point in 2010. The difference could be under-estimated, as some oil revenues have not been accounted for, in particular

Figure 1.1. **Various measures of primary balances**



Note: Command GDP has been derived using the formula: Command GDP = GDP + (Terms of Trade – 1) * Exports. Oil revenues are computed as the sum of royalties, revenues from exploration and an estimation of the tax and social contributions paid by *Petrobras*, using information from the company's financial statements over the period 2007-09.
Source: OECD calculations.

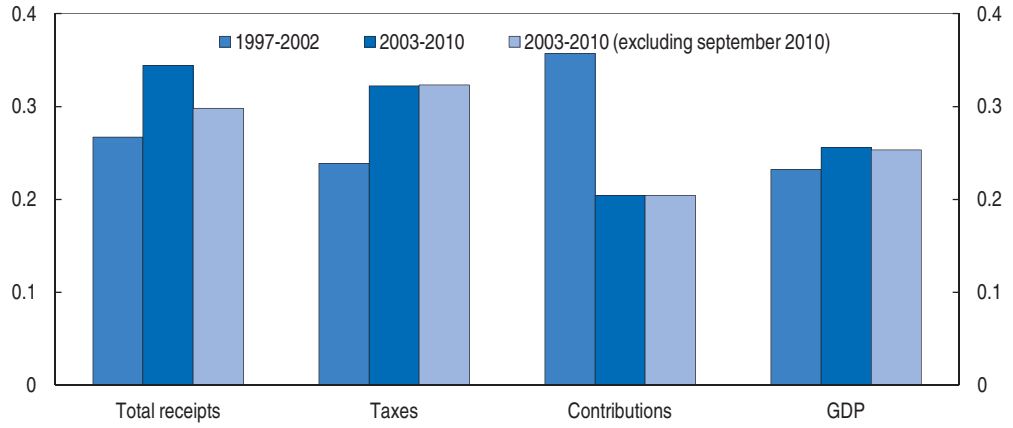
StatLink http://dx.doi.org/10.1787/888932519092

those related to special participation in the oil sector. Using a different methodology, Gobetti (2009) ends up with a larger correction of about 1.5 percentage points on average over the period 2000-08. With the exploitation of the pre-salt oil fields, this issue is likely to gain in prominence. It would be useful to publish non-resource balances in budget documents, as they are likely to paint a more accurate picture of the fiscal stance and the impact of fiscal policy on domestic demand in the future. A simple measure could use command GDP, but a more accurate approach would be to construct a non-oil GDP, as Norway does. An alternative would be to examine the sensitivity of conventional indicators to different oil-price scenarios. Conventional indicators will nonetheless remain useful to analyse liquidity constraints and debt dynamics, and monitoring them will continue to be necessary.

The stronger reliance on petroleum products is also likely to enhance the volatility of fiscal receipts. The variability of central government receipts has already risen since 2003, more than that of GDP (Figure 1.2). While the variability of contributions declined, that of taxes rose, with in particular a marked increase for the tax on imported products (II) and the IOF, a tax on capital inflows. At the same time, income from capital has become more variable, while the opposite can be observed for labour income. A significant increase in variability in other receipts components stems from the *Petrobras*' recapitalisation that occurred in September 2010.

Figure 1.2. **Federal government receipts variability**

Ratio of standard deviation to mean, monthly series



Source: OECD calculations using data from Ministry of Finance and the Central Bank of Brazil.

StatLink http://dx.doi.org/10.1787/888932519111

Sharing oil revenues equitably

A proper handling of oil revenues will raise prosperity. The design of sharing schemes for natural resource-related revenues needs to ensure to the extent possible both an equitable distribution across regions (horizontal equity) and across generations (inter-generational equity).

A new legal framework is being progressively introduced to govern oil reserves in the pre-salt area. Production-sharing contracts will replace the concession contracts for new oil exploration and production in this area, while past contracts will not be modified. The government will remain the owner of all oil extracted, and the companies will receive a percentage of the revenues. *Petrobras* will be responsible for exploration and production in

all contracts with a minimum of 30% share of any partnership. In addition, the creation of a new company *Pre Sal Petroleo* to represent the government is under discussion. This company could have veto power over all production-sharing contracts.

The growing oil sector is expected to increase receipts of corporate taxes and royalties. This will exacerbate trends already visible since the mid-2000s. Financial statements from *Petrobras*, the state-owned company, suggest that about 20% of federal government receipts came from taxes and social contributions paid by the consolidated group on average over the period 2007-09. Oil operations have also generated increases in local-government revenues. Though they remain modest, royalties doubled in terms of GDP from 2002 to 2010 when they amounted to 0.4% of GDP.

International experience in resource-based economies also suggests that commodity booms can give rise to political pressures for additional spending. Sinnott (2009) finds this to be the case for Latin American countries where government revenues respond significantly to commodity prices. Some of this increase corresponds to a rise in investment in infrastructure, which can have large long-term pay-offs if projects are well designed. But oil windfalls have also often been spent on higher public-sector wages or increases in public employment, both of which are hard to reverse if oil prices go back down (Medas and Zakharova, 2009). In the case of Brazil, where the level of mandatory spending is high, the risk is then that the most productive categories such as infrastructure investment and maintenance get cut for reasons of stringency. Moreover, there is evidence that the quality of public spending tends to deteriorate during resource booms, as the introduction of new large-scale programmes results in overstretched administrative capacity and less effective project selection (Medas and Zakharova, 2009).

The government is currently reviewing the allocation rules, and draft legislation aims to share some of the oil windfalls with all states and municipalities, including those that have no involvement in the oil industry. This will imply that oil-producing states and municipalities, which previously received about half of the oil profit, will see their share of receipts decline. Past experience in Brazil suggests that increases in oil revenues at the local level have been matched to a very large extent by spending rise without commensurate improvements in socio-economic outcomes. One explanation put forward has been a rise in corruption, which led to an inefficient use of oil revenues (Caselli and Michaels, 2009). Another explanation could be that reliance on royalty revenues may discourage efficiency by creating an incentive for municipalities to hike spending in response to oil revenues rather than to seek efficiency gains. The federal government could strengthen incentives for efficiency enhancement by introducing rewards (penalties) for good (poor) local government performance.

Revenue-sharing mechanisms should also ensure that future generations get their appropriate share of oil revenues, as oil is a finite resource. Economic theory and international experience offers useful guidance on the optimal way to manage non-renewable resources (Box 1.3). A first option would be to target a level of spending which depends on the return on overall public wealth (which includes oil revenues). In this situation, when social and infrastructure needs are important, it could be desirable to spend more than the return on financial wealth, assuming institutions are sound and resources are directed to worthwhile projects. A second option would be to consume only the real return on the stock of wealth accumulated. In this case, it is particularly important to maximise this return.

Box 1.3. **How can revenues from natural resources be best managed?**

Many countries have set up sovereign wealth funds (SWF) to diversify or improve the return on commodity revenues and sometimes to shield the economy from fluctuations in commodity prices. The design depends on their objectives, but the economic literature and international experience, in particular from Norway, provides some useful insights in the special case of non-renewable resources' revenues management.

How much to save?

To maximise intergenerational equity, the question is which saving rate will sustain stable consumption per capita over time. According to the Hartwick rule, if population is constant all resource rents must be invested in capital, including education, in order to maintain constant income per capita. If consumption per head were rising (falling) over time, social welfare could be increased if earlier (later) generations saved and invested less or consumed capital at the expense of later (earlier) generations.

An alternative approach would be to save oil revenues as financial assets, with only the yield from the accumulated financial assets spent. This rule tends to lead to lower consumption in the first years, and is better suited for countries where there is a strong preference for transferring a substantial share of the oil to future generations due to an ageing population for instance.

In practice, many resource-abundant countries do not follow the Hartwick rule and deplete steadily their resource. It is estimated that Norway has consumed about 80% of its resource rent over the years (Gylfason, 2011). It now sets most of its oil revenues aside in its pension fund.

How should the fund be managed?

Successful stories usually coincide with the delegation of the fund management to an independent agency that protects the resources from policy capture. In Norway, the Central Bank which is *de facto* independent from the government, manages the fund on behalf of the Ministry of Finance, maintaining a useful distance between politicians and the fund.

Transparency is also a key to ensure good management of resources and can mitigate the mismanagement of resource revenues. A well-informed public can engage in constructive discussion around policy formulation and government oversight of resource wealth. Alongside disclosure of information, governments should adopt transparent processes for establishing and implementing resource policies and for taking spending decisions. Resource decisions involve long-term commitments. These will be more credible and less subject to abuse if their rationale is understood by the citizenry. Legislative oversight is a critical part of establishing government accountability. Any concession which departs from standard legislated terms should be submitted to and approved by the legislature.

Where to invest?

There are good theoretical reasons for investing a substantial part of the windfall abroad, as the return on investment would fall below the world interest rate if the oil revenues were to be used entirely for domestic investment. Investing abroad offers an escape from diminishing returns. Foreign assets can be repatriated gradually and used for domestic investment. However, in practice the efficient balance between domestic and foreign assets is politically difficult to sustain, as there will always be competing demands for current consumption and investment at home. Domestic debt repayments may solve this dilemma and pay off as long as domestic debt costs exceed expected foreign returns. They have the added advantage of making foreign asset accumulation difficult to reverse by future governments.

In practice most of the existing SWFs mainly or solely invest in foreign assets. Many SWFs also hire external managers. Contrary to pension funds, SWFs have shorter investment horizons and tend to have broader objectives. Norway's pension fund is invested entirely in foreign assets, 60% in equities and 40% in fixed-income securities.

Source: Reisen (2008); Blundell-Wignall *et al.* (2008); Gylfason (2011) and National Resource Charter (2010).

The Brazilian authorities opted for the latter approach and in December 2010 set up a "social fund" (*Fundo Social do Pre Sal*), in which some of the oil revenues are to be saved. This savings fund complements the stabilisation fund (FSB) created in 2008 to smooth the impact of shocks on activity. The social fund will be managed by a committee comprising officials from the Ministries of Finance and Planning and the Central Bank, under the surveillance of an auditor. Spending from the fund will not be earmarked to any specific measures. The law mandates that the returns on the investments of the social fund should be used to finance mostly education but will also be allocated to the most cost-effective measures in the areas of sports, culture, health, adaptation and mitigation climate-change policies, science and technology and poverty reduction. The allocation mechanism between these different items is still under discussion. The set up of a social fund is a welcome initiative that will help to attain inter-generational equity. It is particularly important to direct spending from investment returns to measures where pays-offs are expected to be higher. Funds should be invested in a diversified portfolio that maximises returns and should therefore include foreign assets. Moreover, international experience suggests that erecting firewalls against political interference should reduce the risk that natural resource revenues are misspent for short-term political gains. This could be done by delegating the management of the fund to an agency, whose good governance will prevent such interference and should be ensured by clearly spelling out its objectives set in a democratic fashion. In Norway, for instance the fund is managed by the Central Bank, which is *de facto* independent from the government. Finally, full transparency on the use of natural resources is essential. One way to enhance this transparency would be to commit to regularly publish in a publicly accessible manner all revenues received by governments from oil, gas and mining companies and how they have been used. This will also have the side effect of improving the investment climate by providing a clear signal to investors and international financial institutions that the government is committed to greater transparency.

Refinement of the fiscal framework will help to sustain strong growth

The fiscal framework is working well and has in particular been effective in supporting the economy during the global crisis. Changes to the framework will nevertheless help to support strong and inclusive growth.

The fiscal framework already contains a counter-cyclical instrument in the form of the sovereign wealth fund (*Fundo Soberano do Brasil* – FSB) to allow smoothing of the tax revenues and to save revenue windfalls associated with business cycle fluctuations. An initial amount equivalent to 0.5% of GDP was injected when the FSB was created in 2008. For the subsequent years, savings have been determined by the difference between the primary fiscal balance and its target, as stated in the Budget Guideline Law (LDO). Reverse transfers from the fund to the Treasury (in the limit of 0.5% of GDP) are possible if the primary budget falls short of the target. Transparency regarding the fund has recently increased through the creation of a special website where the general public can easily access information on governments asset holdings.

The FSB is intended to reduce the volatility of public spending by de-linking the annual budget from the short-term economic volatility. However, although the stabilisation objective of the fund was clearly stated upon its establishment in 2008, the fund has received no further injections since 2009, despite strong economic performance in 2010. This reflects the government priority to pay down the debt, but also a sizeable increase in central government spending and an only gradual withdrawal of the fiscal

impulse injected during the 2008 crisis. Incentives to accumulate a large buffer of financial assets during the earlier economic upturn do not appear to have been sufficient, as is the case in many OECD countries.

As the country has managed to achieve macroeconomic stability, government attention should now focus on ensuring the long-term sustainability of the combined government and social security accounts. The government already sets a primary budget target in levels for the year ahead and in terms of GDP for the two following years. Only the first year is binding. The focus on the primary balance, which excludes interest payments was initially motivated by the fact that the net public debt-to-GDP ratio was overly sensitive to interest-rate changes and exchange-rate fluctuations. But improvements in debt management have lowered these vulnerabilities. It would be useful to consider a fiscal target, expressed in terms of the headline fiscal balance, which would allow a long-term debt-to-GDP objective to be achieved, consistent with economic fundamentals and social preferences. The derivation of such a target is fraught with difficulties, and the economic literature offers little guidance in this respect. One option would be to stabilise the nominal debt by targeting a balanced structural deficit, similar to the debt brake used in Switzerland, which sets a ceiling on expenditure that cannot surpass cyclically adjusted revenue. A less ambitious target would be to stabilise the debt-to-GDP ratio at its current level. The switch to an headline fiscal balance rule could be made over the medium term. In addition, when the issue of oil gains prominence, the authorities could consider adopting a budget balance target defined in cyclically adjusted terms by smoothing expenditure over the economic and the oil-price cycles. The main difficulty in using a structural balance is that it requires estimates of potential output and "equilibrium" oil prices, which are difficult to measure, because they are not observable, and the range of estimates could vary widely depending on the method adopted. Because of their complexity, they also render communication more difficult. Despite this drawback, this option has been recommended by a number of commentators for Latin American countries (see, for instance, Schmidt-Hebbel, 2011).

Transparency and simplicity are important features to ensure the credibility of the process. In some countries, the task of deriving the fiscal balance target has been delegated to an independent body, composed of experts from the public and financial sectors and academics. This body could provide considerable input to the decision on the total amount of spending and the budget deficit, while the fiscal authorities determine spending allocation and how taxes are raised. A comparable mechanism exists in Chile and has helped the country achieve effectively counter-cyclical fiscal policy (Frankel, 2011).

It will be important to move away from the current use of one-off revenues and contingency measures, such as discounting some investment spending and using "savings" from previous years to meet official targets. In the 2012 draft Budget Law, for instance, the government has the flexibility to discount BRL 25.6 billion (around 0.6% of GDP) from the PAC spending in case it is short of achieving the primary balance target. These facilities have existed since 2005 and have already been used twice. The authorities have signalled they will not use them for 2011 and 2012. Although these facilities introduce flexibility, they lower the predictability of fiscal policy and weaken the meaningfulness of the primary balance as an indicator of the fiscal policy stance. It will be useful to remove these facilities and to put in place a commitment to reverse slippages relative to the deficit or debt target and define specific escape clauses to allow for reactions to unpredictable events.

Within this fiscal framework, the introduction of an expenditure growth ceiling would help to achieve fiscal restraint as the experience from the Netherlands and Sweden has shown (Box 1.4). In addition, a ceiling would also give an indication on what is seen to be the desirable long-term level of government expenditure. It also helps to prevent a

Box 1.4. **Expenditure ceilings in the Netherlands and Sweden**

The Netherlands put in place an expenditure ceiling in 1994 and Sweden introduced one in 1997, with the main objective of reining in government expenditures. The main features of these ceilings are described below.

The Netherlands

The expenditure ceilings apply to net expenditures *i.e.* gross expenditures minus most non-tax revenues (for example, traffic fines). Separate ceilings exist for three budgetary sectors: the central government, social security and health care. They are defined in real terms, *i.e.* in constant prices and set for four years in advance. In the spring of every budgetary year, they are transformed into nominal ceilings by multiplying them with the most recent estimate of the price change in national expenditure deflator. This implies a terms-of-trade loss for the government if the price increase of certain government expenditures (*e.g.* government wages) exceeds the overall increase in factor prices in the economy. These terms-of-trade losses are not compensated for and can thus call for additional cutbacks. By contrast, terms-of-trade gains allow for extra expenditures under the ceilings, which can fuel inflationary developments even more.

Any overspending of the ceilings must in principle be compensated immediately within the sector in which the overspending occurs. General compensation by transfers from any other budget can be decided only by the cabinet. The budgetary rules allow for a limited carry-over facility, with an year-end margin is 1% of the corrected aggregated budget.

Sweden

Under the Budget Act, the government proposes a ceiling for central government and old-age pension expenditures for the next three years. The ceilings cover approximately two-thirds of total expenditures, and roughly 50% are transfers to households and 20% public consumption and investment. Interest costs are not covered. For the years t+1 and t+2 these ceilings are already laid down in decisions of earlier years, as there is a strong commitment to maintain previously agreed levels unless overriding reasons justify a change. For the year t+3, the decision is taken on the basis of the revenue forecast for the year t+3 and the necessary surplus for fulfilling the medium-term target.

The expenditure ceiling is fixed in nominal terms, which makes evaluation transparent and simple. Moreover, a nominal ceiling gives less incentive for the government to try to increase inflation. The disadvantage is that nominal ceilings may call for cutbacks whenever the price of government expenditures is higher than initially expected.

There are no formal obstacles to the Riksdag deciding to reassess an established ceiling to adapt to new conditions. Since its inception, the expenditure ceiling on central government expenditure has usually been unchanged from when the ceiling for a given year is initially fixed until that year has ended. The ceiling was altered on just a few occasions, due to changes in the direction of budget policy, and was lowered in every case. A budget margin acts as a buffer in case economic developments cause expenditures to differ from original estimates because of unanticipated or cyclical developments.

Source: Heeringa and Lindh (2001); Swedish Finance Ministry (2010).

potential increase in the tax take that would be needed in case of insufficient expenditure control. Transparent escape clauses would introduce flexibility and prevent the use of tax expenditures or changes to the timing of certain payments to circumvent the ceiling.

A pre-condition for an expenditure ceiling to be effective in the case of Brazil would be to eliminate widespread revenue earmarking, as was recommended in previous *Economic Surveys*. According to the Constitution, at least 25% of tax revenue at all levels of governments has to be allocated to education, and 12 and 15% of the states' and municipalities' tax revenues are earmarked to the provision of health care services. An aggregate spending floor on individual programmes regardless of their cost effectiveness has also been introduced for health care. A legal mechanism was created in the 1990s to allow the government to convert 20% of originally earmarked revenues into non-earmarked revenues. But, it is estimated that revenue earmarking and mandatory allocations amount to nearly 90% of public spending (World Bank, 2006). Although this process was introduced to enhance the transparency of the fiscal accounts, protect some items from cuts in periods of fiscal adjustment and make revenue streams more predictable for different jurisdictions, it ended up preventing the reallocation of budget appropriations toward more efficient uses. These rigidities also discourage efficiency gains through cost-cutting measures by perpetuating budget allocations on the basis of historical spending. The earmarking of local tax revenues for local expenditures has also been identified as a contributor to increasing regional inequalities (Ter Minassian, 2011). In addition, the system implies that attempts to reform specific taxes are bound to trigger discussions about revenue distributions across jurisdictions, which makes any reform politically difficult. Political support for the *status quo* is often driven by the reluctance of a given part of government to lose revenues, rather than by a lack of reform will. However, such discussions on revenue distribution will necessarily surface soon due to a 2010 Constitutional Court ruling that mandated a reform of the main revenue-sharing mechanisms (*Fundo de Participação dos Estados* and *Fundo de Participação dos Municípios*). The authorities should use this window of opportunity to deal with the downward rigidity of certain expenditure items that is largely due to earmarking.

Monetary policy

A sound monetary policy framework has contributed to the earlier rapid disinflation and good economic performance, and, looking forward, it will be important to sustain strong growth. A key challenge is to keep inflation under control without attracting short-term capital inflows. After briefly describing the inflation-targeting framework, this section examines the monetary policy response of the Brazilian authorities to avoid overheating and prevent the build-up of financial imbalances.

Inflation targeting has brought inflation down

Brazil implemented a formal inflation targeting framework in June 1999, a few months after having announced a new free-floating exchange-rate regime. Under this regime, the main objective of the Monetary Policy Committee (COPOM) has been to achieve the inflation targets set by the National Monetary Council (CMN). Council members are the Finance Minister (who heads the Council), the Minister of Planning and the Governor of the Central Bank.

In June of every year, the CMN establishes the inflation targets and their corresponding tolerance intervals for the second year ahead. The target consists of the desired variation

of the consumer price index (IPCA). The target is considered to be reached when the observed accumulated inflation during each calendar year falls within the interval of tolerance. If inflation breaches the target, the Governor of the Central Bank is required to write an open letter to the Minister of Finance explaining the reasons why the target was missed, as well as describing the measures required to bring inflation back to the target and the period over which these measures are expected to take effect. No specific instrument or strategy to achieve the target is specified. The interest-rate target set by the COPOM is the target for the Selic interest rate, which is fixed for the period between regular COPOM meetings. The COPOM can also establish a monetary policy bias at its regular meetings; a bias (to ease or tighten) authorises the Governor to alter the Selic interest rate target in the direction of the bias at any time between regular COPOM meetings.

Since 2005, Brazil has always experienced inflation within the tolerance band, although on average it has exceeded the mid-point by 0.4 percentage point (Table 1.2). The appreciation of the *real* has helped to dampen inflation, which has declined from a very high level experienced in the first half of the 1990s (Barbossa Filho, 2007). Despite these favourable trends, inflation has remained higher than in some regional peers: 0.6-0.7 percentage point higher than the average of selected emerging-market economies during the period 2000-09 (Figure 1.3). More importantly, inflation developments in Brazil display strong inertia, reflecting the prevalence of long-term contracts. For example, electricity and telephone prices are partially indexed to the general price index. In addition, administrative prices are set by contracts based on the path of the price level. Inflation is also particularly sensitive to movements in forward- and backward-looking inflation expectations (see below).

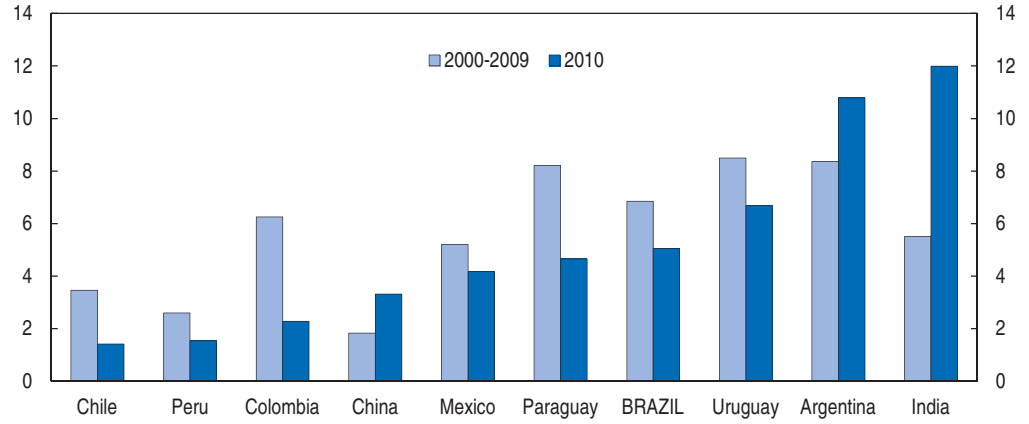
Table 1.2. **The record of inflation targeting in Brazil**

	Target (%)	Tolerance band (percentage points)	Actual inflation (IPCA, % per year)
1999	8.0	2.0	8.94
2000	6.0	2.0	5.97
2001	4.0	2.0	7.67
2002	3.5	2.0	12.53
2003	3.25	2.0	–
	4.0	2.5	9.3
2004	3.75	2.5	–
	5.5	2.5	7.6
2005	4.5	2.5	5.69
2006	4.5	2.0	3.14
2007	4.5	2.0	4.46
2008	4.5	2.0	5.9
2009	4.5	2.0	4.31
2010	4.5	2.0	5.91
2011	4.5	2.0	–
2012	4.5	2.0	–
2013	4.5	2.0	–

Note: An open letter adjusted the mid-point targets to 8.5% for 2003 and 5.5% for 2004.
Source: Central Bank of Brazil.

Figure 1.3. **CPI inflation in Brazil and selected comparator economies**

Per cent



Source: IBGE, IFS statistics.

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Overcoming the "impossible trinity"

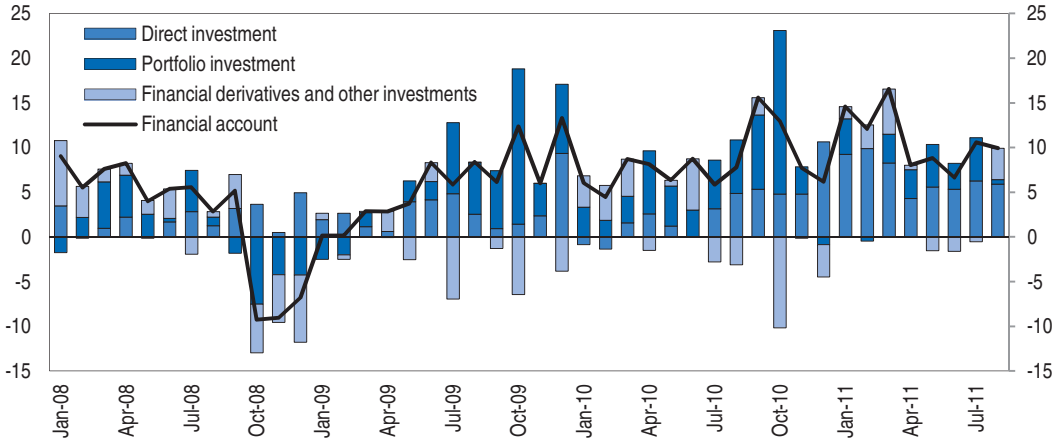
Like many other emerging-market economies, Brazil faces a complex situation, whereby inflation pressures need to be tamed without attracting short-term capital inflows that would put pressures on the exchange rate and hamper competitiveness. Fiscal consolidation will help to overcome the "impossible trinity" of maintaining monetary policy independence, with a stable exchange rate and free capital movements.

Capital inflows have markedly increased

Since 2009, Brazil has experienced a massive surge in capital flows (Figure 1.4). Portfolio investment, in particular in equity securities, has accounted for most of the flows volatility. Both external and internal factors can explain these developments. Global liquidity expansion, which accelerated in the second half of 2007, and high equity returns in Brazil have played a major role (IMF, 2010). But panel analysis on a sample of OECD and

Figure 1.4. **Financial account and its components**

USD billion



Source: Central Bank of Brazil.

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emerging-market economies also suggests that financial-market deepening, increases in GDP per capita and improvements in regulatory quality have helped to attract foreign assets (Furceri *et al.*, 2011).

Looking forward, further progress in financial development and economic convergence are likely to continue to attract capital inflows. By contrast, improvements in regulatory quality are estimated to play in the opposite direction. Evidence regarding the effect of financial deepening on the composition of flows is mixed. Recent empirical work suggests nonetheless that more open capital accounts, more pro-competition regulation and less stringent employment protection could tilt the composition of flows toward more FDI and a lower share of debt, thereby lowering the probability of sudden stops (Furceri *et al.*, 2011).

There is a general agreement that certain types of capital inflows are more beneficial to the host country than others. FDI is usually believed to be beneficial to growth and development in Brazil, as it provides the additional financing and partially offsets low domestic savings, is a source of technology transfers (Chapter 2), allows risk diversification and can deepen financial markets (Kose *et al.*, 2009). Capital flows in the form of debt or loans display a lower degree of risk sharing, as the host country bears the main part of the risk. It is also generally acknowledged that surges in volatile capital inflows present risks. They can lead to large swings in the exchange rate and, especially if the authorities intervene in the foreign exchange market and prevent the implied appreciation, to overheating. Depending on the form of the inflow, they can thereby fuel credit and asset price bubbles. Sharp reversals in capital inflows are disruptive and can lead to crises.

The exchange rate has appreciated

Since 2003, the exchange rate has experienced a steady appreciation, apart from the dip during 2008 global crisis. Recently, the *real* has depreciated as a result of turbulence in financial markets. Over the whole period, capital inflows have helped to push the exchange rate up. Although the currency appreciation and its impact on the country's competitiveness is a legitimate concern, there is some evidence that part of the appreciation experienced by the *real* is stemming from the natural resource shock and reflects a change in underlying fundamentals. To this extent, appreciation should not thus trigger an economic policy response. Nevertheless, empirical estimates point to an overvaluation ranging from 3 to 20% on average for 2010 depending on the approach, with a larger overvaluation by year-end (Box 1.5).

Box 1.5. **Is the *real* overvalued?**

Defining the "equilibrium exchange rate" is one of the most controversial issues in macroeconomics. Still, it is important because it provides an indication of the degree of misalignment of a given currency. It is of particular relevance when large movements in the exchange rate coincide with broad stability in economic fundamentals, as was recently experienced in Brazil. Many methods exist to estimate equilibrium exchange rates, and none of them is fully satisfactory. This section focuses on two approaches: the Fundamental Equilibrium Exchange Rate (FEER) method, developed by Williamson (1994), and a Behavioural Equilibrium Exchange Rate (BEER).

Box 1.5. **Is the *real* overvalued?** *(cont.)*

The FEER is defined in real and effective terms as the exchange rate consistent with the economy being in both internal and external balance. As in Wren-Lewis and Driver (1998), the FEER is estimated by modelling only the current account and using conventional aggregate trade equations. This has the advantage of simplicity, and as a consequence it is relatively easy to determine the factors behind a particular FEER and to examine its sensitivity to key assumptions. One of the disadvantages is that no model ensures the consistency between the assessments of trend output and structural capital flows. More importantly, any feedback from the FEER to the inputs for trend output and structural capital flows is ruled out. Lastly, this method gives no indication on what are the main factors influencing the value of the currency.

FEER estimates of misalignment rely heavily on how the current account target is calibrated. To compute this target, long-term projections for the current account using United Nations population projections and an equation for current account reported in Cheung *et al.* (2010) for emerging and developing countries are used. This equation incorporates demographic and convergence effects. Depending on the specification used and the period considered the long-term average of the resulting current account balance is found to lie around –1.0 to –1.5% of GDP.

Overall, the *real* appears to have overshot from substantial undervaluation in 2002-08 to small overvaluation in the course of 2008-09. Cline and Williamson (2010) find similar trends, though their estimates point to stronger misalignment (of about 15% in December 2009). According to the estimation presented here, the real effective exchange rate was overvalued by 3-10% in 2010 on average, depending on the current account target chosen.

In the second approach, a BEER framework is used to explain the real effective exchange rate as a function of productivity differentials between Brazil and its trade partners, as well as capital flows and oil exports (see Box 4.2). Dynamic simulations of these equations suggest an overvaluation of the *real* by the end of 2010, supporting the conclusions of the FEER analysis. However, the extent of overvaluation varies markedly across estimates. In most cases the *real* was found to be overvalued by 4-6% during 2009 and 10-20% in 2010 (Table 1.3). Equations using the real effective exchange rate based on the wholesale price sometimes point to estimates outside that range, but the fit of these equations is relatively poor compared to other specifications.

Table 1.3. **Percentage of overvaluation of the *real***

	2009	2010	2010Q4
Fundamental Equilibrium Exchange Rate			
Current account target –1.5%	–1.0	3.3	
Current account target –1.0%	2.4	6.4	
Current account target –0.5%	5.8	9.6	
Behavioural Equilibrium Exchange Rate			
Baseline equation			
CPI	5.5	15.4	18.6
Wholesale price	5.2	17.2	24.8
IPEA measure	6.0	9.6	8.6
Equation including GDP growth			
CPI	4.5	19.2	24.5
Wholesale price	9.0	26.3	35.4
IPEA measure	4.3	13.7	14.5

Source: OECD calculations. See Box 4.2 for more details on the equation used.

Consumer prices and credit growth have risen rapidly

Core and headline inflation have edged up since late 2010. While food prices were the main source of headline inflation until the beginning of 2011, price developments were mostly explained by the upward trend in service prices in the initial months of the year. Excess demand has put pressure on prices, although this effect is estimated to be small (Box 1.6). By contrast, forward and backward expectations as well as persistence in inflation appear to be the main source of inflation of late. They have been only partially compensated by the currency appreciation and a cut in the excise on fuel, whose effect is expected to be temporary. Inflation expectations at the 12–month horizon have remained

Box 1.6. **Explaining recent inflation developments**

To shed some light on recent developments in inflation the following Phillips curve has been estimated:

$$\pi_t = c_1\pi_t^{\exp} + c_2\pi_{t-1} + c_3\pi_{t-2} + c_4\pi_{t-3} + c_5 gap_t + c_6 reer_t + \varepsilon_t^h$$

where π_t is the quarter-on-quarter growth of IPCA, $\pi_t^{\exp}$ is the quarter-on-quarter inflation expectations, gap_t is the estimated output gap and $reer_t$ is the real effective exchange rate (see Boxes 4.1 and 4.2 for more details on the computation of these two variables).

The equation has been estimated using quarterly data and OLS estimation. Data are taken from IBGE, the Central Bank of Brazil and *OECD Economic Outlook* databases and have been seasonally adjusted. All the variables appear to have significant and correctly-signed coefficient estimates. In particular, the real effective exchange rate is found to be a significant determinant of inflation in Brazil (Table 1.4).

This is consistent with other findings in the literature (*e.g.* Cataõ *et al.*, 2008; Catão and Pagan, 2009). This could reflect the fact that the price of tradables is determined by foreign inflation and exchange rate developments. In addition, during a large part of the estimation period, the prices of some utilities (in the telecommunication and electricity sectors) were indexed to a price index that was heavily influenced by exchange-rate movements (Barbossa Filho, 2007). The equation passes the standard diagnostics tests, in particular the Chow stability test, and appears to perform relatively well over the recent period. Substituting the nominal for the real exchange rate would not modify the results, but it would worsen the fit.

Table 1.4. **Phillips' curve estimation result**

	Coefficient	t-statistic
$\pi_t^{\exp}$	0.03	5.1
π_{t-1}	0.83	8.5
π_{t-2}	–0.24	–1.9
π_{t-3}	0.25	2.7
gap_t	0.00	1.7
$reer_t$	–0.03	–2.7
Adjusted-R^2	0.85	
S.E. of regression	0.004	
Durbin-Watson statistic	2.4	
Sample	2001Q4-2010Q2	

Source: OECD calculations.

Box 1.6. **Explaining recent inflation developments** *(cont.)*

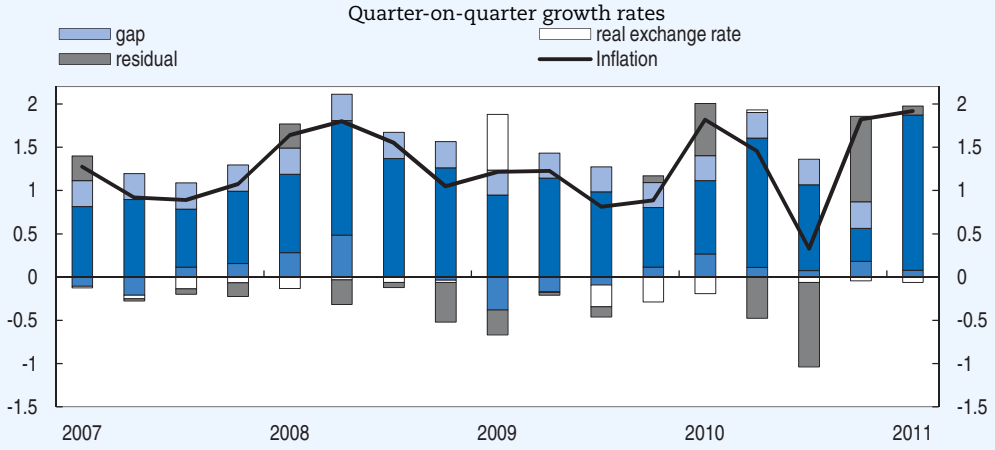
Contributions to inflation using this equation suggest that inertia has been a major contributor to inflation in the past (Table 1.5, Figure 1.5). This may reflect the link of administrative and service prices to past value of the CPI index. Forward- and backward-looking inflation expectations also play an important role. As well, the output gap has also put pressure on inflation, but to a much smaller extent. This may reflect measurement error in the gap in a country where the informal sector still represents a sizeable share of the economy. Finally, since the mid-1990s currency appreciation has dampened inflation.

Table 1.5. **Contributions to quarter-on-quarter IPCA inflation**

	Actual inflation	Forward-looking inflation expectations	Lagged inflation (including backward-looking expectations)	Output gap	Real exchange rate	Residual
2000-06	1.89	–0.05	1.65	0.29	–0.02	0.02
2007-08	1.28	0.09	1.01	0.30	–0.06	–0.06
2009	1.04	–0.13	0.94	0.29	0.02	–0.09
2010	1.36	0.16	0.93	0.30	–0.07	0.04

Source: OECD calculations.

Figure 1.5. **CPI inflation and contributions**



Source: IBGE and OECD calculations.

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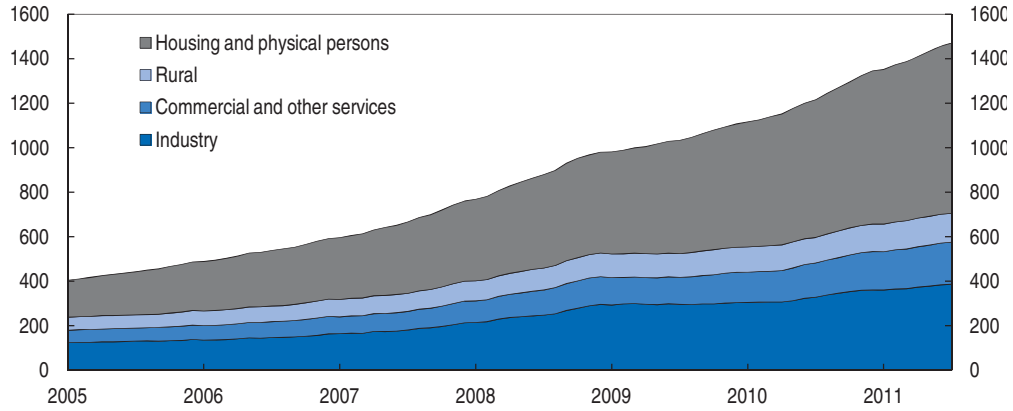
in the upper part of the monetary policy target range. They have moved up following the interest rate cut in September 2011 (see below).

Hefty capital inflows and economic growth have fuelled credit increases. Private credit growth has been recovering to pre-crisis levels (Figure 1.6). However, most of the increase has originated from credit to housing, while credit to industry, commercial and other services has grown moderately. Strong growth in credit to housing can be explained by robust labour incomes, in line with tightening labour market conditions. Another factor was the gradual implementation of the social programme My House My Life (*Minha Casa Minha Vida*) which aims at buildings new dwelling for low-income households. Credit supplied by the national development bank (BNDES) has also contributed, but BNDES'

Figure 1.6. **Private credit by sector**

BRL billions



Source: IPEA.

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provision of short-term working capital has started to be scaled back since the beginning of the year. Signals are mixed regarding house-price developments. While some large metropolitan regions such as Rio de Janeiro and São Paulo have experienced marked rises in house prices, increases in construction costs and the housing component of the consumer price index have so far been moderate. Overall, the absence of an economy-wide house price index makes it difficult to assess the situation in the housing sector.

Strong growth and easier access to credit for the growing middle class has led to rising consumer loans and household indebtedness. In addition, the average rate of interest on consumer lending has jumped from 34.9% in 2010 to 39.7% in July 2011. The build-up of consumer debt at high rates of interest has put a significant cash flow burden on the repayment capacity of borrowers and has put the average Brazilian household's ability to continue paying off its debt into question. Default rates for individuals have been increasing since the beginning of the year.

The policy response has combined a range of instruments

In order to cool the economy and prevent a credit and asset-price bubble, Brazil's policy response has comprised several tools ranging from changes in interest rates and bank reserve requirements, foreign exchange rate intervention, and capital controls in the form of a tax on capital flows.

Increases in interest rate. After having lifted its policy rate by a total of 175 basis points since the beginning of 2011, the Central Bank eased it by 50 basis points to 12.0% in September in a context of increasing uncertainties on the global outlook. Empirical evidence indicates that the impact of a move in interest rates on output is not significantly different in Brazil than in other emerging-market economies (Box 1.7). The delay in transmission of a change in interest rates on output is, however, found to be much shorter in Brazil than in most G7 countries. An increase in interest rates is found to damp inflation, though with a lag of six quarters, but such delays can also be observed in other emerging-market economies.

Box 1.7. **Monetary policy transmission channels in Brazil and other selected economies**

In this box the impact of an increase in interest rates in Brazil and selected emerging and developed economies is estimated using a simple VAR approach. Because of its simplicity, this methodology is known to sometimes result in an inflation puzzle, whereby an increase in the interest rate leads to an increase in inflation. Nevertheless, it can provide useful information on the amplitude and delays of monetary policy effects on growth.

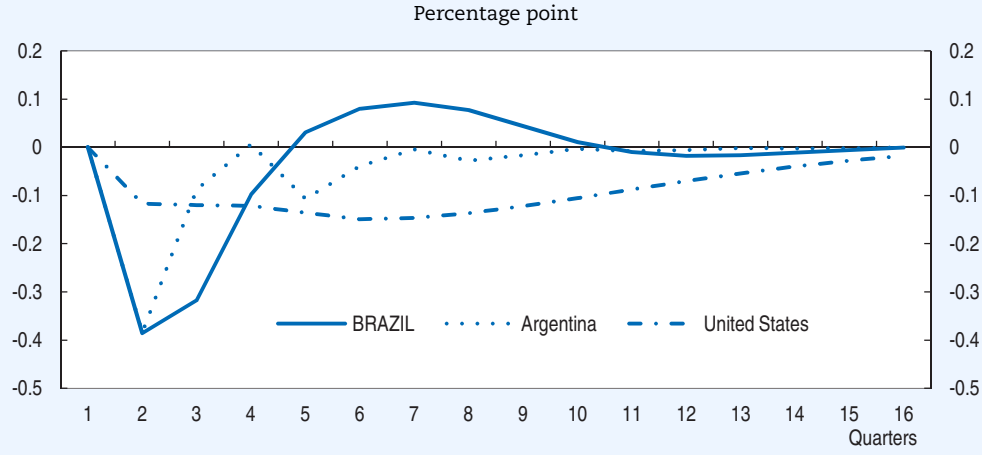
The VAR model consists of a system of three interlinked equations explaining economic growth, inflation and interest rates. The system was estimated on quarterly data from 1999 to 2010 (or the latest data available depending on the country). Data are taken from the OECD *Economic Outlook*, IBGE and the IMF's IFS databases. The Akaike and Schwartz criteria point to an optimal lag structure of two quarters.

Standard diagnostic tests, including tests of autocorrelation and heteroskedasticity, suggest that the model performs relatively well, although it sometimes does not pass the normality test.

To correct the inflation puzzle, which could come from the restricted set of information used in the analysis, the model is complemented by several exogenous variables, which are likely to influence monetary policy decisions. These are oil prices, exchange rates, the difference between national export market growth and the weighted average of those in the G7 countries, and a fiscal variable (public debt as a share of GDP). The incorporation of these variables significantly improves the results for Brazil and partially solves the inflation puzzle. Monetary tightening is found to dampen inflation, though with a lag.

The impact of an increase in interest rates in Brazil does not seem to be significantly different from what can be observed in other Latin American countries, though the maximum impact is reached later in Peru and Colombia. In particular, the output reaction in Brazil is found to be very similar to what can be seen in Argentina (Figure 1.7). Another striking result is that monetary transmission delays to output are very short in Brazil as in other emerging-market economies, in particular when compared to developed economies

Figure 1.7. **Effect of a 100 basis point increase in the interest rate on economic growth**



Source: OECD calculations.

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Box 1.7. **Monetary policy transmission channels in Brazil and other selected economies** *(cont.)*

(Table 1.6). This is consistent with other analyses in the literature (*e.g.* Cataõ *et al.*, 2008) and can reflect the short maturity of domestic credit and relatively high exchange-rate pass-through. Although the maximum impact of monetary policy on output is stronger in Brazil than in United States, the effect seems to be less persistent.

Table 1.6. **Effect of a 100-basis point increase in the policy rate on growth and inflation**

	Effect on growth		Effect on inflation	
	Maximum	In quarter	Maximum	In quarter
Brazil	**–0.4**	**2**	**–0.1**	**6**
United States	–0.1	6	–0.1	2
Germany	–0.5	6	0.0	2
France	–0.2	7	–0.4	2
Italy	–0.7	9	–0.1	2
United Kingdom	–0.2	4	–0.2	2
Canada	–0.1	2	–0.3	2
Argentine	–0.4	2	–0.2	2
Peru	–0.2	4	0.0	13
Columbia	–0.3	7	–0.2	9
Chile	–0.5	2	–0.1	2
China	–0.2	2	–0.1	5
India	–0.2	2	–0.2	2

Source: OECD calculations.

Bank reserve requirements. Compulsory bank reserve requirements have been increasingly used in Brazil as a stabilisation tool to complement conventional monetary measures to tighten policy and curb overheating in consumer credit loans without encouraging short-term capital inflows. High compulsory reserve holdings are a legacy of macroeconomic adjustment in the mid-1990s and have been successful instruments to manage liquidity in periods of financial stress. They are now very high by international standards (Table 1.7). In December 2010, the Central Bank boosted reserve requirements on term deposits to 20% from 15% and the additional requirement on demand and time deposits to 12% from 8% to slow consumer lending and prevent the formation of an asset price bubble. In addition, it raised capital requirements on loans to individuals with a maturity of 24 months or more. Reserve requirements are particularly high on sight deposits, when additional remunerated reserve requirements are included, and remain high for time and savings deposits. Reserves on time deposits (invested 40% in federal securities) and additional requirements (entirely invested in federal securities) are remunerated but at below-market rates. This partly reduces their distortionary impact but also lowers the effect of changes in requirements on bank lending.

The use of reserve requirements for stabilisation purpose can present some advantages in cases where massive capital inflows increase the vulnerability of the economy to sudden stops. Increasing reserve requirements induces banks to raise lending rates while keeping deposit rates stable or lowering them. By contrast, a conventional interest rate increase affects both lending and deposit rates. Reserve requirements can also

Table 1.7. **Reserve requirements by country**

Per cent, 2010

None		Low		Medium		High	
Australia	–	Colombia	0-11	Argentina	0-20	Angola	30-100
Canada	–	Czech Rep.	2	Armenia	8-12	**BRAZIL**	**4-43**
Denmark	–	Euro area	2	Bolivia	2-12	Kuwait	10-100
Mexico	–	Hungary	2	Chile	6.6	Lebanon	15-25
New Zealand	–	Iceland	0-2	Costa Rica	15	Paraguay	15-21
Norway	–	Indonesia	1-7.5	Guatemala	14.6	Serbia	10-100
Sweden	–	Israel	0-6	India	5.75		
United Kingdom	–	Japan	0.05-1.3	Peru	6-30		
		Korea	0-7	Turkey	5-9		
		Poland	0-3	United States	0-10		
		Russia	2.5	Uruguay	9-12		
		South Africa	2.5				
		Switzerland	2.5				

Source: Gray (2011) and Central Bank of Brazil.

be a useful complement to interest-rate increases in situations where traditional monetary channels are impaired or the pass-through from the policy rate to market rates or credit is weak.

The Central Bank has recently signalled that it will rely on both increases in interest rates and macro-prudential measures to achieve its inflation target. This approach is appropriate. While changes in reserve requirements may help to constrain credit growth, they are unlikely to be a perfect substitute for conventional monetary tightening. Very little is currently known about their impact on inflation. Indeed, the effectiveness of these measures can be eroded by financial innovation or regulatory arbitrage when transactions subject to prudential ratios are moved to non-regulated entities. Moreover, their scope is limited, and they do not deal with risks posed by capital inflows outside the financial sector, such as direct external borrowing by the non-financial sector, which can also have implications for the financial sector (Gray, 2011). Moreover, this type of measure may be less effective in shaping expectations about the policy stance because market players may be more familiar with signals sent by interest-rate moves.

International reserve accumulation. Monetary action has also taken the form of accumulation of foreign-exchange reserves to remove liquidity from the market and smooth out exchange-rate volatility. Recent evidence points to reserves moderately in excess of their equilibrium levels in Brazil during the pre-crisis period (Vujanovic, 2011). Since then, reserve accumulation has resumed at a rapid pace, their level exceeding USD 330 billion in the second quarter of 2011 (around 15% of 2010 GDP). Interventions have been complemented by sterilisation of liquidity through open-market operations so as to prevent any impact on domestic money supply. This policy appears to be particularly costly for Brazil, where the difference between what is paid by the central bank to accumulate international reserves and the return on the latter is large and the currency appreciation is a long-lasting rather than a temporary phenomenon. Accumulated losses from interventions since 2005 are estimated to have exceeded USD 42 billion by April 2010 (Levy Yeyati and Sturzenegger, 2010). Disregarding potential valuation effects related to benefits and losses from reserve purchase, an estimate of the fiscal cost of the reserve increase of 1.4% of GDP per year is obtained by multiplying the interest rate differential between

Brazil and the United States by the increase in reserves from December 2006 to April 2011. These costs should be considered in regard to broader benefits brought from intervention in terms of building up a safety net.

In 2010, the sovereign wealth fund (FSB) was granted the right to invest in high-return assets abroad and to buy foreign currency, with a view to it being an additional mechanism to curb the appreciation of the *real*. According to the authorities, this would be a less costly policy than the accumulation of international reserves. As seen above, part of the currency appreciation is likely to reflect changes in fundamentals and should not be resisted. It would thus be useful to restrain the action of the FSB to smoothing excessive fluctuations of the currency.

Tax on capital inflows. In addition to monetary tightening and international reserve accumulation, the Brazilian authorities have opted for capital controls in the form of a tax on inflows to discourage a speculative bubble in the country's capital markets and excessive currency appreciation. In October 2010, Brazil raised the *Imposto sobre Operações Financeiras* (IOF) rate on foreign investment on financial and capital markets (Table 1.8). The IOF applies upon conversion of foreign currency into *reais* related to equity or debt investments by foreign investors on the Brazilian stock exchanges or the OTC market, as well as private investment funds, Brazilian treasury notes and other fixed income securities, but the rate applied to FDI is lower. All outflows of funds from Brazil, including for dividend payments and return of capital, remain subject to the 0% rate. One exception concerns purchases made abroad with credit cards, which are subject to the IOF whose rate was increased from 2.4 to 6.4% in March 2011. This measure was part of a tax-raising package to offset the impact of a rise in the personal income tax threshold and reduce the risk of consumer indebtedness.

Table 1.8. **IOF tax by type of capital flows, per cent**

	March 2008	19 October 2009	4 October 2010	18 October 2010	September 2011
Portfolio					
Fixed income	1.5	2.0	4.0	6.0	6.0
Equity	0.0	2.0	2.0	2.0	2.0
Derivative margin deposit	0.38	0.38	0.38	6.0	6.0
External loan					
90 days	5.38	5.38	5.38	5.38	6.0
260 days	0.38	0.0	0.0	0.0	6.0

Source: Ministry of Finance.

Since March 2011, the authorities have adjusted the IOF rules several times. The tax rate applied on repatriated funds raised abroad through loans or international bond sales has been increased. The authorities have also closed a loophole by applying the IOF to renewed, renegotiated or transferred loans. The maturities of foreign loans subject to the tax has also been extended from 90 days to two years, and the IOF rate on new consumer credit was raised from 1.5 to 3% in April.

The economic literature provides little guidance on the effectiveness of taxes on capital inflows. Theoretically, it could be optimal for a country characterised by a 10% probability of experiencing a sudden stop to impose a tax on international borrowing (Jeanne and Korinek, 2010). Under certain circumstances, a country could also influence

exchange-rate developments through a combination of international and domestic capital controls (Jeanne, 2011). From an empirical point of view, however, the literature provides little evidence on the effectiveness of capital controls in reducing the volume of capital flows and real exchange rate pressure (Magud *et al.*, 2011; Patnaik and Shah, 2011). Although some impact can be visible in the short term, controls tend to lose their effectiveness as market participants find ways to circumvent them. Still, in many countries controls appear to have been successful in altering the composition of capital imports toward longer maturities and more stable forms (FDI in particular) and in giving monetary policy leeway to set interest rates well away from levels observed abroad.

At this stage it is difficult to estimate precisely what has been the effect of the IOF on capital inflows in Brazil. Indeed, the financial account surplus declined somewhat from its peak in September 2010, but the decline started before the imposition of the tax. Capital inflows increased from October 2010 to March 2011 but have been slowing since then. In line with past experience of capital controls, the introduction of the IOF has been followed by a change in the composition of capital flows towards instruments with longer maturities. Portfolio investment, in particular in equity securities, has been markedly reduced, while FDI investment remained broadly stable after October 2010 and even rebounded strongly thereafter. Some of these developments may reflect market players seeking to circumvent the IOF. It remains to be seen whether this compositional effect is solely attributable to the IOF tax and whether it will persist over time.

It is hard to disentangle the effect of the tax on the exchange-rate pressures from those of other factors. The bilateral exchange rate of the *real* against the US dollar depreciated temporarily in November 2010 but resumed its appreciation in the months that followed, though arguably much less than in the currencies of other emerging-market economies, such as Indonesia. It depreciated markedly in September 2011. Overall developments in the exchange-rate are consistent with the view that an important part of the real appreciation can be explained by structural changes transforming the economy, including the role of net foreign assets and of the productivity differential *vis-à-vis* trade partners and the increasing importance of the oil sector in economic developments (Chapter 4).

The IOF may have adverse consequences by delaying necessary macroeconomic adjustment. It has been argued that controls on capital inflows can distract policymakers' attention from other central issues like the vulnerability of the domestic financial system (Calvo, 2011). They can also distort the efficient allocation of resources. International co-operation on capital flows on the basis of conclusions agreed by both developed and emerging-market economies, could help to protect open capital markets and to reconcile their advantages with the need to cope with short-term instability.

Mitigating risks related to capital inflows and slowing down the economy. The main challenge for Brazil for the next few years is to cool the economy without attracting speculative flows, while at the same time not discouraging capital inflows of longer maturities that will be necessary to finance investment. Given the current macroeconomic situation in Brazil and elsewhere and the limited evidence on the impact of the different policies on inflation and capital inflows, it is wise to rely on an array of policy instruments. The current policy of exchange-rate flexibility that followed the abandonment of the exchange-rate peg in January 1999, together with inflation targeting, is probably the most robust measure to reduce the probability of sudden stops. This policy could be usefully

complemented by additional counter-cyclical fiscal measures, which would reduce pressures on domestic demand and help to damp mounting inflationary pressures. Fiscal consolidation should thus be given priority. In addition, macro-prudential measures and temporary taxes on short-term capital inflows could also be used. Measures to deepen financial markets, which are discussed in Chapter 2, are particularly important, as they enlarge investment opportunities and facilitate the economy's capacity to absorb flows. The impact of these measures will, however, materialise only in the medium term.

A summary of policy considerations is presented in Box 1.8.

Box 1.8. **Summary of recommendations: Macroeconomic policies**

Fiscal policy

- Continue fiscal consolidation and protect infrastructure projects and social programmes from budget cuts.
- Continue efforts to secure support from state governments to pass the tax package and simplify the tax system. Compensate any decreases in state VAT by commensurate increases in federal VAT.
- Over the medium term, move from a primary to a *headline* budget target.
- Introduce an expenditure ceiling.
- Remove one-off revenues and contingency measures.
- Phase out existing revenue-earmarking requirements and aggregate spending floors.
- Publish non-resource balances in budget documents and/or examine the sensitivity of conventional fiscal balance indicators to alternative oil-price scenarios.
- Maximise investment returns from the Social Fund by directing it to hold a diversified portfolio of assets, including foreign assets.
- Delegate the management of the fund to an agency whose good governance should be ensured by clearly spelling out its objectives set in a democratic fashion.

Monetary policy

- Minimise the risks posed by abundant volatile capital flows primarily by increasing public saving through fiscal consolidation. If needed, this could be complemented by macro-prudential policies, temporary capital controls and measures to deepen long-term capital markets. Limit policy action to smooth fluctuations of the currency to situations when they are excessive, and do not try to prevent currency adjustments reflecting changes in economic fundamentals.
- Continue to use bank reserve requirements as a complement to the conventional interest rate tool for stabilisation policy.

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Chapter 2

Raising saving and investment

Low investment rates are limiting Brazil's future potential growth rate. At the same time, its saving rate is also well below international averages, and a shortage of domestic saving appears to be a major barrier to higher investment rates.

Public-sector saving is negative due to high levels of expenditures, in particular pension entitlements. In addition to being costly, the pension system redistributes income to individuals with relatively low saving propensities, thereby reducing private saving as well. In order to control pension expenses in the future, useful parametric pension system reforms would include introducing a general minimum retirement age, raising the earliest possible retirement age, strengthening the penalties for early retirement and replacing the indexation of minimum pension benefits to the minimum wage by a more moderate adjustment.

Major curbs on investment include the high level of real interest rates, whose reasons are not easy to pin down. Explanations may include history and macroeconomic fundamentals, such as the downward rigidity of public current expenditures and weak creditor protection. Lending rates are raised further by interest margins that far exceed international levels. These high margins are due to a combination of high interest rates, high reserve requirements and important directed lending obligations, all of which are driving up the costs of financial intermediation. At the same time, public ownership of major financial institutions reduces market pressures for cost minimisation. Investment is also hampered by thin long-term credit markets. Due to the inability of commercial banks to provide investment financing with long maturities, the national development bank BNDES is currently the only sizeable supplier of such funding. BNDES is unlikely to be able to finance the country's investment needs, so that engaging commercial lenders in the provision of long-term funding will be necessary. Another factor limiting investment is the fragmented tax system, which raises firms' compliance costs and adds to an already high tax burden. Finally, regulatory reforms, including the removal of remaining entry restrictions as well as reductions in tariff protection, may reduce firms' costs and enhance investment incentives.

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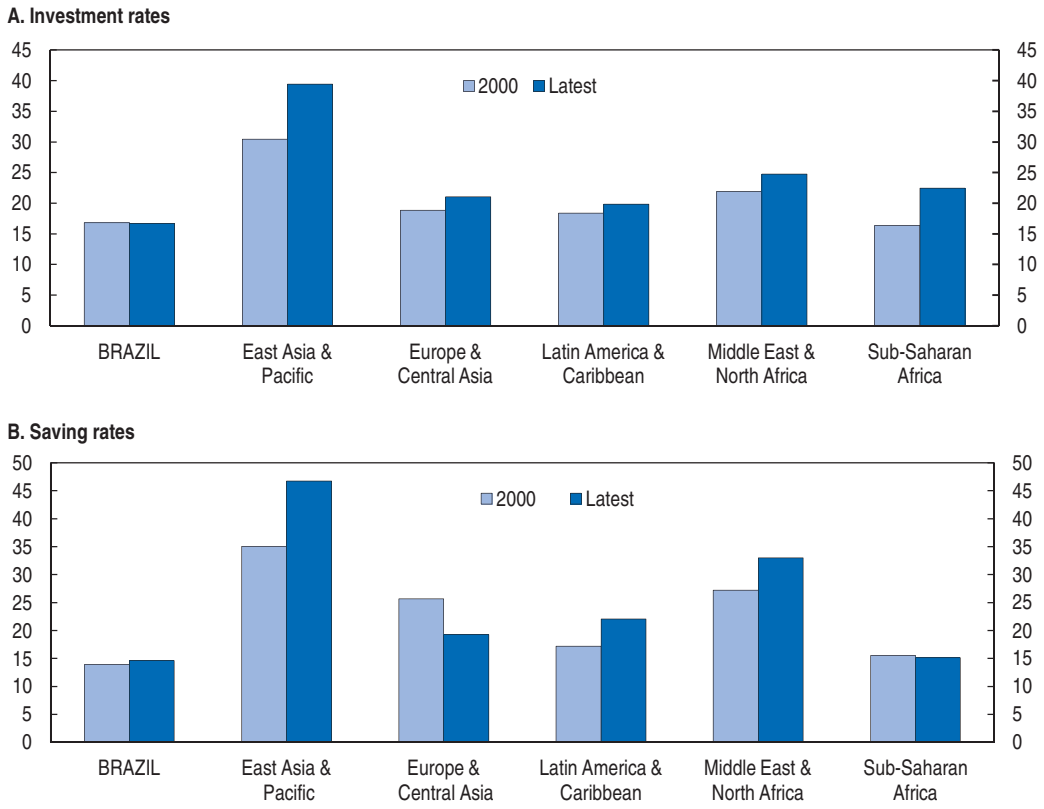
Saving and investment in Brazil – an overview

Having successfully achieved macroeconomic stability and being generously endowed with natural resources, Brazil is well positioned to achieve high growth rates in the near future. But one of the major drivers of growth is the accumulation of capital, and the country is investing too little of its current income for future growth. Despite increases in recent years, the current investment rate stands at 18%, a figure that is low when compared to emerging-market economies across the world and also slightly below the average in Latin America (Figure 2.1). Most of this investment takes place in the private sector, with the public sector accounting for around 12% of domestic investment (Figure 2.2, Panel A). Developing countries in Asia invest close to 40% of GDP in the accumulation of their capital stock. In Latin America, investment rates are 24 and 25% of GDP in Mexico and Peru, respectively, while Chile and Colombia invest 22% of domestic output. There appears to be ample scope for raising Brazil's growth potential if more of its

Figure 2.1. **Investment and saving rates in selected regions**

In per cent of GDP

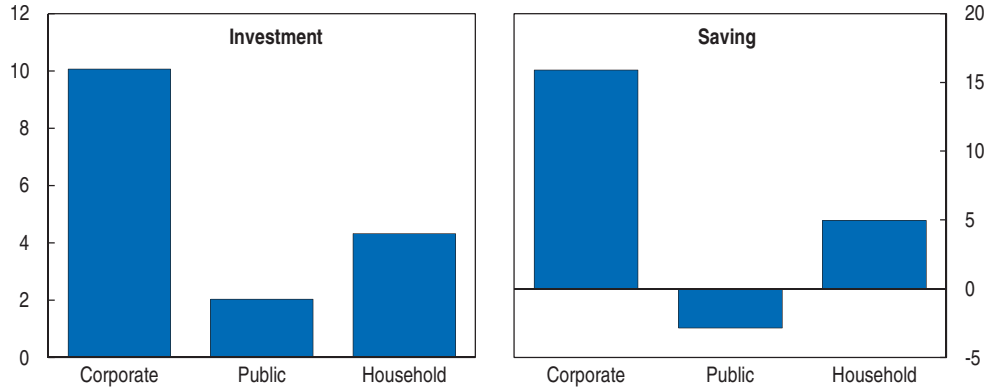


Note: Latest year is 2009 for most economies/ regions.
Source: World Bank (2011c).

StatLink http://dx.doi.org/10.1787/888932519225

Figure 2.2. **Investment and saving by origin sector, 2006**

In per cent of GDP



Source: IPEA (Ipeadata).

StatLink http://dx.doi.org/10.1787/888932519244

output were used for enhancing its capital stock. Furthermore, a comparison across industries shows that Brazil's petroleum sector gets an unusually large share of investment outlays (almost 30%).

Similarly, domestic saving rates in Brazil are low in international comparison. When compared to other developing economies, a striking observation is that Brazil's saving rate is only about a third of the average rates in East Asian developing economies. A generally lower extent of social protection in Asia may explain part of this difference. But even in Latin America, the average saving rate is about 50% larger than that of Brazil. While public saving is negative, Brazilian corporate and household saving rates were about 16 and 5% of GDP in 2006, respectively, compensating negative public sector saving.[1] Almost 90% of national saving comes from the corporate sector (Figure 2.2, Panel B).

Investment rates have traditionally been low, suggesting that the explanations are likely to be structural. However, it is not so much the historical investment rates that are surprising as the current low level: much of the 1980s and 1990s was characterised by macroeconomic instability, which created clear disincentives to invest in long-term projects. But in the light of the substantial progress made in stabilising the Brazilian economy, it is puzzling that the economy has not witnessed substantial increases in the aggregate investment rate. A number of structural factors still seem to be holding investment back.

Given that investment essentially implies putting liquid funds today into less liquid projects that promise a return in the future, potential explanations for low levels of investment in Brazil can in principle be grouped into two categories (Hausmann, 2008). On one hand, a dearth of saving available to finance investment projects could be the binding constraint, and there are a number of explanations why saving is low in Brazil. Alternatively, there may not be enough projects with expected investor returns above the relevant costs of capital – which are closely related to domestic interest rates and the development of the financial system. Investors' returns may fall short of project returns due to shortcomings in the business climate, such as legal uncertainty or excessive taxation.

Following this distinction, the next section presents a few explanations for low saving in Brazil and provides policy recommendations for how these could be raised. A final

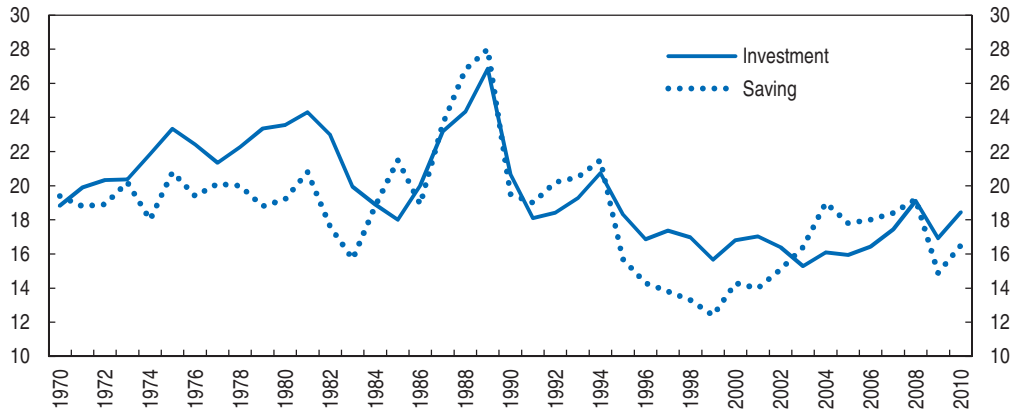
section then discusses non-saving-related institutional features that may be holding back investment, including potential reasons for the high level of interest rates, features of the Brazilian financial markets, the tax system and regulatory policies pertaining to product markets.

Determinants of low saving rates

The low level of domestic saving is likely to provide a first explanation for the low investment rate in Brazil, although it need not be the only reason. A first look at the development of investment and saving rates over time shows a visible correlation between the two (Figure 2.3), in line with the well known Feldstein-Horioka (1980) Puzzle. The scarcity of saving relative to potential investment projects is also confirmed by the observation that Brazil is a country that remunerates saving at real interest rates that are unequalled on the world scene (Bacha, 2010a). Another way to assess the degree to which deficient domestic saving has constrained investment is by looking at varying access to foreign saving over time, because domestic saving is not a binding constraint for investment in times of easy access to external funds. A simple analysis reveals a significant (at 10%) negative correlation between the total investment rate and the current account over the last 35 years, which is consistent with the view that investment responds strongly to changes in the tightness of the domestic saving constraint. Hausmann *et al.* (2005) confirm this view, observing that Brazil's economic performance was good whenever it enjoyed access to foreign capital, but declined when a tightening external constraint pushed up real interest rates and the currency depreciated.

Figure 2.3. **Investment and saving rates over time**

In per cent of GDP



Source: IBGE, IPEA (Ipeadata).

StatLink http://dx.doi.org/10.1787/888932519263

Policies aimed at raising investment rates should hence include attempts to boost domestic saving. Besides increasing the funds available for investment, higher domestic saving in Brazil would also have additional side benefits. These include a reduction in inflation pressures and in the current account deficit, or both. In fact, in the current situation it is hard to see how Brazil could increase its investment without adding to inflationary pressures unless some current consumption is turned into saving. In addition, higher domestic saving is likely to have a downward effect on domestic interest rates, although there may be other reasons for high interest rates besides a low level of saving.

The discussion of ways to raise domestic saving examines in turn measures aimed at affecting public, corporate and household saving, before moving on to foreign saving.

Public saving and fiscal policy

The total government sector contributes negatively to national saving. Overall government financing needs stood at –2.6% of GDP in 2010, with an average over the preceding three years at around –2.7% of GDP. Further increasing the primary surplus with a view towards eliminating the negative contribution of the government sector to national saving could raise investment rates in Brazil if achieved by a reduction of public expenditure. Raising the primary surplus through tax hikes is likely to be less effective due to Ricardian equivalence-type behaviour (Paiva and Jahan, 2003). Chapter 1 puts forward ways to increase government saving by rethinking the tax and spending mix.

Reforming the pension system

A major burden on public finances is social security and in particular retirement pensions, which account for almost one third of current expenditures. Brazil has a costly pension system, whose assets and liabilities are not aligned and whose sustainability is threatened by changing demographic trends and steadily increasing pension benefit levels (World Bank, 2011b). From a longer-term fiscal standpoint, keeping pension expenditures under control is key to getting a grip on public finances in Brazil.

Brazil's defined-benefit pension system includes separate regimes for private and public employees. The private-sector regime (*Regime Geral da Previdência Social*, RGPS) has around 23 million beneficiaries and currently disburses over 7% of GDP, while the public-sector regime (*Regimes Próprios de Previdência Social*, RPPS) pays out around 2% of GDP to about 3 million beneficiaries. In addition to these two schemes, a social assistance programme accounting for 0.4% of GDP pays means-tested non-contributory pensions to the elderly and the disabled with family income per capita of less than 25% of the minimum wage.

These high expenditure levels, particularly in light of Brazil's demographic structure and level of development, reflect the high promises of the pension system in international comparison. The gross replacement rate for full-career workers at average earnings is 86% compared to an average of 57% in the 34 OECD member countries, while the net replacement rate is 97% *versus* 69% on average in the OECD (OECD, 2011a). The current levels of benefits are in part attributable to a continuing indexation of minimum pension benefits to increases in the minimum wage, which has seen real increases of over 70% over the last decade. In the future, minimum pensions should be indexed to the consumer price index for a number of years to reverse the fast pension increases of the past while preserving the purchasing power of pensioners. Thereafter, a more appropriate long-term anchor for indexing pension benefits could be an average of consumer price inflation and average wages, as applies in Switzerland. Applying such a formula would pass part of current productivity gains on to pensioners. Assuming annual productivity growth of 3%, pension benefits would have seen around 42% of the increases of average wages after 25 years with this formula. Political acceptance of these necessary reforms would be enhanced by phasing them in gradually or exempting current and imminent pensioners, who can no longer adapt their saving behaviour during their working lives.

In addition, retirement ages are relatively low. In the RGPS system, minimum retirement ages are waived after 35 years of contributions for men and 30 years for women.

Around three-quarters of workers retire after having completed the minimum length of contribution, and average retirement ages for these retirees are only 54 for men and 51 for women. In the case of women, this implies almost as many years of benefit as of contribution (World Bank, 2011b). In other emerging-market economies including China, India, Russia and South Africa, retirement ages tend to be higher than in Brazil, although generally lower than in OECD countries (OECD, 2011a). Brazil should consider equalising the retirement age for men and women, as is the norm in the vast majority of OECD countries. Minimum retirement ages of 65 years, as currently under discussion within the government, or 40 years of contributions, would seem more in line with current practice in most OECD countries. In a second step, the retirement age should be linked to rising life expectancies.[2] Brazil also offers relatively easy access to early retirement, which is possible at age 53 for men with 30 years of contributions and at age 48 for women with 25 years of contributions. In order to increase the effective retirement age, it would be necessary to substantially raise the earliest possible retirement age and introduce stronger penalties for early retirement. Brazil should also consider increasing the contribution requirement of only 15 years to access a full pension at the official retirement age. Similarly to the private-sector system, the RPPS is characterised by "excessive generosity in both the retirement age and determination of benefits provision" (Ter Minassian, 2011). In 2003, the government proposed changes in the RPPS system that would introduce a ceiling on the pensions of new civil servants and establish a complementary pension fund (FUNPRESP) to which both the employer and the employee would contribute. These measures, if implemented, would be likely to increase household savings and reduce the burden of civil servant pensions on the social security budget in the long run.

Such parametric changes do not exhaust the possibilities of pension reform in Brazil. Other countries have embarked on broader pension reform agendas, including, for example, the introduction of a notional individual accounts system within a pay-as-you-go framework. Such individual accounts can constitute a way to tie individual benefits more closely to individual contributions, increasing the incentives to contribute to the system. In addition, complementary and voluntary defined-contribution pillars have been used to generate additional retirement saving in a number of ways, including through preferential tax treatment of such savings or by matching any contributions that are made by the employee for a set period. In New Zealand's Kiwi Saver scheme, for example, participation in this pillar has been encouraged by enrolling new workers automatically while giving them the choice to opt-out. Establishing such an additional pillar for public pensions has been under discussion in the National Congress since 2003 but was never implemented. Currently, there is no such second pillar in Brazil, although there is an expanding network of private pension funds.

Saving of households

Household saving is influenced by changes in the propensity to save and by disposable income growth, which in turn is affected by changes in employment, incomes and taxation. These two factors are likely to pull in opposite directions in the future, with the net effect on household saving being unclear. On the one hand, the saving propensity is likely to be affected by demographic changes. Brazil's population is set to age fast, with the dependency ratio expected to rise from 2025 onwards (Chapter 4). Assuming that saving ratios decrease around retirement age, the country's demographic developments would imply lower household saving propensities in the future. On the other hand, Brazil's

income distribution is becoming more equal, with a growing middle class and decreasing poverty rates. Since saving part of family income becomes a reasonable option only once basic household needs are satisfied, rising incomes at the bottom of the distribution may suggest higher levels of household saving in the future.

While the demographic effects will become visible only later, micro data from household surveys that allow a comparison of the saving behaviour of families between 2002 and 2008 already show evidence of income distribution effects (Rocha, 2010). Families in the lower range of the income distribution saved larger fractions of their disposable income in 2008 than in 2002, and positive saving started at a lower percentile of the income distribution. Comparing the saving behaviour in 2002 and 2008 for households with similar real income levels suggests that low-income households have increased their saving because their income has risen, although there is also some evidence of a higher saving propensity conditional on real incomes among low-income earners.

While household saving rates are the result of individual decisions on inter-temporal optimisation and therefore a question of personal preferences, they may be distorted by public policies. One possible source of distortion may be the benefit levels in the current pension system. Households that expect to receive ample pension income in the future may have lower incentives to save for their retirement during their working lives. The current level of pensions compares well with working incomes and reduces the need to save for retirement. In fact, a retired couple with two pensions would in most cases have an income of at least two minimum wages, which may place it far above the bottom of the income distribution in some areas. Pensions also represent transfers from working-age individuals towards the elderly who have lower incentives to save. Indeed, empirical results obtained by Rocha (2010) suggest that the marginal propensity to save out of labour income is significantly higher than out of transfer income (including pensions), which is consistent with the idea that high pensions reduce household saving. To sum up, a successful pension reform could increase domestic savings not only through its effect on public saving, but also by increasing household saving rates. This strengthens the argument for pension system reform.

Available financial instruments for saving and dissaving also influence household behaviour. High inflation expectations coupled with a lack of opportunities to hedge against the erosion of nominal asset values may have made saving unattractive for many years in Brazil, and only the price stability of the last decade may have enabled some families to take a longer-term view and save for the future. While this may increase household saving, loosening credit constraints faced by households may work in the opposite direction. In fact, household credit has increased rapidly in recent years, despite very high interest rates charged on consumer loans. From a saving perspective, the measures taken by the government in April 2010 that subject consumer credit to the financial transactions tax (IOF) and are expected to limit the growth of consumer credit are therefore welcome in principle, although the price sensitivity of consumer credit decisions seems limited in Brazil.

Corporate saving

Corporate saving is the main contributor to Brazil's domestic saving at present and has recently been rising due to large increases in export revenues. Still, it is probably held back by high corporate tax rates of 34% including surtax and social contributions (Deloitte, 2011). Increasing tax incentives for companies to retain profits may be one way to

increase corporate saving, which could be achieved by reducing the unequal tax treatment of dividends and capital gains. While the latter are taxed at the corporate tax rate when accruing to corporations and at a rate of 15% when accruing to individuals, dividends paid by domestic companies are tax exempt (Deloitte, 2011). This implies a more favourable tax treatment for distributed than for retained profits. Eliminating this distortion would enhance the incentives for corporate saving, as would lowering the comparatively high tax burden on enterprises.

Foreign saving

Foreign saving can complement domestic saving to finance domestic investment. Brazil has had access to foreign saving at several points in its history, although such access has often been unstable. Over recent years, Brazil's access to foreign funds has improved dramatically, after having needed to borrow from the International Monetary Fund to shore up its foreign liquidity as recently as in 2002-03 (Hausmann, 2008). Greater stability of domestic financing may be one of the reasons why comparisons across countries usually reveal a high correlation between domestic rates of investment and saving (the aforementioned Feldstein-Horioka Puzzle).

Brazil's position as a middle-income country with comparatively high growth suggests that using foreign saving to finance part of its investment needs may be desirable, and a moderate current account deficit should not be a surprise when capital intensity is low and returns to capital are high. But unlike Brazil in recent years, many countries in similar situations fail to receive substantial capital inflows due to shortcomings of institutions, financial markets or education (Lucas, 1990). Structural policy reforms that can make a country more attractive to foreign investors may thus play a key role in defining the scope for complementing domestic with foreign saving.

Foreign capital inflows take different forms, with some more desirable for the host economy than others. Foreign direct investment (FDI) inflows have often been mentioned as particularly beneficial. FDI inflows are typically geared towards the longer term and are less liquid than other forms of capital inflows, which means that they are unlikely to leave the host economy quickly in the event of adverse circumstances. In addition, by transferring more risk to the foreign investor, the remuneration of FDI inflows is more tightly linked to domestic economic conditions than interest payments on debt. Finally, FDI often brings technology spillovers into the host economy and may hence have both direct and indirect productivity benefits for the host economy (Arnold *et al.*, 2011, Arnold and Javorcik, 2009; Haskel *et al.,* 2007; Javorcik, 2004; Keller and Yeaple, 2009).

Brazil receives significant FDI inflows, with a record level of USD 48 billion reached in 2010. It is the 12th country in the world in terms of the stock of inward FDI and the third developing country in terms of inflows (UNCTAD, 2010). FDI inflows have constituted around 10-15% of gross fixed capital formation in recent years. These numbers and Brazil's current account deficit of around 2% of GDP suggest that the country is already making strong use of foreign saving, although, given that 104 countries listed in a recent edition of the IMF's *World Economic Outlook* have current account deficits higher in terms of GDP than Brazil's, there is no reason to believe that the country has already hit the limit of attracting FDI inflows (IMF, 2010). Policies that can improve Brazil's attractiveness for further FDI inflows are essentially the same as those that would enhance the attractiveness of domestically funded investment, including reforms to the tax system and product market regulation (see below). But beyond the domestic investment climate, particular legal or

regulatory restrictions to FDI can render foreign investment more difficult or impossible where domestic investment would be viable. FDI restrictions should be kept to a minimum, given that FDI projects add to domestic investment without subtracting from domestic savings and are a comparatively stable source of finance. With very few exceptions, Brazil has a low level of FDI restrictions. The OECD FDI restrictiveness index shows a considerable improvement between 2006 and 2010, bringing Brazil's outcome slightly ahead of the United States and better than the OECD average (OECD, 2011d). Sectors with relatively high levels of restrictions include fishing and the transport sector. In addition, Congress has recently passed laws to strengthen state control in the development of the offshore oil reserves via the state-owned oil company *Petrobras* and to limit private (including foreign) equity stakes in production-sharing contracts to 70%. In these sectors, there would be scope for attracting additional foreign direct investment inflows by lowering the legal barriers, which mostly take the form of equity restrictions.

Brazil has also had recourse to measures aimed at controlling capital inflows (Chapter 1). For example, the *Imposto sobre operações financeiras* (IOF) has been applied on portfolio capital inflows going towards assets with short maturities, although the threshold maturity has been successively extended, and the IOF now applies to inflows with maturities up to two years. While the IOF targets financial flows with short maturities, which are typically not those used to finance long-term investment, there is a risk of collateral damage, although there is no evidence of FDI inflows having suffered from the IOF so far. Given its shortage of domestic saving and high real interest rates, Brazil can ill afford to keep out capital flows that may be used for domestic investment projects. Policy makers should continue to be careful in the design of measures aimed at reducing portfolio capital inflows so as to avoid a reduction of the resources available to finance fixed investment.

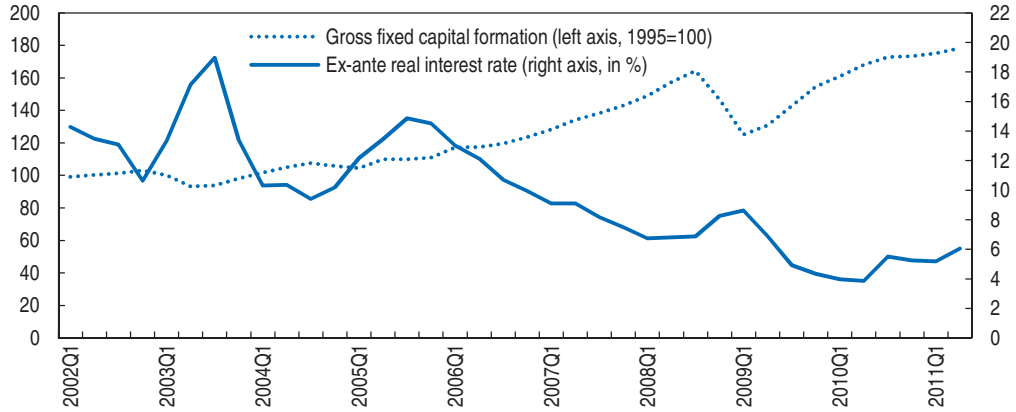
Impediments to investment

To the extent that a lack of saving is the binding constraint for investment in Brazil, and substantial evidence points in this direction, policies to foster saving, particularly public saving, should be first priority. In a stylised world, removing barriers to investment while keeping the pool of available saving fixed would affect only the price of capital but not increase investment volumes. In the real world, however, there are good reasons for policy to improve the conditions for investment. One of these is that identifying and removing distortions and frictions that hamper investment will improve the allocation of capital and generate productivity increases. Particularly given that its existing savings are scarce, Brazil must optimise its use and reduce any distortions in their allocation to a minimum. Another reason is that better investment conditions can attract additional financing resources for domestic investment from abroad. This section on removing impediments to investment examines issues related to high domestic interest rates, the structure of financial markets, the tax system and regulation of product markets.

High interest rates

Arguably the greatest deterrent to investment is the extraordinarily high level of interest rates. Retail interest rates charged on bank loans vary considerably according to the type of borrower, the kind of credit contract and the use of collateral, but they are extremely high across the board. Real interest rates have fallen over the past decade, and investment has drifted up (Figure 2.4). Nevertheless, corporate borrowers are still charged average interest rates of 31%, and personal loans carry a 45% interest rate. With these

Figure 2.4. **Real interest rates and investment**



Note: The *ex ante* interest rate is derived as the difference between the Selic rate and inflation expectations 12 months ahead (IPCA).
Source: Central Bank of Brazil.

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rates, only very profitable investment projects are economically viable. High interest rates hurt small and medium-sized enterprises particularly severely, because they do not have access to foreign finance. Indeed, 90% of small Brazilian firms report high interest rates as one of their major growth obstacles (World Bank, 2011a). Lower bank lending rates would also raise the incentives to join the formal sector, because the most significant advantage of going formal is often the possibility to access bank finance.

Why interest rates are so high in Brazil is a question with no easy answer. Beyond the scarcity of domestic saving as one obvious candidate explanation, several – not necessarily conflicting – explanations have been put forward in the literature without providing a fully satisfactory answer. Since the high interest rates are common to all freely negotiated credit contracts, it is unlikely that the explanation lies in some financial market detail, but rather in systemic factors affecting the Brazilian economy.

History

History is one of the most widely heard explanations for the high general level of interest rates. Former Central Bank governor Arminio Fraga once called the high Selic rate "the consequence of a long history of misbehaviour". But though history certainly plays a role, this explanation is not fully satisfactory, because other countries with turbulent economic histories manage to keep inflation in check with much lower real interest rates.

Fiscal accounts and public debt management

Brazil's fiscal situation has improved markedly over the last decade, the level of public debt has come down, and the solvency of the government is clearly not an issue these days. Despite these positive developments, however, the interest rates for Brazilian debt might be reduced by further improving market confidence in the country's fiscal prospects. Indeed, the primary surpluses of the last few years have been mostly achieved through an increasing tax burden rather than expenditure control, and GDP growth rather than a genuine fiscal effort has been the main contributor to the decline in public debt over the last decade (FUNDAP, 2011). Another factor that has contributed to the debt reduction has been the declining level of real interest rates. The downward rigidity of public current

expenditures may be a concern in light of the demographic changes ahead. Parametric reforms to the pension system that reduce the future burden of social security on public finances would be a useful signal to improve market confidence. In addition, lowering the expected trajectory of public debt through a successful reduction of public current expenditures would be likely to accelerate the recent downward trajectory of the Selic rate. Bacha (2010a) estimates that, due to the country's history, the downward effect of reducing public debt levels on interest rates would be considerably larger than in other countries. A percentage point reduction in the debt ratio would lower interest rates by 0.19 percentage point, and he suggests targeting a reduction in public debt to 20% of GDP to align Brazil's real interest rates with international averages (Bacha, 2010b).

Beyond the level of the public debt, its structure may also play a role in determining risk premiums embedded in the Selic rate. Exchange-rate risks to which the government debt was exposed in the past have been completely eliminated because the Brazilian public sector has become a net creditor in foreign currency. This improvement has probably reduced the role of the public debt in explaining the high level of interest rates compared to the past. But one remaining peculiar feature of Brazilian public debt is a combination of short maturities and interest rate indexation, which exposes the government to significant interest rate risk. While the average maturity increased between 2004 and 2010, it still stands at only 3.4 years, which is around a quarter of the corresponding figure for Chile and Peru, and less than half the average across Australia, Belgium, Canada, Germany, Spain, the United Kingdom and the United States (Bank for International Settlements, 2011). As a consequence, more than a quarter of the outstanding debt matures within 12 months or less, and the government needs to refinance about 8.1% of GDP over the next year at any point in time. But the interest rate risk is not limited to maturing debt due to the high share of floating rate securities whose interest rates are adjusted for changes in the Selic on a daily basis. Reducing the share of floating rate securities (now down to less than 40%) and raising the average maturity are part of the government's debt management strategy and will help to improve investor confidence over the medium term. In the short term, however, pursuing these objectives more aggressively could require paying even higher rather than lower rates to creditors to create more demand for securities with fixed rates and longer maturities. Indexing the debt to the price level instead of the Selic rate may be a relatively favourable option from a stability perspective, as the Chilean example has shown (Eichengreen and Hausmann, 2004; Inter-American Development Bank, 2007). The government has recognised this in its debt management strategy and has increased the share of inflation-indexed government debt over recent years (Tesouro Nacional, 2011).

Inflationary pressures and directed credit

The Selic rate is the Central Bank's key tool to control inflation. While the Central Bank and the inflation-targeting framework have been extremely successful in bringing inflation under control, it is nonetheless puzzling why balancing aggregate demand and supply has required interest rates "that would drive any other economy into a deep recession" (Hausmann, 2008). But taming inflationary pressures may have required higher rates in Brazil than elsewhere due to the particular features of the Brazilian credit market. Through the national development bank *Banco Nacional do Desenvolvimento Econômico e Social* (BNDES), the government has extended increasing amounts of credit for long-term investment projects undertaken by private companies. In the long run, these investments may enhance capacity and hence reduce inflationary pressures, but in the short run they

drive up demand because capacity increases take time to realise (Garcia, 2011). Some observers have argued that the expansion of credit by BNDES has fuelled demand, thus forcing the Central Bank to become more contractionary and keep the Selic rate higher than would have otherwise been necessary to manage domestic demand (Hausmann, 2008; Garcia, 2011; Schwartsman, 2011). Ricardo Hausmann refers to this as pushing the accelerator and the brake at the same time (Folha de São Paulo, 30/08/2010). While it is not easy to evaluate this hypothesis empirically, the argument could in principle add another explanation why the Selic rate has not come down as much as the improvement in economic fundamentals might have suggested.

Uncertainty and property rights

Another widely heard explanation for the high level of interest rates is that jurisdictional uncertainty and an insufficient protection of property rights make long-term lending risky, thus driving up interest rates and reducing the term at which private agents are willing to lend (*e.g.* Arida *et al.*, 2005). Proponents of this hypothesis often point to a systematic anti-creditor bias of the judiciary (generally in favour of small borrowers) and a risk of surprise inflation. In the view of Arida *et al.* (2005), insufficient property rights protection increases the country risk premium unnecessarily and thereby exerts upward pressure on domestic interest rates, while International Commission of Jurists (2008) suggests that there is scope for enhancing the efficiency of Brazil's judiciary. Gonçalves *et al.* (2007) test different variants of the jurisdictional uncertainty hypothesis and fail to find much empirical support for it, with similar evidence reported in Bacha *et al.* (2009). Pessoa and Nakane (2011) make the point that even if the evidence does not confirm jurisdictional uncertainty as a major determinant of the level of basic interest rates in Brazil, it does help to explain the high level of intermediation spreads referred to below. Regardless of how much this hypothesis adds to explaining the current levels of lending rates, strengthening creditor protection is likely to foster investment.

Indeed, Brazil scores comparatively poorly on the "Strength of legal rights index" produced by the World Bank, which measures the degree to which collateral and bankruptcy laws protect the rights of borrowers and lenders and thus facilitate lending. With an index value of 3, Brazil performs less well on this indicator than the average Latin American country with 5.5 or the average OECD country with 6.9. Debtors in Brazil can pledge assets as credit collateral without having to surrender them, but creditors' access to collateral is hampered by burdensome and uncertain judicial procedures. Collateral cannot be described in general terms: each item needs to be listed specifically, such that an automobile or a property pledged to guarantee a loan will no longer be able to serve as collateral once it is replaced by another one. It must be registered with a public registry in the debtor's city of residence. There may be more than one of these in a given city, and they are not linked across regions, with the result that a lender may find it cumbersome to assess the pledgeable value of a given asset. In addition, a creditor who wants to seize and sell collateral upon default will need a court ruling which may take four to five years to obtain, with the asset remaining with the debtor in the meantime. Judges may even put in doubt collateral that has been pledged by contract if it is deemed essential for the defaulting debtor, such as a taxi driver's vehicle (World Bank, 2006). Out-of-court enforcement, which may provide a faster and safer alternative to court orders, are possible only with the defaulting debtor's consent. Enhancing creditor protection through reforms of the legal and judicial system would increase the willingness of private agents to lend

over longer terms and reduce a risk premium embedded in current lending rates. In particular, a unified national collateral registry should be created, providing easy online access to debtor information. In addition, court procedures for repossessing collateral should be made faster. Enforcement of collateralised credit contracts without a court ruling should be made easier and not require the defaulting borrower's consent if agreed upon as part of the credit contract. Stronger creditor protection is associated with deeper credit markets and lower default rates (World Bank, 2006). That such legal reforms can have a noticeable impact on the development of credit markets has been vividly demonstrated by recent reforms in Brazil's mortgage regulation, where private markets started to develop once it became possible for the lending bank to remain the legal owner of the property until the mortgage is paid back.

Multiple equilibria

Some observers have claimed that the existence of multiple equilibria is responsible for the high interest rates. According to this argument, there are different equilibrium constellations of interest rates and default risks that are sustainable, with Brazil currently "trapped" in a sub-optimal one. In the current equilibrium, high interest rates are self-sustaining because they imply a higher risk of default than the one that would prevail at lower rates. At the same time, a lower interest rate, implying a smaller risk premium would be equally sustainable now, but high interest rates were initially required to bring down inflation expectations in the process of macroeconomic stabilisation. Regardless of whether this hypothesis is true, it does not provide clear policy implications. Indeed, it is hard to imagine an inflation-targeting Central Bank jeopardising its hard-earned reputation through substantial interest-rate cuts in the hope of finding another stable equilibrium at lower rates.

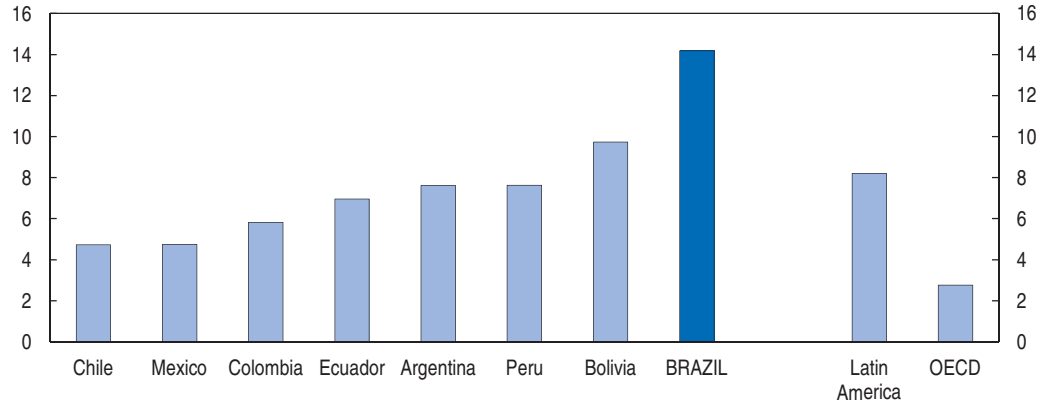
The structure of financial markets

Financial markets in Brazil are largely bank-based. Despite recent increases in market volumes, Brazilian corporate bond markets are small in international comparison, even for Latin American standards. While the outstanding stock of corporate bonds was only around 0.5% of GDP in December 2010 in Brazil, the corresponding figures were 1.8% in Argentina, 3.4% in Mexico and 14.6% in Chile (Bank for International Settlements, 2011). Some OECD countries have large corporate bond markets, including Japan, Italy and the United States (16.5%, 17.7% and 19.8% of GDP, respectively, according to the same source). The economics literature has not reached clear conclusions on the relative merits of bank-based *versus* market-based financial systems, but rather suggests that overall financial development is what matters most (Levine, 2002). In Brazil, corporate bonds appear to be a financing option only for the largest enterprises, and attempts to develop corporate bond markets further may be useful. At present, however, bank credit is the more relevant source of financing for most Brazilian corporate borrowers.

Bank lending is characterised by high intermediation spreads in international comparison. Brazil's net interest margins are over 70% above the Latin American average, and over five times the OECD average (Figure 2.5). Although margins have come down significantly over the last decade, they were flat in 2010, and recent trends suggest that they are on the rise again. Such high spreads are a symptom of a poorly functioning financial system and mean high and often volatile lending rates. This adds substantially to

Figure 2.5. **Net interest margins in international comparison**

Averages for 2007-09, in percentage points



Source: Beck and Demirgüç-Kunt (2009).

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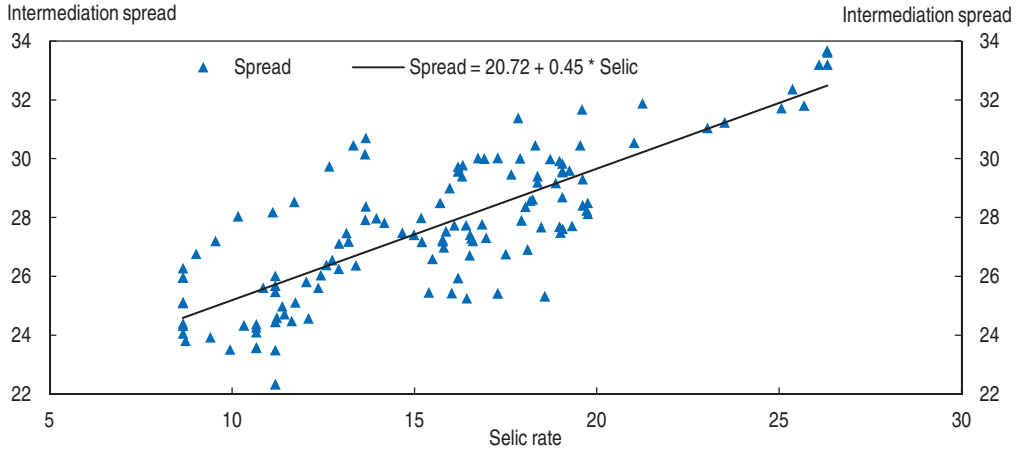
the cost of capital and creates a bias towards short-term, high-risk investment, instead of the long maturing investments with higher returns that the country needs.

Despite a great deal of research aiming to uncover the reasons behind the high banking spreads in Brazil, considerable disagreement and uncertainty remain. Factors that may contribute to high spreads include the high Selic rate, implicit and explicit taxation of financial intermediation and inefficiencies in the banking industry, along with possible interactions among several of these factors.

The high Selic rate is probably one of the major reasons why interest margins are so high in Brazil, as the two series are strongly correlated (Figure 2.6). In fact, the simple linear regression line in the figure is able to explain 64% of the variation in the intermediation spread over the last decade. A vector autoregression between the Selic rate and interest spreads suggests that past values of the Selic rate add significantly to explaining the level of interest spreads (or in other words that the Selic rate Granger-causes spread levels; see

Figure 2.6. **Intermediation spreads and the Selic rate**

Monthly data in percentage points, 2000-2011



Source: Central Bank of Brazil, OECD calculations.

StatLink http://dx.doi.org/10.1787/888932519320

Box 2.1). One explanation for this may be that the Selic rate is a reasonable proxy for bank funding costs. In fact, the Selic rate shows a correlation coefficient of 0.96 with the measure of average bank funding costs published by the Central Bank. Factors other than the high level of interest rates, such as bank reserve requirements, may interact with the latter, and have stronger upward effects on interest spreads at higher interest rates. Policy action should therefore prioritise reforms that can reduce the level of the Selic rate without increasing inflationary pressures, although micro issues related to banking-sector policies may become binding constraints once interest rates have come down further.

Box 2.1. **Direction of causality between the Selic rate and interest spreads**

The existence of a causal relationship between the Selic rate and interest spreads can be tested empirically by running a vector autoregression (VAR) model and testing for Granger-causality. A VAR is an empirical model in which one time series is explained by its own past values and those of other time series. In this context, a time series X is said to Granger-cause another Y if past values of X can significantly add to the explanation of present values of Y. Technically, establishing Granger-causality requires rejecting the null hypothesis that X does not Granger-cause Y. Estimations suggest that there is a causal link from the Selic rate to interest rate spreads. In contrast, no such link seems to exist in the opposite direction (Table 2.1).

Table 2.1. **Selic rate and interest spreads: Vector autogression and Granger-causality tests**

	Dependent variable: Selic	Dependent variable: Spread
	Vector autoregression	
Selic (t-1)	1.82 ***	0.24 **
	(0.00)	(0.05)
Selic (t-2)	–0.84 ***	–0.14
	(0.00)	(0.27)
Spread (t-1)	–0.05	0.89 ***
	(0.21)	(0.00)
Spread (t-2)	0.04	–0.09
	(0.27)	(0.30)
Constant	0.37	4.09 ***
	(0.43)	(0.00)
Observations	126	126
R-squared	0.99	0.89
	Granger-causality tests	
H_0: Spread does not Granger-cause Selic	1.55	
	(0.46)	
H_0: Selic does not Granger-cause spread		19.32 ***
		(0.00)

Note: P-values in parentheses. ** and *** indicate statistical significance at the 5% and 1% levels, respectively. Monthly data from June 2000 to January 2011. Different numbers of lags have been tested and yield qualitatively similar results.
Source: OECD calculations using Central Bank data.

An example for such an interaction is the level of reserve requirements. Banks' costs associated with holding required reserves at the Central Bank are positively related to their funding costs. Required reserves are either not remunerated or are remunerated below market rates and act as an implicit tax on financial intermediation. Higher interest rates imply higher opportunity costs of reserve holdings at the central bank and hence a higher implicit tax. The high level of reserve requirements strengthens the link between intermediation spreads and the level of interest rates. Reserve requirements for demand deposits are currently at 43% (Montoro and Moreno, 2011). This high level may also explain why the ratio of bank credit to bank deposits is only 0.8 in Brazil, while it is above one for both the average Latin American (1.1) and OECD country (1.4). Azevedo and de Carvalho (2008) estimate that some 1% of federal revenues are implicitly collected by the Central Bank through remunerating reserve requirements below market rates, and empirical evidence suggests that reserve requirements affect the interest-rate spreads between lending and borrowing rates (Souza Rodrigues and Takeda, 2005) and credit volumes (Montero and Moreno, 2011; Mesquita and Toros, 2010). The reduction in reserve requirements in reaction to the crisis, for example, is estimated to have caused an expansion of credit of the order of 3-4% of GDP in Brazil (Montero and Moreno, 2011). Reducing the level of reserve requirements for banks would reduce the level of implicit taxation of financial intermediation and contribute to lower intermediation spreads and costs of capital, thereby making more funds available for loans. Regarding the timing of such a reform, the short-term expansionary effects of lower reserve requirements need to be taken into account.

Brazilian banks are also subject to other explicit taxes that add to their costs. Apart from facing the generally high level of taxes on corporations, there are a number of specific distortions that add to the tax burden on financial institutions. For example, the banking sector has been excluded from a 2003-04 tax reform that changed the revenue base for the social security contributions PIS and COFINS from revenues to income. A Financial Operations Tax (IOF) is levied on selected financial transactions including bank loans. Finally, financial-sector companies are subject to a special rate for the Social Contribution on Net Profit (CSLL), which is 15% for financial institutions as opposed to 9% for other companies. Empirical evidence suggests that there is an almost complete pass-through of taxes on lending institutions into lending rates, which would imply that these taxes are ultimately borne by borrowers (Cardoso, 2003). Taxation of financial-sector profits should be aligned to the tax burden borne by other industries, because reducing intermediation spreads should be a priority to foster investment.

Directed lending obligations force banks to lend to certain priority sectors including rural borrowers and housing. As a result, these sectors get more and cheaper access to credit than they would under a free-market allocation, and banks forego potential profits that could be made on other lending operations whose volume is reduced as a result of the directed lending schemes. This is often aggravated by regulations on the interest rates that banks can charge on these forms of lending. Taken together, the mandated rural and housing lending schemes accounted for around 13% of those credit volumes that are unrelated to the national development bank BNDES at the end of 2010. Over the past three years, the volume of the rural lending has come down, while the housing scheme has expanded and is currently much larger than the former. The lost profits for commercial banks on these schemes may be substantial, thus forcing up interest margins on those operations that are not subject to rate ceilings. The extensive interventions in the

allocation of credit by commercial banks create complex relationships between prices and volumes on the credit and deposit side, with fixed shares of given savings instruments allocated to particular directed lending schemes. In some of these cases, the margins that banks can earn on this part of their operations are completely determined by regulation. The exact costs of these schemes and their impact on interest margins in free lending operations is very difficult to quantify, because even individual banks themselves struggle to separate out cleanly the revenues and costs associated with directed and free operations. What can be said with certainty, however, is that these directed lending schemes distort relative prices and credit allocation, and are costly for banks to administer. Part of their costs is borne by existing non-preferential borrowers in the form of higher spreads. But the supply of customer deposits is a finite resource, and these directed lending operations commit a fraction of the deposits that could otherwise be lent under free-market conditions. As a result, part of the cost of the schemes is shifted onto potential borrowers who are crowded out of the credit market. These directed lending schemes represent a complex and inefficient way to subsidise housing investment and the rural sector by committing existing customer deposits. They should be phased out. If such phasing out is done gradually over some time, these subsidies should be financed by a broader tax base, such as general taxation, pending their full removal.

Operating costs of Brazilian banks are also comparatively high. Compared to the average OECD country, they are almost three times higher relative to banking assets, and about 40% above the average in Latin America (Beck and Demirgüç-Kunt, 2009). Access to borrower information is also more difficult than in other countries, and the government has only recently passed a law authorising the creation of a credit bureau containing both negative and positive information. Despite high interest margins, the high costs of doing banking business in Brazil imply that banks are not more profitable than in other parts of the world. According to Beck and Demirgüç-Kunt (2009), Brazilian banks had returns on assets of about 2.3% in 2009 as opposed to 2.6% in OECD countries, with a similar picture emerging for returns on equity. The cost-to-income ratios of Brazilian banks (89%) are high compared to the OECD average (70%), or even the Latin American average (83%).

While directed lending schemes and the difficulties in enforcing credit contracts mentioned above drive up financial institutions' costs, uncompetitive market structures and a low level of contestability may also reduce the pressure for banks to minimise costs and reduce margins. Government-owned commercial banks have large market shares (45% in 2009, mainly *Banco do Brasil*, the largest bank in Latin America by assets, and *Caixa Econômica Federal*), and there is evidence that they operate less efficiently (Tecles and Tabak, 2010). As a result, private banks may be able to charge similar spreads as public banks despite lower costs. In other words, the size and market power of the public banks may reduce the downward pressure on spreads. This is consistent with the observation that private banks tend to be more profitable than public banks in Brazil (Micco and Panizza, 2005; Tecles and Tabak, 2010). Low banking efficiency may also increase default rates, which one would already expect to be high in Brazil, given the high lending rates and difficulties in contract enforcement. Indeed, empirical tests of causality suggest that the comparatively high default rates (currently at 4.9%) are the consequence rather than the cause of inefficient banking institutions (Tabak *et al.*, 2010).

Although it is difficult to establish the exact extent of competition in the Brazilian banking sector, evidence suggests that there are significant differences across market segments. Retail operations, in particular short-term sight deposits and credit card

services, tend to display lower degrees of competition, while corporate banking operations seem to be more competitive (World Bank, 2006). For example, fees on consumer loans and mortgages were close to 0.2% of GDP per capita in 2007, about three times the world average (Beck *et al*., 2007). The Brazilian authorities themselves have raised concerns that "the spread in the interest rates and the level of fees practiced by banks in the national market are beyond the competitive level" (OECD, 2009c). This perception has led to efforts to reduce the switching costs between banks. Competition and efficiency in the Brazilian banking sector could also be enhanced by reducing the dominant role of publicly owned banks. Increasing the role of private ownership in *Banco do Brasil* and *Caixa Econômica Federal* may be useful. In the short run, their dominant roles could also be scaled back by breaking them up and creating several smaller entities, without restricting their operations geographically.

The national development bank and long-term credit markets

Credit markets in Brazil can be characterised as a dual system in which short-term credit is provided by the private sector at market interest rates, while long-term loans are allocated by the national development bank *Banco Nacional do Desenvolvimento Econômico e Social* (BNDES) at rates considerably below the short-term borrowing costs of the government. Investment decisions at the margin are probably determined by market interest rates because firms will always face the opportunity costs of investing any extra resources at the Selic rate and would not invest in their own company unless they expect a return above this rate.

Due to a reluctance of the private sector to provide long-term finance, this segment is currently the exclusive domain of BNDES. It is financed from several sources, including through 40% of the revenues of the *Fundo de Amparo ao Trabalhador* (FAT), a workers' welfare fund that receives taxes collected through a tax on the revenues of private and public firms. The FAT is meant to provide social benefits to employees including supplementary unemployment insurance and annual salary bonuses (the "14th wage"), and to finance long-term development through BNDES. The latter objective gives it a notion of mandatory saving by employees, remunerated at below-market rates. In addition, BNDES receives occasional direct transfers from the budget. The institution extends credit for long-term investment projects directly to investors for projects above BRL 10 million, while loans below this level or those for financing machinery acquisitions are channelled through commercial banks acting as agents for BNDES.

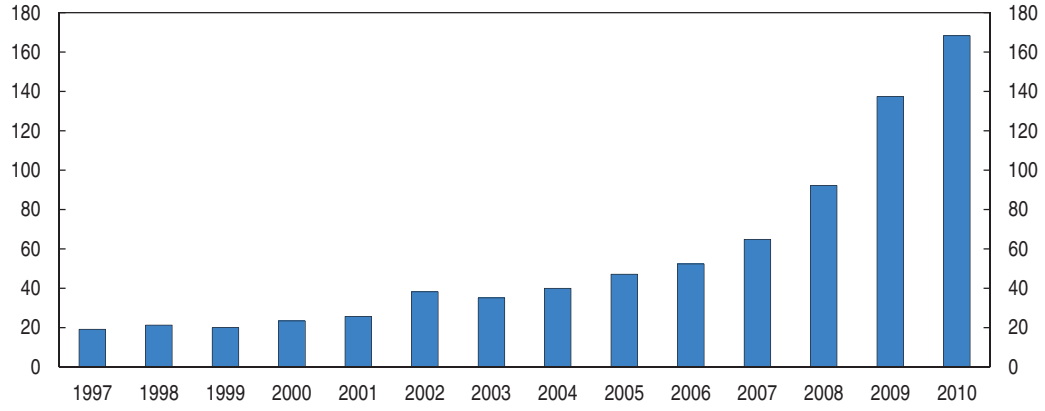
Given its unique sources of funding, BNDES is able to extend the majority of these loans at rates considerably below domestic market rates for short-term credit operations (which are the only feasible comparator, given the absence of private long-term credit), and often considerably below the Selic rate at which the government finances its debt.[3] Interest rates for BNDES finance are typically guided by a long-term interest rate (*Taxa de Juros de Longo Prazo*, *TJLP*), which is set by the National Monetary Council on the basis of the forward-looking inflation target and a risk premium, and which is also the rate at which the mandatory FAT savings of workers are remunerated. Two spreads are added on top of the TJLP to cover BNDES' operational expenses and credit risk. The TJLP currently stands at 6%, and the spreads can be as low as 3.5%. By way of comparison, the Selic is currently at 12%, and private banks lend to commercial borrowers at an average rate of 31%. The allocation mechanism for BNDES financing does not follow market principles but criteria established by BNDES in accordance with industrial policy guidelines. This allocation

mechanism may take into account positive externalities of certain investment projects if correctly identified by public officials, but it also creates considerable scope for government failure and is generally considered inferior to allocation by market principles. A large share of lending goes to companies with over 500 employees (72.5% in 2010). Across broad sectors, almost half of BNDES funds go into industry (47%), followed by infrastructure and trade and services (31% and 16%, respectively). An important distinction between BNDES credit and the directed credit obligations imposed on commercial banks is that BNDES provides additional tax-financed funding and does not draw on deposits collected by banks.

The volume of BNDES financing has been increasing rapidly over the years, with a sharp acceleration since 2006 (Figure 2.7). Part of the expansion of BNDES lending volumes in the last two years is related to the global financial crisis. While private banks' credit growth declined markedly in the autumn of 2008 due to the crisis, public financial institutions including BNDES started increasing their loan volumes massively so as to compensate for the decline in private supply (Figure 2.8). As a result, total credit remained on a fairly smooth upward path despite the financial crisis. In other words, public financial

Figure 2.7. **The evolution of BNDES disbursements**

In BRL billion



Source: BNDES.

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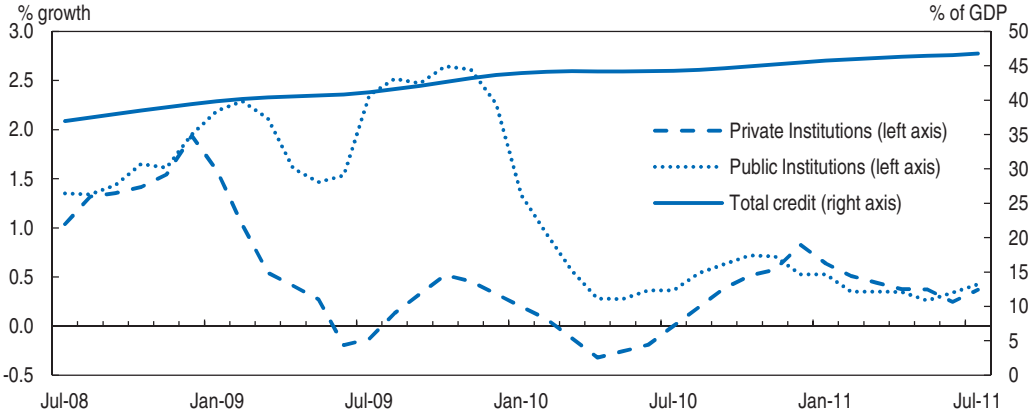
Figure 2.8. **Credit by private and public financial institutions**



Source: Central Bank of Brazil.

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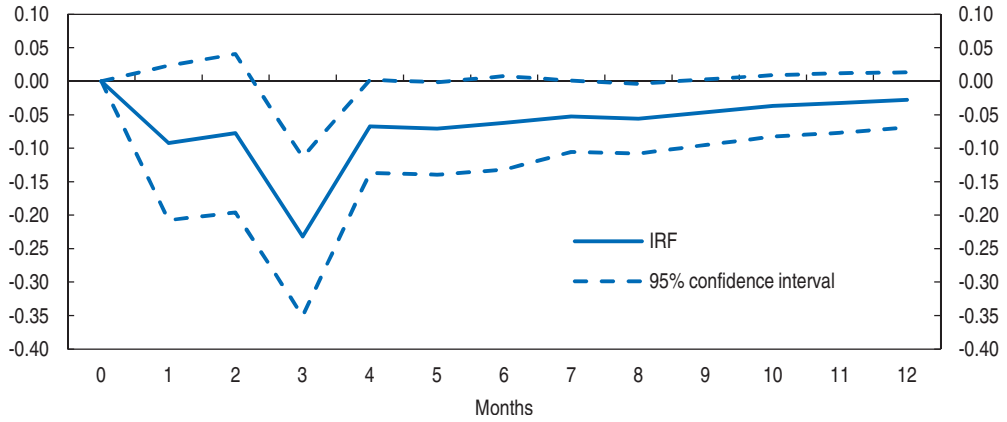
institutions – and most of all BNDES – were used by the government to extend liquidity during the financial slump and to avoid a decline in total credit outstanding. Between September 2008 and January 2010, credit from private banks grew by less than 10%, while credit from public banks rose by 50%. The massive expansion of BNDES credit volumes proved to be a successful tool to avoid a credit crunch for Brazilian firms in adverse times. At the same time, BNDES, in the context of the crisis, has ventured into areas in which private credit institutions were active before the crisis, such as the provision of short-term working capital for firms, but has started to withdraw from these areas now.

Private credit markets in Brazil operate almost exclusively on the short term, in sharp contrast to most OECD countries where they typically provide both short- and long-term lending operations. Banks have traditionally been unwilling to provide long-term funding, and borrowers looking for bank loans with longer maturities to finance long-term investment have typically been unable to find a market. Private credit institutions have instead preferred to invest in relatively high-yield short-term assets available in Brazil, including a considerable amount of public debt, as well as credit card and other short-term consumer lending. This feature is not unique in Latin America where thin or non-existent markets for long-term bank finance are fairly common (BNP Paribas, 2005). Domestic credit to the private sector relative to GDP – currently at 58% – is below the average of the lower half of OECD countries (OECD, 2011b), although in Latin America only Chile and Panama score higher on this indicator (with 97% and 85% of GDP, respectively). In Brazil, reasons for low credit-market development are likely to overlap with those lying behind the high level of interest rates. Indeed, public debt typically serves as guidance for private credit contracts in many ways, and it is hence not surprising that with an average maturity of public debt around 3.6 years in 2010 (Tesouro Nacional, 2011), private credit contracts exceeding this maturity horizon are rare. The average duration of the current loan portfolio of private banks to corporate clients is below 13 months.

The link between BNDES and private credit

The existence of large amounts of directed long-term lending *via* BNDES and the absence of private credit in this segment raises a question about the direction of causality. While BNDES was designed to overcome the failure of private actors to enter the long-term credit segment, it is possible that the private sector has failed to enter this market in the meantime due to the strong presence of BNDES. In other words, BNDES credit may now be crowding out private credit. While this argument has some appeal in theory, the empirical evidence points to rather small effects. It should be recalled that thin private long-term credit markets are a feature of many Latin American economies, none of which has a development bank of comparable size to BNDES, so it would be surprising if this was the major explanation in Brazil. Testing this hypothesis empirically is intrinsically difficult because the counterfactual of a Brazil without BNDES cannot be observed. The link between BNDES credit growth and the growth of non-directed credit volumes appears to be weak. An impulse response function calculated from a vector autoregression (VAR) model on monthly data for 2000 to 2010 (including also *ex ante* real interest rates as a control variable) suggests that an increase in BNDES lending reduces non-directed credit growth by about a quarter of its size after three months. While this effect is statistically significant, its economic significance is far from enough to explain the thinness of private credit markets (Figure 2.9). The upper bound of a 95% confidence interval suggests that the response could be as little as a tenth.

Figure 2.9. **Impulse response function (IRF) of non-directed credit growth on BNDES credit growth**



Note: The vertical axis measures the response of non-directed credit growth to BNDES credit growth, expressed as a fraction of the change in the latter.
Source: OECD calculations using data from Central Bank of Brazil.

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In light of the weak evidence for crowding-out effects, it is doubtful that private long-term financial markets would have developed much more fully in the absence of BNDES in the past. Although BNDES is undoubtedly part of an institutional constellation that does not deliver satisfactory access to long-term credit, other potential reasons for the inability of the private sector to provide long-term finance seem more convincing than the existence of BNDES itself. Regardless of the degree of crowding out, however, political interference and clientelism are generally harder to avoid when credit is directed rather than market-allocated, and the directed credit at rates below short-term market rates is unlikely to allocate scarce capital to those projects with the highest risk-adjusted returns. Indeed, Muendler *et al.* (2002) provide evidence that reallocations of market shares from less to more efficient firms are not the norm in Brazil. Such reallocations are an important contributor to aggregate productivity growth in OECD countries, but they can be realised only if factor reallocations – including of capital – can take place smoothly (Arnold *et al.*, 2008). Although rollover of BNDES loans is not automatic, the fact that many maturing BNDES loans are refinanced may suggest that it is easier to obtain BNDES credit for incumbents with existing access to BNDES funds than for potentially more efficient new entrants, which may create a rigidity in product markets that slows down aggregate productivity growth.

But regardless of the role of BNDES in the past, it is clear that Brazil's future investment needs cannot be financed by a continuous expansion of BNDES' balance sheet. As the country develops, it will be necessary to increasingly involve the private sector in the provision of long-term finance beyond acting merely as distributors of smaller BNDES loans, with a view towards replacing most of BNDES lending in the longer run.[4] How this transition can be made without cutting the credit flow to the corporate sector is a challenging question. Private credit institutions are still struggling with a number of obstacles to enter the long-term credit segment, including difficulties in obtaining long-term funding themselves, as well as the uneven playing field that results from the unique funding sources available to the dominant player, BNDES.

Bank funding and maturity mismatch

Brazilian banks are reluctant to lend long-term because most of their own funding, both through deposits and debt issues, has very short maturities. In the present situation, attractive investment options with very short maturities abound in Brazil, not least due to the availability of government bonds indexed to the policy interest rate and to the high mandated remuneration of savings accounts (Freitas, 2011). As a result, most private investors have a strong bias towards the short term. In this context, banks wishing to venture into long-term credit markets risk a substantial maturity mismatch. A major challenge going forward will be to channel more savings into financial assets with longer maturities, which will require a steeper yield curve so as to make long-term assets more appealing to investors.

One way to make more long-term funding available to the banking sector may be through a reform of the *caderneta de poupança* savings accounts. Such accounts are widely used in Brazil, with deposits in excess of 10% of GDP. They are a fully standardised product, offering uniform and legally guaranteed returns of 0.5% per month plus a Reference Rate (TR), which is determined by the Central Bank. Currently, this results in a tax-free remuneration of saving accounts of close to 7% per year in nominal terms. Removing the rules on the uniform conditions and returns of the savings accounts may facilitate the emergence of a more diverse array of savings instruments with differentiated maturities and interest rates, allowing banks to gather deposits with longer maturities for a premium.[5] At the same time, transforming the current unique tax exemption of the uniform savings account into a tax reward for longer-term instruments may increase the average maturity of bank funding and support the development of private long-term credit markets (Mesquita, 2011). The potential benefit of relaxing the tight rules on the remuneration of savings accounts would be amplified by a removal of the restrictions on the use of such funds, 65% of which must currently be devoted to housing finance.[6]

Another potential source of long-term funds would be through increased bond issuance by banks, which accounts for up to a quarter of bank liabilities in OECD countries. Private bond markets in Brazil are underdeveloped and characterised by low levels of liquidity, implying that investors are often forced to hold bonds until maturity. As a result, banks (and non-financial companies) face difficulties to fund themselves through issuance of bonds with longer maturities. Only bond markets with short maturities exist, with interest rates generally indexed to short-term interbank rates (Freitas, 2011). In December 2010, the government announced a number of measures to foster the development of long-term bond markets. One feature of these measures is to authorise the establishment of a liquidity fund for private long-term bonds that will act as a market maker through daily sales and purchase operations, thus increasing the liquidity of such bonds and making them more attractive to investors. Banks will be allowed to channel 3 percentage points of their current reserve requirements into this fund, which will guarantee a contribution of approximately BRL 2.2 billion. BNDES may contribute additional resources if deemed necessary (Freitas, 2011). In addition, these measures removed restrictions facing financial institutions on selling long-term bonds with a minimum maturity of 24 months (so-called *letras financeiras*) directly to the public. Prior to this measure, *letras financeiras* could be sold only to a reduced range of buyers. Most of the current stock (BRL 73 billion in April 2011, up from BRL 31 billion before the new measures came into effect) is remunerated at interest rates indexed *ex post* to overnight interbank rates.

BNDES itself has also taken a number of measures to support the crowding-in of private actors in long-term financing and to reduce the use of long-term instruments indexed to short-term interest rates. It has reduced its maximum share of financing capital goods acquisitions from 80 to 70% for large companies and from 100 to 90% for small and medium-sized companies, which encourages borrowing firms to seek co-financing from private lenders. BNDES has also become more active as an investor in primary corporate bond markets, with the objective of fostering the use of long-term corporate bonds that are not indexed to the short-term interbank rate and that use transparent pricing and distribution mechanisms. It has launched a new programme under which it intends to purchase such bonds up to BRL 10 billion (BNDES, 2011). On secondary markets, BNDES has become a more active purchaser of private long-term bonds using open electronic auctions. Finally, through own bond sales *via* its subsidiary BNDESPar, it has tried to play a pioneering role in bond markets by implementing new indexing mechanisms that are more appropriate for long-term financing than the current practice of *ex post* indexation to overnight interbank rates. In particular, BNDESPar has placed a bond series worth BRL 1 billion whose remuneration is indexed to a forward-looking 3-month interbank interest rate created in a similar way to the 3-month LIBOR rate and adjusted every three months (BNDES, 2011). Given the leading role of BNDES in Brazilian financial markets and the successful placement of this novel product, it is expected that the private sector will emulate such practices and gradually move away from indexing long-term bonds on very short-term interbank rates. The measures adopted in December 2010 go in the right direction of transforming BNDES into a co-ordinating agent that helps to reduce transaction costs. Leveraging its strong potential as a market maker is a useful strategy, as is the implicit reduction of non-remunerated reserve requirements implied by the liquidity fund.

Liquidity in secondary markets for private securities with long maturities can also be enhanced by reducing the tax burden on buying and selling private bonds, and by creating additional tax incentives for investing in longer-maturity assets. Such tax incentives were implemented as part of the measures announced in December 2010. They seem appropriate to foster the development of private markets for long-term investment funding.

Experience from other countries has shown that a stable local investor base can be helpful for creating demand for financial assets with long maturities, with domestic institutional investors such as pension funds playing a leading role (IDB, 2007). In that respect, the emergence of a complementary funded pension system could be a valuable contribution by increasing the amount of assets currently administered by the existing private pension funds. Pension funds have a long-term horizon by their very nature, and once the yield curve has become steeper, pension funds will seek assets with longer maturities.

Levelling the playing field in the long-term segment

But difficulties in obtaining long-term funding are probably not the only obstacle for private lenders to enter the long-term lending segment. Even once banks manage to secure funding with longer maturities, their entry into long-term credit markets will still be hampered by the uneven playing field and the dominant role of BNDES in this segment. Through the FAT and explicit government support, BNDES receives considerably cheaper funding than private banks, which allows it to lend at rates that are well below the funding costs of private banks. In the current set-up, it is hard to see how private banks would be able to compete with, let alone gradually replace, BNDES lending operations unless they get

access to funding at the same cost as BNDES. Although there is probably unsatisfied demand for long-term credit even in the current situation, as long as BNDES is the only potential provider of such loans with access to cheap funds, it will always be able to skim the cream off the market by picking the lowest credit risks, and there will not be a level playing field in the market for long-term credit. The large share of its loans going to very large companies is an indication that it is already doing this at present (Garcia, 2011).

These obstacles to private market entry could be removed by aligning the funding costs of private banks to those of BNDES while establishing an explicit tax credit for borrowers that would be independent of whether the lender is BNDES or a private entity.[7] The tax credit could be revenue-neutral if financed by demanding a higher remuneration for FAT and government transfers from BNDES, while for borrowers, interest rates could be maintained at present levels through the tax credit. Such a first-stage reform would not remove the problems associated with directed credit, because scarce resources for interest–rate subsidies would still have to be allocated across competing potential borrowers. But it would make market entry feasible and allow the most efficient private financial institutions to gain market share once they have entered the segment. Until this condition is met, BNDES would continue to be the dominant long-term lender, thus avoiding a sudden deterioration in the supply of credit, and lending rates would remain largely unchanged. But as soon as other lending institutions are willing and able to lend long-term, they would not face obstacles to market entry under this set-up. In fact, the extension of long-term credit *per se* can be evaluated separately from the issue of lending at rates below domestic short-term rates.

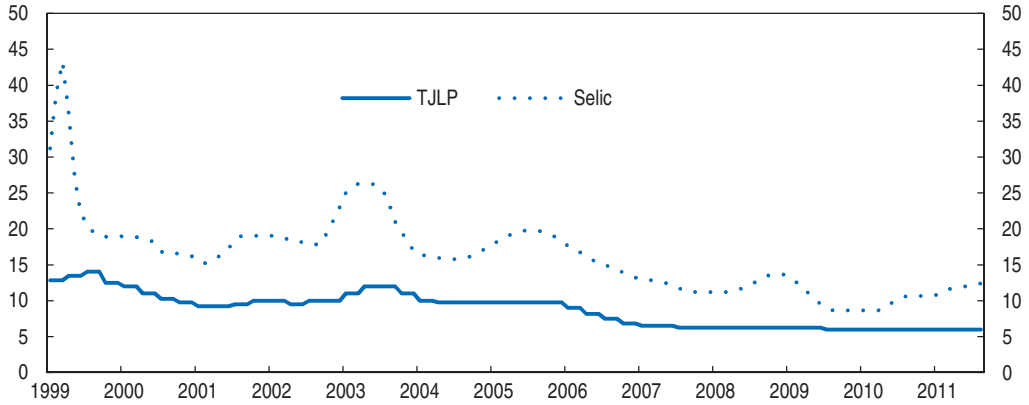
In a second step, and once the funding situation of private banks has improved, subsidies could be reduced. The fiscal implications of current BNDES lending are sizeable, given the gap between the rates at which funding is provided to BNDES through the FAT and government transfers on one hand and yields on long-term government bonds on the other. Although BNDES is currently profitable in commercial terms, the fiscal implications of the current constellation would become more visible if its preferential access to workers' mandated savings in the FAT were properly accounted for. These savings are remunerated at below-market rates, and if not made available to BNDES, they could be used to reduce the public debt or workers could be given higher remuneration. Moreover, the fact that part of loan demand is satisfied at below short-term market rates reduces the political pressure for reforms that would allow market interest rates to come down, which would benefit all potential borrowers and not just those that are able to secure BNDES financing. In the past, the government has often lowered the interest rate that guides BNDES lending (the TJLP) *pari passu* with the Selic rate and hence has missed opportunities to close the gap between the two (Figure 2.10). Moreover, less expansionary lending by the BNDES would reduce the need for the Central Bank to set high interest rates (Bacha, 2010a; Hausmann, 2008).

Taxes and the returns to investment

With general government revenues at 38% of GDP in 2010, according to OECD estimates, Brazil has high levels of taxes for an emerging market economy. An ensuing high tax burden on corporations – resulting from a number of different and sometimes cascading taxes – reduces the after-tax returns of any investment project and hence curbs the incentives to invest. The total tax rate on profits for a benchmark corporation is estimated at 69%, which ranks Brazil at 168th out of 183 economies surveyed (World Bank, 2010). Still, there may not be much scope for reducing taxes without jeopardising fiscal soundness, at least until social security expenditures are reined in. Nonetheless, the

Figure 2.10. **Market (Selic) and administrated interest rate (TJLP)**

Annualised rate in per cent



Source: Central Bank of Brazil and OECD calculations.

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efficiency of the current tax system can be enhanced through revenue-neutral reforms, because taxes levied on Brazilian companies are not only high, but also complex and costly to comply with. Brazil comes last with respect to the time needed to comply with tax requirements in the World Bank survey. For all tax obligations together, the time requirements are more than four times the South American average and more than nine times the world average. Not surprisingly, high tax rates and difficulties in dealing with tax administrations come out on top of the complaint list of firms in the World Bank's Enterprise Surveys – together with access to finance (World Bank, 2009). Some relief may come from the new Public System of Digital Bookkeeping (*Sistema Público de Escrituração Digital* or "SPED") that the tax authorities are currently rolling out. This electronic system may lead to less required reporting to government and reduced compliance efforts.

Brazil's tax system is fragmented into several taxes. Indirect taxes, for which compliance costs are particularly high, consist mostly of a state level value added tax (ICMS) that is applied to intra- and inter-state sales of goods and selected services, in addition to a municipal level tax on other services (ISS). Since the ICMS is levied on an origin rather than a destination basis for inter-state trade, Brazilian states have engaged in competitive tax wars to attract producers by offering favourable tax treatment (de Mello, 2007). Selective excises such as taxes on industrial products (IPI) and so-called contributions (PIS and COFINS), whose revenues are often earmarked for specific uses, are levied by the federal government. The indirect tax system could be improved by unifying the fragmented system of taxes and contributions and combining the ICMS, ISS, IPI, COFINS and PIS into a value added tax with full credit for exports and capital goods purchases. If designed properly, value added taxes can be a comparatively growth-friendly tax instrument, as the experience of OECD countries has shown (Arnold *et al.*, 2011). A government proposal to harmonise and reduce state-level ICMS to 4% was discussed by state finance ministers in July 2011. Such a harmonisation would help to reduce tax distortions and is an important step in the right direction. The simplified presumptive tax regime for small enterprises, *Simples Nacional*, has shown that it is possible to merge several different taxes across different jurisdictions. Should state-level variation in tax rates be maintained, however, taxation should at a minimum be destination-based to avoid distortions to inter-state trade.

Some taxes paid by companies continue to be levied on enterprise turnover rather than value added, especially for small enterprises that are subject to the *Simples Nacional* and some specific sectors. While taxation based on turnover makes compliance easier, this creates incentives for shorter production chains and distorts production patterns, with a possibly detrimental effect on productivity and therefore investment returns (OECD, 2009b). For small firms, reducing compliance costs is probably the dominant argument, but the distortions to the organisation of the production chain gain in importance with increasing firm size. The eligibility threshold for participation in the simplified tax regime has been raised from annual turnover of BRL 2.4 million to BRL 3.6 million in August 2011.

Budget permitting, additional reforms that could enhance investment incentives include raising depreciation allowances for corporate income taxes. Brazil's tax system is furthermore characterised by a heavy taxation of labour income, which can exceed 50% (OECD, 2009b). So far, progress on tax reform has been limited, despite widespread recognition of the need for reform. Several reasonable packages have been unable to gain approval from Congress due to concerns about further tax increases and issues relating to revenue distribution across sub-national jurisdictions.

The government also plans tax reforms in order to foster the development of private long-term credit markets. One of these measures is a tax reduction (or exemption in the case of natural persons and foreign residents) for direct or indirect investments in infrastructure projects with a maturity above four years at fixed or inflation-indexed interest rates, with no possibility of repurchase in the first two years of the investment. For non-residents, the tax exemption is also extended to long-term bonds issued to finance non-infrastructure investment with the same maturity and repurchase restrictions. These measures are likely to be beneficial and to enhance the incentives for private savers to put their funds into financial assets with long maturities. They may also help to improve the structure of foreign portfolio capital inflows.

Regulation on product and labour markets

A common feature that Brazil shares with many other emerging market economies is a generally high level of regulation in product markets relative to OECD countries. Investment incentives can be affected by regulatory policies in at least two ways. First, compliance with regulation can impose a significant cost burden on investment projects, lowering their expected profitability and rendering some economically non-viable at the margin. Second, regulations can hinder the entry of new firms with potentially innovative investment projects, with the result that some investment projects not originating in incumbent companies will not be realised due to regulated market entry. Alesina *et al.* (2005) provide evidence that various measures of regulation in the product markets, concerning in particular entry barriers, are negatively related to investment in OECD countries. Similarly, Djankov *et al.* (2002) focus on regulations that affect the ease of starting a business in 85 countries, and their findings lend support to the view that excessive regulation is a hindrance to entrepreneurship. Arnold *et al.* (2008) provide evidence that anti-competitive regulations can reduce productivity growth in ways that extend far beyond the regulated sectors themselves, which in turn reduces the expected return to investment.

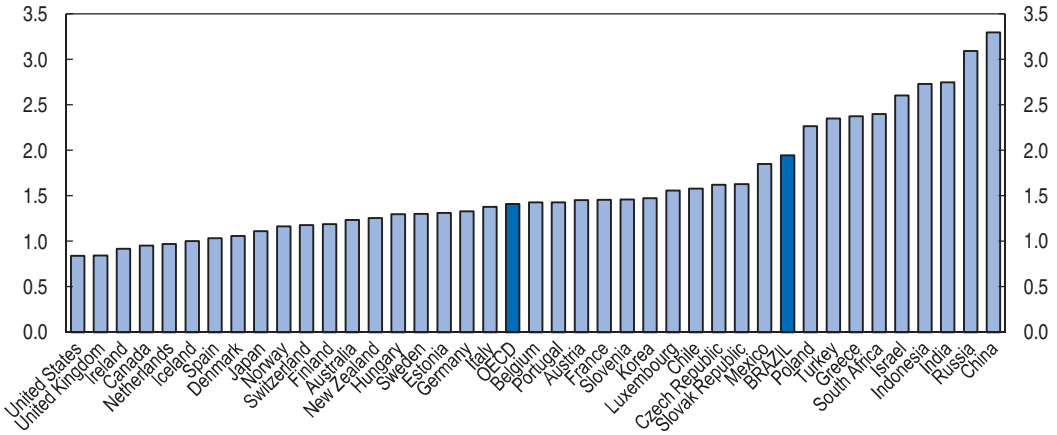
The Product Market Regulation (PMR) indicators produced by the OECD apply a comparable methodology to quantify anti-competitive regulations across OECD and

Enhanced Engagement countries.[8] On the overall indicator, Brazil's level of restrictiveness is about 37% higher than the OECD average, but it is the lowest among the Enhanced Engagement countries and lower than quite a number of OECD countries (Figure 2.11). Areas where regulation is considerably more stringent than what is average practice in OECD countries include administrative burdens on start-ups, barriers to competition and explicit barriers to international trade (Wölfl *et al.*, 2010). Start-ups are particularly hampered by regulation in the case of sole proprietor firms, where procedures required to register an individual enterprise are numerous, lengthy and costly in comparison to OECD countries. This is confirmed by World Bank (2011a), which ranks Brazil in position 128 out of 183 countries with respect to the ease of starting a business. Barriers to competition include legal restrictions on the number of competitors in specific sectors including air transport, water transport, telecommunications and financial services. Sectors where the level of anti-competitive regulation in Brazil diverges significantly from average OECD practice include the airline industry, where entry barriers are high, the postal sector, where entry restrictions and the level of public ownership are significant, and the railways, where excessive vertical integration by incumbent operators, limits on the number of firms and uncompetitive market structures stand out (Conway and Nicoletti, 2006).

Barriers to international trade are mainly related to comparatively high levels of tariff protection in Brazil. With an average applied tariff rate on non-agricultural goods of 14.1%, Brazil's tariffs remain relatively high compared to major OECD countries (European Union 4%, Japan 2.5%, United States 3.3%) and also emerging-market economies (China 8.7%, India 10%, Indonesia 6.6%, Russia 10.1%) (World Trade Organization, 2010). In addition, high costs and time requirements for container handling and customs clearing also act as obstacles to foreign imports (World Bank, 2011a). A new industrial policy plan launched in August 2011 (called *Plano Brasil Maior*, "Greater Brazil Plan") contains a range of measures aimed at protecting the domestic market. These include preferential treatment to domestic products in public procurement under conditions to be specified unless the price differential *vis-à-vis* imports exceeds 25%, stronger use of "anti-dumping" duties such as those imposed on Chinese steel tubes in September 2011 and a reduction in the number of goods subject to automatic import licenses.

Figure 2.11. **Product market regulation by country**

2008, Index scale of 0-6 from least to most restrictive



Note: The indicator is for the economy as a whole.
Source: OECD (2011c).

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Although the most binding barriers to higher investment rates are probably concentrated in other areas, investment incentives could be enhanced by removing remaining anti-competitive restrictions in product markets. In particular, the government may want to remove remaining entry restrictions, as well as making further reductions in trade protection.

A summary of policy recommendations is presented in Box 2.2.

Box 2.2. **Summary of recommendations: Saving and investment**

Reforming the pension system

- As a priority, reduce the burden of pension expenditures on public finances by introducing a general minimum retirement age, raising the earliest possible retirement age and strengthening the penalties for early retirement. The general minimum retirement age should be indexed to rising trends in life expectancy in the future.
- Remove the indexation of minimum pension benefits to changes in the minimum wage, and index them instead to an average of consumer price inflation and average wage gains.

Reforming the financial system

- As a priority, align private banks' funding costs to those of BNDES, at a higher level than the current remuneration of FAT and budget transfers that BNDES receives. At the same time, establish an explicit tax credit for borrowers that is independent of the choice of lender.
- Enhance the possibilities for commercial banks to obtain long-term funding, including through deregulating savings accounts and leveraging the strong potential of BNDES as a market maker.
- Phase out directed lending schemes to the rural sector and to housing.
- Reduce reserve requirements for financial institutions to reduce the costs of financial intermediation. Remove the special tax regime applied to financial institutions.
- Move progressively towards greater private ownership among commercial banks.
- Continue to reduce the share of Selic-indexed securities and increase debt maturities.

Improving taxes, regulation and contract enforcement

- As a priority, reduce tax compliance costs by unifying the fragmented system of taxes and contributions. Create a single value added tax with full credit for exports and capital good purchases. Accelerate depreciation allowances on new capital purchases for corporate income tax.
- Enhance creditor protection through reforms of the legal and judicial system. Create a unified national collateral registry, expedite court procedures for repossessing collateral, and introduce the possibility of extra-judicial enforcement of credit contracts involving collateral without the defaulting borrower's consent.
- Remove remaining entry restrictions in air transport, water transport, telecommunications and financial services. Consider further reductions in tariff protection.
- Ensure that capital controls, should they continue to be used to limit exchange-rate appreciation, continue to be designed in a way that does not jeopardise investment inflows with longer maturities or foreign direct investment.

Notes

1. The year 2006 was the last for which this breakdown is available.
2. Currently, pension benefits in the private scheme are adjusted for changes in life expectancy at the moment of retirement through the *fator previdenciário*.
3. Gobetti and Schettini (2010) calculate the implicit interest rate paid on government debt for the 12 months preceding June 2010 and show that it was actually slightly higher than the Selic rate.
4. There may be a role for a development bank in some niche areas of the financial system where specific characteristics in terms of risks, returns or required maturities raise the degree of uncertainty, such as financing for research and development, innovation or infrastructure projects (Freitas, 2011).
5. Mesquita (2011) argues that a closer link between the remuneration of savings accounts and the policy rate would enhance the effectiveness of monetary policy and allow the Central Bank to reach the inflation target with lower interest rates. He also argues that subsidised credit undermines the effectiveness of conventional monetary policy.
6. This restriction was relaxed slightly in December 2010 by allowing banks to continue counting a gradually decreasing fraction of securitised loans towards the 65% requirement.
7. BNDES loans below BRL 10 million are channelled through commercial banks acting as agents for BNDES, but commercial banks only influence a small spread of the pricing of these loans. In this paragraph, lender refers to the ultimate lender, which is BNDES for such loans.
8. These indicators are available at *www.oecd.org/eco/pmr*.

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Chapter 3

Promoting infrastructure development

Brazil under-invested in infrastructure for over three decades, and infrastructure investment rates have come up only slowly since 2007. Infrastructure needs are sizeable in almost all sectors. It is likely that at its current stage of development the country will benefit from large pay-offs from infrastructure spending. Against this background, the Brazilian authorities have put in place a large infrastructure plan named Growth Acceleration Programme (Programa de aceleração do crescimento, PAC). This programme has been rightly protected from the fiscal cuts announced earlier this year. Nevertheless some changes to the policy and regulatory framework could be introduced to make public investment more cost-efficient and to foster private participation. In particular:

- *The second stage of PAC needs to focus on completing the most worthwhile programmes. In addition, the public-private partnership framework should be streamlined.*
- *In most areas, the regulatory framework is working well, but sectors are at different stages of development. Despite important institutional changes in recent years, policy capture is sometimes still influencing some federal and many state regulatory agency decisions.*
- *In spite of some recent progress, frequent disputes appear to delay some infrastructure projects, in particular in the energy sector. The main challenge in this area is to hasten the licensing process, while continuing to put appropriate emphasis on environmental and social protection.*
- *Reforms have been implemented in individual network industries, but there is still some room to inject competition in fixed-line telecommunications and to prevent product cross-subsidisation in the electricity sector. Concession contracts in both roads and rail could be refined to foster private investment in maintenance and network expansion. In water and sanitation, where investments are the most needed, smaller municipalities should be encouraged to invest and form consortia to reap economies of scale.*

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Large investment in infrastructure will be essential for Brazil to achieve strong and sustainable growth over an extended period of time. Infrastructure development is also associated with reduced income inequality and can thus be a powerful tool for poverty reduction (López, 2004). It improves connectivity, lowers transport costs for both firms and the population and facilitates access to basic education and health services. Empirical evidence also points to larger pay-offs to investment in infrastructure at earlier stages of development (Estache and Fay, 2007; Straub, 2008; Égert *et al.*, 2009). According to Morgan Stanley (2010), infrastructure investment of about 4% of GDP per year over 20 years would be needed for Brazil to catch up to the infrastructure levels of Chile, the current leader in South America. At the same time, important events such as the 2014 World Cup and the 2016 Olympics, as well as the exploitation of the pre-salt oil reserves, offer a window of opportunity for undertaking needed infrastructure developments.

This chapter reviews changes to policies and institutions to make the most of these opportunities and boost investment in infrastructure in the coming years. After briefly reviewing the current state of infrastructure in Brazil, this chapter discusses the financing of infrastructure development. It then turns to an examination of the regulatory framework and compares it with those of OECD countries, before concentrating on sectoral developments. Several network industries are examined in turn, namely electricity, telecommunications, road and rail transportation, and water and sanitation.

The state of Brazil's infrastructure

Brazil's infrastructure is in a relatively good shape compared to what can be observed in other South American countries (Table 3.1). The comparison is less favourable compared

Table 3.1. **Selected infrastructure indicators**

	Brazil			Chile	South America[1]	OECD
	1995	2000	2008[2]	2008[2]	2008[2]	2008[2]
Water and sanitation						
Improved sanitation facilities (% of population with access)	72	75	80	96	83	97.5
Improved water source (% of population with access)	91	93	97	96	92.2	99.0
Energy and transport						
Electric power consumption (kWh per capita)	1 637.7	1 893.6	2 170.7	3 318.2	2 020.8	8 417.1
Electric power transmission and distribution losses (% of output)	16.7	18.2	16.1	8.4	15.1	6.3
Roads, paved (% of total roads)	8.9	10.5	13.8	–	–	84.9
Information and communication technologies						
Fixed broadband subscribers (per 100 people)		0.06	5.26	8.49	5.25	21.8
Internet users (per 100 people)	0.1	2.9	37.5	32.5	29.1	63.2
Telephone lines (per 100 people)	8.2	17.8	21.4	21.0	18.9	42.8
Mobile cellular subscriptions (per 100 people)	0.8	13.3	78.4	88.1	95.3	99.9

1. Unweighted average of Argentina, Chile, Colombia, Paraguay, Peru, Uruguay and Venezuela.
2. 2008 or latest available year.

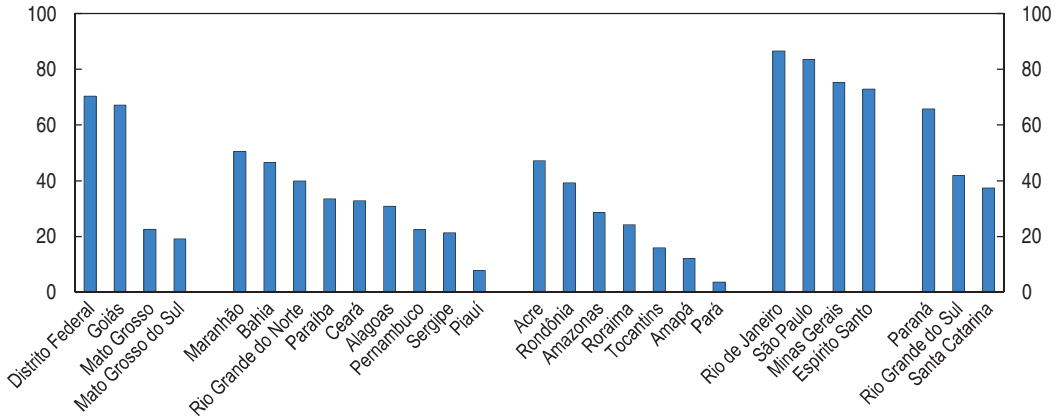
Source: World Bank (*World Development Indicators*).

to other regions in the world. While there has been a catch-up in some sectors such as telecommunications, the infrastructure gap *vis-à-vis* East Asia has narrowed somewhat, but remains considerable (Calderón and Servén, 2004). Access to electricity is now widespread, though some remote areas still have to be connected to the grid. In 2009, the electrification rate was 99.5% in urban areas and 88% in rural areas. By contrast, the country underperforms in terms of access to improved sanitation, while the percentage of mobile cellular subscribers is also low.

The situation varies widely across states and municipalities. In general, access to infrastructure services is more widespread in high-income regions. This is the case for services where local authorities are responsible for provision, such as sewerage (Figure 3.1), but also in sectors where the federal government has been a major investor, like road transport. Nevertheless, there is evidence that regional disparities in access to sanitation services narrowed somewhat from 2002 to 2008. Some disparities also remain in the telecommunication sector and between rural and urban areas. Access to fixed lines is higher in the South-East region than in the North and North-East regions. The number of connections to fixed telephone lines and cable TV in metropolitan areas appears to be at least double of that in rural areas.

Figure 3.1. **Percentage of sewage collected by states grouped by regions**

2008



Source: Ministry of Cities, *Sistema national de informações sobre saneamento* – SNIS.

StatLink http://dx.doi.org/10.1787/888932519434

Infrastructure quality, which is usually well correlated with quantity indicators, varies across sector (Calderón and Servén, 2010). The situation is particularly critical for water and sanitation. The quantity of chlorine residual was on average 63% higher than the minimum required after sewage treatment in 2008. Water distribution losses were on average around 29% of production in 2008, but some firms reported figures of up to 75%. Quality appears to be better in the electricity sector, where losses in distribution and transmission amounted to 9% of domestic energy supply in 2009. Overall, Brazil ranked 62nd out of 139 countries for the quality of its infrastructure in the 2009-10 World Economic Forum survey.

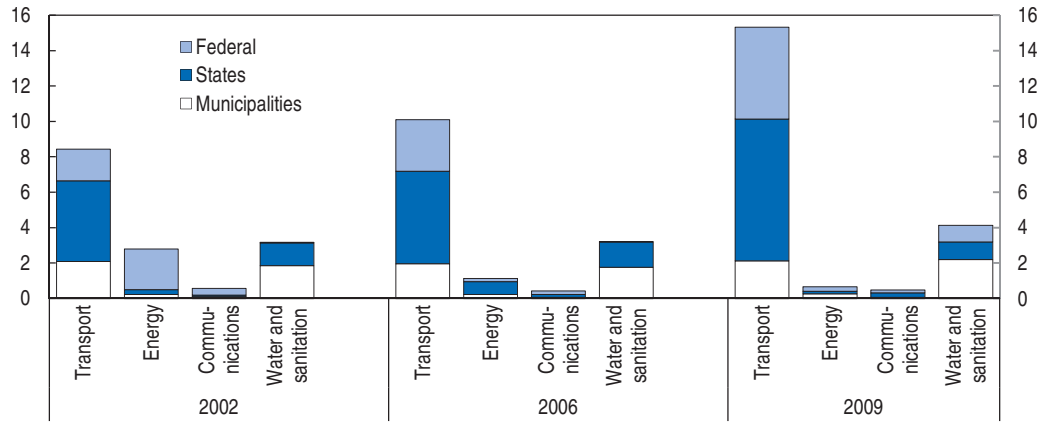
Financing of infrastructure projects

Public infrastructure spending before the mid-2000s

The relatively poor state of infrastructure reflects underspending over at least three decades. Public infrastructure spending has been growing at an increasing though moderate pace since the turn of the millennium to reach 2.1% of GDP in 2009. This increase is attributable to the transport and, to a lesser extent, the water and sanitation sectors (Figure 3.2). A number of factors contributed to this slow growth. First, infrastructure-dedicated federal taxes – earmarked for energy, transport, telecommunications and electricity – were abolished in the 1988 Constitution without identifying new funding alternatives (Afonso *et al.*, 2005; World Bank, 2007). The share of the unemployment benefit fund (FAT) transferred to BNDES is now the only revenue stream partly earmarked for infrastructure projects.[1] At the same time, the Constitution introduced widespread revenue earmarking favouring current spending, especially in health and education, at the expense of capital and infrastructure outlays, which are therefore left to the discretion of policymakers (Figure 3.3).

Figure 3.2. **Public spending on infrastructure by sector and government**

Percentage of GDP



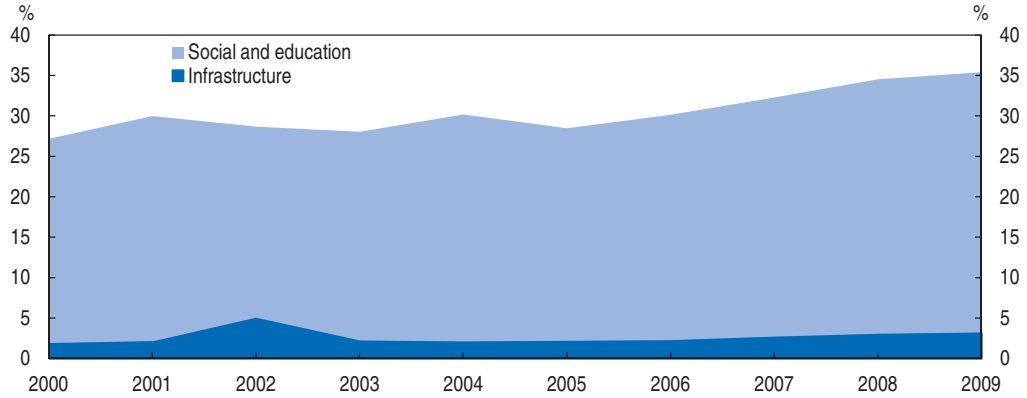
Source: Ministry of Finance.

StatLink http://dx.doi.org/10.1787/888932519453

Second, the general trend towards devolving infrastructure spending decisions to municipalities and states has probably exacerbated the problem of low infrastructure spending in some sectors (Afonso *et al.*, 2005). While federal transfers to sub-national governments have increased since 2002, and federal resources available for capital spending in infrastructure investment were reduced from 2002 to the mid-2000s, particularly in communication and energy. But this was not compensated by a pick up in sub-national governments' infrastructure spending, probably because they had neither the resources nor the expertise in planning and delivering infrastructure policies and projects. At the same time, private investment expansion was insufficient to offset the fall in public investment. As a result, investment in infrastructure had been declining since the late 1990s (Figure 3.4). The drop affected all sectors (Ferreira and Araujo, 2010). Evidence from IPEA (2010a) suggests that the stock of public infrastructure started to rise after 2007.

Figure 3.3. **Social and education *versus* infrastructure spending**

Percentage of general government spending[1]



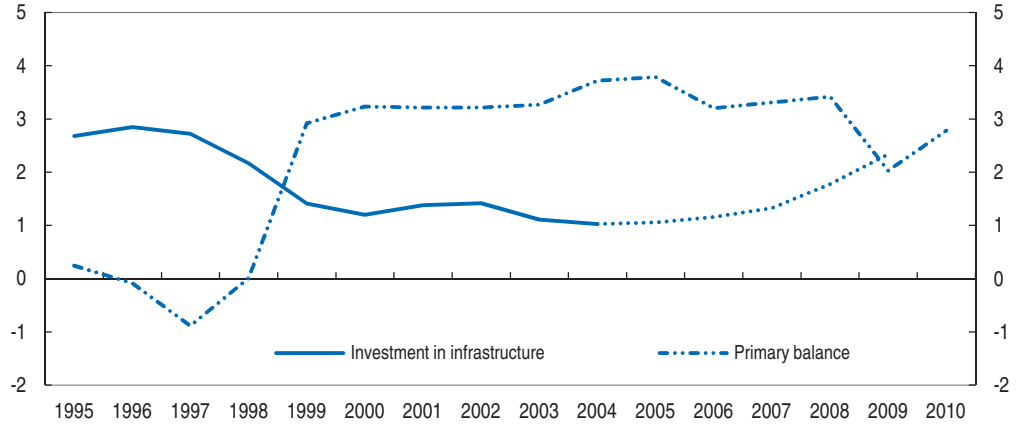
1. Social spending includes health and social insurance.

Source: Ministry of Finance.

StatLink http://dx.doi.org/10.1787/888932519472

Figure 3.4. **Primary surplus and public infrastructure investment**

Per cent of GDP



Note: Sectors covered include transport, sanitation, communications and electricity. Given the lack of official data, total government investment in infrastructure has been extrapolated using data on federal investment in infrastructure after 2005.

Source: Afonso *et al.* (2005), IPEA (2010a) and OECD calculations.

StatLink http://dx.doi.org/10.1787/888932519491

Growth Acceleration Programme infrastructure programmes

Against this background, the government launched a large infrastructure programme in 2007, the Growth Acceleration Programme (*Programa de aceleração do crescimento,* PAC), followed in 2010 by a follow-up programme. These programmes replaced the Investment Pilot Project (*Projeto Piloto de Investisment*, PPI) announced in 2005. The aim was to increase both private and public infrastructure investment and improve co-ordination among the several bodies involved in infrastructure policy (Box 3.1). This resulted in a marked increase in the GDP share of public investment to an estimated 3.2% in 2010, with more than 60% of this investment coming from state-owned enterprises. Overall, the first stage of the programme was successful. However, projects' delivery and spending execution were initially held back by a lack of capacity in project planning and management, difficulties in obtaining environmental licences and, in a few cases, procedural

irregularities (IPEA, 2010). It took approximately two years for infrastructure spending to take off, and only about 82% of the planned 2007-10 projects were completed. But PAC also fostered the building up of expertise and capacity at the central and local levels. Looking forward, most of the factors that led to execution delays are expected to diminish, licences being an exception (see below). In June 2011, the government proposed a bill to speed up projects by holding a single tender for both public works' design and construction of urban transportation, airport and stadiums projects related to the World Cup, as delays were still important in these areas. Efforts have also been made to enhance integrity and lower corruption risks related to these events (OECD, 2010).

Current investment plans are estimated to increase to BRL 757 billion over the next four years, representing around 5.1% of 2010 GDP per year (Table 3.2). The bulk of total projected investments are expected to occur in the oil and gas and electricity sectors. For sectors where information is available, investments appear to be in general higher than what was initially planned in the second phase of PAC.

Table 3.2. **Investment plans**

Sectors	2006-09	2011-14		
	BRL billions	BRL billions	Per cent of 2010 GDP	Share
Electricity	92	139	1.0	18.4
Telecommunications	62	70	0.5	9.3
Sanitation	26	41	0.3	5.4
Railways	20	60	0.4	7.9
Highways	30	51	0.4	6.7
Ports	5	18	0.1	2.4
Oil and gas	205	378	2.6	49.9

Source: BNDES (2011).

Box 3.1. **The Growth Acceleration Programme**

The Growth Acceleration Programme (*Programa de aceleração do crescimento,* PAC) sought to raise economic growth and enhance social inclusion through increasing public and private spending in key infrastructure sectors defined in a very broad sense, *i.e.* including transport, energy but also urban development. PAC is managed by the *Comitê Gestor do PAC* (CGPAC), comprised of the ministers of *Casa Civil* (Presidency), Planning and Finance. An executive group (the *Grupo Executivo do PAC,* GEPAC) is responsible for PAC's implementation and a Secretariat (Secretaria do Programa de aceleração do Crescimento) helps to set targets in PAC projects.

PAC does not aim solely at launching and delivering new projects but also at renovating and renewing the already existing infrastructure stock. The programme also grants tax exemptions to infrastructure projects through a special regime that encourages infrastructure developments (*Regime Especial de Incentivos para o Desenvolvimento da Infraestrutura*, REIDI). This complements other fiscal incentives provided by states using for instance the VAT tax. Given its magnitude and scope, the government sees Public Private Partnerships as an important element to achieve PAC's targets. Project selection is undertaken at the federal level in consultation with states and municipalities.

Box 3.1. **The Growth Acceleration Programme** *(cont.)*

Total spending during the first phase of the programme, from 2007 to 2010, amounted to BRL 503.9 billion (4.7% of 2007 GDP on average per year), of which around 55% was devoted to energy, 12% to logistics and the remainder to urban and social development programmes. With regards to its geographical distribution, around 36% of PAC's planned expenditure was allocated to cross-state projects. The South-East region received the largest share of spending, about 26%, mainly attributable to energy and urban and social development projects, and the Centre-West the lowest, less than 5%. While massive, PAC investments appear to have been much lower than the country's needs. IPEA (2010a) shows, for instance, that needs for highways amounted for about BRL 170 billion as opposed to BRL 23 billion invested by PAC. The largest gaps were reported for the North-East region.

The second phase of the programme was launched in early 2010. The total planned spending is around 50% larger than that of the first phase (Table 3.3). Resources for urban and social infrastructure were hiked considerably because of the large housing project (*Minha Casa, Minha Vida*) aiming at building 2 million new dwellings by 2014, 60% of which for low-income families. Excluding oil and gas and housing, planned spending is estimated to reach BRL 394.9 billion over the next four years, representing an average of around 2.7% of 2010 GDP per year.

Table 3.3. **PAC planned spending**

BRL billions

	2011-14	After 2014
Transport	104.5	4.5
Roads	50.2	2
Railways	43.9	2.1
Ports and water transport	7.4	0.4
Airports	3.0	
Energy	461.6	626.9
Electricity (generation and distribution)	140.3	33.7
Oil and gas	281.9	593.2
Other[1]	39.4	
Urban development	57.1	
Sanitation	22.1	
Urban transport	18.0	
Urban roads	6.0	
Other[2]	11.0	
Urban social development	23.0	
Housing (*Minha Casa, Minha Vida*)	278.2	
Water and light (*Agua and Luz para Todos*)	30.6	
Light	5.5	
Water in urban areas	13.0	
Water resources	12.1	
Total	**955.0**	**631.4**

1. Includes industrial shipping, renewable energy, energy efficiency and mineral exploration.
2. Includes control and prevention of floods, landslides and coastal erosion.

Source: www.brasil.gov.br/pac.

In addition to extending the infrastructure network, PAC seeks to improve the quality of the existing stock by raising public resources allocated to operation and maintenance (O&M). O&M have already been separated from other expenses in sectors such as railways, and a similar separation is planned in others. In addition, O&M costs are used as a criterion in PAC project selection. These are laudable initiatives, but O&M spending is still likely to be hindered by the lack of precise spending guidelines. For this reason, the authorities should focus on setting specific rules to quantify the yearly O&M costs of existing and planned infrastructure and incorporate them in multi-year budgets so as ensure adequate financial cover. This will also lead to better estimates of the total costs of infrastructure projects. In addition, identifying a stable source of funding for maintenance and rehabilitation would be beneficial.

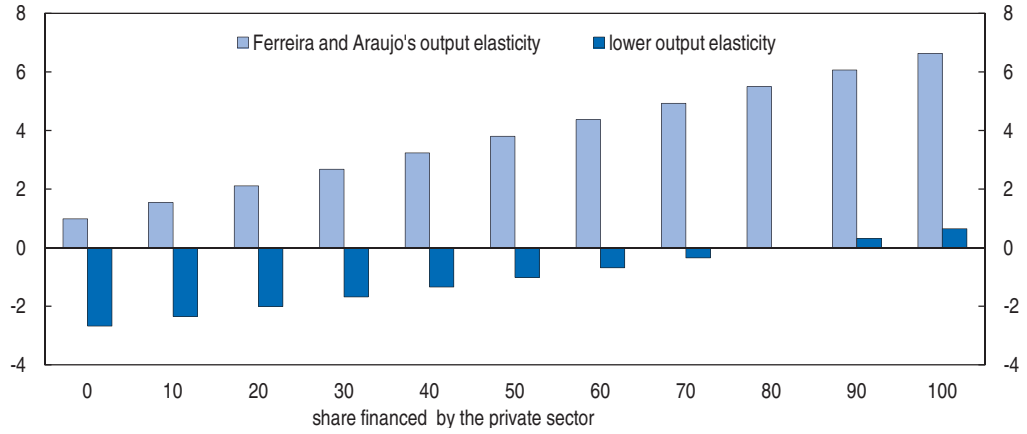
While the PPI programme had initially focused on the most growth-enhancing projects, the coverage of the PAC programme has been expanded over time. It now includes a very wide range of projects, covering several aspects of infrastructure, including both social housing and investment in oil and gas, and involves many actors. Such a broad coverage is based on a structuralist approach à la Rosenstein-Rodan whereby the state should undertake public investment and promote and co-ordinate private investments. According to this view, the expansion of production in one sector is profitable only if it is accompanied by the expansion of production in other sectors. However, the various federal ministries engaged in infrastructure investment have not been able to co-ordinate policies satisfactorily, leading sometimes to inconsistent developments at the economy-wide level. To address this issue, the government has increased resources to monitor progress in the infrastructure programmes and publishes a progress report four times a year. The PAC Secretariat also helps to set targets for individual projects within PAC. In addition, the government concentrates on the large and strategically important infrastructure projects in its PAC reports. It would be useful to give priority on completing the most worthwhile projects within PAC.

At the beginning of 2011, the management and the implementation of PAC was moved to the Ministry of Planning, which is in charge of co-ordination and budgeting. If co-ordination remains an issue, the authorities could consider setting up a dedicated agency to oversee infrastructure developments. Such an agency would assess projects on a common basis and co-ordinates infrastructure policies by advising central and local governments on priorities and possible financing mechanisms. For its first task, the Brazilian agency could be asked to assess infrastructure needs and the impact of PAC projects on economic growth and public finances at the economy-wide level. This would complement current partial information, which is often restricted to sectoral developments alone.

The budgetary cost of the second stage of PAC will obviously depend on the share of investments financed by the private sector, as well as the estimated effect of infrastructure on economic growth (Figure 3.5). In the first stage of the programme private investment represented about 30% of total investment, and this share is expected to be slightly reduced for the follow-up programme. Using this share and an admittedly high elasticity from Ferreira and Araujo (2010), together with a tax elasticity estimated by de Mello and Moccero (2006), PAC is found to be more than self-financed in the long term. However, a similar exercise, using more conservative elasticities of around half the value estimated by Ferreira and Araujo (2010), suggests that the financing of PAC could enlarge the deficit by around 1.7 percentage points of GDP, on the assumption that 30% of the cost is privately

Figure 3.5. **Long-term effect of the PAC programme on the public deficit**

Per cent of GDP



Source: OECD calculations using Ferreira and Araujo (2010) and de Mello and Moccero (2006).

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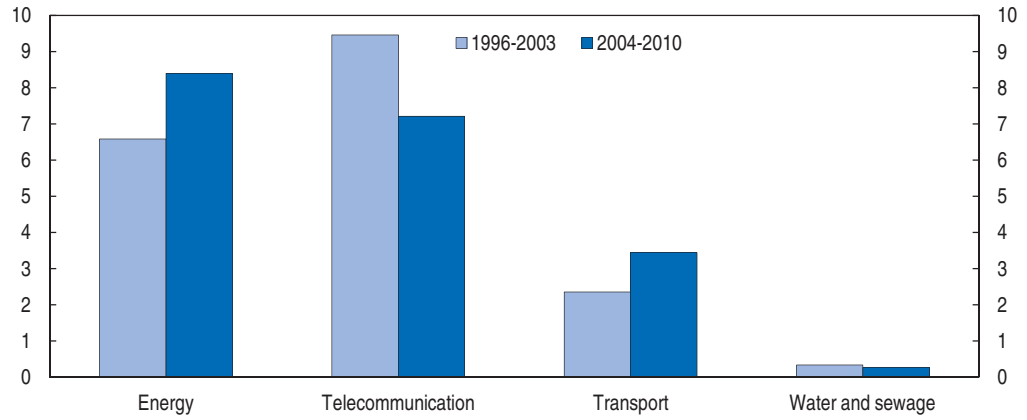
financed. The share of private financing would need to amount to 80% to have a neutral effect on public finances. A 80% target appears to be very ambitious given the current business environment (Chapter 2). This suggests that fiscal room will have to be created to finance PAC measures or private participation will have to play a much more important role than in the past and than what is currently envisaged.

Private participation

Brazil has started to attract private capital into infrastructure provision earlier than other Latin American countries apart from Chile. Initially, private participation was concentrated in the telecommunication sector. Since 2004, a surge in private projects has been observed in the energy sector and since 2006 in the transport sector (Figure 3.6). Private investment in infrastructure as a per cent of GDP appears to be higher in Brazil than in regional peers, even though it has declined (Figure 3.7).

Figure 3.6. **Total investment in private projects by sector**

USD billions, annual average over the period



Source: World Bank and PPIAF, *PPI Project Database*.

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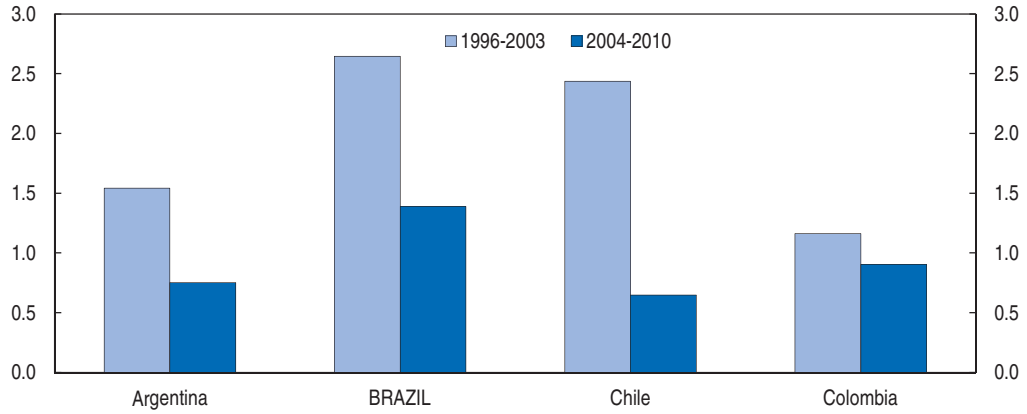
Figure 3.7. **Total investment in private projects in energy, telecommunications and transport in South America**

Per cent of GDP



Source: World Bank and PPIAF, *PPI Project Database*.

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The country has extensive experience with concession contracts, especially at sub-national levels. The general framework for franchise and concession appears to be open and transparent, with features similar to those observed in the majority of OECD countries. At the end of the franchise period, contracts are usually renewed in all sectors but water. Exclusivity clauses can be inserted in Brazil but not clauses enforcing the re-investment of profits, as is the case in many OECD countries. In addition, contracts specify minimum quality standards, which can be translated into measureable output indicators. This is more demanding than what can be found in most OECD countries. As in some OECD countries, performance is not assessed against competitive benchmarks, but bonuses and penalties are specified in contracts in most sectors.

In 2004, a law introduced a distinction between Public Private Partnerships (PPPs) and concessions. Concessions are awarded for those projects that are financially viable without any payment to the private operator by public authorities (*i.e.* they rely on user charges alone). Projects requiring a direct payment from public authorities to the private partner to be financial viable are classified as PPPs. The law contains provisions regulating several aspects of PPPs such as project selection, bidding, signing and management of projects at all levels of government, including companies and agencies under the control of the public sector. It also ensures PPP-related government obligations are incorporated in the budget and sets a ceiling on obligations arising from PPPs for all the three government levels. Overall, this law is likely to limit the occurrence of costly renegotiations, which have frequently impaired PPP contracts in the past in Latin America (Calderón and Servén, 2010). It also enhances the transparency of the whole process. In addition, the relatively sound regulatory framework in most sectors offers a favourable environment to gain from private participation in infrastructure.

Overall, despite some positive aspects, the new legal framework for PPPs has failed to generate the expected increase in the number of PPP projects (the federal government has yet to sign its first contract).[2] This is partly attributable to the careful attitude of the authorities to project selection. The government's announcement that it intends to make more use PPPs, in particular in the road sector, is a step in the right direction. Improving the business environment is the first option to attract further private investment in

infrastructure sectors. Options are detailed in Chapter 2. Égert *et al.* (2009) show that actions aiming at enhancing competition in infrastructure sectors, allowing for cost-recovery tariffs and imposing hard budget constraints on public utilities all help to boost private investment.

As changes to the business environment may take time to materialise, the infrastructure authorities should consider simplifying the current management process of PPPs and concessions. Numerous agencies at federal, state and municipal levels are involved in managing PPPs and concession contracts and shaping the regulatory framework. The Court of Audit (Auditor General) exerts a general control on different stages of PPPs and the fiscal accounting of signed contracts. BNDES, the national development bank, has responsibility during the development stage for advising the federal government, states and municipalities on how to best structure PPP projects. Following the 2004 law, a committee and a fund were created to guarantee and manage PPPs and related obligations. Progresses have been made on circulating instructions on procedures, and further improvements are likely to be achieved as the different actors involved become accustomed to the process. Still, responsibilities among the numerous authorities concerned could be consolidated to streamline the process of project selection and evaluation. The existence of standardised contracts could also overcome some of the important transactions costs associated with PPPs.

The regulatory framework

A sound regulatory framework is key to the development of infrastructure, by lowering regulatory uncertainty usually associated with large and long lived investment projects. In particular, the presence of independent sectoral regulators, appropriate price regulations, calls for tender and FDI restrictions are important features of a best-practice framework and are discussed in turn in this section. The analysis relies extensively on information collected through an Infrastructure Investment Questionnaire sent to OECD national authorities in winter 2008 (Égert *et al.*, 2009). The same questionnaire was sent to the Brazilian authorities in autumn 2010. The information contained in the responses needs to be interpreted with caution, as with OECD member countries. While it is likely to capture the *de jure* regulatory framework, it says little as regards the *de facto* situation.

Sectoral regulators

Regulatory agencies were created after 1996 and were inspired by the North American institutional model of independent regulatory agencies (Pires and Goldstein, 2001). As in most OECD countries, there is in general a single federal regulator *per* sector in Brazil, except for gas distribution in which regulatory bodies operate at the state level. All federal regulatory agencies are under the regime of "*autarquia especial*", meaning that they are independent but administratively linked to a line ministry. In particular, regulatory authorities are granted a degree of independence in Brazil similar to many other OECD countries in most sectors (Table 3.4). In addition to federal regulators, state-level governments also have regulatory agencies, which can be either multi-sector or sector-specific institutions.

A growing body of evidence suggests that having independent regulators results in better industry performance and may help to foster private investment (Égert *et al.*, 2009). Institutions in Brazil have been strengthened over the past eight years, with progress made in recruitment, public procurement and pay policies within the federal government. Still,

Table 3.4. **Independence of the regulatory authority**

Per cent

	The regulatory authority is independent from the executive and has its own legal status and budget		Does the regulatory authority receive instructions from the executive?		Can the executive overturn the decisions of the regulatory authority?	
	Brazil	OECD[1]	**Brazil**	OECD[1]	**Brazil**	OECD[1]
Electricity	**Yes**	73	**No**	27	**No**	23
Gas	**Yes**	73	**No**	30	**No**	20
Telecommunications	**Yes**	83	**Yes**	10	**No**	17
Railways	**Yes**	53	**Yes**	43	**No**	30
Operation of road infrastructure	**Yes**	29	**Yes**	44	**No**	44
Operation of air transport infrastructure	**Yes**	39	**Yes**	48	**No**	44
Operation of water transport infrastructure	**Yes**	37	**Yes**	40	**No**	36

1. Percentage of 25 OECD countries that replied positively to the question.
Source: OECD Infrastructure Questionnaire and PMR questionnaire.

sectors appear to be at different states of development, and the lack of a complete framework sometimes makes some federal regulatory agencies vulnerable to policy capture in areas such as transport and water and sanitation (Correa *et al.*, 2006; Seroa da Motta and Moreira, 2006). In addition, state regulatory agencies are found to be less autonomous than their federal counterparts, particularly in transport, sewerage, gas and electricity. Moreover, in all sectors but energy, the regulatory authority receives instruction from the executive, contrary to what is observed in many OECD countries, signalling that they may not enjoy full independence.

Recently, the authorities have envisaged reducing the scope of competency of the electricity regulatory agency (ANEEL) and giving the Chamber of Commerce the authority to suspend a contract or even shut down a market player, without the involvement of the regulatory agency. At the same time, the intent is to reform the structure of the Chamber of Commerce and allow the federal government to appoint two members of its executive board. It is important to preserve the independence of the regulator from the government and the industry. The proposed changes may increase the risk of capture by the industry and should be resisted.

As in most OECD countries, regulatory authorities are responsible for implementing regulations and verifying compliance (Table 3.5). They also have some powers in applying fines and sanctions and designing specific rules, but these powers are generally shared with the executive, parliament or the competition authorities. Regulatory independence is counterbalanced by the possibility of making appeals in court against regulators' decisions, as is the case in many OECD countries, but also by the existence of an arbitration procedure in most sectors. This feature is observed in only a minority of OECD countries.

Price regulation

Prices are regulated in all network industries except gas production in Brazil. This is a common feature in OECD countries and can be justified by the existence of natural monopoly, the presence of positive externalities, and the high political and social sensitivity of some sectors. Regulating prices is also a necessity when the core monopoly network provider must ensure access to it for different service operators under payment of

Table 3.5. **Powers of regulatory authorities in infrastructure industries**

Per cent

	Design specific rules for the sector		Implement regulations and verify compliance		Power to apply fines and sanctions	
	Brazil	OECD[1]	**Brazil**	OECD[1]	**Brazil**	OECD[1]
Electricity, consisting of:						
Electricity generation	Yes, shared	64	Yes	68	Yes, shared	60
Electricity transmission	Yes, shared	84	Yes	92	Yes, shared	76
Electricity distribution and supply	Yes, shared	88	Yes	92	Yes, shared	80
Gas, consisting of:						
Gas production	Yes, shared	28	Yes	36	Yes, shared	28
Gas transmission	Yes, shared	84	Yes	92	Yes, shared	76
Gas distribution and supply	Yes, shared	88	Yes, shared	92	Yes, shared	76
Water collection, purification and distribution	Yes, shared	40	Yes	44	Yes, shared	36
Railway transportation						
Passenger transport	Yes, shared	40	Yes	52	Yes, shared	52
Freight transport	Yes, shared	40	Yes	48	Yes, shared	52
Operation of railroad infrastructure	Yes, shared	36	Yes	56	Yes, shared	56
Operation of road infrastructure	Yes, shared	44	Yes	44	Yes, shared	44
Operation of water transport infrastructure	Yes, shared	44	Yes	48	Yes, shared	40
Air transportation, consisting of:						
Air transport	Yes, shared	44	Yes	48	Yes, shared	60
Operation of air transport infrastructure	Yes, shared	48	Yes	48	Yes, shared	64
Telecommunications, consisting of:						
Fixed-line network	Yes, shared	80	Yes	96	Yes, shared	84
Fixed-line service	Yes, shared	80	Yes	96	Yes, shared	84
Mobile services	Yes, shared	80	Yes	96	Yes, shared	84
Internet services	Yes, shared	76	Yes	88	Yes, shared	80

1. Percentage of 25 OECD countries that replied positively to the question and whose regulatory authorities are responsible for the specific issue.

Source: OECD Infrastructure Questionnaire.

an access fee – as in the electricity transmission network – or when markets can only be periodically contested – as in concessions for toll roads or water supply.

The optimal price regulation regime depends on industry characteristics. Pure price cap is the most common form of price regulation and can be found in electricity, road infrastructure and fixed line services and in some areas in gas transmission. This type of regulation simulates competition, offers strong incentives to adopt cost-saving technology and increase efficiency, but it has also been found to lead more often than cost-based pricing to contract renegotiation (Guasch *et al.*, 2003 and 2007). Price caps, if associated with independent regulators, have been found to boost infrastructure investment in OECD countries (Égert, 2009). Cost-based regulation prevails in water and air transport sectors, as was found to be the case in the majority of OECD countries that responded to the questionnaire.

Investment needs are usually the main criteria taken into account when the regulator determines the prices firms are allowed to charge (Table 3.6). Prices are differentiated according to the type of customer and to a lesser extent the distance between production and customers. Demand has an impact on prices only in water, transport, road and mobile telecommunication services sectors. In line with most OECD countries, prices in most sectors are adjusted during the next round of contract revision in case of cost-saving investment.

Table 3.6. **Degree of price regulation in infrastructure industries**

Per cent

	Are prices regulated?			
	Brazil	OECD[1]		
		Yes, for all prices	Partially	No
Electricity, consisting of:				
Electricity generation	Partially	0	20	64
Electricity transmission	Yes, for all prices	80	12	4
Electricity distribution and supply	Yes, for all prices	28	68	4
Gas, consisting of:				
Gas production	No	0	8	48
Gas transmission	Yes, for all prices	68	16	4
Gas distribution and supply	Yes, for all prices	36	56	4
Water collection, purification and distribution	Yes, for all prices	32	32	12
Operation of railroad infrastructure	Yes, for all prices	32	32	12
Operation of road infrastructure	Yes, for all prices	32	12	16
Operation of water transport infrastructure	Partially	8	20	44
Operation of air transport infrastructure	Yes, for all prices	8	52	16
Telecommunications, consisting of:				
Fixed-line network	Yes, for all prices	12	68	16
Fixed-line service	Yes, for all prices	0	76	20
Mobile services	Partially	0	64	20
Internet services	Price was never regulated	0	24	40

1. Percentage of 25 OECD countries that replied to the questionnaire. Percentages may sum to less than 100 because of non responses.

Source: OECD Infrastructure Questionnaire.

Environmental licensing

Environmental licences appear to be a source of investment delay, particularly in the energy sector, the main issue being the resolution of disputes rather than meeting environmental requirements *per se*. Licences cannot be obtained in Brazil before calls for tender are made (Table 3.7). Some large plants – especially large hydro facilities – had to wait for an environmental green light for over a decade (OECD, 2008). On average environmental licensing costs have been estimated at 15 to 20% of the total cost of the project, of which only 2% is related to environment requirements, while 80% is attributable to the cost of relocating population, and supporting communities and municipalities in several social areas (World Bank, 2008). Some of these costs are inherent to the projects and would have occurred even in the absence of the licensing process. In the past one reason for delays was the lack of adequate staffing in planning functions at the government level in the aftermath of the fiscal consolidation plans. To address this, the government established the Energy Research Company (EPE, *Empresa de Pesquisa Energética*) in 2004 to

Table 3.7. **Investment planning**

Per cent

	Brazil	OECD[1]
Does the contractor (a public body) usually obtain planning permission before calls for tender are made?	**Yes**	56
As a principle, is environmental licensing obtained by the public body before calls for tender are made?	**No**	44
If applicable, are local authorities' licenses obtained by the public body before calls for tender are made?	**No**	76

1. Percentage of 25 OECD countries that replied positively to the questionnaire.

Source: OECD Infrastructure Questionnaire.

plan and design projects in the energy sector and support the national energy policy. This has improved the government planning capacity and sped up the delivery of licences.

But frequent disputes still prolong the environment licensing process. Brazil is one of the very few countries that employ a three-stage process (Preliminary, Installation and Operating Licenses), with separate procedures for granting licenses at all three stages. This makes disputes more likely besides offering too many opportunities to restart or revisit old ones. Furthermore, it generates much uncertainty, lengthy delays and high transaction costs. In 2005, a timeline for each step was established, with the main objective of reducing the time spent during the first phase. Further progress could be achieved by the adoption of comprehensive rules for financial compensation for populations harmed by projects. In addition to increasing predictability, this would also hasten the process and lower the likelihood of disputes.

Developments in selected infrastructure sectors

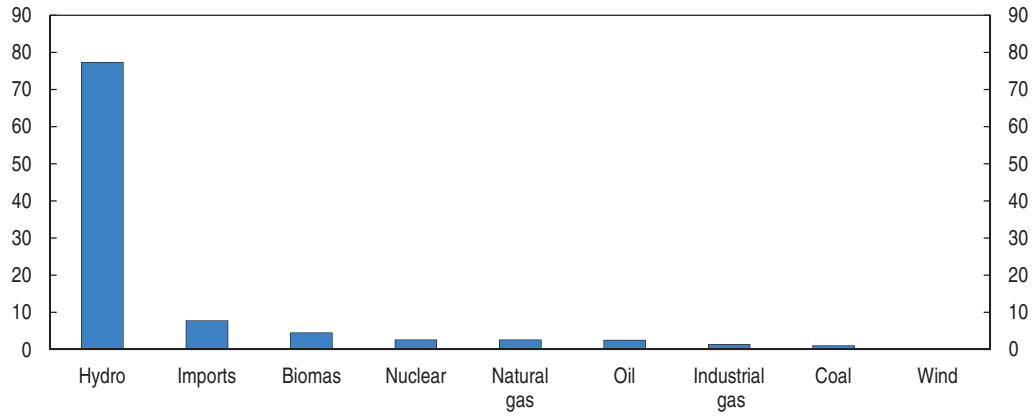
This section identifies the main challenges to promote infrastructure development in network industries. The focus is on electricity, telecommunications, road transport, railways and water and sanitation, all of which play important roles in Brazil's development strategy and account for an important share of PAC spending.

Electricity

Electricity generation in Brazil is dominated by hydropower, which represented about 80% of total generation in 2009 (Figure 3.8). Most of the electric energy is supplied by the regionally integrated grid transmission system (*Sistema Interligado Nacional*). In remote areas small diesel plants supply electricity but at high cost.

Figure 3.8. **Sources of electricity supply, 2009**

Per cent of total supply



Source: Ministry of Mines and Energy.

StatLink http://dx.doi.org/10.1787/888932519567

The state is still a major shareholder in the electricity sector. State ownership predominates in generation (80% of assets). By contrast, over two-thirds of distribution assets are in private hands. The sector includes one very large government-controlled holding company, *Eletrobrás*, for generation, transmission and distribution, alongside a

number of smaller companies. *Petrobras,* the state-owned oil company, owns over a fifth of thermal plant capacity.

The current model was introduced in 2004 in the aftermath of a major supply crisis in 2001. It replaced a framework that focused on privatisation and sought to move toward full competition, but failed to attract private investment because of inadequate pricing and institutional weaknesses with, in particular, a lack of strategic planning. The 2004 model aims at securing an adequate supply of power by attracting investment, exploiting potential hydro resources and promoting universal access via social programmes. A regulated market is organised around a wholesale power pool based on long-term contracts allocated through competitive auctions between generators and distribution companies. In addition, large consumers can deal directly with generating firms in a much smaller free market. Partial market opening and the managed framework of auctions are likely to mute price signals, which will not reflect short-term variations in demand.

The sector is mainly regulated at the federal level. The Ministry of Mines and Energy (MME) oversees the whole power sector and is responsible for policy setting. Created in 1996, the Electricity Regulatory Agency (ANEEL) is financed by a tax on power companies. The current legal framework appears to be a result of different reform waves since the mid-1990s. It consists of seven laws and related secondary legislation. Despite the lack of rationalisation, this framework is found to work efficiently (OECD, 2008).

The most important challenge lies in raising generation capacity to meet demand in the context of rapid economic development and increasing population. Official projections point to electricity consumption increasing by 5.0% per year from 2010 to 2019 on average (*Ministério de Minas e Energia* and EPE, 2010). Meeting this demand will require important investment, in particular from the private sector, and improving the business environment will be a first step in this direction (Chapter 2).

Even though the 2004 model has managed to attract some investment in the electricity sector, the economy remains vulnerable to power shortfalls. A cushion is provided by imports of Bolivian natural gas to fuel thermal plants, although these may be vulnerable to political shocks. Looking forward, projections point to a substantial rise in domestic production of natural gas, but this is unlikely to fully address the problem. In this context, the government has sought to diversify generation sources through different options including new hydro plants or plants powered by other energy sources (thermal, nuclear, coal). In addition, the authorities are envisaging making prices more reactive to demand. One option currently being discussed is to create differentiated tariffs for low-voltage consumers by creating three differentiated tariffs throughout the day, depending on energy consumption. The idea is to encourage consumers to shift energy consumption to cheaper tariff periods to reduce the consumption peak. This proposal could diminish the risk of blackouts and is likely to be beneficial to the consumer. It should be implemented as soon as possible.

Cross-subsidisation can hinder the good functioning of electricity markets. This issue concerns not only the main incumbent, *Eletrobrás*, but also distribution companies, which sometimes belong to groups with interests in generation, although distribution firms are not allowed to own generation plants directly. "Regulatory accounts", which contain financial information related to individual firms (*e.g.* their subsidiaries) or activities have been demanded by the regulator on a regular basis to enforce effective separation in the absence of divestiture. It is not clear, however, to what extent these procedures are

effective in preventing anti-competitive behaviour (OECD, 2008). In this context, an in-depth evaluation of the state of competition in the power sector is warranted and, if needed, should be followed up by actions to prevent cross-subsidisation, such as prohibiting distribution and generation firms from belonging to the same group. Given the dominant role played by *Eletrobrás*, it would be also useful to investigate whether there is room to open up generation to competition. Such cost-benefit analysis would be in line with best practice, as described in the 2001 *Recommendations of the Council Concerning Structural Separation in Regulated Industries*. Many OECD countries have moved toward structural separations in their electricity sectors, with particularly successful reforms in Australia and Chile (OECD, 2011).

Electricity tariffs vary across regions. This reflects differences in the size of concessions and population density, as well as in electricity sources. As a result extended geographical areas with low density are likely to experience much higher tariffs than smaller regions with large population. The first consequence is that incentives to invest in these regions may be lower, limiting access to high-quality electricity delivery in remote areas. In this context, the electrification programme *Luz para Todos* (LpT, Light for all) started in 2003 with the objective of bringing electricity to rural and remote areas by 2010. The programme relied on substantial federal and state resources directed to service providers, who covered connection costs. The programme was successful, and universal access was almost reached in 2010. The second consequence is that tariffs may be prohibitively high for low-income households in some regions. In addition, tax (net of subsidies) accounted for about 35% of the tariff in 2006, boosting prices. To address this issue, the authorities have implemented reduced social tariffs for low-income households. But these discounts can blur price signals and distort investment decisions. They can lead to cross-subsidisation across customers, with higher prices for high-volume customers and, in the case of firms, hampering their competitiveness. A more cost-effective way to support low-income households would be to make use of compensation programmes in the form of existing targeted cash transfer schemes, which, like the LpT, target the rural poor.

Telecommunications

The telecommunication sector has the most developed regulatory framework of all infrastructure industries in Brazil. Regulatory reforms started in the mid-1990s and revolved around the following principles: dismantling the state-owned company *Telebrás*; creating regional operators and introducing competition in the market; expanding the existing network to fulfil newly specified universal service obligations (USOs); and establishing a modern regulatory authority (*Agencia National des Telecomunicações*, ANATEL). The structure of the regulatory agency and its degree of independence are generally similar to those observed in a number of OECD countries (OECD, 2008).

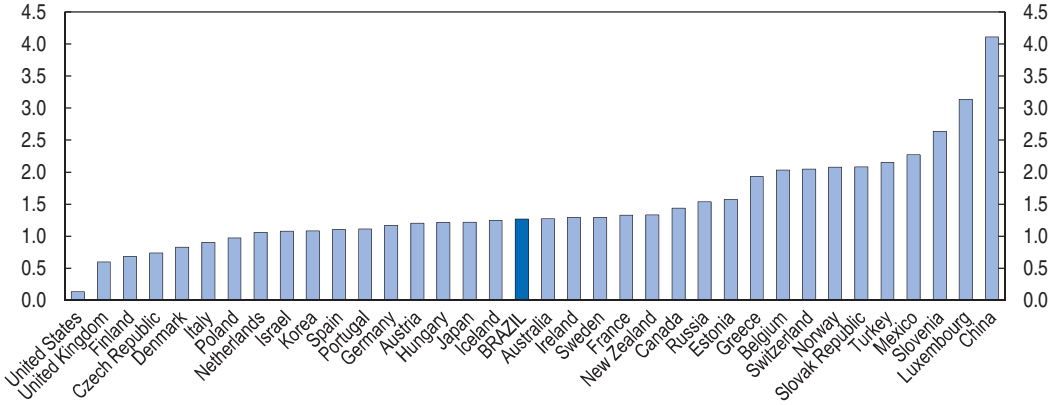
However, the regulatory framework seems ill-suited to deal with the ongoing process of telecommunication and broadcasting service convergence. ANATEL focuses on telecommunications only, whereas broadcasting services are under the purview of the Ministry of Communications. The current legislative setting treats these two types of services as distinct and subject to different sets of rules and regulators. Yet, technological developments are leading to an rising overlap between them, with users increasingly exploiting them with the same tools/platforms. A number of OECD countries (for instance, the United Kingdom and Australia) have a single body responsible for regulating market

entry in broadcasting (carriage) and cable operators, and the same body is also responsible for content regulation, access to spectrum and licensing (OECD, 2009). The Brazilian authorities should better co-ordinate the regulatory settings of the communication and broadcasting sectors to meet the reality of service convergence. Such a measure could prepare the sector to move to a single licence, which would probably spur competition in different telecommunication service markets, allow operators to reap economies of scope and increase the variety of services offered, thereby raising consumer welfare.

The market for telecommunication services is separated into two distinct regimes and suffers from a lack of competition in the fixed-line segment. In the "public" regime, which is restricted to the fixed-line segment, firms have to achieve universal service targets, comply with price caps and fulfil service obligations and accounting separation. There is usually one dominant player per state. This regime is set to expire by 2025 and is to be reviewed by 2015. Under the "private regime", firms operate under minimum intervention from the government and prices are free. There is no restriction on foreign investment in the private regime. Although reforms have sought to foster competition and product market structure appears to be more competitive in Brazil than in many OECD economies (Figure 3.9), the fixed-line sector is dominated by only a few enterprises (IPEA, 2010b). Firms usually benefit from a monopoly in their concession areas, as they have full control over the use of their infrastructure network. There is no regulation that defines the conditions under which a firm can exploit a competitor's network. The authorities should take the opportunity of the 2015 review to reassess the costs and benefits of maintaining the current dual system, given the difficulty of injecting competition in market segments under concessions. If it is found useful to maintain the two regimes, the authorities should lower entry barriers and issue regulations that clarify the conditions under which a competitor can rent existing fixed-line infrastructure.

Figure 3.9. **Product market regulation in telecommunications**

2007



Note: The indicator ranges between 0 (less restrictive) to 6 (more restrictive).

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There is some scope to finance universal service obligations (USOs) in a more cost-effective manner. The *Fundo de Universalização dos Serviços de Telecomunicações* (FUST) was established in 2000 to finance USO targets and is funded through a 1% tax on telecommunication companies' revenues. This adds to the already high tax burden, which amounts to around 40% and is eventually passed on to customers. However, only BRL 10

out of 756 million of FUST revenues are actually used to finance USOs. The rest lies in Treasury accounts. The government should quickly remedy this situation by developing a clear investment plan of FUST's resources. Moreover, given the dominant role played by the service provider in the public area, it is unclear whether the current system provides the right incentive to minimise USO costs. Allocating subsidies to extend services in underserved areas through auctions where both the private and public regimes could compete would be a way to minimise these costs.

Land transport

Railways

Despite its huge potential, the Brazilian railway sector is underdeveloped and underexploited. Tight control by the federal government over tariffs until the late 1980s led to impaired financial conditions of railway operators and resulted in severe underinvestment and low maintenance spending (Estache *et al.*, 2001). This has produced a rather singular phenomenon: the total length of the railway network shrank from 34 207 kilometres in 1930 to 29 637 in 2009 (ANTT, 2010; da Silva Campos Neto *et al.*, 2010). Railways are used only to transport merchandise. A first high-speed passenger line between Rio de Janeiro and São Paulo is currently under consideration, but because of the lack of private-sector interest, the project has been delayed.

The Ministry of Transport (MoT) and the regulatory authority *Agência Nacional de Transportes Terrestres* (ANTT), created in 2001, have joint responsibilities over the railway sector. The MoT is responsible for setting long-term railway-transport policies and guiding the development of the sector. The main responsibilities of ANTT involve the definition of rights and duties of users and railway operators, managing railway interconnections and joint transport, specifying penalties for missing output and safety targets and reviewing output and safety targets every five years. Another important player in the sector is the public-sector company, *Valec Engenharia Construções e Ferrovias*. It is in charge of constructing rail tracks, promoting feasibility studies on high-speed trains and signing contracts and agreements with national administration bodies, private companies and international organisations to implement investment projects. In addition to Valec, there are four large groups in the sector, each enjoying a regional monopoly.

The railway transportation system was privatised in the mid-1990s. The impact of privatisation on operational outcomes has been by and large positive (Estache *et al.*, 2001). Productivity increased as the labour force was reduced. Although profitability continued to vary considerably among railway companies, with some even posting losses, the subsidies paid by the federal government decreased drastically. Yet, privatisation has not eliminated all bottlenecks hindering the development of the sector. The prospect of huge sunk costs still deters private investment.

One major issue is to expand the network, given the significant social externalities associated with railway transport and its smaller greenhouse gas (GHG) emissions relative to road transport. PAC allocates BRL 43.9 billion to the railway sector for the 2011-14 period, of which less than 30% will be financed by the public sector. The decision to increase public investment in railways in a context of fiscal consolidation is welcome, given the large long-

term pay-offs associated with this type of investment. The authorities should continue to protect cost-effective projects in railways from budget cuts.

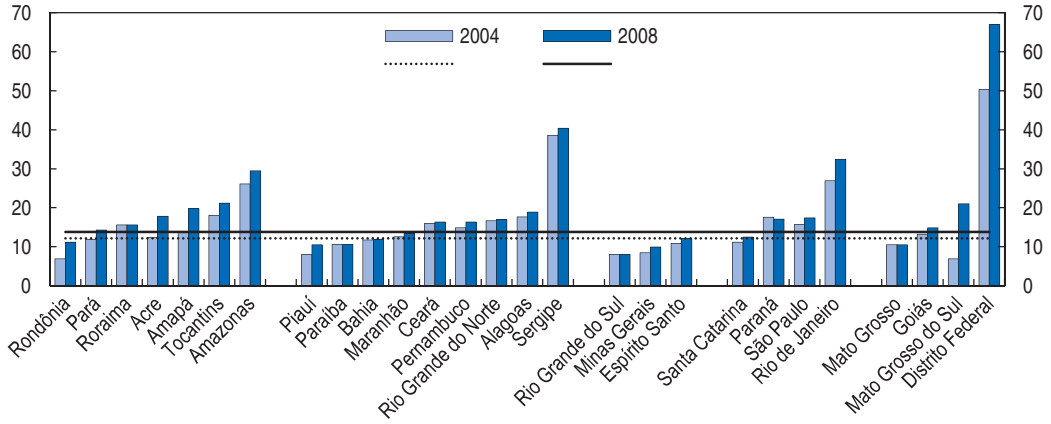
The sector would benefit from additional private investment. Improving the business environment is likely to foster such investment (Chapter 2). At the moment only the public company *Valec* has been granted the right to expand the network. Relying on a public company makes sense, given the very high sunk cost and the large externality of building the rail network. However, changes could also be made to the content of concession contracts, which have constituted up to now the only form of private-sector participation. These contracts include output and safety objectives aiming at improving and renovating the existing network and rolling stock. These targets are commendable from a regulatory point of view, as they let the authorities set some welfare-enhancing objectives while allowing private operators to identify the most cost-effective ways to achieve them. However, they have not succeeded in spurring maintenance outlays. It would be useful to specify clear maintenance spending targets in concession contracts to improve the quality of the railway network.

Limited interconnectivity among the networks under different concessions unduly limits the return on investment to extend the rail network and therefore prevents the much needed enlargement of Brazil's railway system (da Silva Campos Neto *et al.*, 2010). The privatisation process has conferred on vertically-integrated railway companies a monopoly over relatively disconnected rail tracks extending over the East-West axis. However, growing North-South traffic has made it clear that concessionaires are obliged to increasingly use other concessions' tracks to expand their services and reach new destination markets. To ensure a minimum degree of interconnectivity, concessionaires are expected to undertake joint transport, whereby the cargo of a railway company is loaded and carried by the concessionaire of the network through which it needs to be transported, upon payment for the transport services. If this is not possible, concessionaires should grant access to their network, upon payment of a fee. In case the parties do not find an agreement the Ministry of Transport could impose compulsory tariffs. This system has, however, failed to produce smooth network interconnections, partly because of physical constraints (tracks' gauge may differ across networks) and insufficient regulation. Setting *ex ante* compulsory interconnection fees at cost-recovery levels is likely to lower the probability of disputes between concessionaires over connecting rail tracks in different concession areas.

Roads

Brazil's road system is inadequate to the country's needs. Although the network of around 1.7 million kilometers is one of the longest in the world, the share of paved roads was only 13.8% in 2008, with large disparities across states (Figure 3.10). The poor state of the system is likely to impinge more negatively on Brazil's competitiveness and economic growth than in other countries as around 60% of freight is transported by lorries (*Ministério dos Transportes*, 2007). This share is much higher than the corresponding figure of most other continental-sized countries such as the United States (35%), Russia (5%) and China (20%). There is evidence that low-quality roads raise transport costs on average by 28% compared to what they would be under ideal road conditions (CNT, 2010; Resende, 2006). Poor-quality roads are particularly pervasive in the North and the Northeast regions. Data suggest that states that invested more in road infrastructure also experienced stronger increases in GDP per capita from 2000 to 2008.

Figure 3.10. **Percentage of paved roads**



Note: The lines represent the Brazilian average.
Source: ANTT.

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To rehabilitate the road sector, the government began to sign road concession agreements in the 1990s, mostly for 25-year periods. At the end of 2009, around 50 concessionaires managed 14 993 kilometres of the road network. Of the total roads conceded, 32% are owned by the federal government and the rest by state governments. A recent survey (*Pesquisa Rodovias*) reports that 87.3% of highways under private concessions are in good or very good condition, whereas the corresponding figure for those under the responsibility of public authorities is just 32.4% (CNT, 2010).

The way contracts are written at the moment does not encourage concessionaires to undertake investments to improve or expand toll roads. This issue arises as the main criterion currently used to award federal road concessions is based on the lowest toll charged. Winners are expected to undertake rehabilitation works at the beginning of the concession period and ordinary maintenance until the concession expires. But clauses in existing contracts are sometimes vague. To overcome this problem the government should spell out precise investment targets in concession contracts aiming at significantly extending and improving roads over the entire life of the concession and not just at rehabilitating and maintaining them. Specifying such targets and keeping the current allocation system based on the lowest tariffs may be infeasible. The authorities could explore the use of alternative awarding criteria such as the Least Present Value of the Revenues mechanism (LPVR). With this option, the winning bid would be the one offering the least present value of the accumulated revenues – using a pre-determined discount rate that reflects the weighted average cost of capital. The experience of Chile with this scheme since 1998 has been positive (Box 3.2).

Water and sanitation

Water and sanitation is the sector where investments are probably the most needed. The situation is particularly critical for sewerage, as only 47% of the population – concentrated in the South-Southeast region – benefit from sewage collection and approximately 20% of collected sewage is treated. It is estimated that an investment of BRL 22 billion will be necessary to prevent 55% of the municipalities, including large ones like São Paulo or Rio de Janeiro, from facing water shortages by 2015 (ANA, 2011). Accordingly, the government has rightly indicated it will direct more resource to the sector

Box 3.2. **The experience of Chile with the Least Present Value of the Revenues mechanism**

The Least Present Value of the Revenues (LPVR) method to award concession contracts in the road sector was developed by Engel, Fischer and Galetovic (1997 and 2001) following a proposal from the Chilean Ministry of Public Works. Chile awarded the first concession on the basis of this selection criterion in 1998. LPVR eliminates the demand-side risk as the concession period ends when LPVR is reached. If the traffic is ultimately higher than projected, the concession will end earlier. On the other hand, if it is lower the concession will finish later. Using the LPVR, bidders disclose the revenue they require to meet their targeted return on investment. This discourages artificially low bids and reduces the scope for renegotiations during the life of the contract. Another substantial advantage is that public authorities may reserve the right to buy out the concession by paying the concessionaire the difference between the LPVR and the revenues already accrued. Besides putting a ceiling on government's contingent liability, this allows the public authority to end the contract instead of renegotiating it.

Source: Vassallo (2006).

via the second step of the programme My House My Life (*Minha Casa, Minha Vida*). Within PAC, investments for the period 2011-14 are estimated to be 92% higher than those during 2007-10. In addition the federal government has encouraged municipalities to invest in the sector.

The current framework was established in 2007. Past regulatory structures ranged from a totally decentralised framework to a fully centralised one (*Planasa*) and performed poorly, in part because of the unstable macroeconomic environment, but also because they lacked specific guidelines on tariff policy. The 2007 law filled this gap. In addition, it granted regulatory authorities administrative and financial independence. It also strengthened public accountability mechanisms of the planning and decision-making process in the sector by means of public hearings and consultation with all stakeholders. The new regulatory framework is well thought out overall and has the potential to increase investment in the sector by explicitly addressing issues that have beset it for a long time, especially the financial and economic sustainability of water and sanitation service provision.

The sector is highly decentralised: municipalities are responsible for service provision, and states oversee large urban agglomerations to exploit available scale economies and cross-subsidise poor municipalities. Sub-national entities responsible for the local water and sanitation sector can delegate the organisation, regulation and provision of such services to public or private companies or consortia, but in practice, private participation in the sector is very limited. The federal government has mainly a co-ordinating role. It is tasked with developing the national basic sanitation plan (which sets targets to achieve universal access in the whole country and other guiding principles) that local sanitation plans have to follow. Decentralisation poses a trade-off between locating supply and management decision-making near the source of demand and creating co-ordination challenges among different local authorities. Still, international experience shows that Brazil's decentralised system should not be viewed as an obstacle to reaching universal coverage of high-quality water and sanitation services. Alternative systems relying on a single utility managing several or all of a country's water and sanitation services, rural and

urban, have not been more effective in extending service coverage than more decentralised structures (Clarke and Wallsten, 2002; Kessides, 2004).

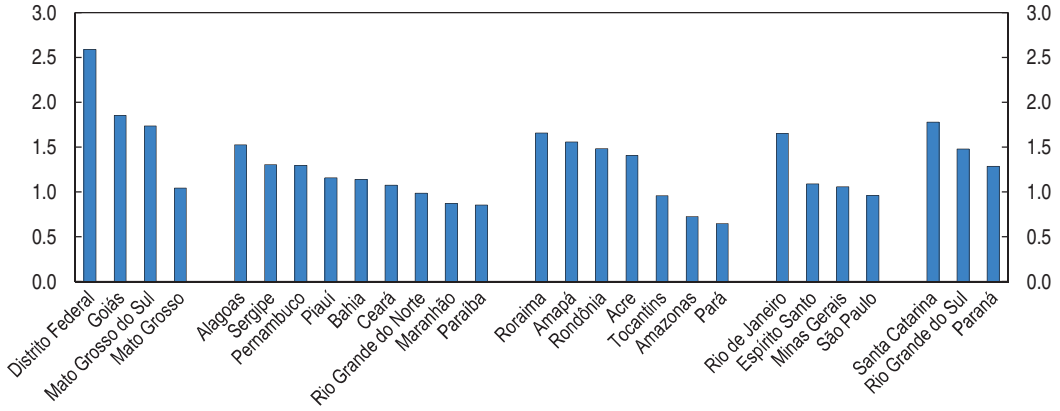
Wide variations exist in local service coverage and in quality of service provision across regions, reflecting differences in sub-national administrative capacity and the ability to pay of the local population. To address this issue, the federal regulatory agency for water resources (*Agência Nacional do Agua*, ANA) has put in place special programmes to increase the management capabilities of municipalities. In addition, the federal government has recently devised a Federal Sanitation Plan, with the objective of guiding municipalities in the nature and the sequencing of reforms. These initiatives are useful and should be pursued. The federal government should also set guidelines defining minimum quality-of-service requirements to improve service quality and coverage in laggard jurisdictions.

Ensuring that water and sanitation services' supply satisfies increasing demand requires institutional arrangements that simulate a competitive environment. Competition in the sector is arguably difficult because of the existence of natural monopoly. Exclusivity rights are usually granted to water and sanitation utilities to make concession contracts more attractive to potential investors or permit the service provider to cross-subsidise customers. Yet, exclusivity may not produce the expected social benefit where water coverage is low and utility performance poor. Easy regulators' and consumers' access to information on performance levels and quality of services of utilities may strengthen incentives for efficiency and make it possible to formally introduce yardstick competition. The federal government already collects a substantial amount of data on different aspects of water and sanitation operations, which should make implementing yardstick competition an achievable target. Local governments could make use of this detailed information and introduce performance-based penalties and rewards to create incentives to reach minimum service quality and coverage and promote best practice.

Water and sewerage tariffs vary widely between cities and regions (Figure 3.11). Regulatory agencies define the tariff regime and specify the mechanisms to revise tariffs at periodic intervals. Tariffs must be set at cost-recovery levels and should allow for the necessary investments to expand service coverage and guarantee an appropriate

Figure 3.11. **Average water tariff**

BRL/m^3, 2008



Source: Ministry of Cities, *Sistema national de informações sobre saneamento* – SNIS.

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remuneration of the capital invested. In most cities, a low social tariff applies to the first block of consumption in order to support low-income households. In some cases, the targeting of social tariffs has been improved by using registers from the *Bolsa Familia* programme, but in most cases the targeting remains poor. In addition, the resulting cross-subsidies among users can be detrimental to the efficiency of service delivery, while not helping to address inequality. Indeed, cross-subsidies can hinder network expansion in rural and poor areas as revenues may not cover the costs of extending the network therein. At the same time, cross-subsidies do not always benefit poorer households, who do not necessarily have access to the network, especially in remote areas in the North of the country. Against this background, the federal government plans to provide financial incentives to water companies to expand the network and to offer a subsidised tariff to poor households. It is also seeking to improve the targeting by making more systematic use of *Bolsa Familia*'s registries. This initiative is likely to be effective in increasing access to water and sanitation services to needy households and should be implemented as soon as possible.

Consolidation of small-scale water and sanitation operations merits attention. Brazil's water and sanitation providers are extremely heterogeneous in size and economic performance. The average number of connections was 62 490 for water and 47 611 for sewerage in 2008, but this figure masks considerable variation. It is likely that small establishments incur large costs because of the lack of economies of scale. Such economies are substantial for establishments serving up to 125 000 households and become weaker for those with more than 250 000 (World Bank, 2007). This suggests that renewed efforts might be needed to raise the size of water and sanitation establishments by merging the smallest and rationalising their operations. One way to consolidate water utilities could be to merge them by river basins. The Consortium Law passed in 2005 is a step in the right direction, as it sets an appropriate legal framework allowing municipalities to share their water and sanitation services. Nine consortia have been created in the area of public sanitation. However, to date there do not exist enough incentives for municipalities to form consortia, especially for water and sanitation companies in surplus to merge with those in deficit.

One reason for the lack of investment in the sector is the high level of debt of certain municipalities, which puts them at risk of not complying with the Fiscal Responsibility Law. This problem is not easy to solve as the water and sanitation law forbids the federal government from allocating budget resources for the operation and maintenance of water and sanitation services not administered by a federal agency or entity, except in case of imminent risks to public health and the environment. But the federal government can (and has) provide(d) special loans through the state bank *Caixa Econômica Federal* (CEF) to help municipalities in financial difficulty. This policy appears to be useful, but the federal government could envisage making such loans conditional on reforming service providers' structure and making their operations financially viable, for instance by forming a consortium. This might provide stronger incentives to achieve available scale economies.

A summary of policy recommendations is provided in Box 3.3.

Box 3.3. **Summary of recommendations: infrastructure development**

Improving infrastructure spending

- Continue to protect PAC measures from budget cuts, and focus on completing the most worthwhile projects.
- Set specific rules to quantify the yearly operation and maintenance costs of existing and planned infrastructure, and incorporate them in multi-year budgets.
- Consolidate responsibilities among the numerous authorities involved in Public Private Partnerships selection process.
- Monitor improvement in co-ordination among all federal ministries involved in infrastructure programmes.

Strengthening the regulatory framework

- Resist proposed changes to lower the regulatory power of the electricity agency.
- Adopt comprehensive rules for compensation for populations affected by infrastructure projects.

Electricity

- Evaluate the state of competition in the power sector and if needed follow up by actions to prevent cross-subsidisation. Investigate whether there is room to open up competition in generation.
- Make use of targeted cash transfers rather than social tariffs to support low-income households.

Telecommunications

- Review the costs and benefits of having a dual system, whereby firms are subject to different price-setting regulations and service obligations depending on the regime which they belong to.
- Specify the conditions under which a firm can exploit an existing network.
- Better co-ordinate the regulatory settings of the sectoral regulator, ANATEL, and the Ministry of Telecommunications in order to meet the requirement of service convergence.

Railways

- Specify clear maintenance spending targets in concession contracts to improve the railway network.
- Set up *ex ante* compulsory interconnection fees.

Road transport

- Specify clear investment targets in concession contracts aiming at significantly extending and improving roads over the entire life of the contract.

Water and sanitation

- Associate penalties and rewards with worst and best performances creating strong incentives for utilities to reach minimum service quality and coverage.
- Grant operators a subsidy to encourage them to expand the network and ensure affordability of low-income households, as planned.
- Make loans to municipalities conditional on forming consortia where this would be cost effective.

Notes

1. There was an attempt to increase earmarking for the infrastructure sector in 2001 with the establishment of a federal tax (*Contribução sobre Intervençao no Domínio Econômico*, CIDE-combustiveis) to finance investment and maintenance in the transport sector, but between 2002 and 2004 only a limited share of the revenues of CIDE-combustiveis (14%) was allocated to road transport (Afonso *et al*., 2005).
2. Since the 2004 law only two PPPs have been signed in the road sector, by the state governments of Minas Gerais and of Pernambuco (ABCR, 2010).

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Chapter 4

Achieving strong and sustainable growth

Over the past decade Brazil has managed to achieve economic stability, and more recently its economy proved very resilient in response to the global economic crisis. The key challenge for the country is now to continue to grow at a fast pace to close its income gap with the OECD countries, while choosing a development pattern that is consistent with long-term sustainability concerns both socially – in terms of ensuring all Brazilians benefits from gains in living standards – and in terms of protecting the environment.

Brazil will experience major changes in the decades to come, which will have implications for the design of policy. Like many other emerging-market economies, the country is going to age much more rapidly than today's advanced economies. As a result, long-term output growth is expected to slow in line with a deceleration in the working-age population. The effect of this ageing process on saving will depend on a range of factors, including the effectiveness of social policies. In addition to increasing the burden on public finances, ageing will also tilt the composition of public expenditure toward more pension and health spending. The country is also going to rely increasingly on oil resources. Oil production has steadily increased since 2003, but production from the pre-salt fields will move the country into the top ten oil exporters in the world. While net foreign assets and rising oil production appear to have pushed up the equilibrium exchange rate and the country has benefited from sizeable terms-of-trade gains, there are very few signs of de-industrialisation thus far.

Income redistribution and education policies as well as environmental policies are key areas where reforms will help to maintain economic development on a path of long-term sustainability. Poverty and inequality reduction is probably the area where Brazil has made the most significant progress in the last decade, owing in large part to Bolsa Familia, a targeted conditional cash transfer programme, whose resources should be increased. Brazil should continue with the main pillars of its recent success in the area of education, but a stronger focus on teaching quality and on reducing drop-out rates in secondary education would speed up the pace at which it can catch up with educational attainment in OECD countries.

Cutting greenhouse-gas emissions is a policy priority, and the country has managed to slow the pace of deforestation dramatically in recent years. As a result, it will achieve its emission reduction targets ahead of the 2014 deadline. Given the importance of deforestation in climate-change policies, the authorities should persevere with their efforts. In addition, they should pay particular attention to the greening of infrastructure investment and account for this in project selection within the Growth Acceleration Programme.

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Brazil implemented major policy changes over the last few decades and has managed to put in place a well-functioning macroeconomic framework. Most recently, the economy recovered very rapidly from the global financial crisis and in 2010 experienced its best growth outcome in two decades. Strong economic performance over an extended period of time will be needed to catch up with high-income countries. The three preceding chapters focused on ways to spur robust economic growth through sound stabilisation policies, enhanced incentives to save and invest and faster development of infrastructure in network industries. Although these measures also have some redistribution implications and can help to reduce poverty, they will not be sufficient to ensure all segments of the population benefit from gains in prosperity and that economic development is consistent with a sustainable management of natural resources. Income redistribution and education policies, as well as environmental policies, will have to play a major role.

This chapter first discusses two issues that are going to modify Brazil's economic landscape over the medium term. First, demographic changes are expected to impact macroeconomic performance and to heighten pressures on fiscal sustainability. The most rapid ageing phase has not yet occurred, so that policymakers have a window of opportunity to prepare for this change. Second, the country is going to have access to plentiful domestic oil resources that will need to be properly managed. The chapter then turns to examining key policies to ensure that growth can be sustained in terms of income distribution, poverty reduction, education policies and climate-change strategy.

Coping with an ageing population

Brazil will soon enter into an extremely rapid phase of demographic transition, which will drive profound economic changes as key drivers of economic growth tend to vary depending on where most people fall in the life cycle. This section reviews the impact of population ageing on labour input, savings, as well as the public-spending mix.

Demographic changes in Brazil

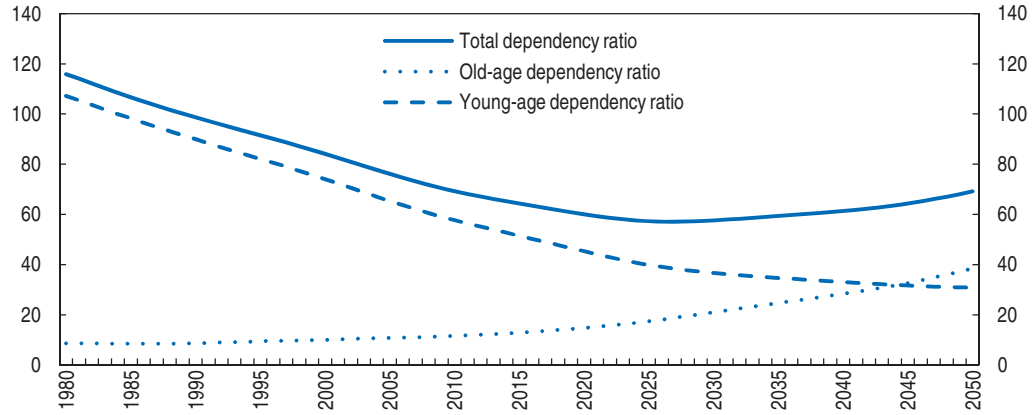
The speed of population aging in Brazil is going to be significantly faster than what has been experienced by developed economies (except Japan) over the last century (World Bank, 2011). The same demographic aging process that unfolded over more than 60 years in the United States will occur in only two decades in Brazil. According to the United Nations population projections, the elderly population (over 65) will more than triple within the next four decades, increasing from about 7.6% of the population in 2010 to 38% by 2050. As a result, the dependency ratio, which has been declining since 1965, will reach a trough in 2025 and increase subsequently (Figure 4.1).

Effect of ageing on labour input

Reforms undertaken since the 1990s have finally begun to bear fruit. Potential output growth has been steadily improving since 2000 to reach 4.6% in 2010 (Table 4.1). A sound macroeconomic framework combining inflation targeting, a flexible exchange rate and

Figure 4.1. **Dependency ratios**

Percentage of working age population



Note: The old-age (resp. young-age) dependency ratio is computed as the ratio of the population of over 65 years (resp. of 0 to 19 years) on the working-age population (20-64 years). The total dependency ratio is the sum of the two.
Source: IBGE and OECD calculations.

StatLink http://dx.doi.org/10.1787/888932519643

Table 4.1. **Actual and potential output growth and contribution to growth**

	GDP growth	Potential GDP growth	Contribution to potential output growth		
			Percentage point		
	Per cent	Per cent	TFP	Capital	Labour
1981-89	2.3	2.6	–0.9	1.7	1.8
1990-94	1.3	2.0	–0.3	1.2	1.0
1995-99	2.0	2.3	0.1	1.2	0.9
2000-08	3.7	3.3	0.7	1.3	1.3
2009	–0.6	4.4	1.3	1.8	1.3
2010	7.5	4.6	1.4	2.0	1.2

Note: Potential output is estimated using a production-function approach (see Box 4.1).
Source: OECD calculations.

rules-based fiscal management has gradually been put in place and has succeeded in stabilising the macroeconomic environment. This has been complemented by structural reforms to liberalise the country's trade and investment regimes and to inject competition in product markets. As a result, the contribution of total factor productivity (TFP) – the efficiency with which the factors of production are used to produce output – which detracted from output expansion in the 1980s and the early 1990s, appears to have risen steadily since then. It reached almost 30% of potential output growth in the 2006-10 period, from only 10% at the beginning of the century. Capital accumulation also contributed to the rise in potential output growth. Although labour input increases supported growth in the last two decades, there is some evidence that Brazil did not take full advantage of the demographic dividends and the resulting growth in the working-age population (Queiroz and Turra, 2010). Low investments in human capital and the lack of proper social and economic institutions have been put forward to explain this missed opportunity.

Over the medium to long term, assuming no major reforms, projections point to a substantial slowdown in potential output growth (Figure 4.2). These projections rely on the United Nations' medium population scenarios and assume that capital and trend TFP grow

Box 4.1. **Estimation of potential output**

Potential output is calculated using a Cobb-Douglas production function. The methodology is similar to that used for OECD countries, which is described in Beffy *et al.* (2006) but has been adapted to account for Brazil's data limitations.

Potential output is calculated using the following equation:

$$y_t^* = tfp_t^* + (1-\alpha)*k_t^* + \alpha(1-u_t^*)*lf_t^*$$

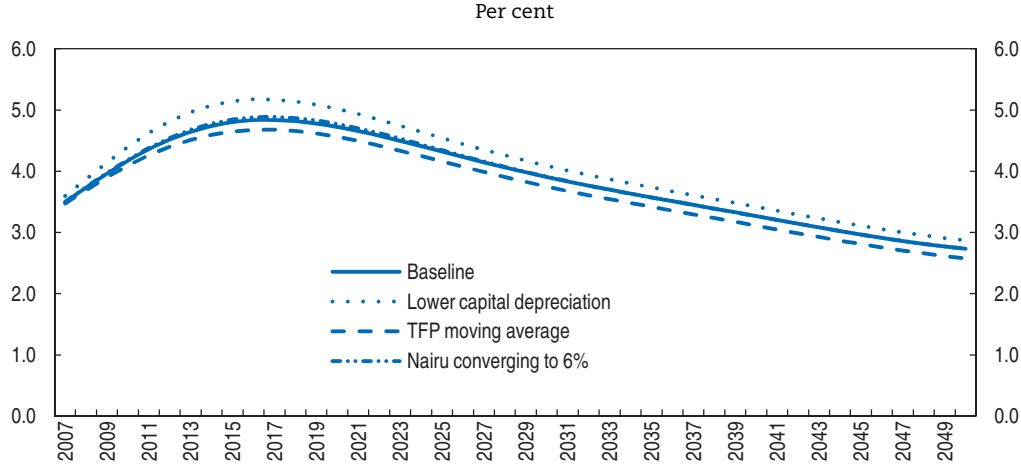
where all the variables are expressed in logarithms. y_t^* denotes potential output, k_t^* the optimal capital stock, u_t^* is the structural rate of unemployment, lf_t^* is the labour force and tfp_t^* total factor productivity (TFP). Structural unemployment, labour force, capital and tfp have been filtered using a double-sided Hodrick-Prescott filter.

Data for GDP, gross capital formation, labour force and the unemployment rate are taken from national accounts and labour force surveys. The capital stocks were constructed using the perpetual inventory method (for investment series starting in 1960 and using a fixed depreciation rate of 5%). Missing values in the unemployment rate series were interpolated linearly. TFP data have been computed as a residual from the following equation using data on real GDP, actual capital, unemployment and the labour force: $tfp_t = y_t - (1-\alpha)k_t - \alpha(1-u_t)*lf_t$. The share of labour in GDP, α, is set at 60% to fit the Brazilian data. This is consistent with Bonelli (2010) and OECD (2009). Potential output estimates are not significantly modified when alternative plausible values of this parameter are used.

As underlined in Cotis *et al.* (2005), production-function-based potential output estimates, as well as those derived from other approaches, should be interpreted with caution. They are in particular sensitive to the measurement errors in TFP. Moreover, factor quality is treated in the calculations as constant over time, whereas increases in the stock of human capital of the labour force are expected to affect the economy's overall efficiency.

Figure 4.2. **Effect of ageing on potential output**

Per cent



Source: OECD calculations.

StatLink http://dx.doi.org/10.1787/888932519662

at rates observed in 2005-10 and that the participation and structural unemployment rates remain constant at their 2010 levels. Reasonable alternative assumptions do not dramatically change this assessment. In the same vein, using population projections from

IBGE, the national statistical office, would lead to the same conclusions. These projections incorporate solely the mechanical effect of the change in age structure and assume unchanged age-specific behaviour. More importantly, they do not account for the effects on activity and on total factor productivity of the Growth Acceleration Programme (PAC), a large planned infrastructure programme. This omission could be serious, because there is evidence that variations in public infrastructure spending in Brazil have contributed to the evolution of productivity growth in the past (Mussolini and Teles, 2010). Assuming standard elasticities, the PAC programme is estimated to boost economic growth by 0.8-1.1 percentage points in the long term, assuming 30% of it is privately financed.

Effect of demographics on domestic saving

The effect of ageing on saving is uncertain. The life-cycle theory predicts that population ageing is likely to depress it. Nonetheless, it is unclear whether such a pattern will be observed for Brazil, where saving rates remain virtually unchanged after the age of around 40 (Jorgensen, 2011). Empirical evidence on the link between the old-age dependency ratio and private saving in Brazil is mixed. This is consistent with other analyses in Latin American countries, where the relationship is often found to be insignificant. This unexpected dynamics is traditionally explained by the desire to leave bequests or for the elderly to share their pension income with co-habiting children. In the case of Brazil, public pensions play a crucial role. When public pensions are excluded from income, re-computed saving rates by age display a hump-shaped curve, in line with the life-cycle theory. In the end, personal saving prospects will depend on the way the government will finance the increasing costs associated with social security and health.

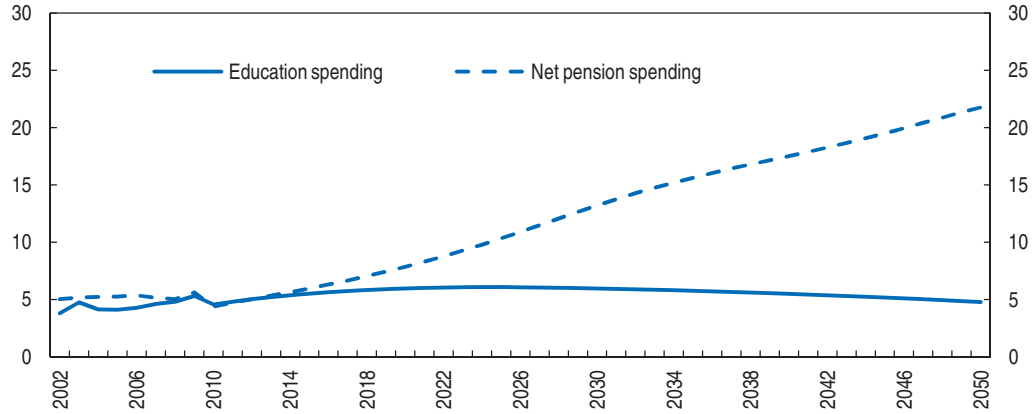
Developments in poverty are also likely to matter as there are differences in saving behaviour between poor and non-poor households in Brazil. Indeed, the poor tend to display negative saving after the age of 45 until 65, while saving remains positive for the non-poor at these ages. In addition, the poor save much less within each age category. In this respect, prospects for aggregate savings will depend on the effectiveness of social and labour-market policies to continue to lower the share of poor households in the economy (see below). Simulations undertaken in Jorgensen (2011) suggest that, if the declining trend in the poverty headcount observed since the beginning of the 2000s continues, the household saving rate excluding public pensions would increase to 7.5% by 2050 from an estimated 4.8% in 2010. If, however, the poverty headcount stays constant, the end-point saving rate would be around 0.5 percentage point lower.

Effects of ageing on public finances

Shifts in population age structure will lead to substantial fiscal pressures on publicly financed health care and pensions, offset only partly by a reduction in education spending. At the moment, public spending on education and health are well below the OECD average. Despite the 1999 and 2003 pension reforms, which are estimated to have more than halved pension costs, public pension benefits have remained at above 60% of the average wage in Brazil, while they are below 40% in many OECD and Latin American countries (World Bank, 2011).

Population ageing will cause significant shifts in the pattern of these three spending items (Figure 4.3). Assuming no policy changes, education spending as a percentage of potential output will decline steadily. Net spending on pensions (*i.e.* pension benefit minus contributions) is projected to increase to more than 20% of GDP by 2050, if spending per

Figure 4.3. **Effect of ageing on pensions and education spending**



Note: Net pension spending is the difference between pensions received by old-age workers and contributions paid by the working-age population.
Source: OECD calculations.

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head continues to rise at a rate observed in the last few years in inflation-adjusted terms. These increases stemmed from the successive gains in the real value of the minimum wage, on which the minimum pension is indexed. Ways to contain further increase in public pension spending are examined in Chapter 2.

Health care expenditure is expected to grow significantly, as the proportion of frail elderly in the population increases. In addition, a more intensive use of the formal healthcare sector and technology will put pressure on spending. Public spending on health could rise from 3.6% of GDP in 2010 to 5.1% by 2030, with ageing accounting for more than one third of the increase (IMF, 2010). This rise is of the same order of magnitude as what is expected for other Latin American countries but much stronger than what is foreseen for Asian emerging-market economies, where the public health system coverage is more limited. These projections account for differences in spending by age group as well as the expected changes in the age structure of the population. Given the paucity of data, the projections assume similar excess cost growth (*i.e.* the excess growth in real per capita health expenditure over the growth of real GDP per capita, after controlling for demographic changes) to what has been observed in the developed economies over the last three decades. This is a relatively cautious assumption for Brazil, where recent data point to higher estimates of excess cost growth.

A growing oil industry

This section examines the implications of the expanding oil sector on several macroeconomic issues, with a particular focus on exchange-rate developments.

Brazil is experiencing a resource boom

The production and export of oil has been growing at a steady pace since the beginning of the 2000s, and the long-standing national objective of achieving self-sufficiency in oil was first attained in 2006 (Table 4.2). A range of different energy policies, which in the late 1990s injected competition in the oil market and eliminated subsidies to imports and price controls, has facilitated these developments, even though the industry remains dominated by the state-owned company *Petrobras* (Guan, 2010; Caselli and

Table 4.2. **Selected data on oil in Brazil**

Thousands barrels per day

	2003			2010		
	Brazil	Central and South America	World	**Brazil**	Central and South America	World
Production of crude oil[2]	**1 496.1**	5 911.1	69 430.3	**2 054.7**	6 413.7	74 051.9
Total petroleum consumption	**2 055.7**	5 195.7	79 722.0	**2 599.0**	6 420.7	85 294.6
Imports of crude oil[2]	**351.2**	1 921.7	41 402.9	**375.0**[1]	1 876.2[1]	42 233.3[1]
Exports of crude oil[2]	**241.7**	2 643.2	39 964.1	**505.01**[1]	2 671.0[1]	41 298.6[1]
Crude oil proven reserves (billion barrels)	**8.3**	98.6	1 212.3	**12.8**	124.6	1 341.6[1]
Crude oil distillation capacity	**1 865.1**	6 633.9	81 995.2	**1 908.3** [1]	6 607.8[1]	85 900.4[1]

1. 2009.
2. Includes lease condensate.

Source: EIA, *International Energy Statistics*.

Michael, 2009). Looking forward, the economy is likely to rely even further on oil production, especially of offshore oil, for both domestic use and export. In 2007, *Petrobras* discovered massive oil reserves in the Tupi and subsequently other offshore fields, known under the name "pre-salt" because the oil is located very deep underwater under a thick layer of salt. These fields have been estimated to double Brazil's current reserves, placing the country within the top ten countries in terms of oil reserves (Lobão, 2009). Notwithstanding the technical difficulty of extracting oil from these fields, *Petrobras* plans to increase production to 3.6 million barrels per day by 2017 and to export approximately 1 million barrels per day.

Is Brazil suffering from Dutch disease?

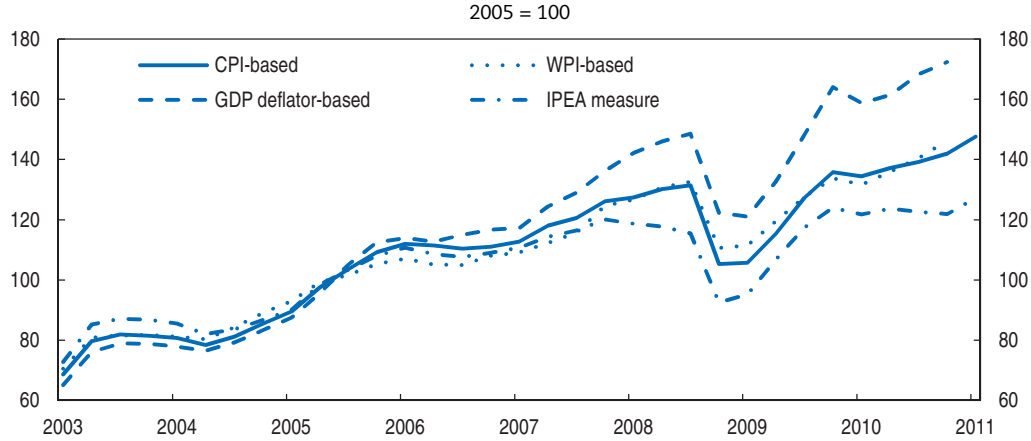
Dutch disease refers to the effects of discoveries or price increases of natural resources that result in real exchange-rate appreciation, positive spending or wealth effects and factor reallocation leading to de-industrialisation through reduced manufacturing output and net exports (see Magud and Sousa (2010) for a review of the literature on the effects of Dutch disease on economic growth).

Currency appreciation

The appreciation of the *real* started in 2003, but the extent of the appreciation varies widely depending on which exchange rate measure is used. The bilateral rate against the dollar rose by 74% from 2003 to 2010. During the same period, the effective rate, based on the relative importance of Brazil's main trading partners, appreciated by around 63%. Developments in real effective rates, which are those which ultimately matter for price competitiveness, depend on the deflator considered. A GDP deflator-based measure would point to a more marked appreciation of the *real* in the recent period than a CPI- or wholesale price-based measure (Figure 4.4).

There is some evidence that foreign capital inflows have contributed to push the currency up over the period, and have played a predominant role in explaining short-term developments (Box 4.2; Figure 4.5). In addition, structural factors such as growing oil production have increasingly contributed to the appreciation of the *real* over the long term. By contrast, the contribution of the productivity differential between Brazil and its trading partners has been decreasing. Interest-rate differentials are not found to influence exchange-rate developments, probably because their effects are already captured by

Figure 4.4. **Real effective exchange rates**



Note: See Box 4.3 for more information on the calculation of the different real exchange rate measures.
Source: OECD and IPEA.

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Box 4.2. **Explaining the appreciation of the *real***

This box casts some light on the main factors underlying the *real* appreciation and the extent to which developments in the oil sector have explained these developments.

Approach

The analysis relies on a Behavioural Equilibrium Exchange Rate (BEER) framework and seeks to explain the real effective exchange rate as a function of the productivity differential between Brazil and its trading partners, as well as capital flows and developments in the oil sector:

$$q_t = c_0 + c_1 * rprod_t + c_2 * oil_t + c_3 * nfa_t \quad (1)$$

with q_t the real effective exchange rate (in logarithms), $rprod_t$ a proxy for relative productivity, oil_t the production of oil, which is used as a proxy of development in the oil sector and nfa_t net foreign assets as a per cent of GDP.

Given the limited number of observations, the estimation relies on a two-stage Engle and Yoo (1991) procedure, which adapts cointegration tests to small samples. In a first stage we estimate equation (1). The stationarity of the residual is then tested and injected in the following error correction model (equation 2).

$$\Delta q_t = c_{10} * \Delta q_{t-1} + c_{11} * \Delta rprod_t + c_{12} * \Delta oil_t + c_{13} * \Delta nfa_t + c_{14} * ecm_{t-1} \quad (2)$$

where ecm_{t-1} is the residual from equation (1).

Data

The estimations are carried out using different measures of the real effective exchange rate, namely CPI-based, GDP deflator-based and wholesale price-based measures. These exchange rates have been re-computed using time-varying weights for 30 trading partners of Brazil, representing about 80% of its total trade. The indicator published by the IPEA has also been tested to check the robustness of the results. The IPEA measure is based on wholesale prices with fixed 2001 weights for 16 trading partners.

Following Paiva (2006), the relative productivity measure is computed as the difference between productivity in Brazil and in its main trading partners (using the same weights as for the real effective exchange rate). Given the difficulty to get reliable relative productivity data, the latter is captured by relative prices in the tradable and non tradable sectors, respectively captured by CPI and the GDP deflator. This is clearly a strong assumption, as developments in relative prices may differ from those of relative productivity.

Box 4.2. **Explaining the appreciation of the *real*** *(cont.)*

Data for net foreign assets are taken from the IMF's IFS database and expressed as a percentage of GDP. The production of oil uses ANP data. As a robustness check oil exports, using FUNCEX data, have also been tried. Both series are available on a monthly basis and have been seasonally adjusted and converted into quarterly terms. Both variables display an upward trend since at least the beginning of the 2000s. Other indicators such as the terms of trade using either national accounts or balance of payments definitions have also been tested.

Results

Granger tests have been run to investigate a possible causality between the real exchange rate and the two proxies for oil developments, but the results of these tests are inconclusive.

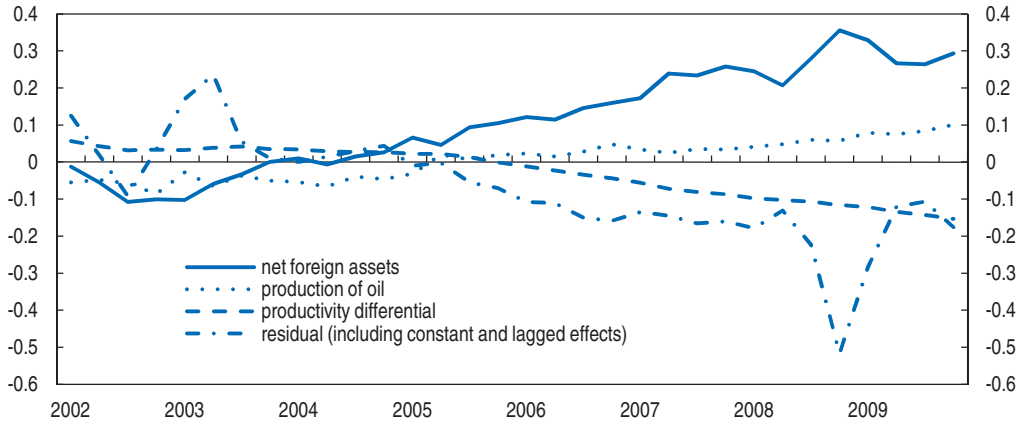
By contrast, estimations of equations (1) and (2) point to a significant effect of oil developments in explaining exchange-rate movements, on top of traditional factors. More specifically:

- In most equations, net foreign assets and the productivity differential are found to be significant determinants of real effective exchange rate in the long run. The effect of net foreign assets is also found to be the most prominent factor influencing exchange-rate developments in the short term.
- The production of oil appears to be a significant determinant of the real effective exchange rate in the long run. This also holds for the terms of trade and the export of oil.
- The equations appear to be well specified. In general, the residual derived from the long-term relationship is found to be stationary and appears to be significant in equation (2). The dynamics vary widely from one equation to the other, as well as the overall fit of the equations. These making use of the GDP-deflator version of the real effective exchange rate appear to be less well determined.

The state of fiscal policy is likely to affect exchange rate developments through market expectations. To test this assumption fiscal variables are introduced in equations (1) and (2). Several measures were tested: the primary fiscal balance and the headline balance (as a per cent of GDP) as well as the debt-to-GDP ratio. In most cases, these variables do not explain real effective exchange-rate developments. As a test of robustness, real GDP growth was included in the specification, but this did not modify the results. Economic growth was not always significant, but when it was, the oil proxy continued to explain developments in the real exchange rate. A similar exercise was undertaken for the terms of trade. The latter were found significant in the equation including the production of oil but not the one with export of oil. In both cases, the oil proxy remained significant. Finally, to test whether the significant effect of the production of oil was not capturing the more general influence of commodities in the economy, several measures of commodity prices (using IPEA data) were also tested. These variables were found to be significant in some specifications, but oil production remained significant in explaining exchange-rate developments in the long term.

Figure 4.5. **Contributions to the CPI-based real effective exchange rate quarter-on-quarter changes**

Percentage point



Source: OECD calculations.

StatLink http://dx.doi.org/10.1787/888932519719

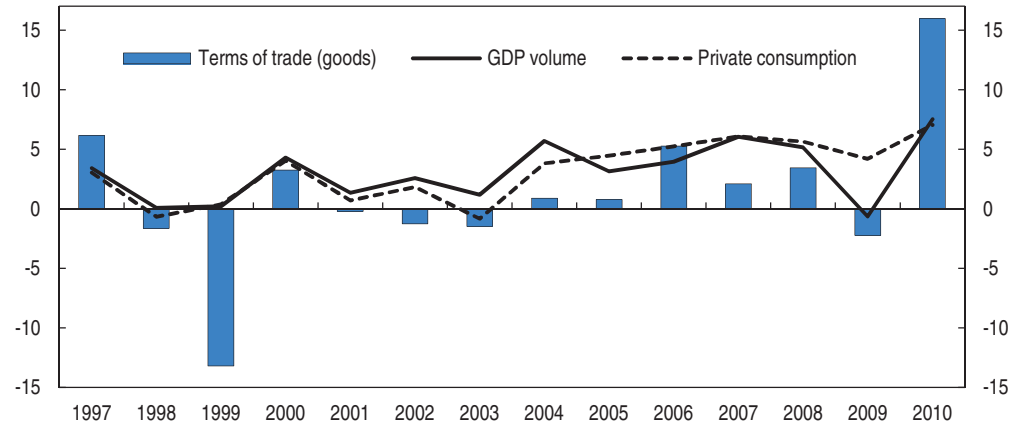
capital inflows, which are included in the specification. Estimations using alternative measures of the exchange rate would lead to qualitatively similar conclusions.

Spending effects

The resource boom has generated significant wealth effects through terms-of-trade gains, which have helped to support consumption and economic growth (Figure 4.6). From 2006 to 2008, after Brazil became self-sufficient in oil, the rise in oil prices added to the currency movement and boosted the terms of trade, which reached a temporary plateau in 2009 when the *real* depreciated in the aftermath of the financial crisis. It rebounded strongly in 2010.

Figure 4.6. **Terms of trade, private consumption and GDP growth**

Per cent



Source: IBGE and Funcex.

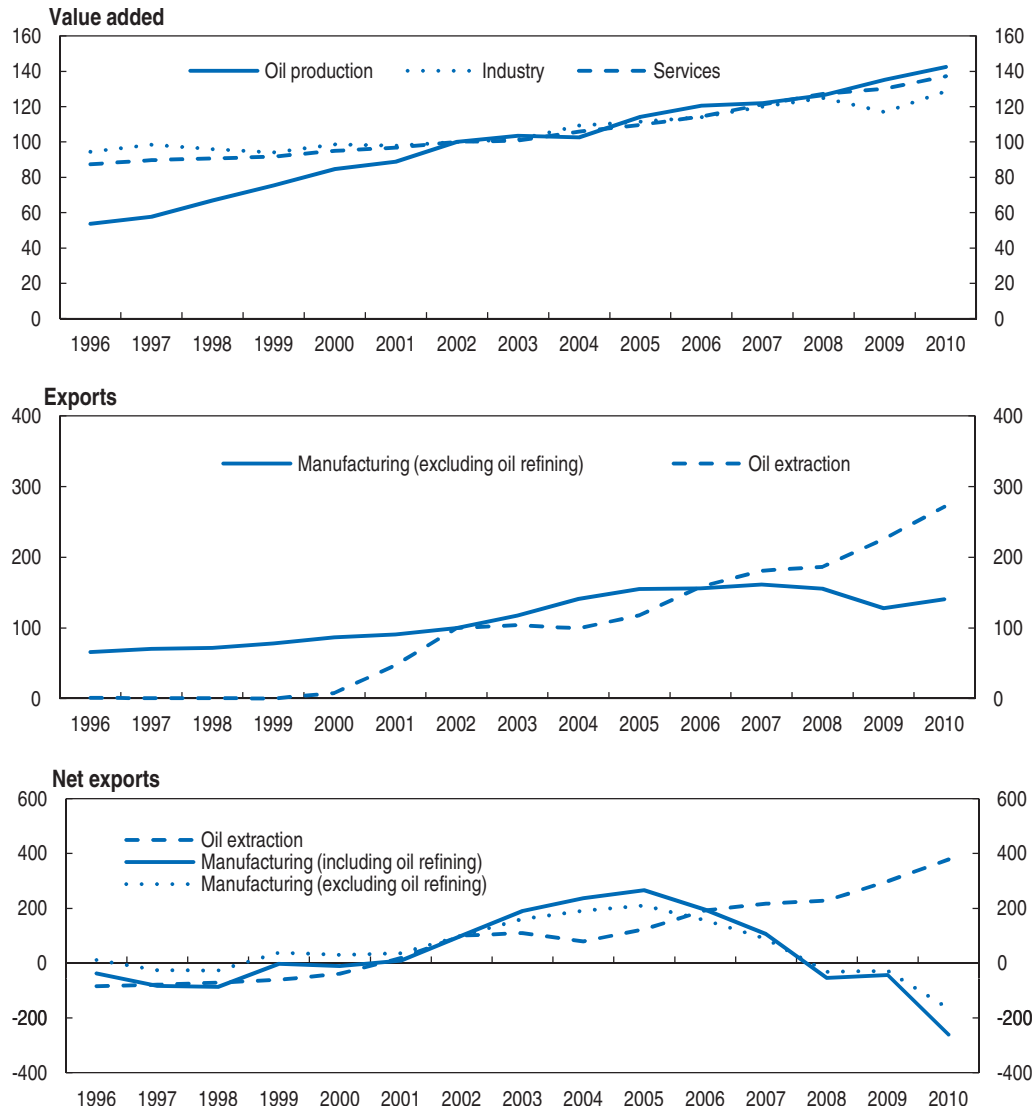
StatLink http://dx.doi.org/10.1787/888932519738

Factor reallocation

Signs of de-industrialisation are mixed. Manufacturing production has declined, but only in the aftermath of the financial crisis (Figure 4.7). At the local level, there is no evidence of a reallocation of production factors away from manufacturing stemming from the existence of offshore operations, though onshore operations have triggered some reallocation (Caselli and Michaels, 2009). Employment growth in the manufacturing sector has underperformed that of the service sector, but other forces may also be at play as shifts to tertiary activities are usually a natural outcome of development. There is more evidence of Dutch disease effects on the trade side, as net exports of manufactures started to decline in 2005 while net exports of crude oil continued to grow at a rate of more than 30% on average per year from 2005 to 2010. Part of these developments may nonetheless be

Figure 4.7. **Value added and exports by product**

2002 = 100



Source: ANP, IBGE and FUNCEX.

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explained by the increasing trade linkages between China and Brazil, with Brazil exporting mostly commodity products and importing manufactures from China.

More generally, it remains to be seen whether the resource boom that Brazil is experiencing will have an adverse impact on aggregate growth. While it could lead to further contraction of the manufacturing sector, this may not necessarily fully offset the positive wealth effect and income gains associated with term-of-trade increases. Extra fiscal resources will also allow the government to finance higher expenses without raising tax rates nor worsening the public deficit. In the end, economic policy should aim at taking advantage of the positive effects while mitigating the undesired consequence of the resource boom. Structural reforms aiming at enhancing labour- and product-market flexibility would facilitate factor reallocation.

Achieving inclusive and environmental-friendly growth

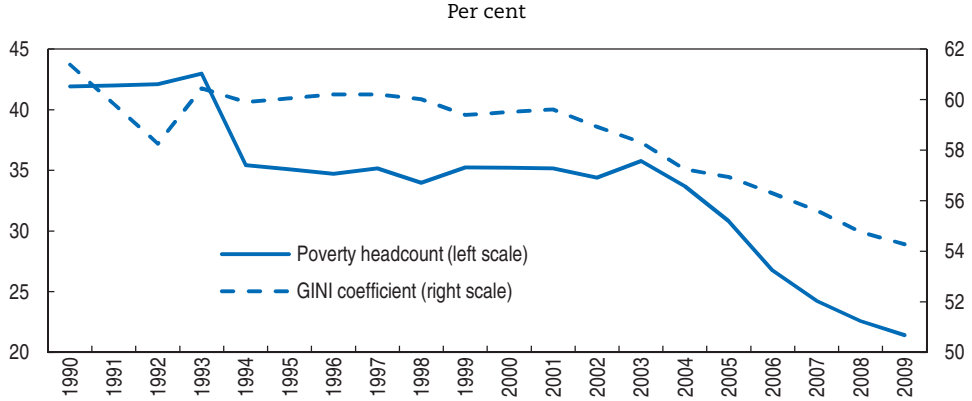
For strong economic growth to be sustainable, it is essential to ensure that prosperity gains are widely shared among the population and that economic development is pursued with environmental costs and benefits in mind. This is consistent with the Brazilian government's priorities of fighting against extreme poverty and improving environmental outcomes. This section examines policies that will help to reach these goals. It first focuses on the need to further reduce poverty and social inequality and to upgrade student skills, following up on the tremendous achievements made over the last decade in these areas. Finally, the section reviews climate-change policies, underlining the success in dramatically reducing deforestation in recent years and the need to maintain such efforts, while using the Growth Acceleration Programme (PAC) to promote green infrastructure projects.

Further reducing poverty and inequality

Income redistribution is one of the pillars of Brazil's current growth model, and the country has made tremendous progress in reducing poverty and inequality over recent decades (Figure 4.8). While the bottom decile of Brazilians enjoyed very fast annual income growth rates comparable with China's per capita GDP growth rates, the top decile had a slower income growth rate closer to that of Germany. This faster income growth of the poor

Figure 4.8. **Poverty and income distribution**

Per cent



Note: Poverty headcount refers to the number of persons below the poverty line, in per cent of total population.
Source: IPEA (IPEADATA).

StatLink http://dx.doi.org/10.1787/888932519776

has resulted in declines in inequality and is predicted to allow Brazil to reach the Millennium Development Goal (MDG) of reducing extreme poverty by 2015, almost ten years ahead of schedule. Absolute poverty has fallen by 67.3% between the beginning of the stabilisation in 1994 and 2010 (*Fundação Getulio Vargas*, 2011). Despite this progress, Brazil remains an unequal society with a significant incidence of poverty. There remain 16.3 million Brazilians (8.5% of the population) who live in extreme poverty, defined as having incomes below the federal poverty line of BRL 70 per month, which is approximately USD 1.5 per day.

While the solid growth rates of the economy have supported poverty reduction, Brazil's achievements cannot be explained by growth alone, but also reflect an effective redistribution of incomes. The Gini index, a commonly used measure of inequality, has declined at an average rate of 1.2% a year, and simulations suggest that even without any growth in GDP per capita, the MDG would have been met in time (Barros *et al.*, 2010). Put differently, the economy would have had to be growing at an extra 4 percentage points a year to achieve the same reduction in poverty without redistribution. Changes in both labour and non-labour incomes received by households can explain the redistribution of income in about equal proportions.

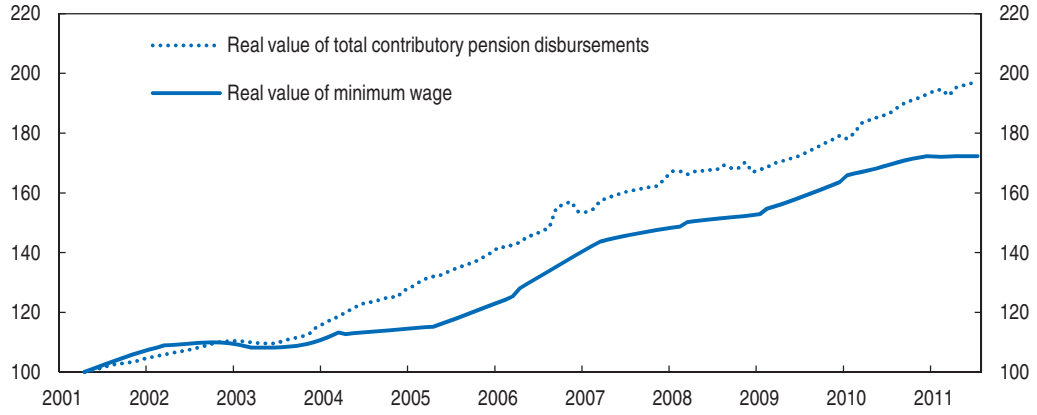
Labour incomes have become more equally distributed because education premiums – which have traditionally been very high in Brazil and are still higher than in any OECD country – came down markedly as the supply of skilled labour increased, reducing the gap between the labour incomes of low income earners and other households. At the same time, better access to education has allowed more households to earn higher wages. Falling wage premiums can explain a larger share of the observed fall in inequality than higher educational attainments, suggesting significant positive externalities of education for the reduction of inequality (Barros *et al.*, 2010). Regional disparities in labour incomes have also come down for workers of comparable skills, although more so between small and large cities within states than across states. This may be the result of economic activities that demand skilled labour expanding into smaller towns while still staying close to the economic core regions of the country.

Changes in the distribution of non-labour income have also contributed to declines in inequality and poverty. This was largely the result of public transfers that accounted for around 82% of non-labour incomes in 2009. Social policies in Brazil have been based on two main kinds of public transfers: contributory and non-contributory pensions, on the one hand, and the conditional cash transfer programme *Bolsa Familia* which provides transfers to low-income households conditional on school attendance and health check-ups on the other hand. Contributory social security payments amount to around 9% of GDP, while non-contributory pensions for the poor elderly and the disabled (based on the constitutional right of the elderly and disabled to an independent living) and conditional cash transfers from *Bolsa Familia* each account for around 0.4% of GDP. An estimated 30% of Brazilian households receive contributory social security benefits, whereas *Bolsa Familia* benefits are paid to about 17% of Brazilian households and non-contributory pensions reach a much smaller number of recipients. Average benefit levels are much higher for recipients of contributory and non-contributory pensions, who receive a monthly payment of at least one minimum wage (currently BRL 545), while the average benefits paid by *Bolsa Familia* amount to BRL 115 per household per month (Vegas Soares, 2011).

Over the last decade, public transfers have become an increasingly important component of household income, contributing to the decline in inequality. In the case of contributory pensions, this was almost exclusively the result of a rise in benefit levels due to increases in the minimum wage, which tracks the minimum pension benefit and whose real value has increased by over 70% over the last decade (Figure 4.9). In contrast, a widening coverage of *Bolsa Familia* and to some degree also of non-contributory pensions explains the increasing share of these transfer payments in household income. A specific feature of Brazil's current transfer system is that it redistributes a larger share of national income to the elderly than any other Latin American country (Neri, 2010).

Figure 4.9. **Minimum wage and pension payments**

Deflated by consumer price index (INPC), 12 months moving average, April 2001 = 100



Source: OECD calculations based on data from Central Bank of Brazil.

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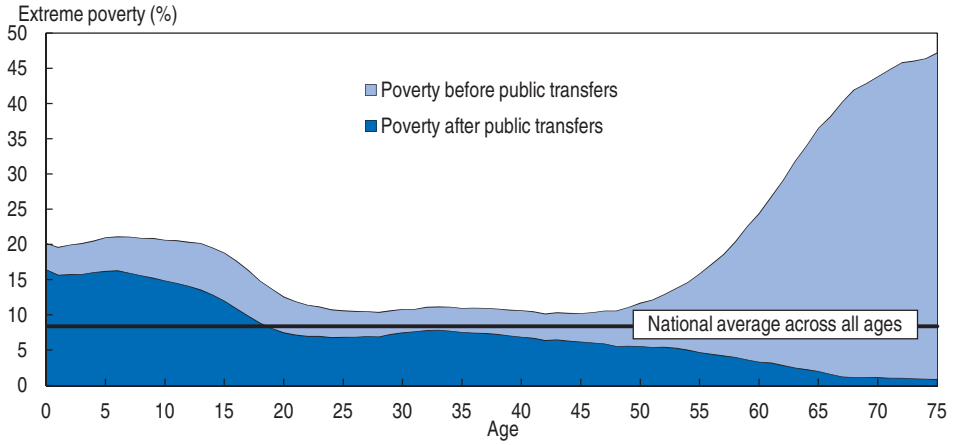
When evaluating the impact of the public transfer system, it is essential to distinguish between its respective effects on poverty and on inequality. The conditional cash transfer programme *Bolsa Familia* has proven a powerful tool to reduce poverty, while the rise in the real value of pension payments has been the major cause of the fall in inequality because their volume dwarfs all other transfers.

Analysing the effects on inequality, Barros *et al.* (2010) decompose the fall of the Gini index and find that between 2001 and 2007, pensions accounted for a three times larger share of the decline in inequality than *Bolsa Familia*. Pension benefits have reduced inequality because the pension beneficiaries tend to have below-average incomes. The rise in pension benefits stems from the rapid increases in the minimum wage, whose adjustment is linked to the sum of the real GDP growth (experienced two years before) and CPI inflation. However, minimum wage increases do not affect the bottom 5% of the income distribution who are neither in formal employment nor in receipt of a pension, and hardly any of Brazil's pensioners are poor given that they receive at least the minimum wage. In addition, a number of measures in the pension system do not appear to be cost-effective in fighting against poverty and would best be scaled back. These include granting a survivor pension to beneficiaries who already receive their own pension or providing additional free services such as free public transport to pension recipients through the Elderly Statute.

As regards poverty, the current transfer system reduces the incidence of poverty to levels well below the overall average for the elderly, but it leaves poverty rates among youths visibly above average (Figure 4.10). By contrast, *Bolsa Familia* has proven a very effective and well-targeted tool for fighting child poverty and now reaches almost 13 million families. Benefits depend on family income and the number of children. Families with per capita income below the extreme poverty line of BRL 70 per month receive a basic benefit of BRL 70, plus BRL 32 for each child up to the age of 15 and BRL 38 for each adolescent aged 16 or 17, with a maximum of three children and two adolescents taken into account. Families with per-capita incomes between BRL 70 and BRL 140 receive only the benefits for children and adolescents, but not the basic allowance. The maximum monthly benefit that a family below the extreme poverty line with three children and two teenagers can receive from *Bolsa Familia* is therefore BRL 242 (Veras Soares, 2011). Each family's eligibility is re-assessed every two years through personal visits of social workers. These regular assessments have resulted in the establishment of an almost exhaustive register of poor families in the country, called *cadastro único*. Additional benefits of the programme include the increased schooling rates and the number of vaccinations and health check-ups that have been achieved through the conditions attached to transfers. While cash transfers are effective tools to alleviate poverty in the short term, the eligibility requirement that children attend school fosters literacy and numeracy skills acquisition and human capital investment more generally, with clear long-term benefits. Increasing *Bolsa Familia*'s resources would be useful to reach the government's objective of eradicating poverty in Brazil.

Figure 4.10. **Poverty impact of public transfers by age group**

2009



Note: Extreme poverty is defined as households having incomes below the federal poverty line of BRL 70 per month.
Source: Barros *et al.* (2010) based on *Pesquisa Nacional por Amostra de Domicílios data*.

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The government has recently launched a new social policy programme called *Brasil sem Miseria*, which builds on and extends *Bolsa Familia*, and aims to eradicate extreme poverty in Brazil by 2014. One focus of the programme is to enhance the sustainability and efficiency of *Bolsa Familia*'s successes by providing poor families with more than just income transfers. In particular, the extensive information about the living conditions of poor families that has been acquired through *Bolsa Familia* and collected in the *cadastro*

único will be used to make other social services available to poor families, according to their specific needs. This may include services like care for children and the elderly, training, assistance in finding employment or the provision of loans. Offering such services through the local contact points that administer *Bolsa Familia* will help to overcome informational barriers of poor families with respect to the social policies already on offer, extend these policies into regions where they are currently underdeveloped and improve their targeting. This new programme is a welcome and promising measure, and should be given priority.

Improving access and quality of education

In the longer term, widespread education is paramount for securing higher incomes for the poor, as well as an important investment into future competitiveness and growth. Brazil has made impressive progress in this area over the past decade. While only 30% of the labour force had completed secondary school in 1993, this share stands at 60% today, and this development is part of the reason for the remarkable decreases in inequality mentioned above. Student performance has also increased, and the country has moved from being one of the lowest performers in the PISA assessment to a model case for what kind of improvements can be achieved. Comparing 2000 test results with those of 2009, Brazil's students have gained the equivalent of a full academic year of math skills, and the increase in the overall score is the third largest advancement recorded in the PISA database. A large part of these dynamics has occurred among the lower income groups: today, a Brazilian six-year-old in the bottom quintile of the income distribution will benefit from twice as many years of education as his/her parents. Despite these achievements, the performance of Brazilian students is still significantly below OECD, East Asian and Eastern European countries, and much work remains to be done to close this gap.

Major elements of the success in recent years included mechanisms to equalise and top up per-student school funding across regions, states and municipalities via the FUNDEB programme. With an increase from 11.2% to 17.4%, Brazil witnessed the greatest relative expansion in the share of public expenditure on education between 2000 and 2008 of all countries featured in the OECD's Education at a Glance report (OECD, 2011). But improving funding has not been the only factor. Brazil has created incentives for good performance at the local level, coupled with a uniform PISA-referenced benchmarking mechanism across educational institutions that has allowed measuring student attainments and school performance. Nationwide aptitude tests for Portuguese language and maths skills (SAEB) evaluate students' learning achievements after the 4th, 8th and 11th grades, and are used to construct indicators of school performance (IDEB) that allow comparisons across 175 000 primary and secondary schools in the country. As with any indicator, these aptitude tests can measure only a subset of student learning objectives, and narrowing the curriculum to what is asked in the standardised tests should of course be avoided. The ability to monitor progress at the school level in a comparable manner is a major achievement that has been very helpful in improving the performance of the education system as a whole, and will continue to be a powerful tool to evaluate the success of future reforms. At the same time, the conditional cash transfer programme (first *Bolsa Escola*, later integrated into *Bolsa Familia*) created both the incentives and the means for poor parents to send their children to school. All these measures have delivered important improvements in Brazil's education system and should be continued.

While the responsibility for primary and secondary education lies with state and municipal authorities, the federal government has played a successful role in co-ordinating

and improving education policies at lower-level jurisdictions through measures such as setting uniform standards for teachers and the funding of teacher training and learning materials. The federal government has also created incentives for medium-term planning at the school level through the *Fundescola* programme.

The main challenges going forward include improving the quality of instruction, lengthening the school day and reducing drop-out rates in secondary education. While access to primary and secondary education was the most urgent issue in the past, Brazilian children nowadays complete between 9 and 11 years of schooling, regardless of their family background.

The quality of instruction and teachers has struggled to follow the rapidly growing number of students, which has implied large hiring needs for teachers over a relatively short time. Accordingly, a non-negligible share of teachers has not completed university training. In addition, as in most Latin American countries, teaching is not regarded as a high-status profession, and teachers are frequently hired from the lower third of secondary school graduates, as opposed to Finland, Korea and Singapore where the top graduates often become teachers (World Bank, 2010a). Attracting more qualified individuals into the teaching profession may imply improving school working conditions, improving pay and creating stronger performance incentives. Currently, pay gradients are tightly defined by seniority (World Bank, 2007). Some Brazilian states and municipalities have acknowledged this problem and started paying a teacher bonus related to school performance. These programmes appear to be successful and it may be worth considering deploying them on a broader scale. Appointments of school principals have in some cases served local political objectives rather than being organised through an open, merit-based competition. Such practices hamper the progress of reform and should be avoided. Moreover, principals should have full discretion over teacher hiring decisions.

Improving the quality of instruction will also entail investing more in appropriate educational school infrastructure, including libraries, science labs and computer facilities, as has become standard in most OECD countries. A lack of physical infrastructure implies that many schools run several shifts during the day, with the result that Brazilian secondary students receive an average of only 4 hours of instruction per day, while schools in OECD countries deliver around 7 hours (World Bank, 2010b). Around 42% of secondary students are enrolled in night shifts. The government has launched efforts to increase spending on education further and set targets on education expenditures and quality improvements in the National Plan for Education (*Plano Nacional de Educação*), with the aim of increasing public investment in education from the current 5% to 7% of GDP within a decade.

Tackling comparatively high drop-out rates in secondary education is a challenge for future education reforms. In many cases, social issues including teen pregnancy, gang and drug involvement, family instability or developmental deficits are behind the failure of around 40% of secondary schools to graduate at least 60% of their students, resulting in high school enrolment of only about 70% of a given cohort (World Bank, 2010a).

Students with these kinds of problems may not be well served by a one-size-fits-all education system with a largely academic orientation. Dropping out should be seen as a cumulative process of student disengagement or withdrawal that occurs over time. Measures to reduce drop-outs should begin at a young age with the improvement of the quality of Brazilian early childhood education services and primary schools as well as the

reduction of grade repetition, one of the main predictors of drop-outs. Brazil still has one of the highest levels of grade repetition in the region (24.5% in primary first grade according to UNESCO, 2011). Students with a high drop-out risk should receive adequate support (such as tutoring) as early as possible in their schooling. Teachers and other education staff should be trained to adequately support these students. Secondary students with a high drop-out risk should be offered more attractive alternative options to the standard curriculum, including a stronger vocational content, technical education and labour training. The *Pronatec* initiative, launched in April 2011, facilitates the access of the unemployed and beneficiaries of the *Bolsa Familia* to technical schools and is a step in the right direction. However, some of these measures are only available to graduates from the regular secondary curriculum, a condition that may place them out of reach for groups with a strong propensity to quit school. To reach students from less favourable backgrounds and reduce drop-out rates, vocational degrees should be offered, with financial support and validity for the labour market being independent of successful graduation from a regular academically oriented curriculum. After all, it is preferable to equip such students with a less challenging education that will improve their labour market performance even if it will not lead all the way into higher education than to lose them entirely.

Reducing GHG emissions

Brazil is expected to suffer significantly from the adverse effects of climate change, leading in particular to less available water for hydropower-based electricity and lower crop yields in the Central-West and Northeast regions. Deforestation – much of it in the form of illegal logging – is responsible for almost half of Brazil's greenhouse gas emissions (Table 4.3). In some regions, activities associated with deforestation represent a sizeable source of employment and resources for the local economy. Agriculture is the second largest GHG-emitting sector due to cattle rearing and some farming practises in managing soil nutrients and burning waste. Contrary to most other countries, emission levels from the power and the transportation sector are relatively low, thanks to the preponderance of hydroelectric plants for power generation and the high penetration of sugar-based ethanol as an automotive fuel. In addition, domestic crude oil production appears to be less carbon intensive in Brazil than in many industrial countries. This stems from the type of crude oil produced, the technology used to extract and refine it and the significant environmental measures adopted by the industry.

Table 4.3. **GHG emissions by sectors**

Sector	2008		Reference scenario 2030		Low-carbon scenario 2030	
	$MtCO_2$ eq	Per cent	$MtCO_2$ eq	Per cent	$MtCO_2$ eq	Per cent
Energy	232	18	458	27	297	29
Transport	149	12	245	14	174	17
Waste	62	5	99	6	18	2
Livestock	237	18	272	16	249	24
Agriculture	72	6	111	6	89	9
Forestry	536	42	533	31	196	19
Total	1 288	100	1 718	100	1 023	100

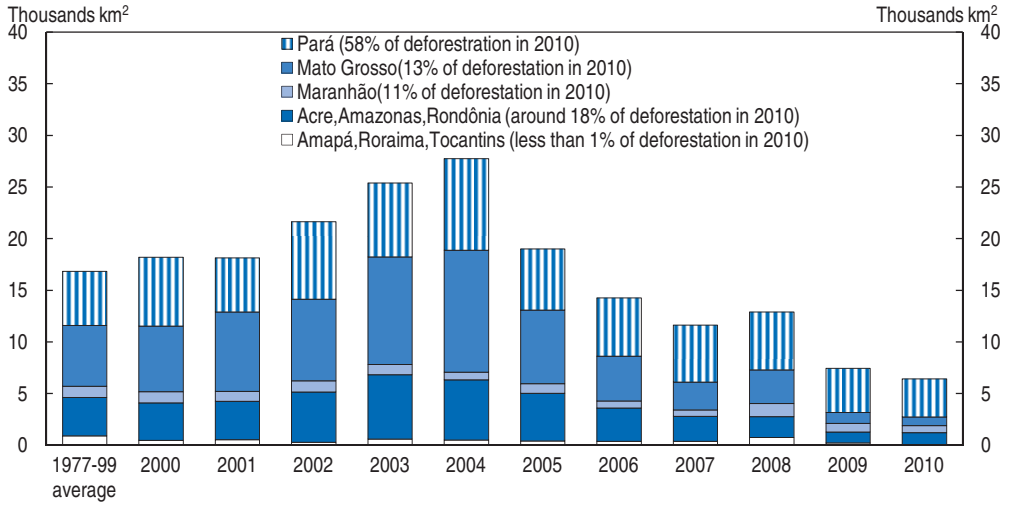
Source: World Bank (2010b).

The 2008 National Climate Change Plan aims to gradually reduce deforestation by 40% from 2008 to 2017. Projections to 2030 by the World Bank suggest that deforestation will level off. Excluding forestry, emissions are expected to rise in line with sustained economic growth. Power generation is likely to rely more extensively on fossil fuel than at present, leading to increased emissions from the energy sector. The exploitation of the pre-salt fields is not expected to increase emissions markedly as a large share of this production is destined for exports.

Against this background, at end-2009 the government legislated the *National Climate Change Policy* shortly after the United Nations Copenhagen Conference and set a national target of emission reductions between 36.1% and 38.9% by 2020 compared to a business–as–usual scenario. The law provides more details on how Brazil will finance its climate change policies and estimates the necessary emissions reductions per sector. It also requires mitigation actions to be quantifiable and verifiable.

The government has also introduced several initiatives to curtail deforestation, including the Action Plan to Prevent and Control Deforestation in the Amazon. Efforts have also been directed to create conservation areas, introduce new regulations that limit credit for properties that have environmental liabilities, establish new credit facilities for reforestation and create State programmes to fight deforestation and discourage the use of illegal timber. An Amazon Fund has been set up to support systemic initiatives to reduce deforestation and promote sustainable developments in the region. Overall, deforestation rates have declined markedly over the last decade, due to better enforcement and control over illegal logging (Figure 4.11). However, progress has been uneven across regions, and deforestation rates remain high in the region of Pára. In addition, the latest monthly data suggest that deforestation rates have risen sharply in early 2011, notably in the region of Mato Grosso.

Figure 4.11. **Deforestation rates in the Amazon**



Source: National Institute for Space Research.

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Thanks to significant progress in reducing the pace of deforestation, the country is on track to achieve its emissions targets four years before the 2020 deadline. The authorities should persevere in their efforts. *First*, better enforcement of existing law could be achieved

by increasing human resources to monitor and control compliance in forestry in regions where deforestation rates remain high. *Second*, further developing job opportunities and social protection in regions whose economies depend on deforestation could lower the attractiveness of illegal logging. *Third*, the authorities should resist the proposed changes to the Forest Code that would lower the proportion of a property in the Amazon (currently at 80%) and of land in certain areas (currently between 20 to 35%) that must remain forested. Such changes could accelerate deforestation and reverse recent trends. *Finally*, given the large areas of land that have been degraded in the past, the potential for afforestation and reforestation is sizeable. According to some estimates, land available for these activities in Latin American countries is close to 3.4 million km^2, most of it in Brazil (de la Torre *et al*., 2009). The authorities should encourage activities in this direction.

Climate-change policies are also closely related to infrastructure developments (Box 4.3). Well-planned infrastructure developments can reduce water and air pollution. In turn, damage to infrastructure can be limited if climatic changes are accounted for in the initial design, location and material selection (Fay *et al*., 2010). The Growth Acceleration Programme (PAC) offers the Brazilian authorities an opportunity to introduce greener infrastructure and to improve its climate resilience. At the moment, the programme includes only some limited green investments. Measures to promote renewable energy and foster energy efficiency account for less than BRL 39.4 billion out of the 462 billion in total allocated to energy measures. To some extent this reflects the very high uncertainties surrounding this type of project which make them less attractive to investors. Given the

Box 4.3. **The greening of infrastructure**

Tackling climate change requires modification in the planning and design of infrastructure. The use of infrastructure in services and transport is expected to contribute to 39% of Brazil's greenhouse gas emissions over the period 2010-30, and will also contribute indirectly through industry and commercial buildings. At the same time, infrastructure services are also very vulnerable to changing climatic conditions.

Climate change introduces deep uncertainties that complicate investment decisions. First, the extent of likely change in climate conditions is highly uncertain, as are the timing and location of specific impacts. At the moment, both the level and the period when carbon will be priced are still unknown. Second, there are uncertainties regarding the technologies that will be available to deal with climate change and higher carbon prices. These uncertainties are magnified because infrastructure cannot adjust rapidly.

Estimates of investments in developing countries required to adapt infrastructure to a changing climate are relatively modest compared to the additional annual investment that will be needed to close the development gap. Parry *et al*. (2009) estimated that the infrastructure deficit (including housing) amount to USD 37 billion in the Latin America and the Caribbean countries, while the average infrastructure-related adaptation cost would range between USD 2 to 7 billion per year by 2050. Estimates from the World Bank (2010) are in the lower part of this band. Contrary to adaptation costs, mitigation costs would be much higher and associated with large upfront costs in developing countries, with more than half of it concerning infrastructure. At the same time, greener investments also carry co-benefits such as a reduction in road congestion and local pollution. Better cost-benefit analyses are needed to completely assess the consequences of investment decisions and account for both high uncertainties and co-benefits.

potential high co-benefits of green investments, the authorities should ensure that investment decisions appropriately account for environment-related externalities in project selection within PAC. This could be done, for example, by taking full account of environmental impacts in cost-benefit analysis.

A summary of policy considerations is presented in Box 4.4.

Box 4.4. **Summary of recommendations: Social and education policies and climate change**

Social and education policies

- Expand the conditional cash transfer programme *Bolsa Familia*, and its follow-up programme *Brasil sem Miseria*.
- Improve the quality of instruction and teachers and increase opportunities for technical education and labour training not contingent on successful graduation from the regular academically oriented curriculum to students with high drop-out risk.

Climate-change policies

- Increase human resources for forest monitory and regulatory enforcement.
- Develop job opportunities and social protection in regions whose economies depend on deforestation resources.
- Resist proposed changes to the Forest Code that lower the percentage of a land that should remain forested.
- Ensure that investment decisions appropriately account for environment-related externalities in project selection within the PAC infrastructure programme.

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