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Refining Macroeconomic  
Policies to Sustain Growth  
in Brazil

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**REFINING MACROECONOMIC POLICIES TO SUSTAIN GROWTH IN BRAZIL**

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**By Annabelle Mourougane**

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## ABSTRACT/RESUME

### **Refining macroeconomic policies to sustain growth in Brazil**

This paper identifies refinements to the macroeconomic framework that will help Brazil to achieve strong performance in a new environment in which population will age at a rapid pace, heavy reliance on oil resources will increase public 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. This Working Paper relates to the 2011 OECD Economic Review of Brazil 2011 ([www.oecd.org/eco/surveys/Brazil](http://www.oecd.org/eco/surveys/Brazil)).

*JEL classification codes:* E5; E6; F4

*Keywords:* Brazil; monetary policy; fiscal policy.

### **Ajuster les politiques macroéconomiques pour soutenir la croissance**

Ce papier identifie les changements du cadre macroéconomique qui aideront le Brésil à réaliser des performances robuste dans un nouvel environnement dans lequel la population va vieillir rapidement, une forte dépendance vis-à-vis des revenus pétroliers vont accroître la volatilité des revenus publics et les incertitudes sur l'environnement international seront plus fortes, peut-être de manière durable. Plus précisément, le pays doit poursuivre l'assainissement de ses finances publiques et supprimer les facteurs de rigidité qui caractérisent la procédure budgétaire. Sur le moyen terme, l'adoption d'une cible de solde budgétaire global garantirait la viabilité à long terme des comptes publics (sécurité sociale comprise), tandis qu'un plafonnement des dépenses faciliterait leur maîtrise. La mise en œuvre des propositions de simplification de la fiscalité actuellement à l'étude améliorerait l'environnement des entreprises, et le gouvernement devrait poursuivre ses efforts afin d'emporter l'adhésion politique des États fédérés à ces propositions. Il est urgent d'adapter les mécanismes actuels de transfert afin d'assurer l'équité régionale et intergénérationnelle en matière de partage des recettes pétrolières. La mise en place d'un fonds social, visant à économiser une partie de la manne pétrolière et dont le retour sur investissement servira à financer les dépenses sociales, pourrait contribuer à réaliser ces objectifs d'équité, pour autant que ce mécanisme soit conçu de façon satisfaisante.

L'envolée actuelle des entrées de capitaux complique la tâche aux autorités monétaires et ce problème devrait être traité par divers moyens, au premier rang desquels figure l'assainissement des finances publiques. Des initiatives complémentaires, telles que des mesures macroprudentielles ou une taxe temporaire sur les entrées de capitaux à court terme, pourraient également contribuer à empêcher la formation de bulles des prix des actifs.

Ce document de travail se rapporte à l'Étude économique de l'OCDE du Brésil 2011 ([www.oecd.org/eco/etudes/Bresil](http://www.oecd.org/eco/etudes/Bresil)).

Classification JEL : E5 ; E6 ; F4

Mots clefs : Brésil ; politique monétaire ; politique budgétaire

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## **Refining macroeconomic policies to sustain growth in Brazil**

Annabelle Mourougane<sup>1</sup>

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

### **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 1).

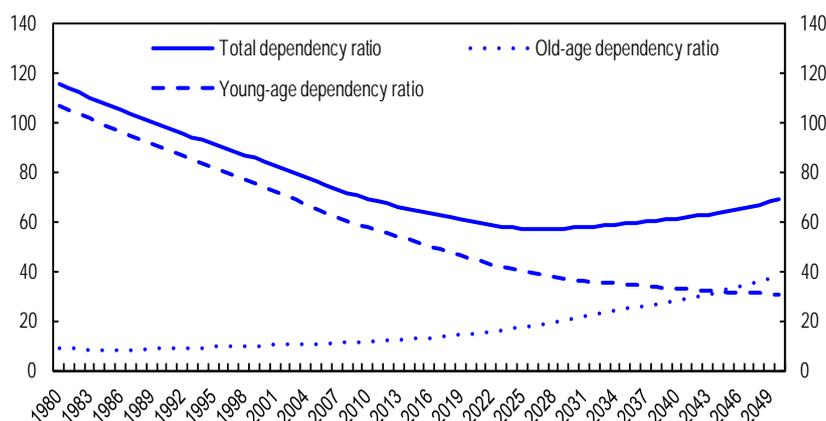
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1. Senior Economist and Economist in the OECD Economics Department. This paper reports on background work for the 2011 *OECD Economic Survey of Brazil*. The author is grateful for the valuable comments received on earlier drafts from Andrew Dean, Robert Ford, Peter Jarrett and Jens Arnold as well as for comments from Christian Daude and Angel Melguizo and discussions with officials of the Brazilian government. Special thanks go to Anne Legendre for statistical assistance and to Mee-Lan Frank and Maartje Michelson for editorial support. The views expressed here are the author's personal views, and do not necessarily reflect those of the OECD or its member countries.

### *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 1). A sound macroeconomic framework combining inflation targeting, a flexible exchange rate and 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.

Figure 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.

Over the medium to long term, assuming no major reforms, projections point to a substantial slowdown in potential output growth (Figure 2). These projections rely on the United Nations' medium population scenarios and assume that capital and trend TFP grow 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.

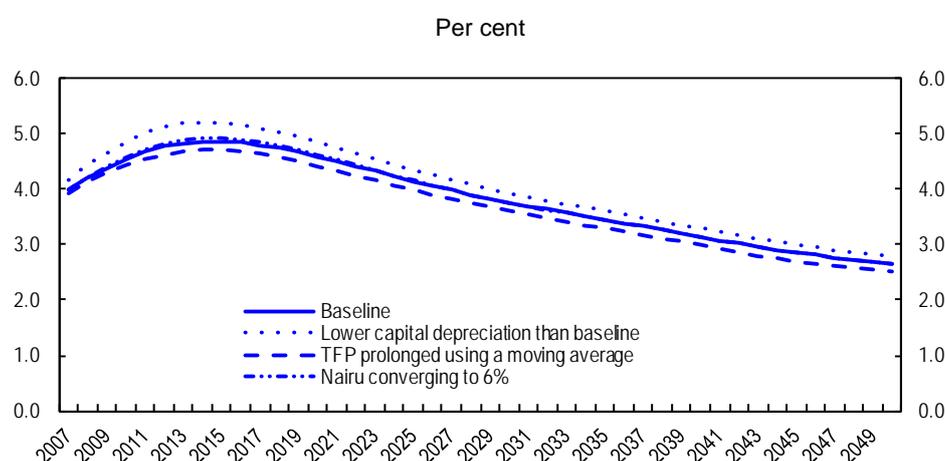
Table 1. Actual and potential output growth and contribution to growth

	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 Annex 1).

Source: OECD calculations.

Figure 2. Effect of ageing on potential output



Source: OECD calculations.

### *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.

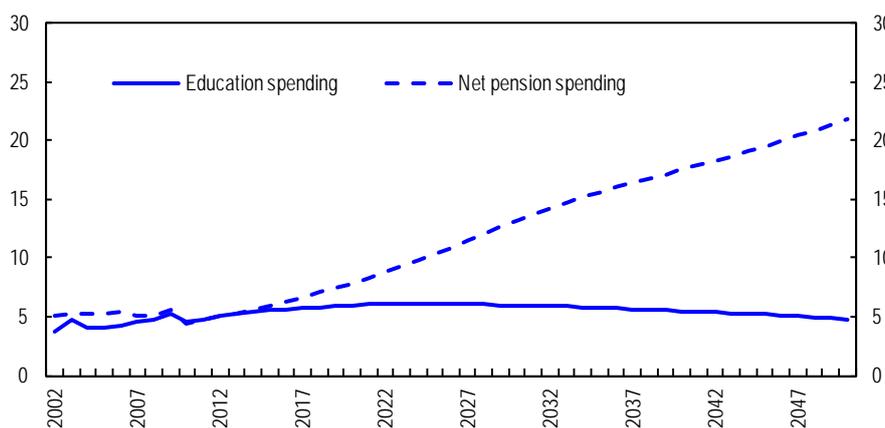
Developments in poverty are also likely to matter as there are differences in saving behaviour between poor and non-poor households in Brazil. Indeed, the poor tend to display negative saving after the age of 45 until 65, while saving remains positive for the non-poor at these ages. In addition, the 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 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 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 Arnold (2011).

Figure 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.

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 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 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.

Table 2. **Selected data on oil in Brazil**

Thousands barrels per day

	2003			2010		
	<b>Brazil</b>	Central & South America	World	<b>Brazil</b>	Central & South America	World
Production of crude oil <sup>2</sup>	<b>1 496.1</b>	5 911.1	69 430.3	<b>2 054.7</b>	6 413.7	74 051.9
Total petroleum consumption	<b>2 055.7</b>	5 195.7	79 722.0	<b>2 599.0</b>	6 420.7	85 294.6
Imports of crude oil <sup>2</sup>	<b>351.2</b>	1 921.7	41 402.9	<b>375.0<sup>1</sup></b>	1 876.2 <sup>1</sup>	42 233.3 <sup>1</sup>
Exports of crude oil <sup>2</sup>	<b>241.7</b>	2 643.2	39 964.1	<b>505.0<sup>1</sup></b>	2 671.0 <sup>1</sup>	41 298.6 <sup>1</sup>
Crude oil proven reserves (billion barrels)	<b>8.3</b>	98.6	1 212.3	<b>12.8</b>	124.6	1 341.6 <sup>1</sup>
Crude oil distillation capacity	<b>1 865.1</b>	6 633.9	81 995.2	<b>1 908.3<sup>1</sup></b>	6 607.8 <sup>1</sup>	85 900.4 <sup>1</sup>

1. 2009.

2. Includes lease condensate.

Source: EIA, International Energy Statistics.

### ***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).

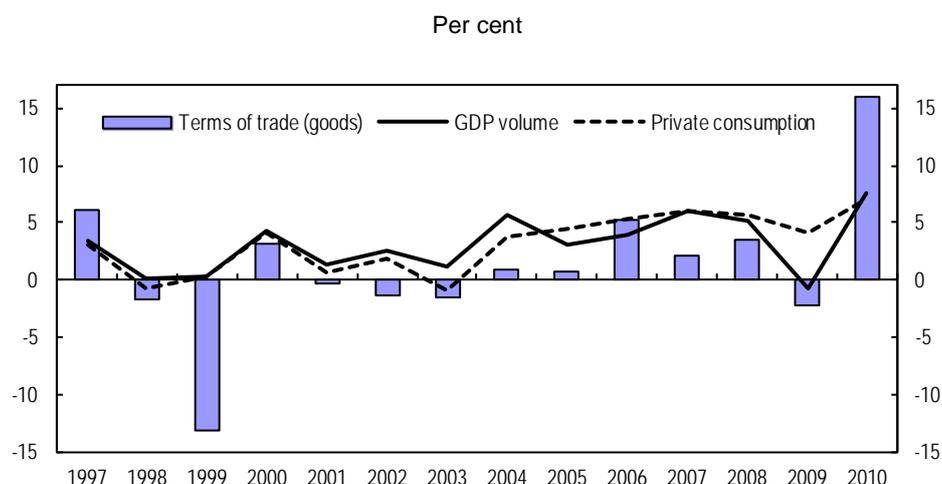
#### *Currency appreciation*

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. 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 (Mourougane, 2011). 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 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). 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. Terms of trade, private consumption and GDP growth



Source: IBGE and Funcex.

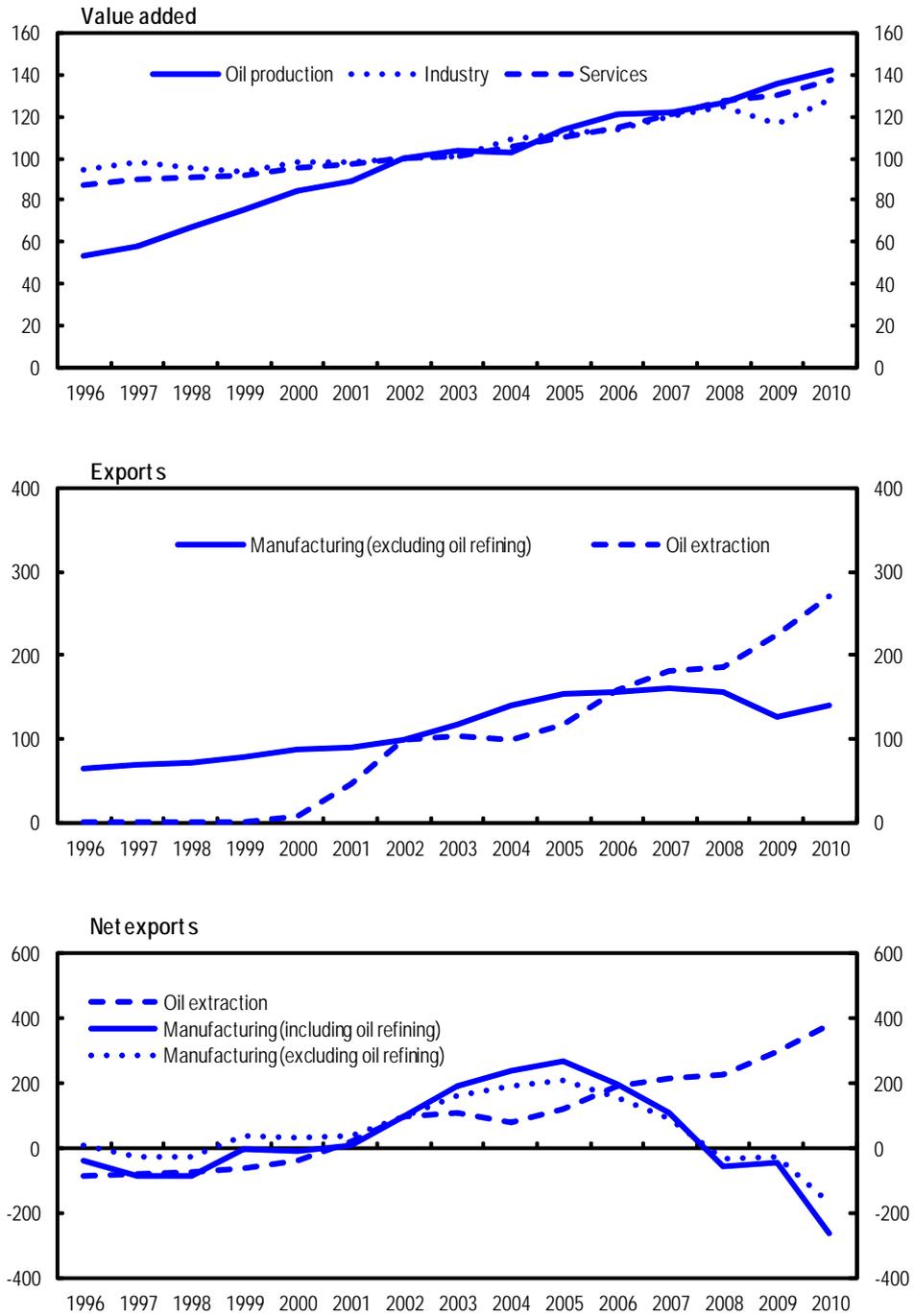
#### *Factor reallocation*

Signs of de-industrialisation are mixed. Manufacturing production has declined, but only in the aftermath of the financial crisis (Figure 5). 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 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.

Figure 5. Value added and exports by product

2002 = 100



Source: ANP, IBGE and FUNCEX.

## 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 3). 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.

Table 3. Government fiscal account, per cent of GDP

	2000	2005	2006	2007	2008	2009	2010
<b>Central government</b>							
<b>Revenues</b>	19.9	22.7	22.9	23.3	23.6	23.2	25.0
<i>of which:</i>							
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
<b>Expenditure</b>	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
<i>of which:</i>							
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
<b>Transfers to states and municipalities</b>	3.4	3.9	3.9	4.0	4.4	4.0	3.8
<b>Public sector<sup>1</sup></b>							
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.

The composition of debt also changed during the 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 (Mourougane and Pisu, 2011). Well-targeted social spending will also be crucial to achieving social equity, in particular if support focuses on measures to help the young (OECD, 2011a). 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 Miséria* 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). 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.

#### Box 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.

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 ressaldadas 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 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. 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 2 for an overview of the tax system). Onerous social security contributions and additional levies on enterprise payroll 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.

#### **Box 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.

### Box 2. An overview of the tax system (cont'd)

- *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 cooperatives 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*).
- *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).

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, 2011b). 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).

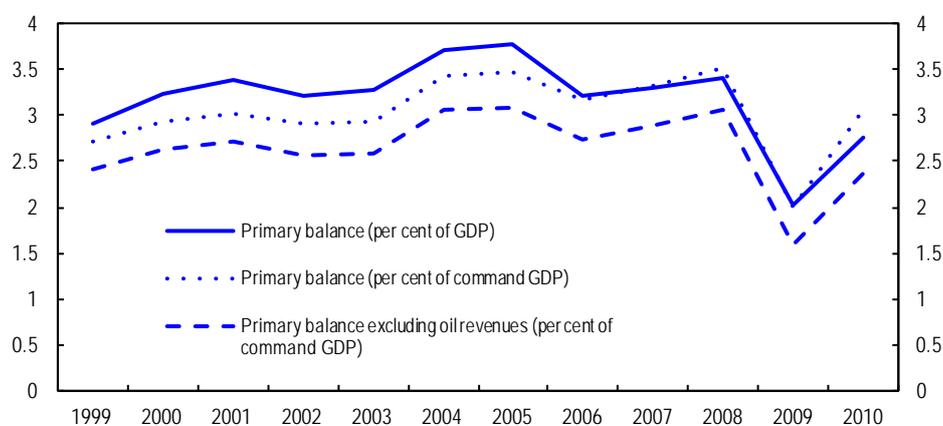
*Adapting fiscal policy to growing revenue from natural resources, especially oil*

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 6). 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 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 7). 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 6. Various measures of primary balances

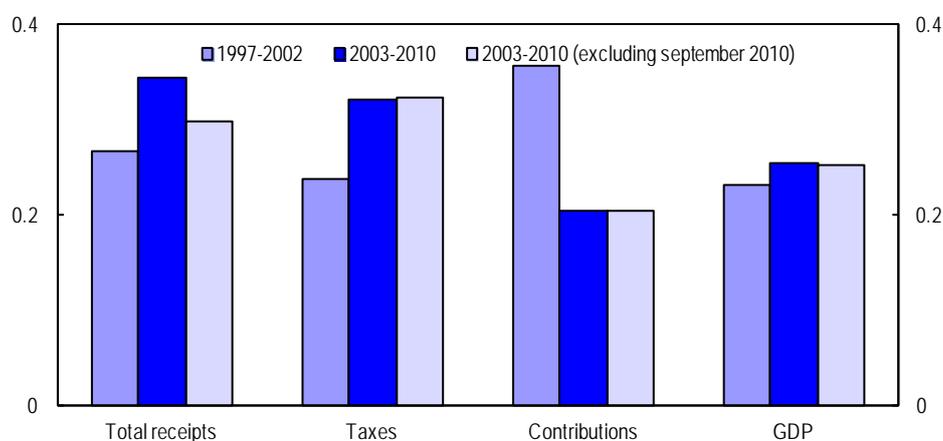


Note: Command GDP has been derived using the formula:  $\text{Command GDP} = \text{GDP} + (\text{Terms of Trade} - 1) * \text{Exports}$ . Oil revenues are computed as the sum of royalties, revenues from exploration and an estimation of the tax and social contributions paid by *Petrobras*, using information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

Source: OECD calculations.

Figure 7. 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.

### *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 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.

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.

### Box 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.

**Box 3. How can revenues from natural resources be best managed? (cont'd)**

**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).

***Refinements 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 government's 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 macro-economic 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 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 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.

#### Box 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).

## 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 4).

Table 4. **The record of inflation targeting in Brazil**

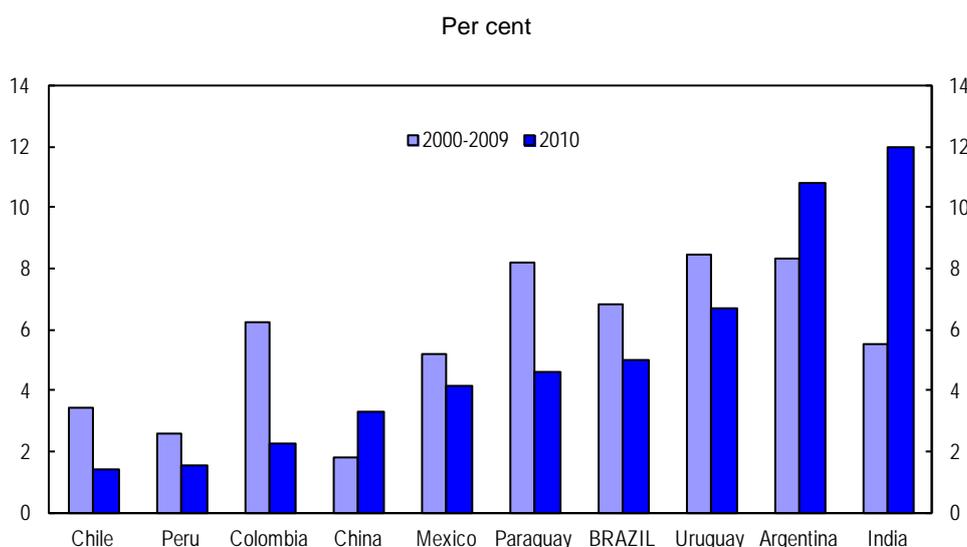
	Target (%)	Tolerance band (percentage points)	Actual inflation (IPCA, % per year)
1999	8.0	2.0	8.94
2000	6.0	2.0	5.97
2001	4.0	2.0	7.67
2002	3.5	2.0	12.53
2003	3.25	2.0	–
	4.0	2.5	9.3
2004	3.75	2.5	–
	5.5	2.5	7.6
2005	4.5	2.5	5.69
2006	4.5	2.0	3.14
2007	4.5	2.0	4.46
2008	4.5	2.0	5.9
2009	4.5	2.0	4.31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

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 (Barbosa 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 8). 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).

Figure 8. **CPI inflation in Brazil and selected comparator economies**



Source: IBGE, IFS statistics.

### ***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*

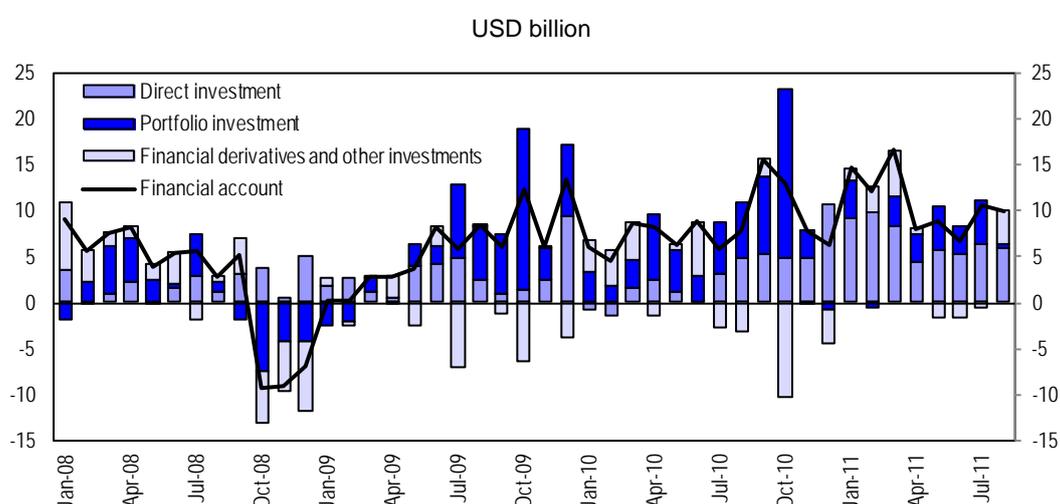
Since 2009, Brazil has experienced a massive surge in capital flows (Figure 9). Portfolio investment, in particular in equity securities, has accounted for most of the flows volatility. Both external and internal factors can explain these developments. Global liquidity expansion, which accelerated in 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 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.

Figure 9. Financial account and its components



Source: Central Bank of Brazil.

### *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 (Mourougane, 2011).

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

#### Box 5. Explaining recent inflation developments

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

$$\pi_t = c_1\pi_t^{\text{exp}} + c_2\pi_{t-1} + c_3\pi_{t-2} + c_4\pi_{t-3} + c_5\text{gap}_t + c_6\text{reer}_t + \varepsilon_t^h$$

where  $\pi_t$  is the quarter-on-quarter growth of IPCA,  $\pi_t^{\text{exp}}$  is the quarter-on-quarter inflation expectations,  $\text{gap}_t$  is the estimated output gap and  $\text{reer}_t$  is the real effective exchange rate (see Box 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 5).

This is consistent with other findings in the literature (e.g. Catao *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 telecommunications and electricity sectors) were indexed to a price index that was heavily influenced by exchange-rate movements (Barbosa 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.

Contributions to inflation using this equation suggest that inertia has been a major contributor to inflation in the past (Table 6, Figure 10). 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 6. Contributions to quarter-on-quarter IPCA inflation

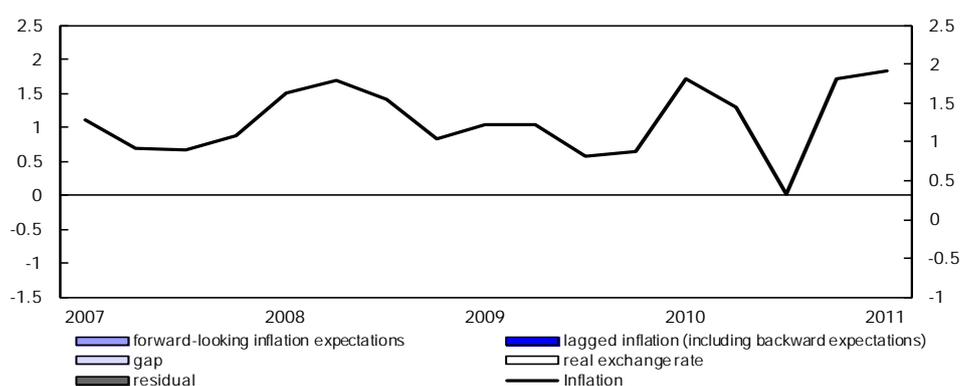
	Actual inflation	Forward-looking inflation expectations	Lagged inflation (including backward-looking expectations)	Output gap	Real exchange rate	Residual
2000-06	1.89	-0.05	1.65	0.29	-0.02	0.02
2007-08	1.28	0.09	1.01	0.30	-0.06	-0.06
2009	1.04	-0.13	0.94	0.29	0.02	-0.09
2010	1.36	0.16	0.93	0.30	-0.07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

Source: OECD calculations.

## Box 5. Explaining recent inflation developments (con't)

Figure 10. CPI inflation and contributions

Quarter-on-quarter growth rates

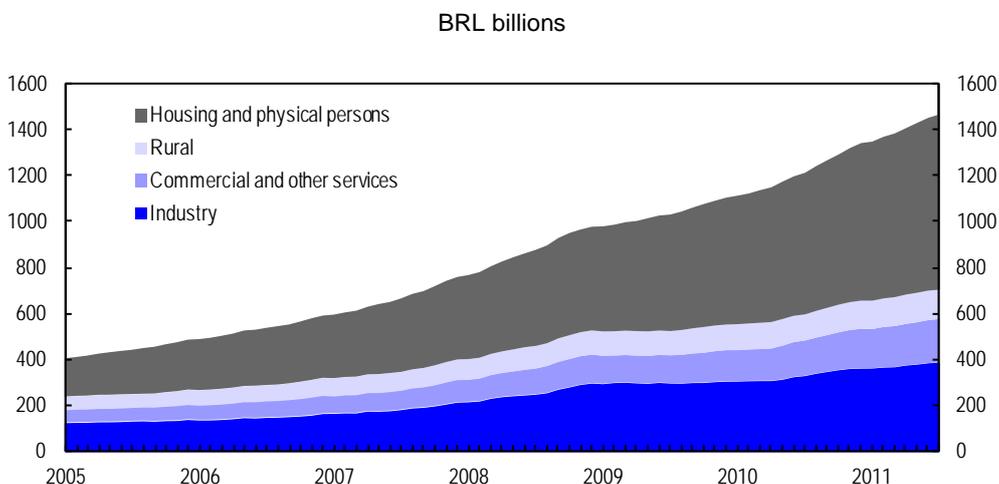


Source: IBGE and OECD calculations.

Hefty capital inflows and economic growth have fuelled credit increases. Private credit growth has been recovering to pre-crisis levels (Figure 11). 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 building new dwelling for low-income households. Credit supplied by the national development bank (BNDES) has also contributed, but BNDES' 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.

Figure 11. Private credit by sector



Source: IPEA.

*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 6). 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 6. Monetary policy transmission channels in Brazil and other selected economies

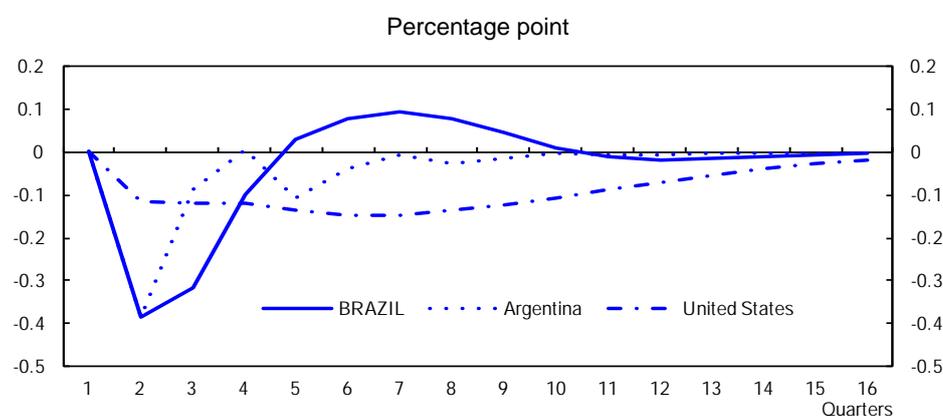
In this box the impact of an increase in interest rates in Brazil and selected emerging and developed economies is estimated using a simple VAR approach. Because of its simplicity, this methodology is known to sometimes result in an inflation puzzle, whereby an increase in the interest rate leads to 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.

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 12). 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 (Table 7). This is consistent with other analyses in the literature (e.g. Catao *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.

Figure 12. Effect of a 100 basis point increase in the interest rate on economic growth



Source: OECD calculations.

## Box 6. Monetary policy transmission channels in Brazil and other selected economies (con't)

Table 7. 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
<b>Brazil</b>	<b>-0.4</b>	<b>2</b>	<b>-0.1</b>	<b>6</b>
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
Argentina	-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 8). 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 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.

Table 8. 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	<b>BRAZIL</b>	<b>4–43</b>
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.

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 9). 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.

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.

Table 9. 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.

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.

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 cooperation 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 macro-economic 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.

#### Conclusion

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. In addition, it would be useful to publish non-resource balances in budget documents and/or examine the sensitivity of conventional fiscal balance indicators to alternative oil-price scenarios.

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. Moreover, international experience suggest that it is important to delegate the management of this fund to an agency with appropriate mechanisms that will ensure good governance.

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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## ANNEX 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,  $\alpha$ , 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.

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