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From: The Secretary

Subject: **Brazil—Selected Issues**

This paper provides background information to the staff report on the 2012 Article IV consultation discussions with Brazil (SM/12/154, 6/26/12), which is tentatively scheduled for discussion on **Monday, July 9, 2012**. The Secretary's Department has been notified by the authorities of Brazil that their explicit consent is required prior to the publication of Board documents on Brazil. At the time of circulation of this paper to the Board, the authorities have indicated that they do not consent to the Fund's publication of this paper.

Questions may be referred to Mr. Haksar (ext. 37157), Ms. Garcia-Escribano (ext. 37573), Mr. Roache (ext. 38207) in WHD.

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# INTERNATIONAL MONETARY FUND

## BRAZIL

### Selected Issues

Prepared by Mercedes García-Escribano, Joana Pereira, and Karlye Dilts (all WHD),  
Marialuz Moreno Badía, Alex Segura-Ubiergo (FAD), and Joonkyu Park (MCM).

Approved by Western Hemisphere Department

June 22, 2012

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## I. MACROECONOMIC IMPLICATIONS OF PENSION REFORM IN BRAZIL<sup>1</sup>

*The long-term pension challenges facing Brazil are well documented. Recognizing these, the authorities have over the years sought to advance reforms of the systems. An important signal of this commitment has been sent by the recent reform of the public system. Much of the debate over the years has focused on the fiscal implications of the outlook for and possible reforms of the pension system. However, different reform options can have very different macroeconomic implications, including for savings, growth, and external balances. To illustrate these differential impacts and inform the debate on the issue, this paper simulates the general equilibrium effects for Brazil of various pension reform options that have been used in countries around the world. All options examined help address the system's long term funding gap and are conducive to raising real private savings and growth in the long run. However, we find that reforms that involve lower mandatory contributions or higher retirement ages have larger effects on output though a boost in labor supply. Meanwhile, reforms focused on reducing benefits would promote growth mostly through a larger impact on private savings.*

### A. The Brazilian Pension System

#### Current Structure and Fiscal Position

1. **The Brazilian public pension system currently comprises three defined-benefit schemes:**<sup>2</sup> a mandatory private sector regime (*Regime Geral de Previdência Social*, RGPS), currently covering some 23 million beneficiaries and disbursing around 6½ percent of GDP, a mandatory public sector regime (*Regimes Próprios de Previdência Social*, RPPS), with about 1 million beneficiaries<sup>3</sup> and a disbursement of some 2 percent of GDP, and a non-contributory means-tested branch for rural workers, disabled people and other low income families, which disburses less than ½ percent of GDP. Benefits are financed out of current proceeds from an 8 to 11 percent payroll tax paid by employees, a 20 percent contribution tax by employers (which also finances other social insurance benefits such as for sickness and maternity) and two other specific taxes.<sup>4</sup> Both contributions and benefits are capped in the RGPS, but in the RPPS only future participants will be subject to such rules (see below).

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<sup>1</sup> Prepared by Joana Pereira.

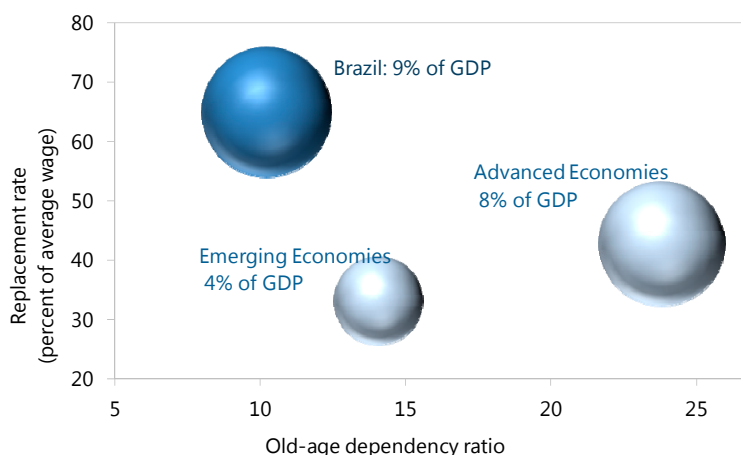
<sup>2</sup> In addition, there is also a growing network of private pension funds (mostly defined contribution). Participation in these schemes is voluntary and the government only plays a regulatory/monitoring role therein.

<sup>3</sup> Applies to federal workers only.

<sup>4</sup> Contribution to Social Security Financing (*Contribuição para o Financiamento da Seguridade Social*, COFINS) and Social Contribution on Net Profits (*Contribuição Social sobre o Lucro Líquido*, CSLL).

2. **Pension spending in Brazil is very high by international standards, considering the relatively young Brazilian workforce.** Indeed, both the RGPS and RPPS are currently running deficits—1 percent and 1.4 percent, respectively, in 2010—as a consequence of relatively generous replacement rates, a low average retirement age<sup>5</sup> and current indexation rules. The indexation of minimum pensions to the minimum wage is a particularly large driver of overall pension costs. About 40 percent of total spending pertains to beneficiaries receiving the minimum pension (2/3 of RGPS beneficiaries), which has more than doubled in real terms over the past 15 years. Nonetheless, it has contributed for the important reductions in old-age poverty seen in Brazil.

**Figure 1. Pension Spending in International Context, 2011**



Source: IMF Fiscal Board Paper FO/DIS/11/252 and staff calculations

3. **Staff estimates that the pension system faces an NPV funding gap of close to 25 percent of GDP over the next 20 years, rising to 100 percent through 2050.**<sup>6</sup> Under current rules, the financing needs of the social security system should undergo a modest rise in the coming 20 years, when the population is still relatively young. After that, the funding gap will increase sharply as the old age dependency ratio is expected to continue rising steeply (to over 60 percent in 50 years, from today's 10 percent).

4. **Comparatively, the RPPS has traditionally offered especially advantageous conditions,** including very high replacement rates (still equal to 100 percent for participants who started service before 2003, compared to an average of the best 80 percent monthly

<sup>5</sup> The average retirement age is 53 for RGPS beneficiaries who contributed a minimum of 35 years (for men) or 30 years (for women). Among retirees who contributed for a shorter period and among RPPS retirees the average age is close to 60.

<sup>6</sup> The estimates are based on the authorities' actuarial projections of RGPS and RPPS financing needs as of April 2012, as well as of the fiscal impact of the latest reform (see paragraphs 5 to 9) recent FAD projections of public pension increases - IMF Fiscal Board Paper FO/DIS/11/252.

salaries during the working life in RGPS),<sup>7</sup> a short entitlement period (only 10 years of civil service to qualify for an RPPS pension) and the indexation of pension benefits to the salaries of active civil servants instead of inflation. This explains why deficits in the two subsystems are of the same order of magnitude, even though the RGPS has a much wider coverage.

## Recent Reforms

5. **Important changes to the RPPS were first enacted in 2003, including steps for the ongoing establishment of a dual pillar system (2012 reform).** Faced with mounting pension costs—a 1998 pension reform had a relatively limited impact on curbing deficits—and in a context of a rising external risk premium, a reform of the pension sub-system for civil servants was introduced in 2003 to enhance long term fiscal prospects. The reform introduced a number of parametric changes: an 11 percent payroll tax on pension benefits,<sup>8</sup> lower replacement rates (harmonizing the rules with RGPS for new civil servants), and the penalization of early retirement of 5 percent of benefits per year (before age 60 for men and 55 for women).<sup>9</sup> Importantly, it also set the stage for the creation of a fully funded pillar for public servants, which institution was finally approved by the Senate in March 2012.

6. **The 2012 reform introduces a defined contribution pillar to the RPPS.** Benefits and contributions for new civil servants will be subject to the same ceilings as those in the RGPS, while participants have the option to enroll in a complementary defined-contribution scheme (*Previdência Complementar*) if they wish to receive a pension beyond the ceiling. Current active civil servants may choose to stay in the old system or switch to the new one with two pillars. Participants can choose how much to save into a retirement account, knowing that the employer will match their investment by up to 8.5 percent of their salary. At the time of retirement, they accrue the returns from this investment.<sup>10</sup>

7. **During its first stage of implementation, the 2012 reform will generate a net cost driven essentially by the loss of contributions** to the pay-as-you-go (PAYG) branch. The state will also be making transfers to the individual pension accounts on behalf of employees. However, since the reform affects only the RPPS subsystem and the contribution ceiling is

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<sup>7</sup> Furthermore, benefits in the RGPS are subject to an adjustment factor (*factor previdenciário*)—based on age and length of contributions—which was introduced in 1999 to account for changes in average life expectancy.

<sup>8</sup> Levied on the portion exceeding 60 percent of the RGPS's benefits ceiling, for all participants.

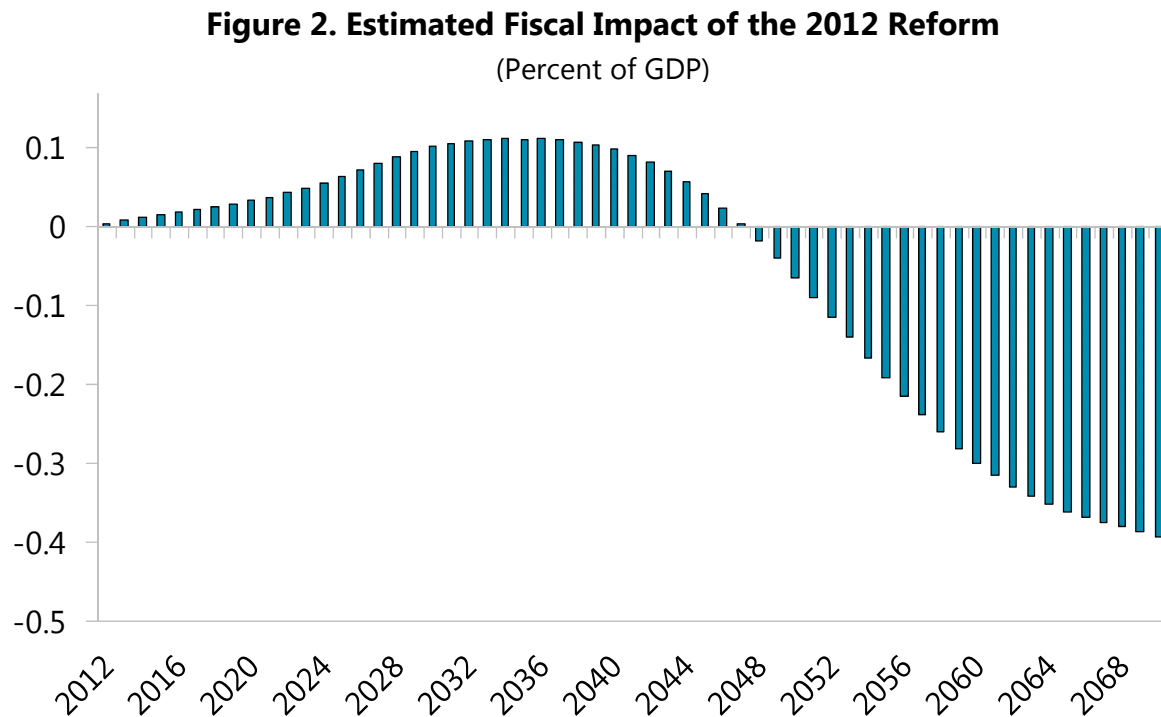
<sup>9</sup> The minimum retirement age is 53 for men and 48 for women, provided that participants qualify for a full pension by time of contribution.

<sup>10</sup> The defined contribution scheme is to be administered by a newly created Fundação de Previdência Complementar do Servidor Público Federal (Funpresp), divided into three branches for servants in the executive, judiciary and legislative power, respectively. Members of the Funpresp's Executive Board and Financial Committee are appointed by the government, but the institutions enjoy administrative independence and are subject to a private legal regime (like public enterprises).



relatively high—only 1/3 of servants earn beyond the correspondent salary base—, the transition cost is expected to be contained (about 0.1 percent of GDP).

8. **As the new generations of civil servants retire and disbursements will be lower, the government will reap the benefits of the 2012 reform.** On net terms, the authorities expect an improvement in the balance of the RPPS from 2033 onwards, with gains rising to 0.2 percent of GDP per year in the long run. Staff estimates point to an overall impact of around 10 percent of GDP in NPV terms up in the long run.



Source: Ministry of Finance.

9. **The introduction of a funded pillar into the RPPS is welcome.** By reducing replacement rates for higher earners, it is expected to encourage long-term private savings and thereby support the development of financial markets. Progressiveness within RPPS system is also enhanced, as well as equity *vis-à-vis* private sector workers. Finally, the relatively small transition cost is an important consideration for sustainability of the reform—especially given that the fiscal framework in Brazil is anchored by a primary surplus target—in light of international experience where costly pension transitions have at times lead to some unwinding of the pension reform. The reform may thus be a stepping stone for further improvements to the system down the road.

## B. Macroeconomic Implications of the 2012 reform

### 10. **We now assess the broader macroeconomic implications of the recent reform.**

The analysis uses the IMF's Global Integrated Fiscal and Monetary (GIMF) model parameterized on data for the Brazilian economy.<sup>11</sup> The GIMF is a non-Ricardian, dynamic stochastic general equilibrium model which features—overlapping generations, finite horizons (myopia), and endogenous labor and capital markets—allowing for a meaningful discussion of the short and medium run impact of pension reforms.

11. **Our baseline is an economic environment reflecting pre-Lehman fiscal trends.** In particular, data as of 2007 was used to parameterize initial levels of government spending, revenue decomposition and transfers (including pensions), thereby abstracting from cyclical impact of the recent crisis on these variables. Net public debt is assumed at 40 percent of GDP in the initial steady state, close to 2011 levels.

12. **The 2012 reform is introduced as a shock, first to contribution rates and later to pension benefits.** By capping mandatory contributions to the PAYG pillar, the government will effectively be lowering average (mandatory) contribution rates for public servants. Based on the estimated transition cost shown in Figure 2, we proxy that change by the shift in labor taxes that, in the model, would produce such a cost (up to its peak in 2035). In other words, we assume that contributions to defined benefit schemes are generally perceived by participants as a tax, unlike what would happen in an optional defined contribution plan.<sup>12</sup> After 2035, the average contribution rate is kept fixed and the fiscal trajectory thereafter is dictated by the reduction in pension benefits for new entrants.<sup>13</sup> As will be shown, the quantitative impact of the reform is small in broad macroeconomic terms; but this is only a consequence of the circumscribed scope of the reform in terms of affected beneficiaries. The results do suggest a high elasticity of private savings and growth rates to the implied fiscal savings in the context of this particular reform.

### **Macroeconomic impact when the reform is financed by public debt**

13. **For illustrative purposes, we analyze first the effects of the 2012 reform under the assumption that it is financed by public debt.** The resulting path of the relevant fiscal

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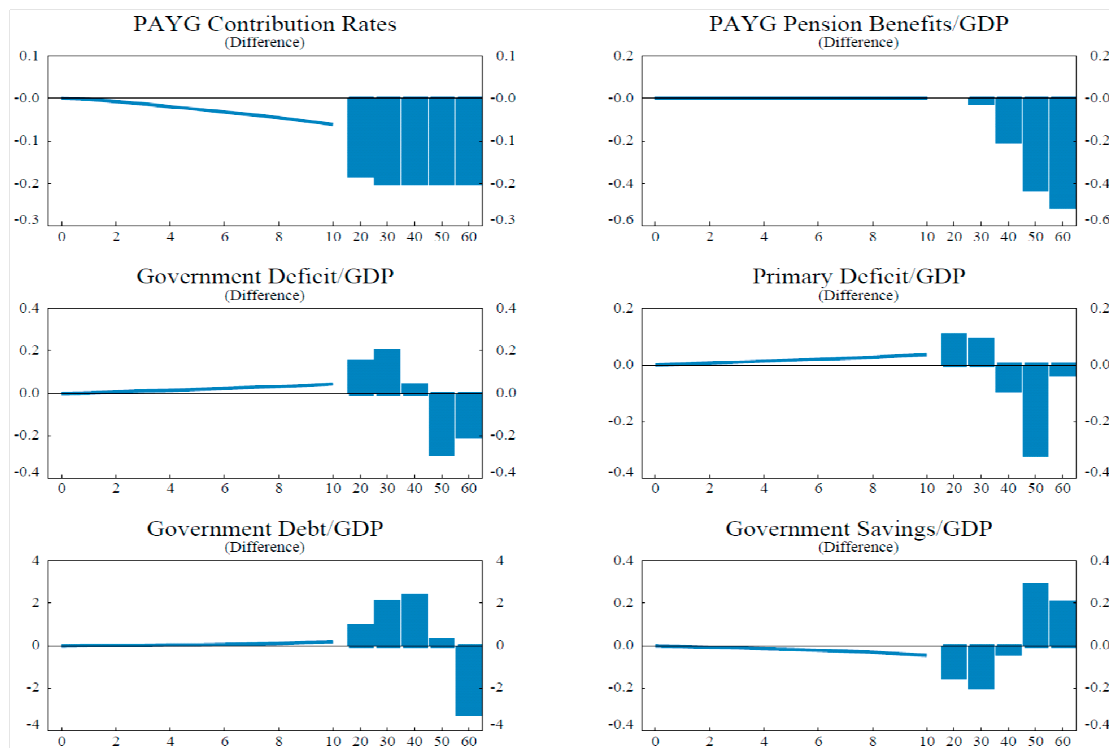
<sup>11</sup> A detailed outline of the GIMF model can be found in Kumhof et al (2010). For calculations in this paper, the model features three regions: Brazil, Emerging Asia, and Rest of the World.

<sup>12</sup> We are also assuming that the co-payments by public employers to the optional pension savings accounts are perceived as part of the tax-rate reduction, and participants would take it into account when targeting a desired pension savings amount.

<sup>13</sup> The GIMF features two types of agents: a group of liquidity constrained households (LIQ agents), who do not have access to capital markets, and intertemporal optimizers (OLG agents), who can borrow and save. In this section, we assume that reductions in PAYG benefits affect OLG agents only because in reality only the highest earners will be affected.

variables, in deviations from the baseline scenario, is shown in Figure 3a.<sup>14</sup> Primary balances worsen in the first 20 years and improve subsequently, like in the estimated net cost/benefit shown in Figure 2 above. Implicitly, the initial rise derives from the reduction in the average contribution rate—as weighted by the share of agents in the economy subject to the new pension rules—of 0.2 percentage points by 2027. Pension benefits start falling on that date, and the system matures with disbursements 0.4 percent of GDP lower than the baseline. Since public investment does not change and the impact on GDP is small (see below), net public savings mirror the dynamics of the overall deficit.

**Figure 3a. The 2012 Reform with Debt Finance: Dynamics of Fiscal Variables**  
(Deviations from steady state. Periods correspond to years.)



Source: IMF staff calculations

14. **Labor supply increases, pushing up real GDP growth.** The drop in compulsory contribution rates reduces a labor market distortion, raising marginal incentives to work and thereby increasing the return on capital.<sup>15</sup> Real investment is thus higher, although with some

<sup>14</sup> To guarantee the dynamic stability of the model, the deficit and debt to GDP ratios need to stabilize in the long run, which in our simulations requires that the fall in primary surplus cannot be permanent. Thus, we assume general transfers to rebound after 2075.

<sup>15</sup> Labor and capital are complementary factors of production in the GIMF.

recoil in the medium run because real interest rates rise during that period. With both higher labor supply and capital accumulation, real GDP increases above its long term trend during the first years, which ends up putting pressure on prices. Monetary policy adjusts by hiking real interest rates temporarily.

15. **As expected, the reform builds incentives to raise private savings.** Faced with higher net income during their working life and foreseeing lower pension transfers in the future, individuals accumulate savings during the next 30 years, incidentally in the form of optional contributions to the second pillar of the pension system. The subsequent drop in government transfers reduces disposable household income and thus the private savings ratio to GDP, but in NPV terms private savings increase. Since agents are myopic—one of the non-Ricardian features of the model—and a share of the population is liquidity constrained, consumption is not perfectly smoothed. Furthermore, private savings undershoot in the medium run, as the long run decline in pensions is not fully internalized by the currently active population.

16. **National savings, on the other hand, stay roughly constant during the transition period.** Initially, higher households' savings are simply traded off by government debt accumulation. However, as pension benefits drop permanently, so do private savings, the public debt ratio and interest payments. There is therefore a small rise in national savings rates over the very long run, owing almost exclusively to lower public debt service. With the investment ratio mostly constant over the entire period, the current account starts improves permanently once the transition period is over.

**Although a low impact of multi-pillar reforms on total savings has been observed in a number of emerging economies, the existing evidence is far from conclusive.**<sup>16</sup> In countries like Chile, Peru, and Latvia national savings rose in the aftermath of the reform, but in other cases—including Colombia, Mexico, and Uruguay—it either remained unchanged or dropped slightly. The relationship between these types of reforms and savings is nonetheless hard to pin down in the long term because the latter depends on a myriad of factors. In practice, reform packages often include parametrical changes with adverse effects on private savings, as is the case of increases in the retirement age (see below). Furthermore, an important determinant of the impact on savings is the financing strategy for the transition cost, as we will argue in the next paragraphs. Finally, the relatively short time period since most of multi-pillar reforms were introduced—particularly in Eastern Europe—makes it hard to fully assess the impact of those in household savings and labor incentives. Indeed, reforms

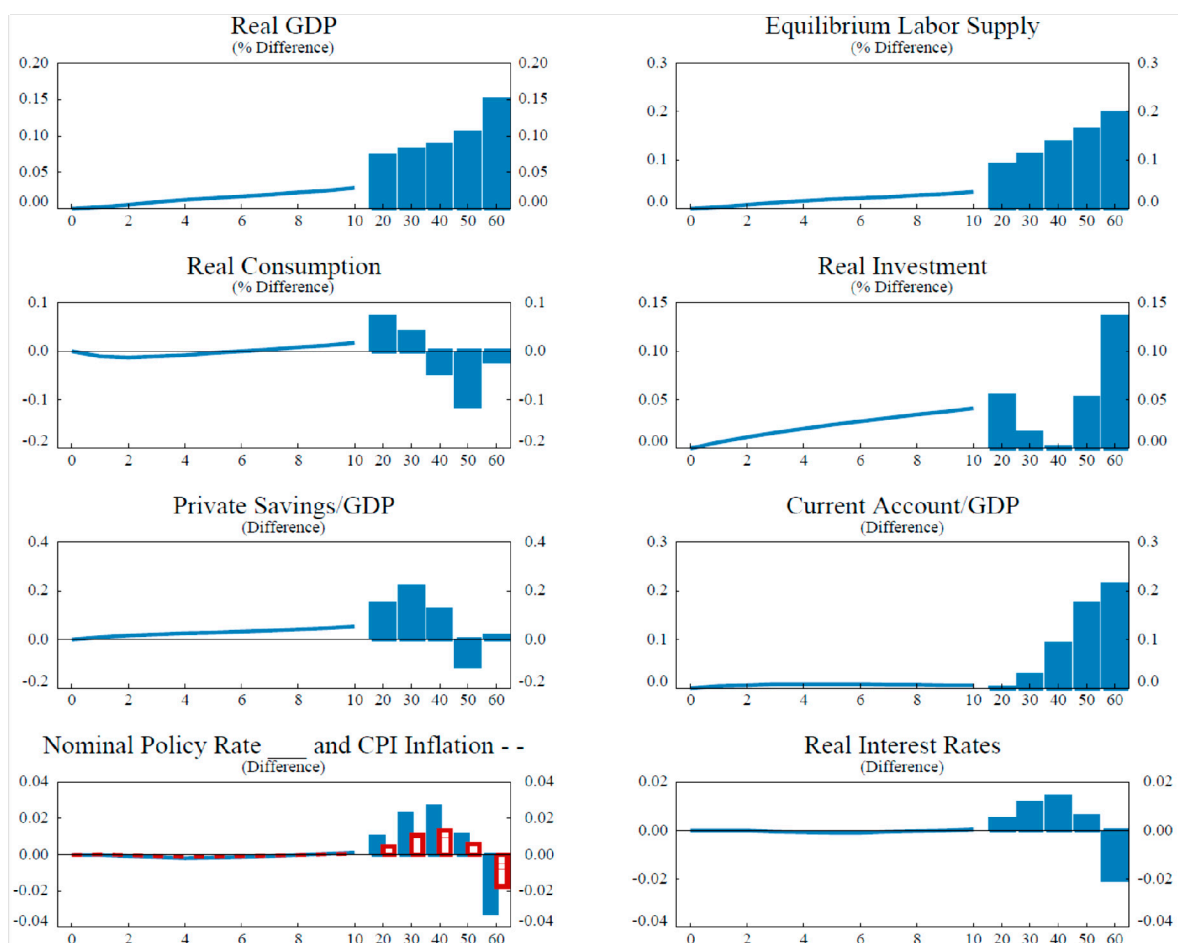
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<sup>16</sup> The World Bank's Independent Evaluation Group notes a generally small impact on national savings in the short to medium run in its report on *Pension Reform and the Development of Pension Systems, An Evaluation*, 2006. A number of papers also note a very high (low) substitutability between pension savings with a high (low) actuarial component and other kinds of financial wealth (e.g. Attanasio and Rohwedder (2003) and Disney (2005)), hinting at a low overall impact of these reforms. However, Arnold (2011) points to the generosity of the PAYG pension system as one of the main causes of low savings in Brazil.

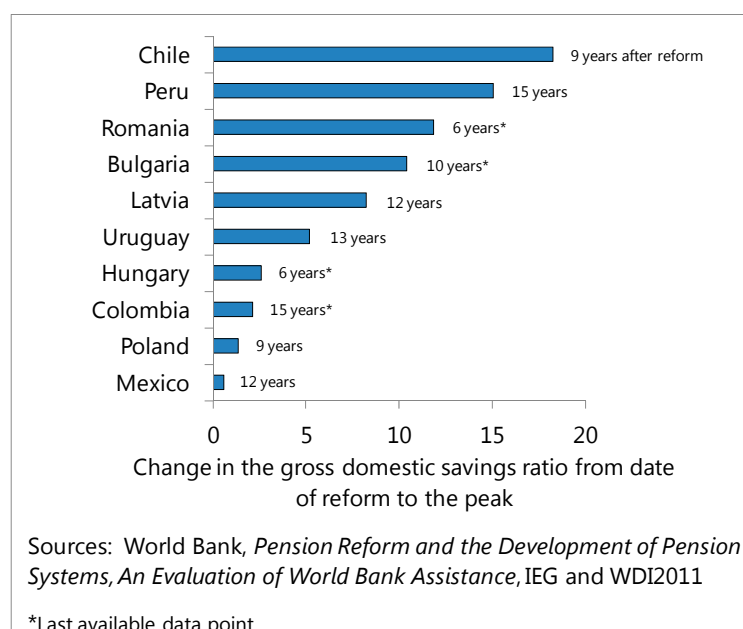
of pension systems in the 1990's advanced economies such as Sweden have been associated with increases in household savings, but these behavioral changes have been observed gradually over long periods.

**Figure 3b. The 2012 Reform with Debt Finance: Impact on Macroeconomic Variables**

(Deviations from steady state. Periods correspond to years.)

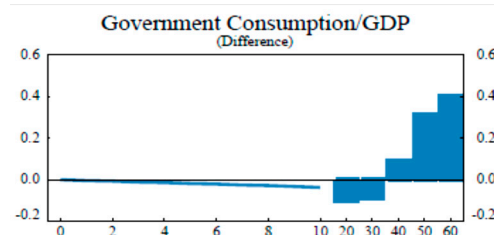


**Figure 4. Trends in Gross Domestic Savings  
(Percent of GDP)**



### Macroeconomic impact when the reform is financed by government savings

17. **Given the primary surplus fiscal target in Brazil, the next scenario assumes that the transition cost is financed by a reduction in government consumption.**<sup>17</sup> Labor taxation and pension benefits still follow the same path as before, but government consumption now mirrors their combined budget impact, such that the primary balance doesn't change. Thus, changes to the government's overall balance debt reflect solely the small variation in interest rates.



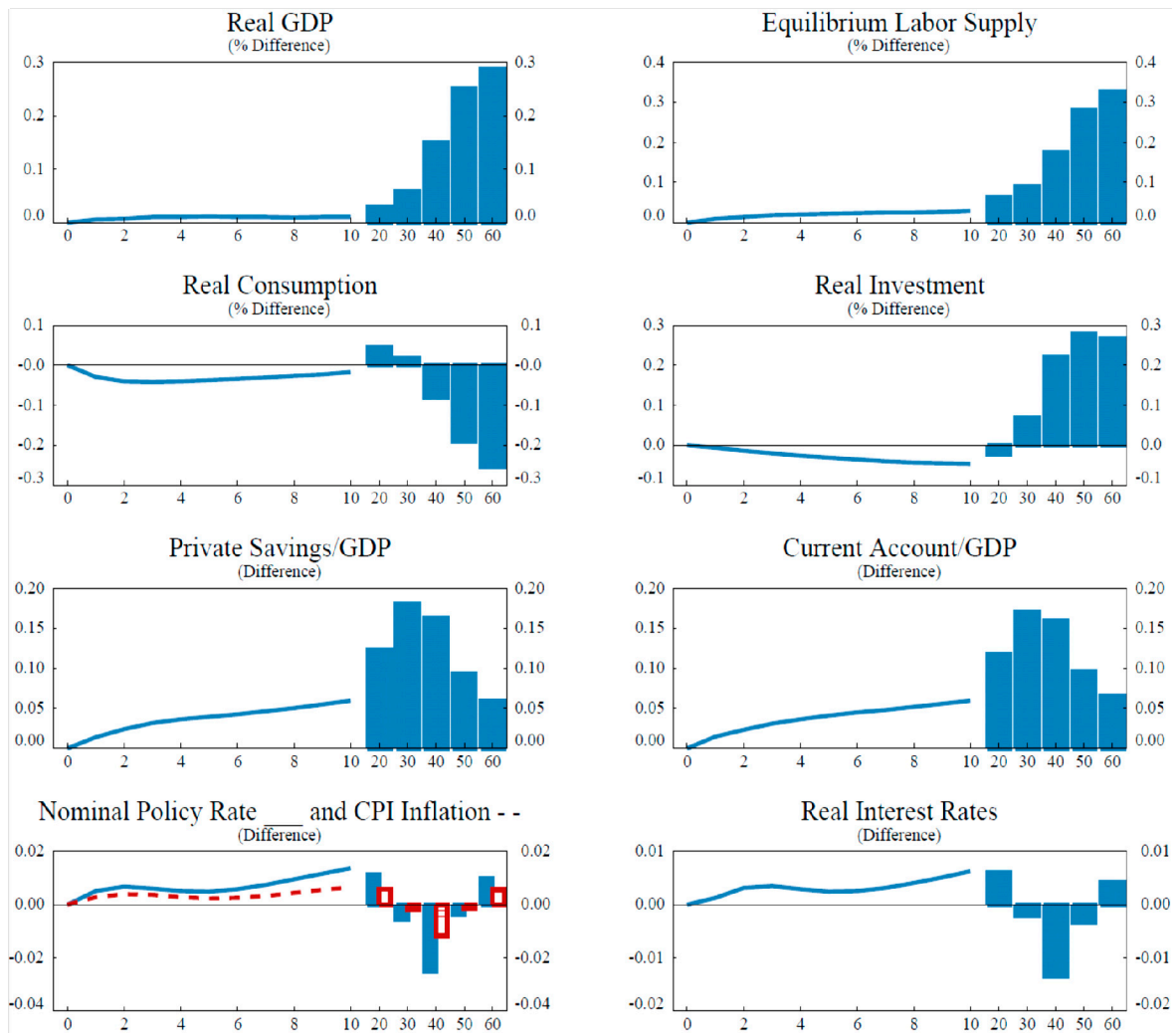
18. **As before, the fall in contribution rates promotes labor supply, investment and real growth—however, the impulse to national savings turns positive at all dates.** Since the medium-to long term decline in total transfers—pension and others—is higher in this case,<sup>18</sup> the impact on aggregate labor supply is stronger, which in turn brings up real GDP by

<sup>17</sup> Likewise, when the reform produces a net benefit (after 2035) we assume that government consumption rises accordingly. This assumption does not impact significantly the short-to medium term macro-impulses, but it leads to lower government saving rate and higher private savings in the very long run because transfers are permanently lower in this case (see footnote 11).

<sup>18</sup> See footnote 14.

more than double the amount found when the reform is financed through debt. At the same time, the decline in government consumption keeps government savings close to the baseline level. National savings will then rise already in the short to medium term, arguably in the form of increased savings in household retirement accounts.

**Figure 5. The 2012 Reform with Debt Finance: Impact on Macroeconomic Variables**  
(Deviations from steady state. Periods correspond to years.)



### C. Macroeconomic Implications of Alternative Pension Reform Options<sup>19</sup>

19. **Reflecting existing high costs, which will be exacerbated by demographic transition, further adjustments to the social security system will be needed in the future.**

Efforts will likely need to focus not only on the RPPS but also the RGPS. Although less generous, the private sector subsystem covers a much wider range of the population and is therefore bound to be most affected by ageing. Furthermore, as discussed above, the NPV of the 2012 reform is modest when compared with the actual pension gap.

20. **We now present some illustrative simulations of the macroeconomic effects of possible alternative approaches, as future reforms are considered in Brazil.** For the purposes of the analysis here, the focus will be on parametric changes to the pay-as-you-go (PAYG) systems that reduce their financing needs other than those associated with an expansion of the defined-contribution pillar. However, our simulations from the previous section suggest that the latter could be beneficial (by reducing the threshold further and increasing the importance of pension savings accounts), should the government identify fiscal space to finance the transition cost.

21. **With a medium to long term horizon in mind, the analysis uses average pension spending in G20 countries as an indicative benchmark for Brazil.** Convergence to such an average would imply a decline in social security disbursements in Brazil of about 2 percent of GDP, practically eliminating the projected social security deficit, barring ageing pressures. In these simulations we will assume that such reforms could be phased-in over the next 20 years. A gradual implementation of this nature would be associated with a higher sustainability of the associated reforms over time, which Brazil can afford as it still enjoys the demographic dividend of a young labor force with a low overall dependency ratio.

22. **Two types of general instruments are considered for convergence to such a benchmark—lowering benefits and increases in the retirement age,**<sup>20</sup> in both cases assuming that the government would keep its primary surplus target unchanged.<sup>21</sup> The former can be achieved through a number of specific policies, such as the reduction of net replacement rates (either directly or by revisiting the formula of the *factor previdenciário*<sup>22</sup>)

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<sup>19</sup> Reform scenarios explored in this section are illustrative.

<sup>20</sup> Staff estimates—based on the total current level of pension and life expectancy at average retirement age—that an increase of 3 years in average retirement ages is needed to produce savings of 2 percent of GDP. Considering a 20 percent lower participation rate for workers older than the current average retirement age, such a rise corresponds approximately to a 7 percent increase of the workforce.

<sup>21</sup> We adjust government consumption so that the target is met. Public investment or taxes could be used instead, although the effects on real GDP will be harder to identify in that case.

<sup>22</sup> See footnote 4.

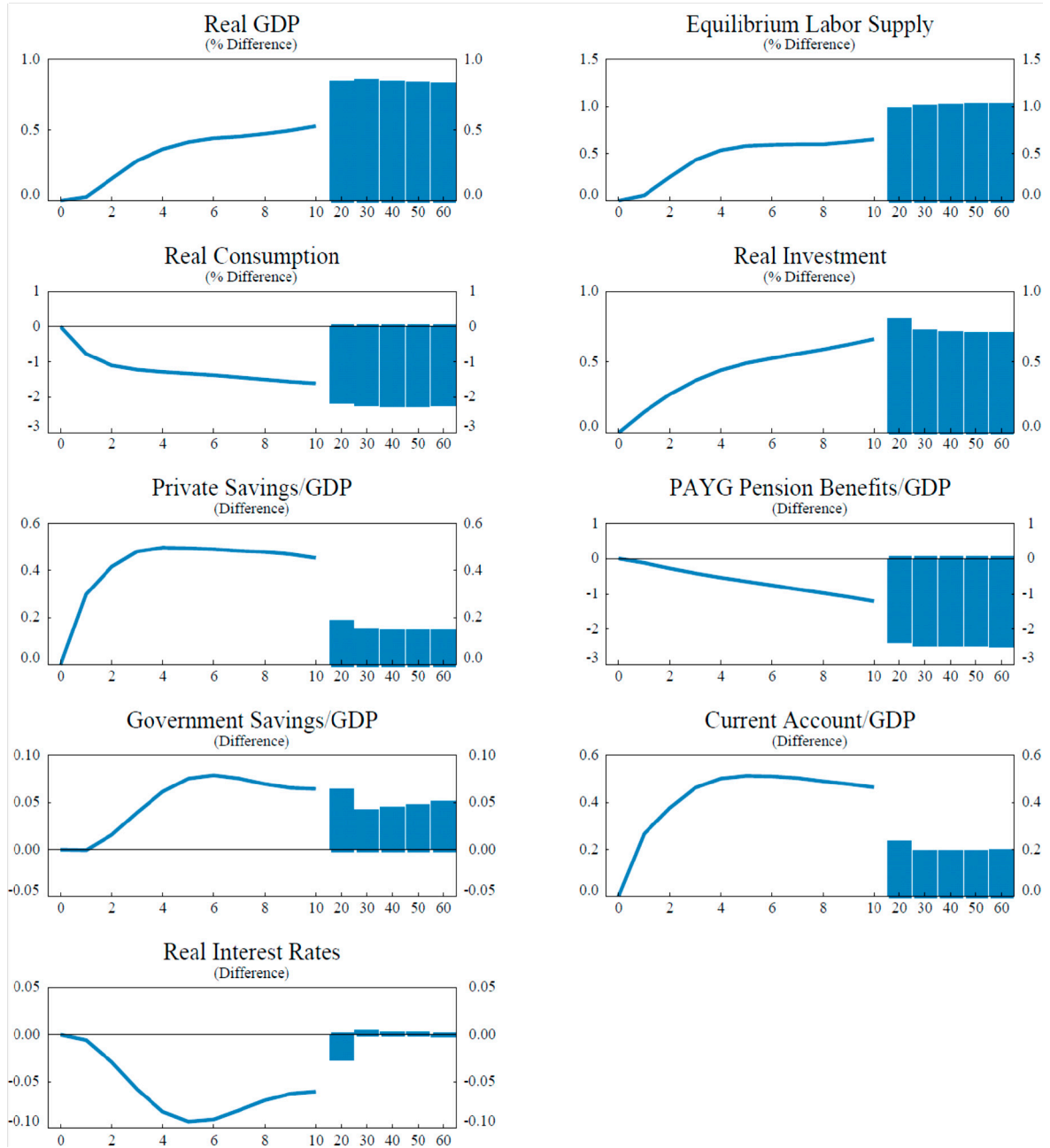


or a change in the minimum pension indexation rules. For simplicity in the simulation, we will assume that pension reductions are evenly spread across liquidity constrained and unconstrained agents. Average retirement ages could increase directly through a hike of the minimum retirement age or by penalizing early retirement (for instance, extending the minimum time of contributions required to qualify for a full pension).

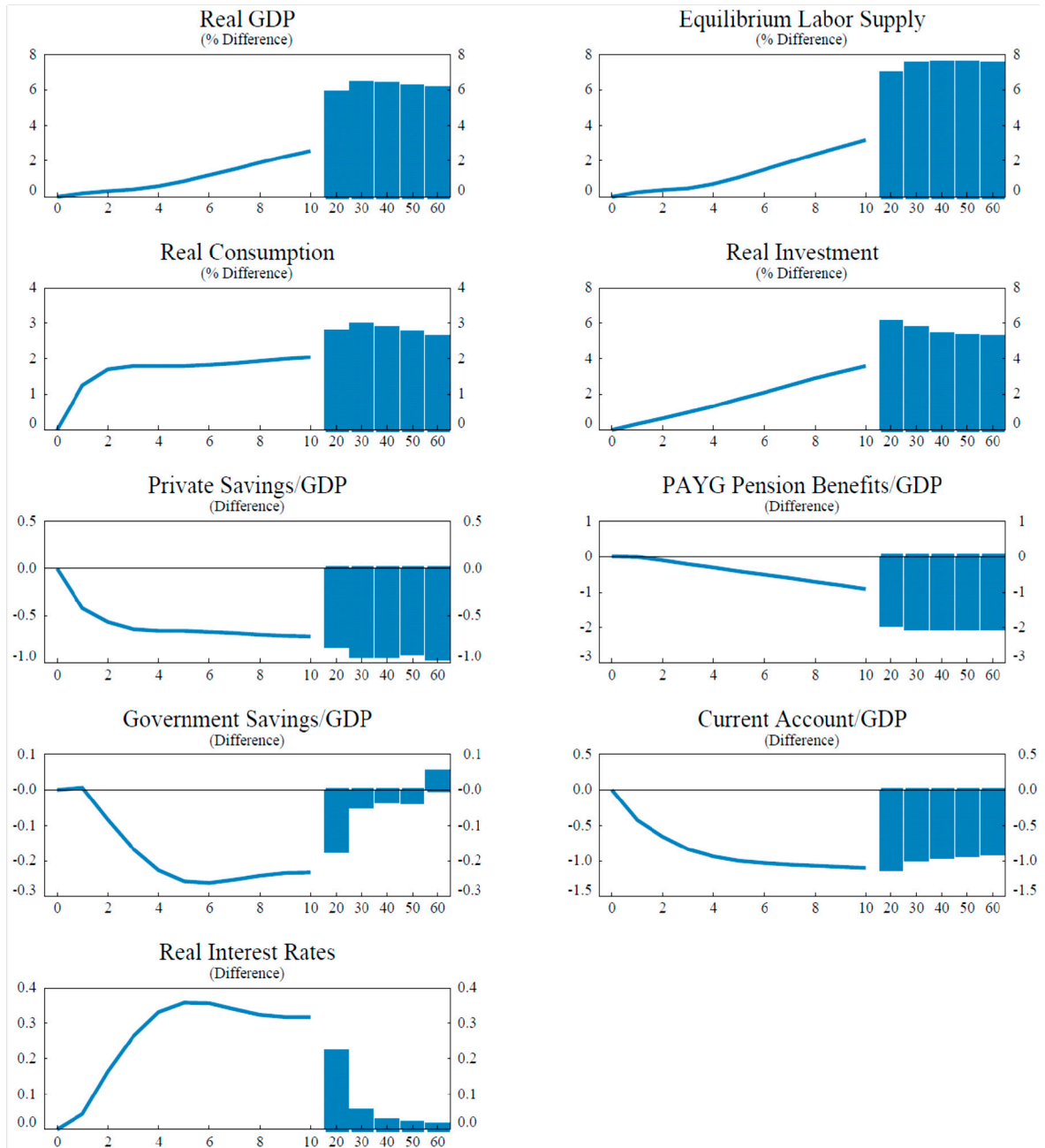
23. **The decline in benefits raises private savings, investment, and labor supply, although with a modest real GDP gain of 0.8 percent over 20 years.** When the reform is announced, current workers and beneficiaries internalize the permanent decline in future pension benefits. Thus, consumption immediately drops and savings rise, putting downward pressure on interest rates. Labor supply increases—as consumption and leisure are complementary goods—which, together with the lower interest rate, encourages higher private investment. As transfers decline, so does disposable income and consumption will continue converging to a lower level. For the same reason, the private savings ratio eases in the long run, but it is still permanently higher than in the baseline. In all, the national savings ratio increases on the back of higher private savings and a permanent (albeit small) reduction in public debt service.

24. **By contrast, an increase in retirement ages depresses savings in the short- to medium term, but has a large positive impact on investment and output growth** (6 percent increase). Agents foresee a shorter retirement period at the time the reform is announced, and immediately decrease savings. Interest rates go up, but the substantial rise in labor supply improves returns on capital so much that private investment rises in equilibrium. This furthers demand pressures, contributing to higher interest rates. In the medium- to long run, output rises significantly, and so does household disposable income. Thus, private savings rebounds in real terms, although its ratio to GDP is permanently lower than in the baseline. With a slightly higher deficit, the national savings ratio falls permanently in this case, although again mostly due to a denominator effect.

**Figure 6. Decrease in Pension Benefits: Impact on Macroeconomic Variables**  
 (Deviations from steady state. Periods correspond to years.)



**Figure 7. Increase in Retirement Age: Impact on Macroeconomic Variables**  
 (Deviations from steady state. Periods correspond to years.)



#### D. Conclusion

25. **Current levels of pension spending in Brazil are high by international standards, particularly as the country is now enjoying the peak of its demographic dividend.** The generosity of the system is believed to hold back private savings, investment and aggregate labor supply. If unadjusted, over time, spending pressures here will compromise the achievement of primary surplus' targets without substantially squeezing discretionary spending or further increases in already high—by emerging market standards—income and consumption taxes.

26. **Our simulations suggest important effects on macro variables such as savings and growth of different parametric adjustments that have been used in other countries and might possibly be considered in Brazil.** In this note we discussed the macroeconomic impact of different parametric reform options, starting with the recently approved introduction of a defined contribution scheme for the public sector subsystem. We found that pension reforms increase real private savings and growth, although the elasticities to the implicit fiscal savings are quite different across the different options. Reforms that involve an increase in retirement ages or a decline in average contribution rates are supportive of higher growth through their positive income in labor supply and investment, even if the impact on savings is not necessarily higher than in options mostly focused on a reduction of benefits.

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## II. REAL EXCHANGE RATE APPRECIATION: CAN FISCAL POLICY HELP?<sup>1</sup>

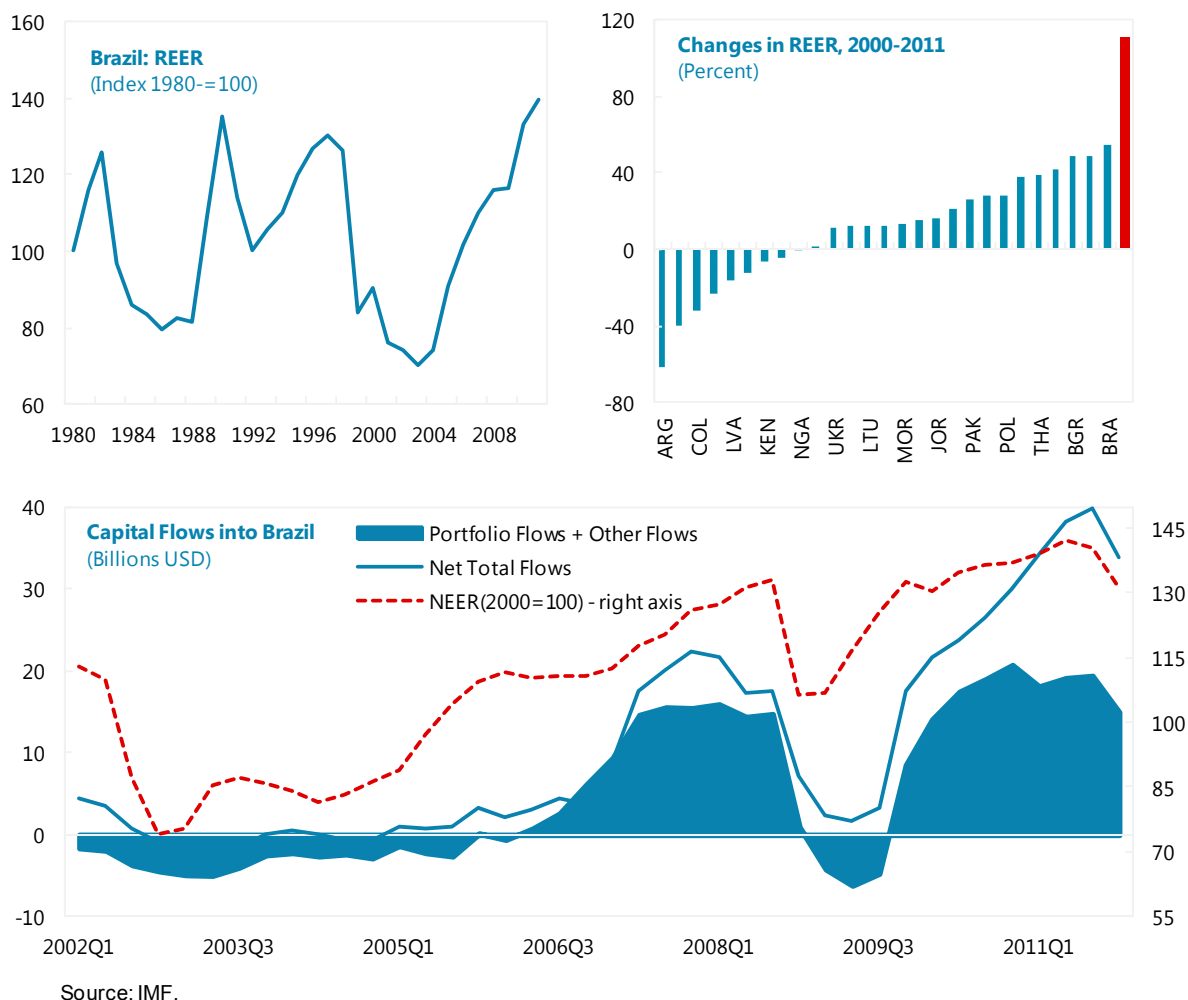
*Brazil has experienced a large real exchange rate appreciation in recent years, generating concerns about competitiveness and prompting the authorities to respond with a combination of policies. This paper shows that fiscal policy can play a role in alleviating these pressures. In particular, we find that a permanent fiscal adjustment is associated with a real exchange rate depreciation over the long term. Furthermore, increases in public investment could also reduce the real effective exchange rate. As the magnitude of these two channels is roughly equal in size, the implication for Brazil is that increasing public investment is likely to ease appreciation pressures but, to be an effective tool, the increase cannot be deficit-financed. This highlights the importance of tackling long-standing budget rigidities to generate fiscal space for public investment.*

### A. Introduction

1. **Brazil's real effective exchange (REER) rate is at historical highs.** Since 2000, the REER has appreciated over 50 percent, surpassing most emerging markets (Figure 1). Among other factors, this partly reflects large terms of trade gains and capital inflows. Indeed, just in 2011 gross capital inflows (defined as direct investment, portfolio investment and other flows) exceeded \$133 billion (5¼ percent of GDP). Strong economic growth prospects in the aftermath of the global crisis and structurally high interest rates have been elements behind this surge. This trend raises important challenges for Brazil because of the potential loss of competitiveness and the increased exposure to volatile capital flows.
2. **The Brazilian authorities have used all aspects of the policy toolkit to manage these pressures.** The exchange rate has appreciated, the macro-policy mix has been adjusted, and reserves have been built. Furthermore, macroprudential measures (such as reserve requirements limiting short dollar position of banks) and capital flow management measures (notably the tax on foreign purchases of domestic bonds and equities, “IOF”) have been used in an adaptive manner to stem the large inflow of foreign capital and to slow the pace of nominal appreciation (see Benelli et al, 2011 for further discussion of these issues). Notwithstanding these efforts, the reality is that the real effective exchange rate in Brazil remains somewhat overvalued.

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<sup>1</sup> Prepared by Marialuz Moreno Badia and Alex Segura-Ubiergo.

**Figure 1. Real and Nominal Effective Exchange Rate, Trends**

3. **In this context, we ask to what extent fiscal policy can help reduce these appreciation pressures.** Several strands of the literature have highlighted possible channels through which fiscal policy can indeed affect the REER (see section B). To be sure, fiscal policy is often cited as an important instrument in the policy toolkit available to countries preoccupied with this issue. For example, Ostry et al. (2010) highlight “using available scope to tighten fiscal policy” as a fundamental part of the macroeconomic response to capital inflows when there are concerns about excessive exchange rate appreciation. At the same time, theoretical analysis and the empirical evidence to date are somewhat inconclusive about the effect of fiscal policy on the real exchange rate.

4. **The purpose of this paper is to assess empirically the relationship between fiscal policy and the REER in emerging markets and draw policy implications for Brazil.** Specifically, the paper analyzes whether (1) fiscal adjustment can have a permanent effect on the REER; and (2) to what extent the composition of public spending can play a role. Overall, the findings in this paper suggest that both fiscal adjustment and an increase in

public investment are associated with a reduction in the real exchange rate. The strength of these two channels is approximately the same for Brazil, which suggests that increases in public investment are likely to reduce appreciation pressures only to the extent that they are financed through a compositional shift within the budget (i.e. reducing government consumption to increase public investment) rather than financed via additional public debt. The rest of the paper is organized as follows: section B briefly reviews the literature. Section C describes the data and model specification. Section D presents the results. Section E draws policy implications for Brazil and section F concludes.

## B. Literature

5. **While exchange rates are one of the most studied topics in international economics, most papers analyzing their determinants do not focus on fiscal variables.**

The empirical literature on the long-term behavior of exchange rates is dominated by attempts to test the PPP theory. In the international finance literature, the focus is more on short-term dynamics, with an emphasis on tests of the uncovered interest parity theory. These papers focus mostly on the interaction between monetary policy, interest rates and the nominal exchange rate.<sup>2</sup>

6. **Moreover, there is no consensus in the existing theoretical literature about the relationship between fiscal policy and the real exchange rate:<sup>3</sup>**

- In *Keynesian models*, an expansionary fiscal shock raises the demand for home goods and money, thereby inducing a real appreciation either through higher interest rates and arbitrage capital inflows or a rise in domestic prices (see, Mundell, 1963; and Flemming, 1962).<sup>4</sup> However, Sachs and Wyplosz (1984), argue that the Mundell-Fleming framework ignores a number of critical factors that may be associated with a different result.<sup>5</sup>
- The *composition of government spending* could also matter. In particular, increases in government spending—whether tax or debt financed—will result in a real appreciation if skewed toward nontradable goods. The effect of public investment, on the other hand, is ambiguous. An increase in public investment may lead to a real appreciation if it raises productivity in the tradable sector through the Balassa-

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<sup>2</sup> See Abhyankar, Sarno and Valente (2009); Rime, Sarno and Sojli (2009); Sarno and Taylor (2001); Engel and West (2005) or Mark (2005).

<sup>3</sup> For a review of the literature, see Abbas et al, 2011.

<sup>4</sup> Goods market clearing will result in a nominal appreciation assuming prices are sticky.

<sup>5</sup> These include (i) the growth of public debt that may follow a fiscal expansion; (ii) the fiscal measures that may have to be taken to service growing debt; (iii) the wealth and portfolio implications of current account deficits induced by the fiscal expansion; and (iv) forward looking expectations in the asset markets.



Samuelson mechanism (see, Balassa, 1964; and Samuelson, 1964). But the opposite effect may result if public investment disproportionately increases productivity in the nontradables sector. Moreover, if productivity increases symmetrically in both sectors, there will be no impact on the real exchange rate (Galstyan and Lane, 2009).

- In *real business cycle models*, increases in government spending trigger a decline in domestic private consumption and an increase in labor supply leading to a real appreciation (see, Backus et al, 1994). In contrast, more recent models find that, under incomplete financial markets this is not necessarily the case (Kollmann, 2010). In particular, when faced with an increase in government spending, domestic households experience a negative wealth effect and, thus, they work harder and increase domestic output. Limited risk sharing exacerbates the negative wealth effect, with the resulting supply-side response leading to a deterioration of the country's terms of trade and real exchange rate depreciation.

7. **The empirical evidence is also relatively inconclusive.**<sup>6</sup> Results vary depending on the methodology, specification, and sample used in the estimation. For example, Cardarelli, Elekdag, and Kose (2007) estimate a model based on a cross-section of countries (including advanced and emerging economies) and show that real appreciation and demand growth is more contained in countries that respond to capital inflows by pursuing a tighter fiscal policy in the form of slower growth of government expenditure. In the same direction, IMF (2008) and Ricci et al (2008) estimate panel cointegration models and find that an increase in government consumption appreciates the REER. Guajardo et al (2011) use a historical approach to identify changes in fiscal policy in advanced economies and find that the real exchange rate depreciates in response to fiscal consolidation. On the other extreme, several studies based on dynamic VARs have found that fiscal expansions in advanced economies are associated with real depreciations. For example, Kim and Roubini (2008) find that an increase in the government primary deficit induces a real exchange rate depreciation for the United States. Similarly, Monacelli and Perotti (2007) look at the United States, United Kingdom, Canada, and Australia and show a negative relation between government spending and the real exchange rate.

### C. Data and Econometric Methodology

8. **Given data constraints, we focus on a parsimonious set of economic fundamentals to explain the REER.** Our sample covers an unbalanced panel comprising

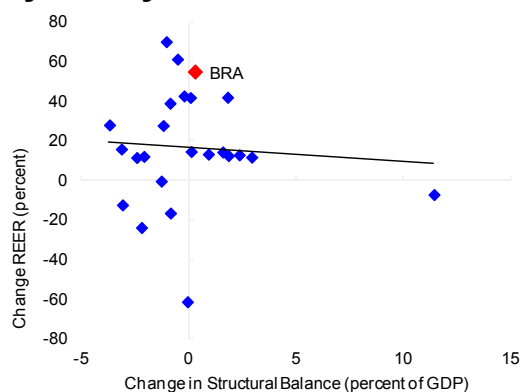
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<sup>6</sup> The relationship between fiscal policy and the real exchange rate has been much less studied than the relationship between fiscal policy and the current account balance. For example, in a comprehensive review of the literature, Abbas et al, 2011 look at 20 papers studying the impact of fiscal policy on the current account balance, and only 5 analyzed the impact on the real exchange rate as well. Most studies find a positive relationship between budget balances and the current account.

28 emerging economies for the period 1983–2011.<sup>7</sup> In the baseline model, we relate the real effective exchange rate to five underlying determinants drawn from the literature:<sup>8</sup>

- *Relative GDP per capita (GDPPC)* in constant 2005 U.S. dollars is measured relative to a weighted average of trading partners. Since it works as a proxy for the level of productivity, we expected to find a positive correlation between GDPPC and the REER in line with the Balassa-Samuelson conjecture. Also, richer countries tend to spend more on services that have higher income elasticity of demand (see, Bergstrand 1991) which would result in a higher real exchange rate.
- *Balance of goods and services (TB)* is measured as ratio of GDP and is used as a proxy for the international investment income. In steady-state, the trade balance surplus should equal the international investment income deficit and, thus, we expect to find a negative relation between the TB and the REER.<sup>9</sup>
- *Structural balance (SB)* is defined as the non-financial public sector cyclically-adjusted balance excluding one-off adjustments. Since we want to focus on discretionary fiscal policy we prefer to use the SB as opposed to the headline fiscal balance. Also, by using the SB we limit endogeneity problems as the effect of automatic stabilizers is excluded in this measure (although the possible endogeneity effect from countercyclical fiscal policy is not corrected).<sup>10</sup> We hypothesize that a

Figure 2. Change in REER and Structural Balance, 2000-2011



Sources: IMF; and staff's calculations.

<sup>7</sup> The time dimension varies depending on countries/variables. For a description of the variables and a list of countries, see Appendix I.

<sup>8</sup> Empirical analyses differ in their choices of the underlying real exchange rate fundamentals, sometimes because of data constraints. Alternative specifications were also estimated and some of these results are reported in the robustness checks. We did not include a measure of systemic risks in our estimation, such as VIX, since it is unlikely it would affect the REER long-term dynamics and the effect would in any case be wiped out once a time variable was included.

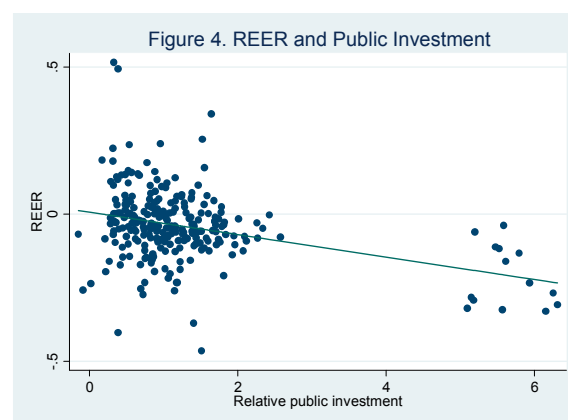
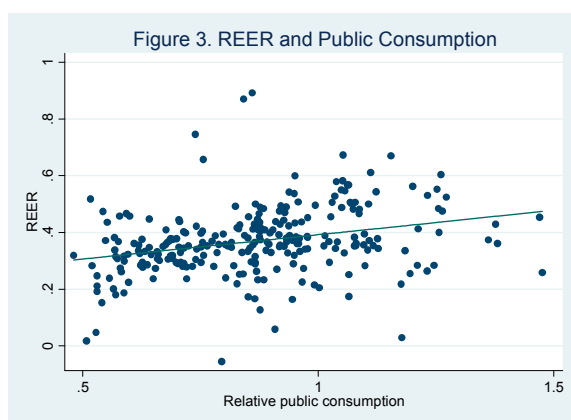
<sup>9</sup> Standard intertemporal macroeconomic models predict debtor countries will need a more depreciated real exchange rate to generate trade surpluses necessary to service their external liabilities.

<sup>10</sup> An alternative to deal with the endogeneity problem would be to use historical documents to identify changes in fiscal policy as has been done in the literature looking at the impact of fiscal policy on growth (see, for example Romer and Romer, 2010). One limitation of this approach, however, is that retrospective estimates of measures are rarely available and using contemporaneous assessments could be misleading since the size of the

(continued)

higher SB will be associated with a depreciation of the real exchange rate, in line with the conventional Keynesian model. Preliminary evidence seems to suggest that this is the case, i.e. there is a negative relation between the changes in the structural balance and the changes in the real exchange rate (Figure 2).

- *Relative public consumption (PC)* is defined as government consumption as a share of GDP relative to a weighted average across trading partners.<sup>11</sup> We measure this variable in relative terms in order to capture the forces driving the structure of relative prices captured by the real exchange rate. We expect an increase in public consumption to raise the relative demand for nontradables, thereby leading to a real appreciation (Figure 3).
- *Relative public investment (PI)* is defined as government investment as a share of GDP relative to trading partners. As discussed above, the effect of PI on the real exchange rate is ambiguous. Public investment will lead to a real appreciation (depreciation) if it improves disproportionately productivity in the tradable (non-tradable) sector. If, on the other hand, productivity improves symmetrically in the tradable and nontradable sectors, there will be no impact on the real exchange rate. Figure 4 indicates there could be a negative relationship between public investment and the REER in our sample.



Sources: IMF; and staff's calculations.

Note: Figures 3 and Figure 4 show partial residual plots.

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fiscal adjustment ex-post may differ from what policymakers believed ex-ante. In any case, Granger-causality tests seem to indicate that the REER does not cause movements in the structural balance.

<sup>11</sup> For each country we focus on the top trading geographic destinations of its exports that account for at least 80 percent of exports during the period 1980–2010.

9. **Following Ricci et al (2008) and Galstyan and Lane (2009), we estimate a panel dynamic OLS (DOLS) to establish the long-run relation between the explanatory variables and the real exchange rate:**

$$y_{it} = \alpha_i + t + \beta' x_{it} + \sum_{j=-1}^{j=1} \gamma' \Delta x_{it-j} + \epsilon_{it} \quad (1)$$

where  $x$  is a vector including the explanatory variables described above and  $t$  is a time variable. In this model  $\beta$  is the vector of long-run cointegrating coefficients,  $\Delta$  denotes the first-difference operator and  $\gamma$  is the vector of coefficients of leads and lags of changes in the determinants<sup>12</sup>, and  $\epsilon_{it}$  is the residual term. Fixed effects are necessary because the real effective exchange rate measures are index numbers, making their levels not comparable across countries. They also account for time-invariant country-specific factors, reducing the omitted variable bias. We favor the use of a panel DOLS because: (1) given the limited length of the sample, estimating separate real exchange rate equations for each country would result in imprecise estimates; and (2) data series are non-stationary.<sup>13</sup>

#### D. Results

10. **Our results show that fiscal policy has a non-negligible permanent effect on the REER:**

- *Permanent fiscal adjustment is generally associated with a depreciation of the real exchange rate* (Table 1, columns 1 and 3). The estimated coefficient of the structural balance is about -0.017. Since the dependent variable is estimated in logs, this means that an improvement in the structural balance of 1 percent of GDP would imply a depreciation of the real exchange rate of 1.7 percent over the long term. This is line with the results of Guajardo et al (2011) for advanced economies who find for a sample of advanced countries that a 1 percent of GDP consolidation is associated with a 1.57 percent real depreciation.
- *The composition of spending also matters.* An increase in relative government investment depreciates the real exchange rate in the long run while government consumption does not have a statistically significant impact (Table 1, columns 2 and

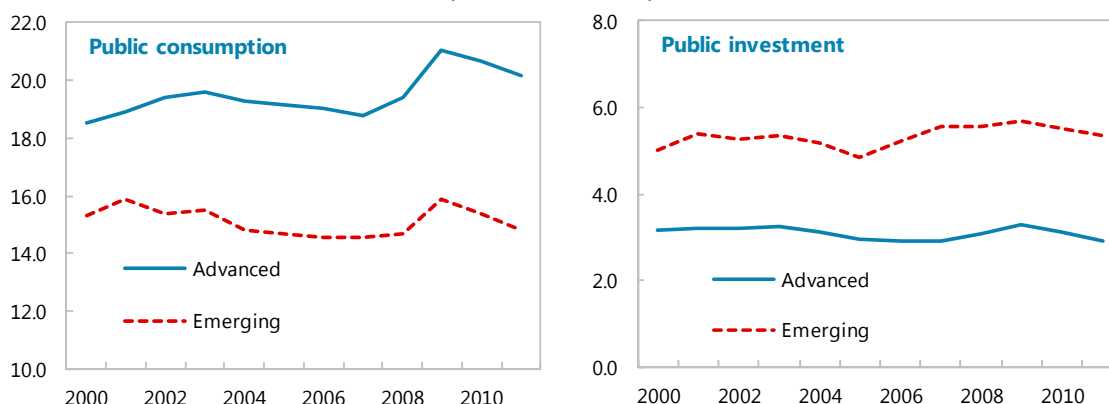
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<sup>12</sup> The choice of one lead and lag is dictated by the sample length.

<sup>13</sup> Standard panel unit root tests do not reject the null hypothesis of a unit root for the real exchange rate. In addition, the tests indicate nonstationary for several of the explanatory variables (trade balance, structural balance). The DOLS methodology adds leads and lags of first differences of right-hand side variables to the set of regressors in order to wipe out the correlation of the residuals with the stationary component of the unit root process of the explanatory variables. Since this introduces serial correlation of the residuals, we use the Newey-West correction method to correct the standard errors. The DOLS residuals were found to be stationary using panel unit root tests, which is consistent with panel cointegration.

3).<sup>14</sup> As an illustration of the effect of these relativities, a 1 percentage point increase in relative public investment in Brazil would mean increasing public investment by 7½ percentage points of GDP; such a sizable increase would be associated with 12.6 percent depreciation in the real exchange rate. These results are in contrast with findings for advanced economies where government consumption appreciates the real exchange rate while public investment does not have an effect (Galstyan and Lane 2009). A possible explanation for this difference is that public investment is more likely to increase productivity in the nontradable sector among emerging markets given likely lower levels of infrastructure development. An additional argument could be associated with the different composition of government spending: emerging markets have relatively higher public investment but lower public consumption compared to advanced economies (Figure 5).<sup>15</sup>

**Figure 5. Composition of Government Spending**  
(Percent of GDP)



Source: IMF, *World Economic Outlook*.

11. **Several sensitivity analyses confirm the robustness of these results.** The first question is whether these findings are driven by some groups of countries. In particular, Asian emerging economies have particularly large investment rates that could explain these results. Thus, we begin by estimating the model adjusting for possible outliers and find a similar message as in our baseline specification with the size of the coefficient on investment being only slightly smaller (Table 1, column 4). Also, estimating the model with a dummy for Asia yields the same results. Second, we look into a different measure of fiscal adjustment. In particular we use the structural primary balance instead of the overall structural balance. This variable may be more accurate to capture the true policy stance as

<sup>14</sup> An alternative specification with time dummies shows relative public consumption to have a positive significant effect but this result is not robust and thus we do not report it in here.

<sup>15</sup> Brazil has public investment ratios closer to the average of advanced economies; nevertheless, there are sizable infrastructure gaps, suggesting potential productivity gains from public investment could be large.

interest rates (which are outside the control of the government) may fluctuate distorting the size of fiscal adjustment. Consistent with our previous results, we find that an increase in the structural primary balance depreciates the REER, although the impact is smaller (Table 1, column 5). Finally, we introduce capital inflows as an additional control and results remain unchanged (Table 1, column 6). Interestingly, though, capital inflows do not seem to have an effect on the REER over the *long term* irrespective of whether we use portfolio inflows or other inflows as our preferred measure.<sup>16</sup> This is a question we leave for further investigation in future research given our focus on fiscal policy variables.

### E. Implications for Brazil

**12. What role can fiscal policy play in efforts to contain real exchange appreciation pressures in Brazil?** In order to make an assessment it is important to look at fiscal performance in Brazil and place it in an international perspective.

- *Fiscal policy.* Since the introduction of the Fiscal Responsibility Law in 2000 Brazil has maintained primary surpluses of around 3¼ percent of GDP, one of the highest among emerging markets (Figure 6). However, the overall deficit is still relatively high—because of large interest payments. In terms of the fiscal policy stance, there was a large adjustment during the period 2002–2008. This allowed the creation of buffers that were used in part during the crisis in the form a discretionary stimulus.<sup>17</sup> Following a large fiscal withdrawal in 2011, the structural deficit has declined to 3¼ percent of GDP, still larger than pre-crisis levels. Further improvements will likely require addressing budgetary rigidities going forward.
- *Composition of spending.* Relative to other emerging markets, Brazil is an outlier. In particular, public consumption, at 21¼ percent of GDP in 2011, is one of the highest among emerging markets and almost double the level of peers in Latin America (Figure 7). Public consumption in percent of GDP has increased by 2 percentage points in Brazil since 2000, in contrast to most other emerging markets where it has declined. This is striking taking into account that public consumption does not include transfers (where increases have been large). On the other hand, public investment in Brazil has increased somewhat since 2000 but, at about 2½ percent of GDP, is less than half the average of other emerging markets. Moreover, the level of

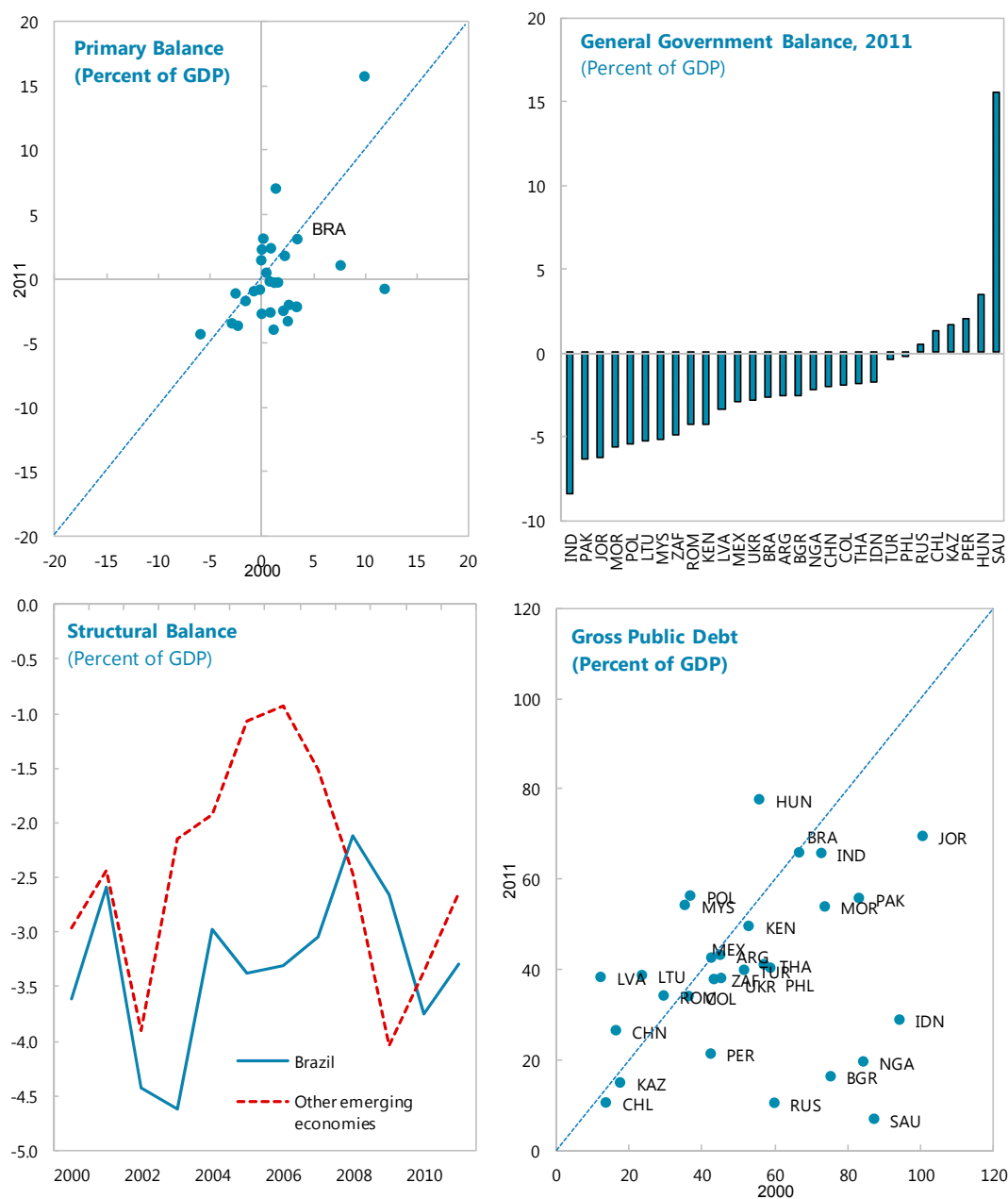
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<sup>16</sup> Nevertheless, in an alternative specification (not reported here) we find that capital inflows have a significant impact on the REER for Brazil although the effect is relatively small.

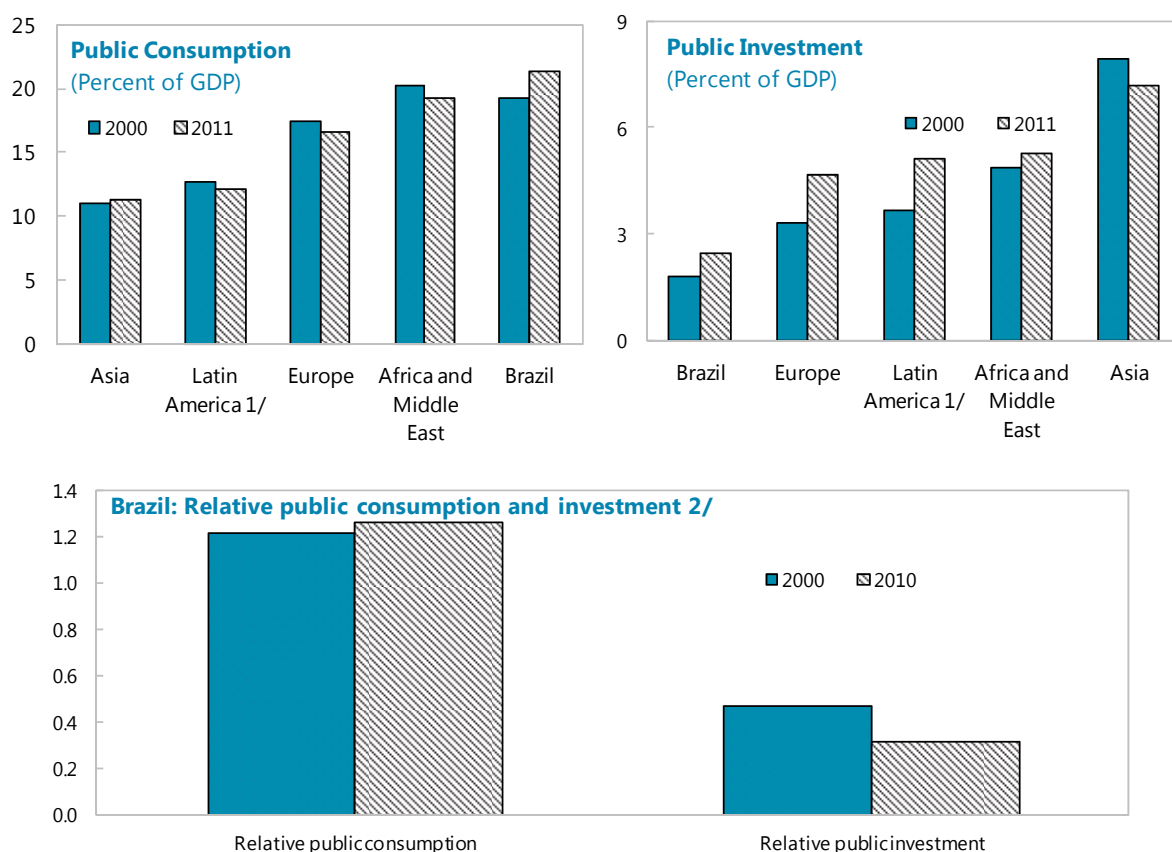
<sup>17</sup> Public gross debt fell from 79.8 percent of GDP in 2002 to 63.5 percent of GDP in 2008 reflecting this effort. Moreover the composition of debt improved dramatically with substantial reductions in external and short-term indexed debt. Nonetheless, for some perspective, it is useful to recall that debt levels today are the same as in 2000. This reflects partly the spike in debt associated with the economic shock Brazil experienced in 2002–03, as well as the impact on debt of the stimulus extended during 2009–10 to offset the effects of the global crisis.

public investment is now 70 percent below that of trading partners (a marked deterioration since 2000). This evidence suggests that, by reallocating spending, Brazil could make some space for public investment and reap additional benefits.

**Figure 6. Emerging Markets: Fiscal Performance**



Sources: IMF, World Economic Outlook; and staff's calculations.

**Figure 7. Emerging Markets: Composition of Government Spending**

Sources: IMF, *World Economic Outlook*; and staff's calculations.

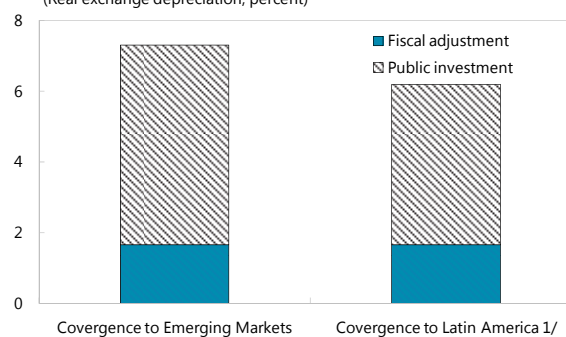
1/ Excluding Brazil.

2/ Relative public consumption (investment) is calculated as the ratio of Brazil's public consumption (investment) in percent of GDP to a weighed average of its trading partners' public consumption (investment) in percent of GDP. A number above 1 means Brazil has higher public consumption (investment) in percent of GDP than is trading partners.

13. **Simulation analysis suggests that fiscal policy in Brazil could help reduce real appreciation pressures over the long term.** In particular, a 1 percent of GDP increase in public investment in Brazil would lead to a 1.7 percent real depreciation. However, this is roughly the same effect but with an opposite sign as a corresponding 1 percent of GDP deterioration of the structural balance. Thus, if both investment and the structural deficit were to increase by similar amounts, the REER would not change. In other words,

**Figure 8. Brazil: Simulation Analysis**

(Real exchange depreciation, percent)



Sources: IMF, *Information Notification System*; *World Economic Outlook*; and staff's calculations.

1/ The countries included in Latin America are: Argentina, Colombia, Peru, and Mexico.



increasing public investment could only help if accompanied by offsetting measures to generate savings (for example, by reducing public consumption). To put this into context, we consider two scenarios. *Scenario 1* assumes Brazil improves the structural balance by 1 percent of GDP. In addition, we assume public investment in Brazil converges to the level of its Latin American peers. This would require finding additional fiscal space of 2½ percent of GDP. *Scenario 2* assumes the same improvement in the structural balance but public investment converging to the average in emerging markets (requiring fiscal space of 3¼ percent of GDP). These scenarios imply that an appropriate combination of fiscal policy actions could, *ceteris paribus*, support a real depreciation in the range of 6¼ to 7¼ percent in the long term (Figure 8).

14. **In order to reap these benefits, it would be important for Brazil to create fiscal room.** Our results show that strengthening the structural fiscal position could play a role in alleviating appreciation pressures. As an added benefit, this could help reducing real interest rates, thus creating additional fiscal space (see, Segura-Ubiergo, 2012). A particularly promising avenue to facilitate a real depreciation would be to increase public investment, which is already an important priority for the authorities as demonstrated in their strategy under the Growth Acceleration Program (*Programa de aceleração do crescimento*, PAC). Nevertheless, to be an effective tool for the exchange rate, the increase in public investment would need to be financed by savings, and not by an increase in the deficit. A similar logic applies to financing investment through quasi-fiscal operations (such as policy lending to BNDES). Beneficial effects on the exchange rate would likely be maximized if these operations were matched by higher public savings. Else the external current account could deteriorate, pressing up the real exchange rate. Moreover, the interest subsidy on BNDES lending directly lowers net public saving, while an increase in contingent liabilities here could gradually push up risk premia. Similarly, public investment projects undertaken via concessions or PPPs could also result in higher current account deficits (if not accompanied by an increase in public savings) and crowding-out of private investment.

15. **The most promising route to create that space would be lowering government consumption.** Achieving this end would require reducing fiscal earmarking/mandates that lock current spending at very high levels and create a bias against public investment. While some of these earmarks/mandates, like those for health and education spending floors have positive social objectives in their design, improvements at the margin in their design could be explored. The priorities could include (i) reducing revenue-earmarking and mandatory spending in combination with more effective medium-term planning and rolling multi-year budget plans; and (ii) strengthening the costing, monitoring, and evaluation of public spending with a view to increasing its efficiency.

## F. Conclusions

16. **Fiscal policy in emerging markets does have an effect on the real exchange rate.** This works through two channels. First, increases in public savings (i.e. a stronger structural fiscal position) could reduce appreciation pressures over the long term and hence might be an important instrument to ensure higher competitiveness. Second, the structure of government spending matters, with increases in public investment leading to a reduction in appreciation pressures. This has important implications for Brazil since current spending accounts for almost 90 percent of total spending and, thus, there is scope to increase public investment. One caveat, however, is that both channels have roughly the same impact on the REER. What this means in practice is that increases in public investment that are not accompanied by offsetting measures to reduce current spending would likely have little effect on the REER. Therefore, creating room for investment by a reallocation of public spending would have multiple beneficial effects, both for improving public service delivery but also for helping address real appreciation pressures. Just as an example, Brazil would need to increase public investment by  $2\frac{1}{2}$  to  $3\frac{1}{4}$  percent of GDP to converge to levels in emerging market peers. Given already high primary surpluses, achieving this solely through fiscal adjustment is likely to be challenging, which highlights the importance of addressing budgetary rigidities to reallocate resources from public consumption to investment. Equally important to increase public investment would be to improve project's delivery and spending execution. This is an area where lack of capacity in planning and management, difficulties in obtaining necessary licenses and procedural problems have resulted in long delays in the past (for further discussion, see OECD, 2011).

Table 1. Real Effective Exchange Rate: Long-Run Estimates

	(1)	(2)	(3)	(4)	(5)	(6)
Structural balance	-0.018 (0.00)***		-0.017 (0.00)***	-0.018 (0.00)***		-0.016 (0.00)***
Relative government consumption		-0.027 (0.62)	0.164 (0.30)	0.001 (1)	0.119 (0.47)	0.184 (0.24)
Relative government investment		-0.044 (0.08)*	-0.126 (0.01)***	-0.114 (0.00)***	-0.144 (0.01)***	-0.129 (0.01)***
Relative GDP per capita	0.127 (0.05)**	-0.013 (0.00)***	0.139 (0.04)**	0.121 (0.03)**	0.161 (0.02)**	0.154 (0.02)**
Balance of goods and services	-0.303 (0.23)	-0.632 (0.00)***	-0.198 (0.43)	-0.278 (0.18)	-0.076 (0.76)	
Structural primary balance					-0.013 (0.02)**	
Capital inflows						0.095 (0.74)
R <sup>2</sup>	0.60	0.44	0.65	0.54	0.63	0.65
Observations	195	564	190	190	185	145

Notes: The dependent variable is the log of the real effective exchange rate. Structural balance is the structural balance in percent of GDP. Rel. government consumption is relative government consumption as a share of GDP; Rel. government investment is relative government investment as a share of GDP; Rel. GDP per capita is the log of real GDP per capita; Balance of goods and service is as a share of GDP; Structural primary balance is in percent of GDP; Capital inflows are direct investment, portfolio investment and other flows as share of GDP. Hausman tests indicate fixed effects are more appropriate than random effects in our preferred specification.

Asterisks \*\*\*, \*\*, \* indicate significance at 1%, 5% and 10% respectively.

## APPENDIX I. DATA

The sample includes 28 emerging countries for the period 1983 to 2011: Argentina, Brazil, Bulgaria, Chile, China, Colombia, Hungary, India, Indonesia, Jordan, Kazakhstan, Kenya, Lithuania, Malaysia, Mexico, Morocco, Nigeria, Pakistan, Peru, Philippines, Poland, Romania, Russia, Saudi Arabia, South Africa, Thailand, Turkey, and Ukraine. Time span varies depending on the countries with shorter data available for the fiscal aggregates.

Variables are defined as follows:

*Real effective exchange rate* is based on consumer price index and taken from the IMF, Information Notification System.

*Balance of goods and services* is defined as the difference between exports and imports of goods and services. The data are taken from the IMF, *World Economic Outlook*.

*Real GDP per capita (in constant 2005 prices)* is taken from the IMF, *World Economic Outlook*.

*Structural balance* is defined as the overall balance adjusted for the cycle and excluding one-offs. Due to data availability, we take the cyclically adjusted balance for Mexico and Philippines. Cyclically adjusted balance is defined as the overall balance minus cyclical balance whereby the cyclical revenues and expenditures are computed using country-specific elasticities with respect to the output gap. Data are from the IMF, *World Economic Outlook*.

*Public consumption* is defined as current primary spending excluding transfers. The data are based on national accounts and come from IMF, *World Economic Outlook*.

*Public investment* is defined as public gross fixed capital formation. Data come from IMF, *World Economic Outlook*.

*Trade weights* are calculated using *Direction of Trade Statistics* data. For each country we focus on the top trading geographic destinations of its exports that account for at least 80 percent of exports during the period 1980–2010. Because of data limitations, coverage is below 80 percent at the beginning of the sample.

*Capital inflows* are defined as gross flows including direct investment, portfolio investment and other flows. Data are from the IMF, *World Economic Outlook*.

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### III. LOCAL CAPITAL MARKETS: CURRENT STATUS AND ISSUES FOR FURTHER DEVELOPMENT<sup>1</sup>

#### A. Motivation and Background

1. **Financial development is important for fostering economic growth and stability.**

This is a feature of the development process that has been extensively documented in the literatures (see Levine).<sup>2</sup> One of key components in this process is capital market development. For example, deepening the long-term local bond market facilitates the reduction of currency and maturity mismatches on corporations' balance sheets. This also creates alternatives to bank financing that can support efficiency and stability. From investors' point of view, deep and liquid capital markets increase the supply of differentiated assets facilitating investment choices. Perhaps most importantly for emerging markets (EMs), the macroeconomic and financial dislocations experienced following the crises in the late 1990s have led to increased efforts in these countries to develop local capital markets.

2. **Capital market development in Brazil is a key policy issue going forward to foster savings, investment and absorptive capacity in a context of rising capital flows.**

Brazil's savings and investment levels as a share of GDP are still low by international standards. As such, deepening capital markets would be important to increase incentives for savings and allocating these efficiently to investments. Deep and liquid capital markets could also help bolster resilience to capital flows by developing greater absorptive capacity.

3. **This paper reviews the state of play in Brazil and steps for further development.**

It starts by taking stock of the current status of local capital markets in Brazil, including in terms of size, investor base, maturity structure, both for the public and private sector. It then discusses what the key challenges are, and policy options for further development.

#### B. Local Capital Markets—Issues and Status

##### Short-Term Maturity and Low Turnover

4. **Brazil's capital market remains focused on short term instruments.** Most financial contracts among residents are indexed to the overnight interest rate, although there has been a gradual trend towards increasing duration in recent years. This largely short term structure reflects long-standing fundamental factors, including a legacy of past high inflation that typically is associated with a more short-term focus for investing (see Figure 1).

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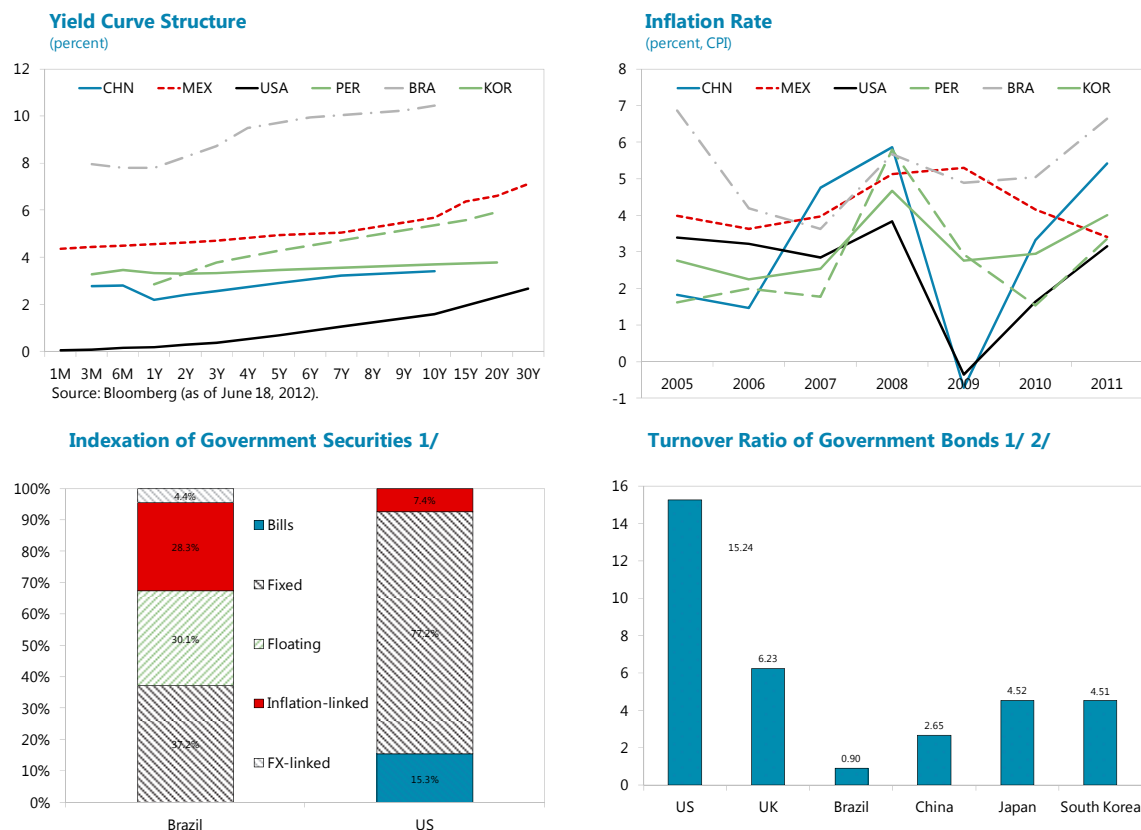
<sup>1</sup> Prepared by Joonkyu Park (MCM)

<sup>2</sup> Levine, R., "Financial Development and Economic Growth: Views and Agenda," *Journal of Economic Literature*, Vol. 35, No. 2. (Jun., 1997), pp. 688-726.



Moreover, the flatness of the yield-curve—a reflection of the high level of short-term interest rates and degree of indexation of debt holders—contribute to a low secondary market turnover ratio, constraining overall market development.

**Figure 1. Variables Related to Short-Term Duration and Low Turnover**



Source: Bloomberg, WEO, Asian Bonds Online and Central Banks

1/ Based on data as of December 2011.

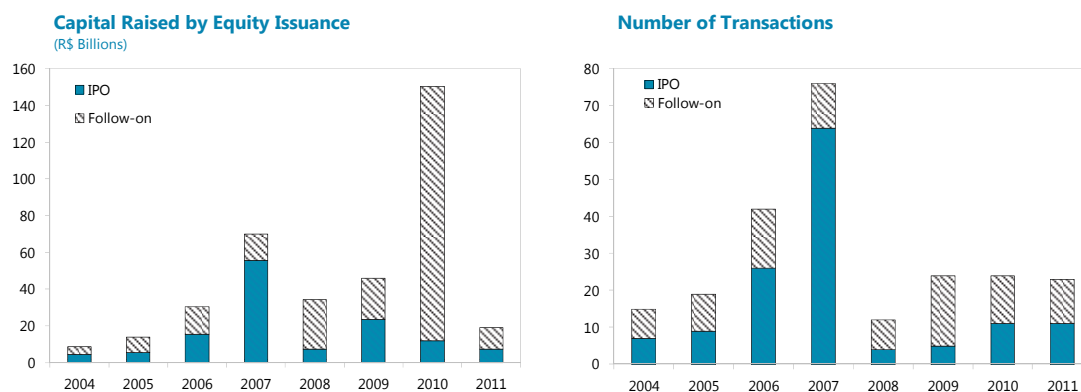
2/ Turnover ratio = total annual trading volume/average debt outstanding

## Equity Market

5. **Brazil's equity market has grown rapidly in terms of both market capitalization and transaction volumes.** Total equity market capitalization was about 55 percent of GDP in 2011 with a diversified investor base including individuals, institutional investors, financial institutions, and foreign investors. This growth has been fueled by a combination of strong market performance and a steady increase in the total quantity of shares. The introduction of the Novo Mercado ("New Market"), which encouraged corporations to adopt higher standards for corporate governance, transparency, and minority shareholder protection, as pre-requisites for listing, has also contributed to further market development.

6. **Despite these gains, the Brazilian equity market still has a small number of listings.** Following a record 76 offerings (IPO and follow on) in 2007, the number of offerings in the past three years has stabilized at lower levels (see Figure 2), in part reflecting weak global financial conditions. The growth in market capitalization and the number of listed companies has slowed in the recent years. Cross-country comparisons show that the number of listed companies is still lower than in advanced economies and Brazil's peers in Asia. Indeed, the share of the top 10 companies' in market capitalization has remained over 50 percent in the recent years, showing limited diversification of issuer base, in line with the experience in several other EMs (see Figure 3).

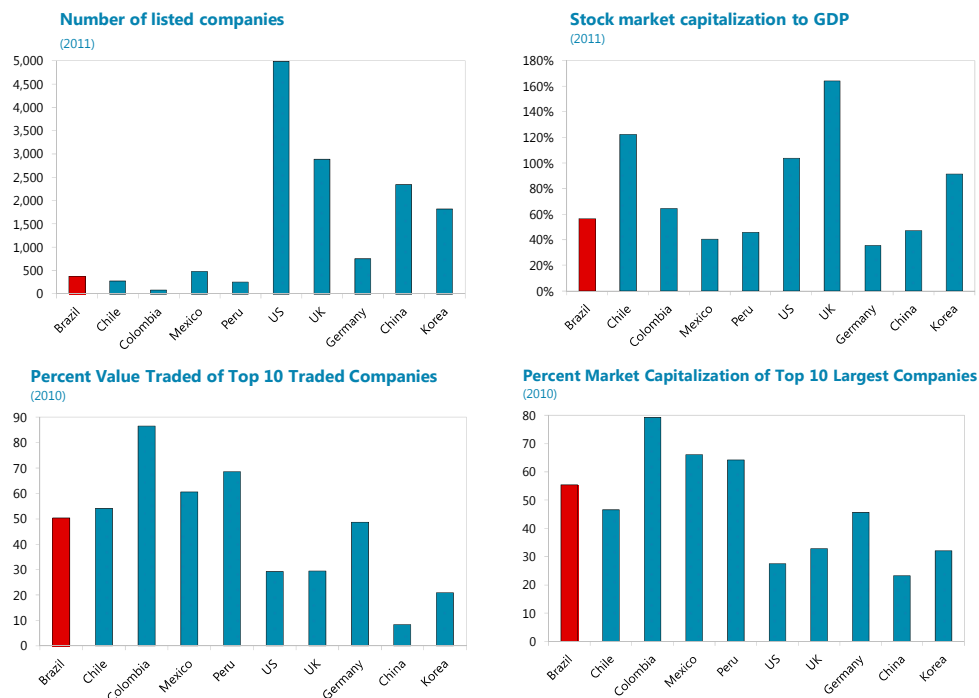
**Figure 2. Recent Developments in Equity Market**



Source: Anbima

Note: 2010 figures include equity offering by Petrobras.

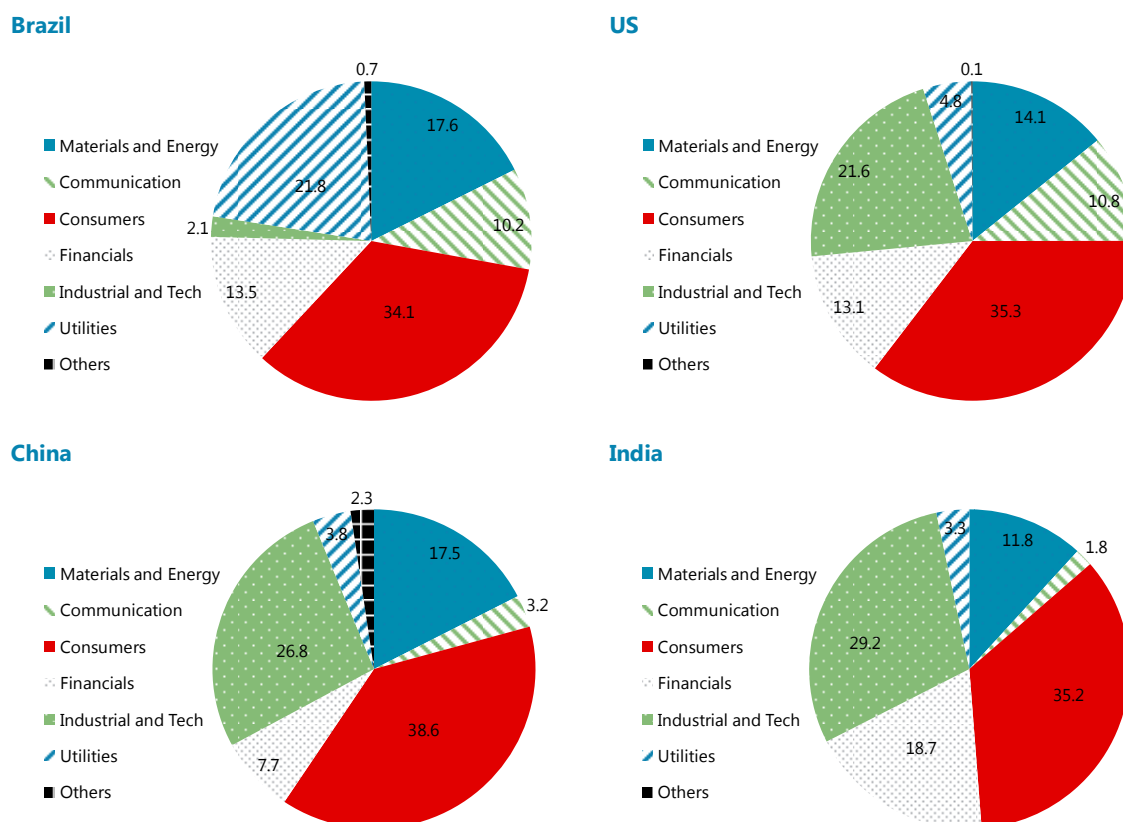
**Figure 3. Peer Comparison of Equity Market**



Source: FinStats and World Federation of Exchanges

7. **More specifically, industry composition in the stock exchange is concentrated in a few sectors.** The major equity index (Bovespa) has large weights in basic materials, energy, and utilities, which are sensitive to the global economic cycle. In contrast, industrial and technology sector take a much smaller share (2 percent level) than in other countries (over 20 percent). This concentration is likely a reflection of the key role in Brazil—including recent growth dynamics—of the commodity sector (see Figure 4).

**Figure 4. Industrial Composition of Stock Exchanges**



Source: Bloomberg

Note: Major Indices: BOVESPA (Brazil), SENSEX (India), Shanghai A (China), S&P 500 (US)

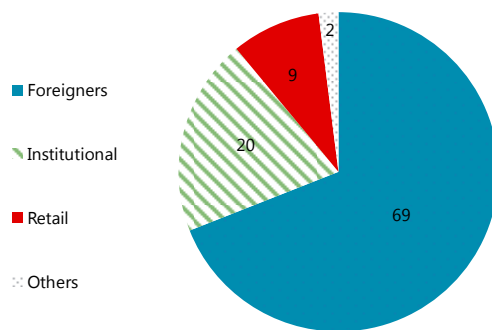
8. **Foreign investors are significant players in the equity market.** Indeed, foreigners are majority investors, especially, in public offering market. Most non-resident investors are domiciled in the U.S. and Europe, introducing an important link between the offering market and conditions overseas (see Figure 5). In August and September 2011, for example, there was no share issuance—several public offerings were canceled or postponed due to investors' concerns on contagion risks from the euro zone. Cross-country analysis also shows that foreigners' share in market capitalization has been higher than in other large emerging economies (see Figure 6).

9. **Local institutional investors in Brazil—pension funds and mutual funds—have been less active in the equity market.** For instance, mutual funds' asset allocation has been concentrated in safe and liquid assets such as government bonds and repo transactions. Pension funds, whose return target is typically set to achieve a certain spread over the rate of inflation in the context of a high short-term interest rate environment, tend to invest in inflation-linked bonds rather than equities. As such, lower interest rates and rising valuations in the equities, if supported by fundamental improvements in corporate prospects, could attract a greater number of companies to go public.

**Figure 5. Investor Composition in IPO and Stock Trading**

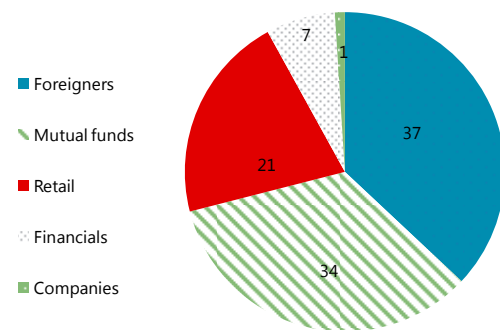
**Investor Composition in IPO**

(Jan - Aug 2011)



**Investor Composition in Stock Trading**

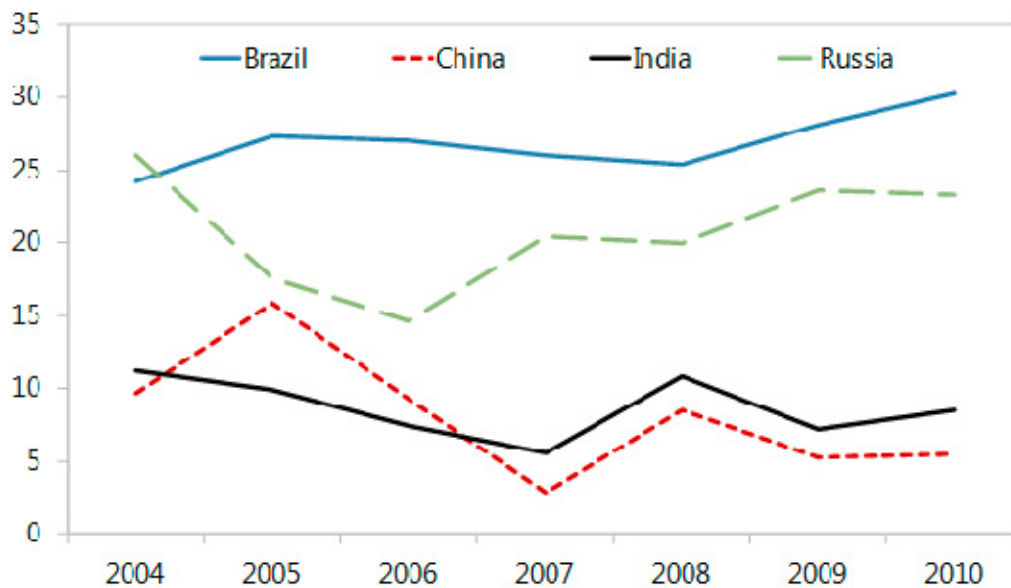
(Jan 2012)



Source: Anbima and BM&F Bovespa

**Figure 6. Foreign Investors' Share in Market Capitalization**

(percent)

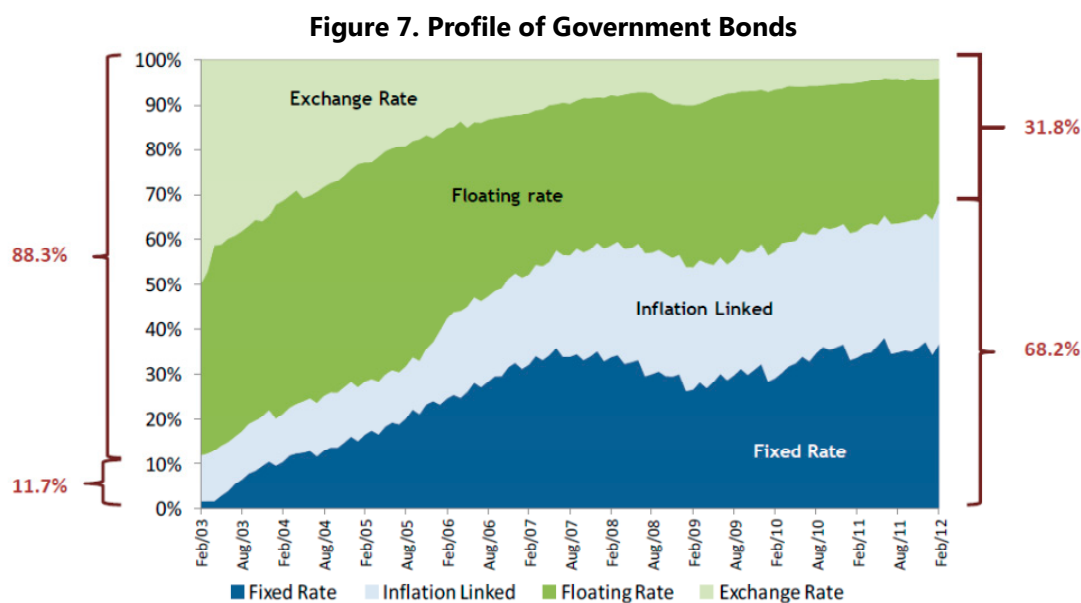


Source: Bloomberg

## Government Bond Market

10. **There has been substantial progress in the development of the government bond market.** Key steps include a lengthening of the yield curve, reduction in external exposure and diversification of the investor base. This has been supported by improved macroeconomic conditions, foreign investors entering the fixed rate segment of local currency government debt, and well designed microstructure reforms regarding issuance policy and auction process. As shown below, the government bond market has become more resilient to various risk factors.

11. **Market risk: the share of fixed rate bonds and inflation linked bonds has increased while the issuance of floating and FX rate linked bonds has decreased.**<sup>3</sup> The combined ratio of fixed rate and inflation linked bonds increased to around 70 percent in 2011 from 12 percent in 2003. The reduction in the public sectors' exposure to changes in short-term interest rate and FX variation has improved the risk profile of public debt (see Figure 7).



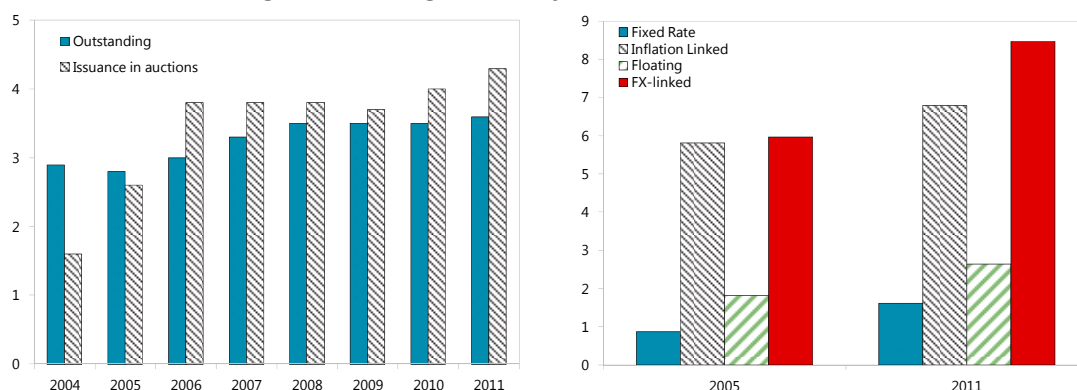
Source: Ministry of Finance

12. **However, extending the maturity of public debt has proved a challenge.** The average maturity of fixed rate government bonds has remained under 2 years while that of all government bonds is just over 3 years (see Figure 8). This may reflect the legacy of

<sup>3</sup> The majority of floating rate securities are linked to the Selic rate and foreign currency denominated securities are subject to volatility in the currency market.

gradual macro stabilization, wherein private investors continue to prefer shorter term variable rate debt or indexed instruments. Indeed, most domestic investors swap their exposure to fixed rates for variable rates in the DI futures market with foreign investors traditionally taking the opposite position. As such, foreign investors have provided important liquidity to fixed rate bonds. However, this could create volatility in case of a sudden exit of these investors from the market.<sup>4</sup> Indeed, the experience during the crisis highlighted the need to develop depth in the investor base for fixed rate bonds. Increased risk aversion in both global and domestic markets led investors to reduce their demand for fixed-rate bonds with net outflows during the crisis period (see Figure 9).

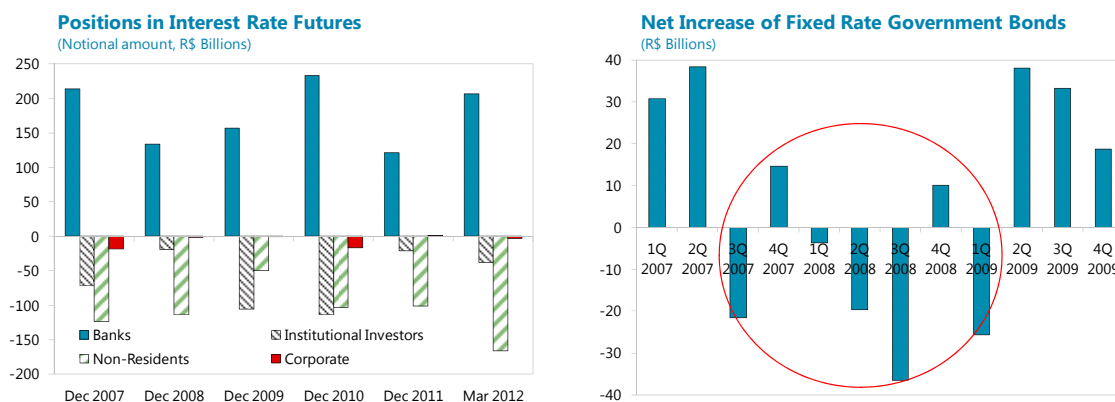
**Figure 8. Average Maturity of Government Bonds<sup>1/</sup>**



Source: Ministry of Finance

1/ In Brazil, the calculation of this indicator focuses on computing all disbursement flows, including payment of interest coupons while, in other countries, the methodology typically considers payments of principal. Brazil's average maturity of bonds could be longer if the calculation is based on only principal payments.

**Figure 9. Investor Base for Fixed Rate Bonds**



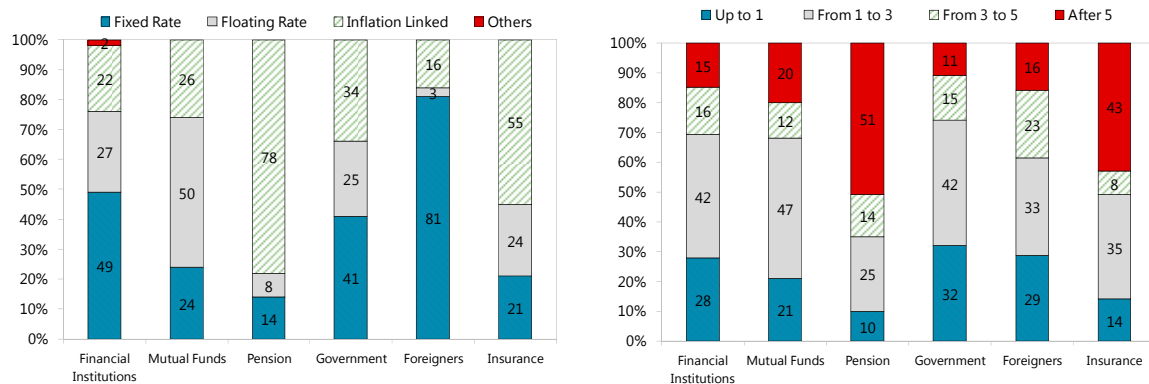
Source: Ministry of Finance, Central Bank and BM&F

<sup>4</sup> There is limited data on the composition of non-resident operations in the derivative market. Arguably, the pay-off structure in the derivatives markets could be more attractive for short-term investors than in the cash market.

13. **Refinancing risk: the concentration ratio of short-term debts—especially less than 1 years—has improved gradually.** The percentage of government debts with less than 12 month maturity decreased from 39.3 percent in 2004 to 21.9 percent in 2011. Also, the share of debts with maturity between 1 and 3 years has shown the same pattern, resulting in more balanced maturity distribution in the bond markets.

14. **Investor base: participation by different investors in the government bond market has grown more diversified.** Of the various actors in this market, banks tend to invest in relatively shorter term bonds to match their short-term liability. Pension funds and insurance companies prefer hedging long-term inflation risks by investing more in inflation linked bonds. Non-residents concentrate their direct exposure to fixed rate instruments, but with maturity less than 3 years. Mutual funds, which tend to be more sensitive to high frequency changes in financial market conditions, have demonstrated a greater preference for floating rate bonds (see Figure 10).

**Figure 10. Each Investor Group's Preference on Government Bonds (as of April 2012)**



Source: Ministry of Finance

## Private Bond Market

15. **The private bond market remains much smaller than that for the government.** The outstanding issuance of corporate bonds has risen to almost 10 percent of GDP in 2011, but the market is still very concentrated in short duration rates, with a limited investor base and less diversified issuers. As such, this suggests that the private fixed income market is not a significant long-term financing source for non-financial corporations.

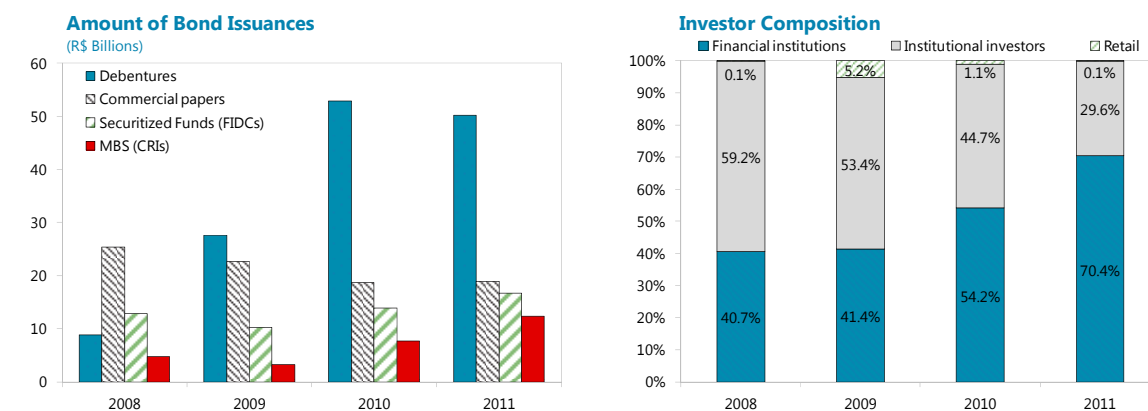
16. **Indexation: Around 90 percent of private bonds are linked to the DI rate, resulting in little incentive for active trading.** The share of fixed rate bonds still remains very low at about 1 percent of total bonds, suggesting that investors remain reluctant to take interest and credit risk in the private corporate sector. Moreover, prime corporations may

have relatively little incentive to issue relatively costly long term debt given that they have access to long term financing from BNDES, indeed at lower than market rates of interest in many cases.

17. **Investor base: about 70 percent of private bonds were purchased by banks in 2011.** Their participation has increased further recently partly because they have faced constraints in expanding consumer loans given increased risk and higher cost in the sector, and therefore have sought alternative higher-yield investment instruments. Liquidity in the secondary market is very limited as many banks tend to hold private bonds until maturity. Retail investors' participation remains low (see Figure 11).

18. **Securitized instruments are rapidly growing, albeit from a very low base.** The most active instrument is the FIDC (Asset Backed Securities), used to securitize a variety of assets including trade receivables and loans, as well as expected revenues in infrastructure projects. FIDCs are targeted to institutional investors, require a credit rating and comprise a subordinated tranche of up to 20 percent of the portfolio. CRIs (Mortgage Backed Securities) are used to securitize mainly loans related to sale of real estate. This product has been one of the fastest growing instruments in Brazil. This is partly due to the product's relatively low starting point, as well as the high marginal funding needs of the real estate sector—a sector that has been growing strongly, partially related to large housing needs in Brazil.

**Figure 11. Private Bond Issuance and Investor Composition**



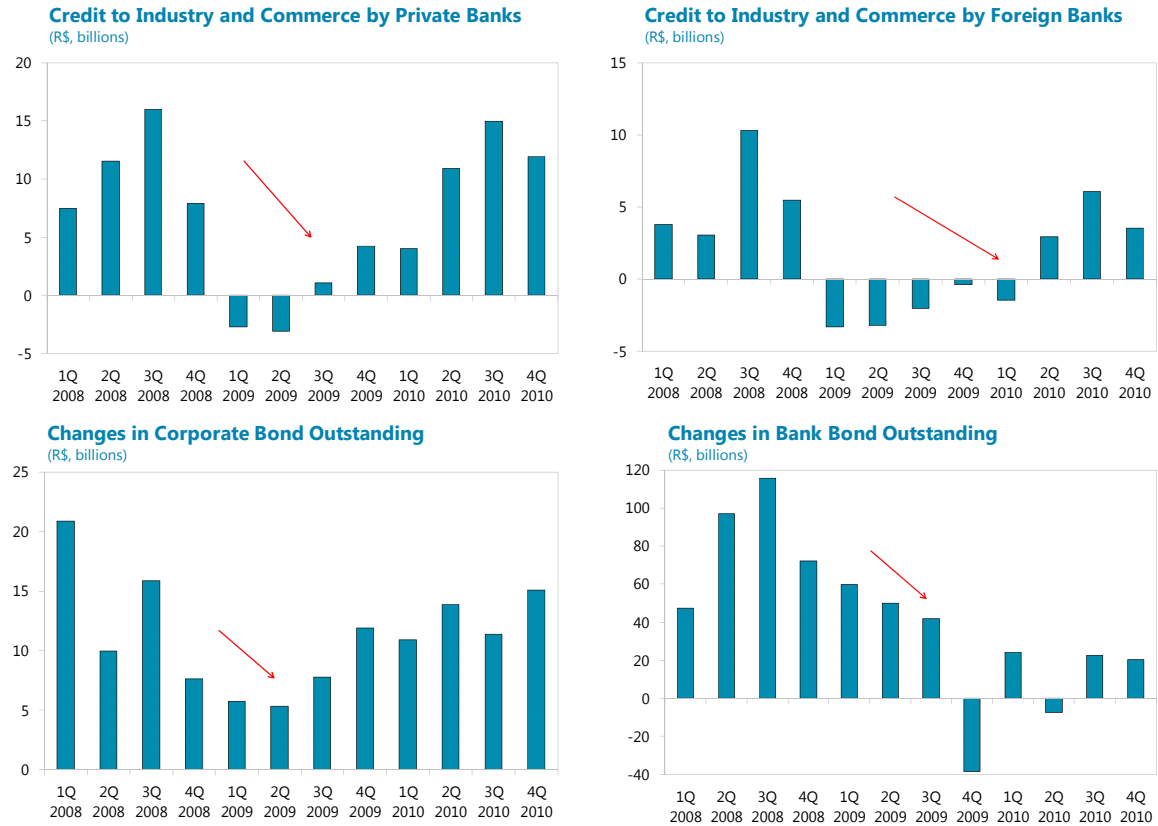
Source: Anbima

19. **The small size of the private bond market also constrains its role.** One of important benefits of a developed private bond market is that it can act as an alternative funding source when corporations' access to overseas markets is limited or in the face of a domestic bank credit crunch. The disruption in the global money and credit markets in 2008 led to a liquidity squeeze for Brazilian corporations and financial firms. However, issuance of private bonds decreased during the crisis period (see Figure 12), reflecting in part the difficulties in efficient pricing and relatively short track records for borrowers. This was a



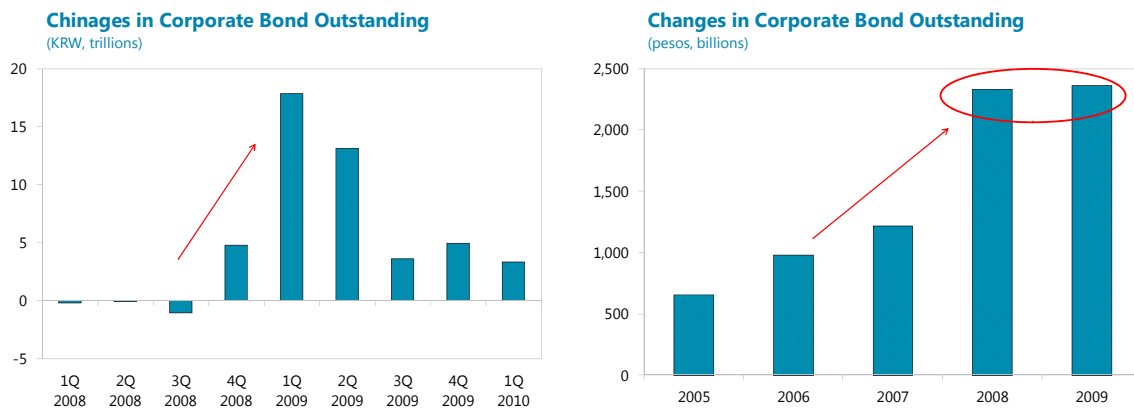
sharp contrast to the experience in other emerging markets such as Korea and Chile where the deeper private bond market served as a buffer, providing an alternative source of funding during the crisis (see Figure 13 and 14).

**Figure 12. Corporate Financing during the Crisis: Brazil**

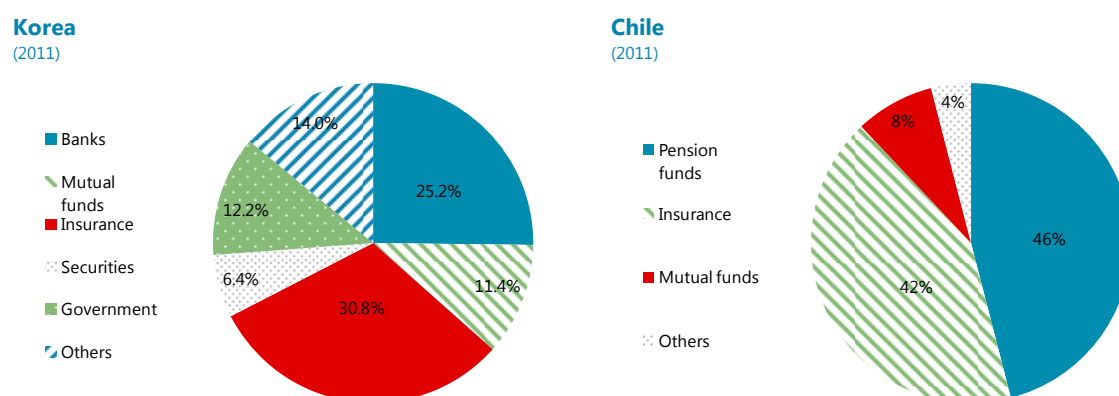


Source: Anbima and Central Bank of Brazil

**Figure 13. Corporate Bond Market during the Crisis: Korea and Chile**



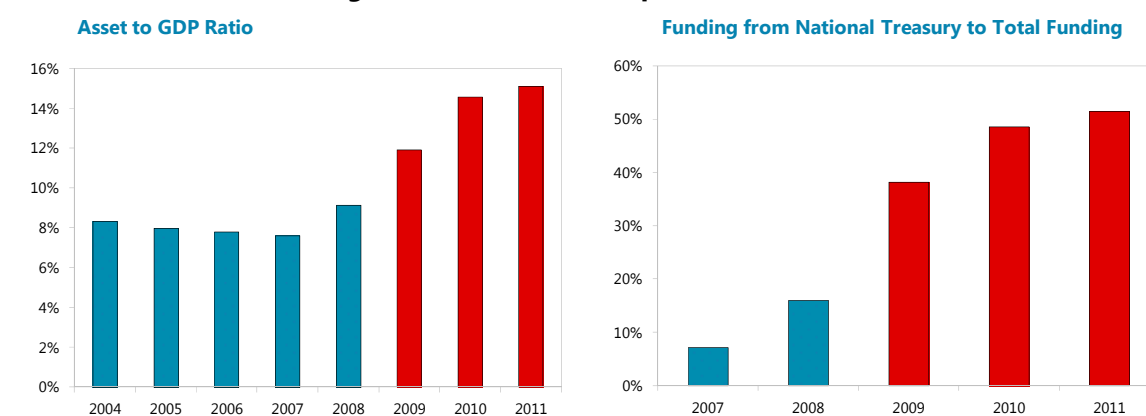
Source: Central Bank of Chile, Superintendency of Securities and Insurance of Chile, and Bank of Korea

**Figure 14. Investor Base in Corporate Bond Market: Korea and Chile**

Source: Bank of Korea and Central Bank of Chile

## Role of BNDES

20. **BNDES has traditionally had an important role in the Brazilian financial system, but its size has doubled in the post-Lehman period.** BNDES has typically been a major source of long-term financing for industry and infrastructure. During the crisis, it played an important counter-cyclical role as private bank credit fell off sharply in 2009 during the height of the Lehman related global tensions. However, it has been accompanied by a doubling of the size of BNDES' balance sheet from 7½ percent of GDP in 2007 to over 15 percent of GDP in 2011 (almost 10 percent financial system lending) (see Figure 15).

**Figure 15: Recent Developments in BNDES**

Source: BNDES

## C. Key Policy Challenges and Options

21. **Overcoming the current challenges and fostering further capital market development will require efforts across a broad policy front.** Significant efforts to realize this crucial agenda are underway and could be deepened further. A *sine qua non* is to

continue to further entrench the important and hard-won gains on macro stability that Brazil has achieved in the last years, including on the fiscal responsibility and inflation targeting frameworks. This continued predictability will further anchor the economy and facilitate a shift from shorter to longer term horizons for investment planning and the structure of finance. Raising savings rates should also contribute to gradually reduce Brazil's high interest rate structure.<sup>5</sup> Continued efforts to build fiscal savings and raise productivity by focusing on physical infrastructure, logistics, and human capital could help a virtuous circle boosting growth potential, underpinned by a dynamic equilibrium of higher investment and higher saving rates.

*Issuers' Side: Enhance supply and attractiveness of long-term instruments*

**22. The authorities have made continuous efforts to build benchmarks at different points along the yield curve.** The aim of this strategy is to further develop the interest rate term structure in the local currency, which would allow better pricing and liquidity of bonds issued both by the government itself and by the private sector. To this end, the authorities have increased the average maturity of the outstanding debt and smoothed its maturity profile. Moreover, in March 2012, the National Treasury carried out the first auction of fixed rate bonds due on January 2023, which will be the new 10-year benchmark fixed rate bond in the domestic market.

**23. The authorities have also led some policy initiatives to encourage investors to adopt new references moving away from short-term indexation.** For example, the main securities exchange (BM&F Bovespa) introduced reference rates for 3 and 6 months aiming at extending the reference rate for investors. In February 2012, the National Treasury undertook securities exchange operations with Extramercado Funds<sup>6</sup> in order to adjust their portfolio. Moreover, the investment policy of these funds has been adjusted such that they must be referenced to one of the Anbima Market Indices (IMA). The exchange operations resulted in a redemption of R\$ 61 billion in securities linked to Selic overnight rate (LFT) and an increase in fixed rate and inflation-linked bonds. A similar exchange program was also conducted with the Government Severance Indemnity Fund (FGTS) as well, resulting in a redemption of R\$ 38 billion in the floating rate bonds. More broadly, there may be a case for trying to lead the market development by issuing longer term debt, albeit initially at a relatively high cost, in order to jump-start the market transformation process towards a better developed yield curve.

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<sup>5</sup> See Segura-Ubiergo (2012).

<sup>6</sup> Extramercado funds comprise the available resources originated from the revenues of non-financial state-owned companies included within the Indirect Federal Administration, such as Eletrobras, Correios and Chesf (it excludes Petrobrás), as well the resources of the Workers' Support Fund (FAT), the Coffee Economy Defense Fund (Funcafé) and the National Education Development Fund (FNDE).

24. **Additional efforts are underway to further increase the attractiveness of capital market investment in Brazil.** The income tax exemption was extended to foreign investors' investments' in long term corporate bonds and infrastructure bonds.<sup>7</sup> The private sector is also keen on this policy agenda. The private capital markets association Anbima launched a "New Fixed Income Market" project to facilitate long-term financing operation. This proposal includes a set of measures aiming to support secondary market liquidity that include standardization of issues and the plan for a liquidity improvement fund as well as liquidity guarantee fund.<sup>8</sup> This proposal has been showing moderate progress. Cemig, one of Brazil's major power generators and BNDESPar, the holding company of BNDES, issued corporate bonds under the guidelines of this project.<sup>9</sup> Some mutual fund managers have started taking Anbima's bond indices—especially inflation-linked bond indices—as benchmarks for their investment funds.

*Investors' Side: Boost potential in mutual funds*

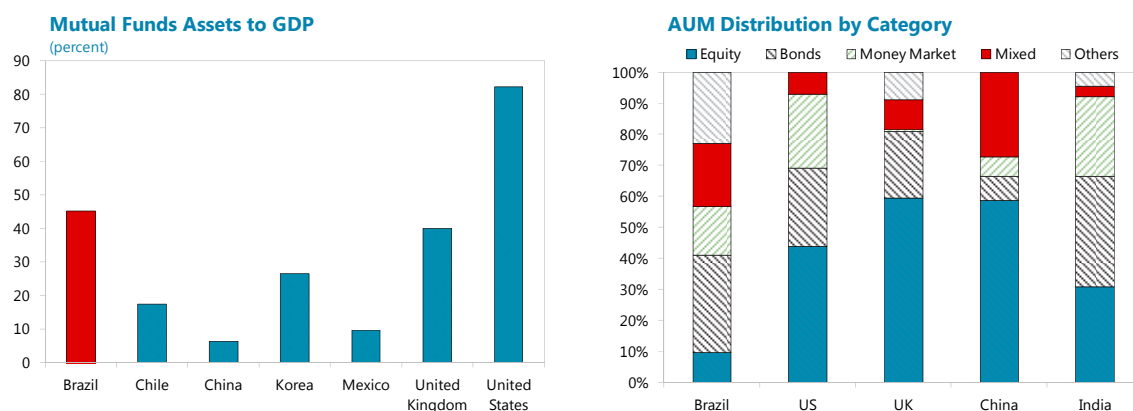
25. **Brazil has the largest mutual fund industry in Latin America, and indeed is large also by international standards.** Nevertheless, the mutual fund industry has been concentrated on short-duration and highly liquid assets, resulting in its being a minor contributor to the growth in the capital markets. In particular, the asset allocation to equity is much lower than in other countries (see Figure 16).

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<sup>7</sup> In October 2008, the Korean authorities introduced tax incentive scheme for long-term (more than 3 years) equity and corporate bond mutual funds to support long-term financing for corporations. This measure contributed to stabilizing investor sentiment and building stronger investor base during the crisis period.

<sup>8</sup> Liquidity Improvement Fund: An investment fund with public and private resources that will be managed by private agents. It will act as a market maker, buying and selling New Market bonds; Liquidity Guarantee Fund: An investment fund performing a lender task for agents holding New Market bonds that have a provisional liquidity problem that could be solved by a sale of the bonds against a haircut.

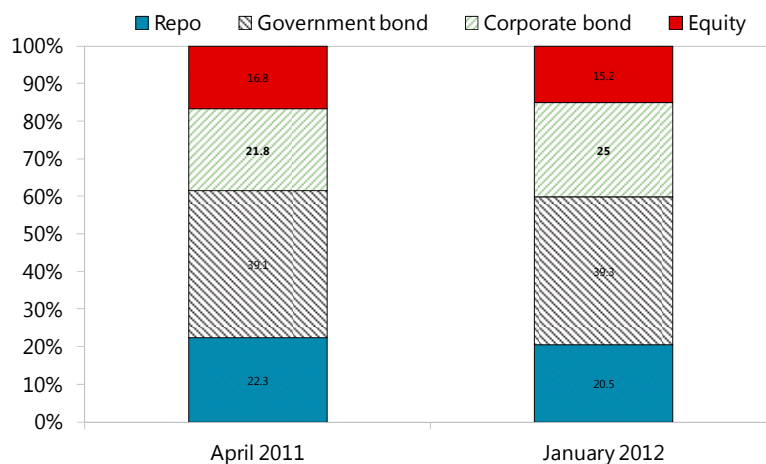
<sup>9</sup> Key conditions include the following criteria: Issuance: Minimum 10 investors; Maximum holding 20 percent for each; Unit Value of R\$ 1,000; Term: 4 years minimum average term; call options not allowed in the first 2 years; Rates admitted: Fixed Rate, Price Index, Brazilian Floating Rate for 3 and 6 months; Rating: required, yearly updated

**Figure 16. Peer Comparison of Mutual Fund Industry**

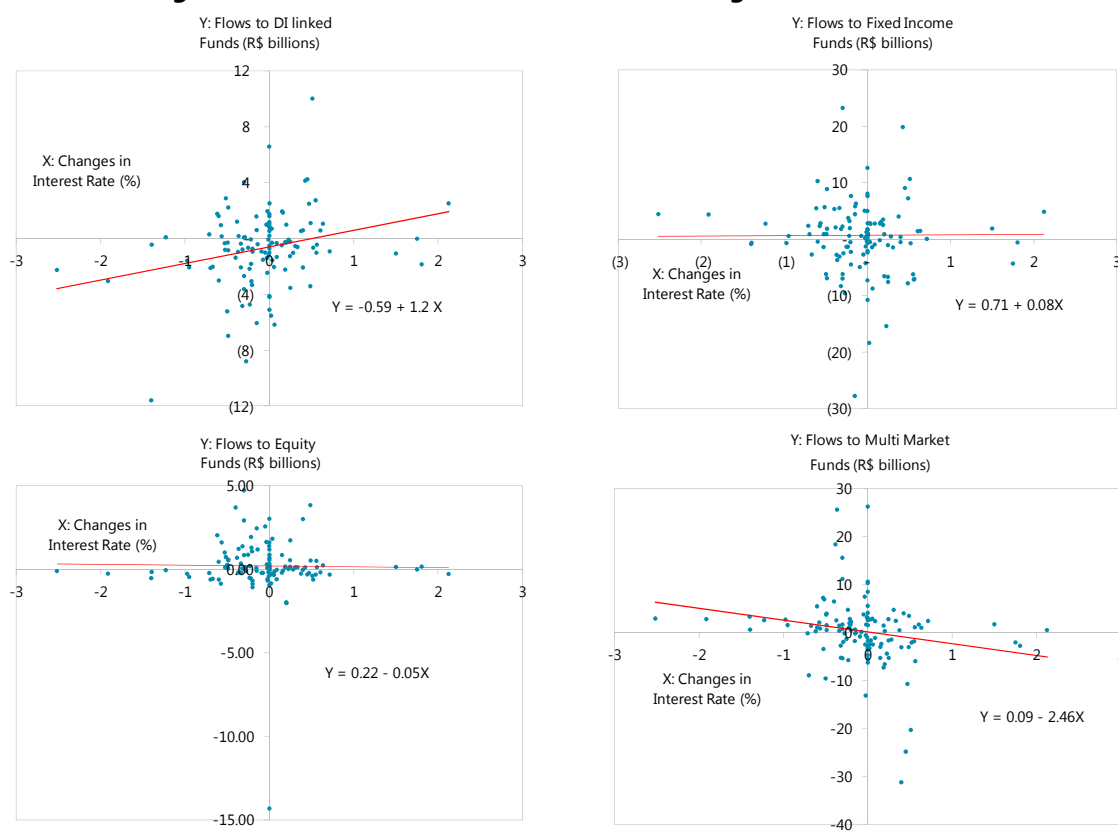
Source: FinStats, Anbima and Investment Company Institute

Note: Asset allocation in Brazil: February 2012, asset allocation in other countries: September 2011

26. **This environment could change if the downward shift of yield curve continues.** Anecdotal evidence suggests that institutional investors are becoming more sensitive to changes in financial market conditions and therefore are increasingly interested in higher-return generating assets and more sophisticated styles in fund management. Indeed, the fall in the short term interest rate since last August appears to have been gradually affecting investors' behavior. Clients' requests for daily liquidity have decreased at the margin. These behavioral changes have resulted in mutual funds' reducing their asset allocation into repo transactions and increasing their exposure to corporate bonds (see Figure 17). Indeed, simple regression analysis on the relationship between flows to different categories of mutual funds and changes in interest rates suggests that the downward shift in the yield curve could lead to some reallocation of assets away from DI linked instruments (see Figure 18).

**Figure 17. Changes in Asset Allocation of Mutual Fund Industry**

Sources: Anbima

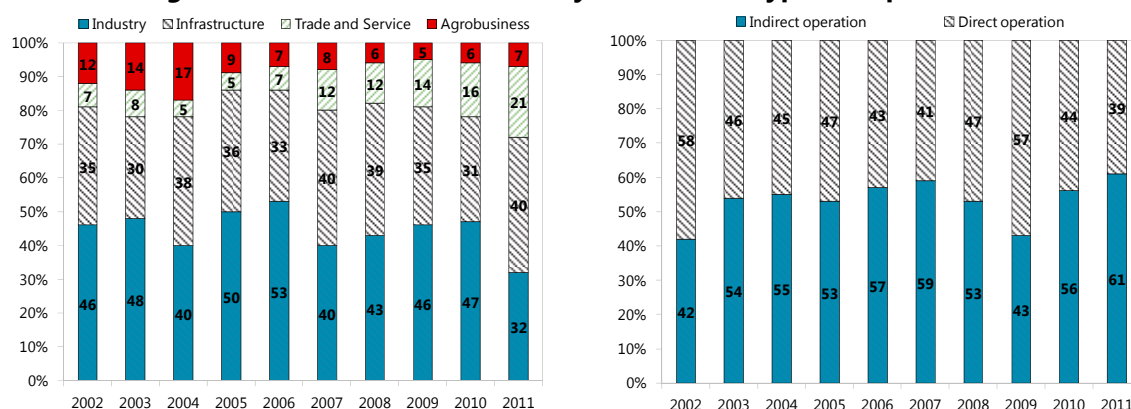
**Figure 18. Mutual Fund's Sensitivities to Changes in Interest Rate**

Source: Anbima, Bloomberg and IMF staff calculations

Note: the regression is based on monthly flows to each type of mutual funds and Selic overnight interest rate (monthly average) from January 2002 to January 2012.

### *Changes in the role of BNDES*

27. **BNDES lending could be well-targeted to areas where there are market failures or significant externalities, such as lending to SMEs and long-term projects, including for infrastructure.** BNDES has traditionally provided significant financing to large strategic companies in Brazil, notwithstanding that these have recourse to alternate sources of financing. Recently, its resource distribution has shifted at the margin toward its more traditional development banking operations. The share of infrastructure increased to 40 percent in 2011 from 31 percent in 2010 while the share of industry decreased to 32 percent—though given the substantial increase in BNDES lending, the absolute levels of credit for industry have increased (see Figure 19). Looking further ahead, BNDES could gradually shift toward promoting the development of long-term capital markets, including by playing a role in standardization and market making (e.g., co-financing of infrastructure projects with the private sectors) in the long-term financing market.

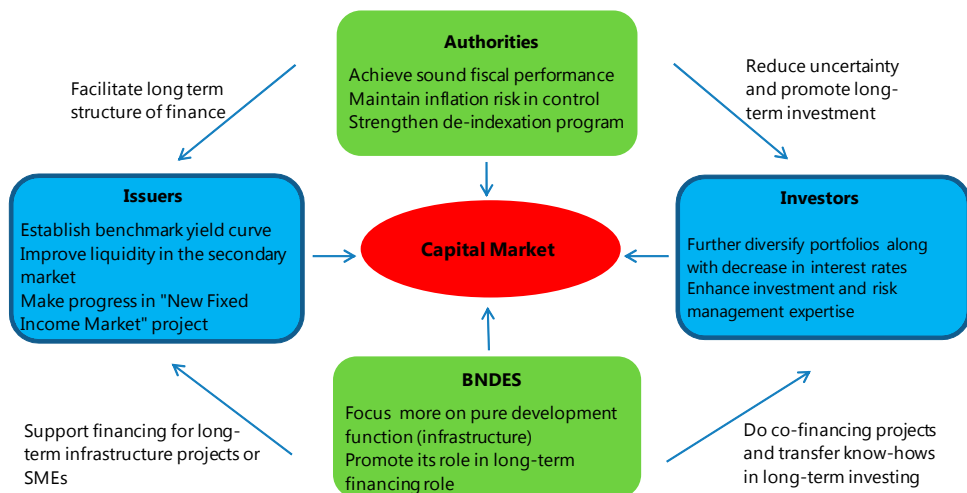
**Figure 19. BNDES Disbursement by Sectors and Types of Operations**

Source: BNDES

## D. Conclusions

28. **During the last decade, Brazil has achieved substantial progress in capital market development.** The menu of available financial instruments has been expanded, market infrastructure has been reformed and strengthened, and a diversified investor base has been built. This was a high-priority agenda for the authorities, and the reforms were introduced in close cooperation with market participants.

29. **Nonetheless, challenges remain and the continued development process will need careful management.** Despite the country's great potential (e.g., large size of economy, sound fiscal management, and large mutual fund industry), Brazil's capital markets are still facing a number of challenges. These include still prevalent short-term indexation, investors' risk aversion to long-term fixed rate bonds, illiquidity in the secondary market, and managing the role of BNDES. A shift to a lower yield curve environment should continue to gradually take place. But further progress will require continued policy effort to assure macro stability and financial sector reforms to promote the development of longer-term private finance. (see Figure 20). It will also require close monitoring, to avoid a build-up of risks that could be engendered by the search for yield as the yield curve shifts down.

**Figure 20. Design of Capital Market Development**



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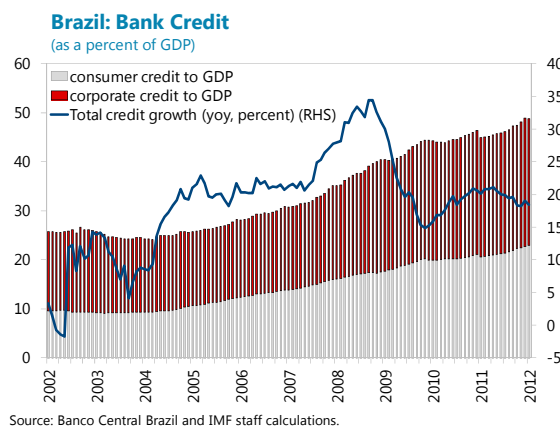
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## IV. CONSUMER CREDIT GROWTH AND RISKS FOR HOUSEHOLD FINANCIAL STRESS<sup>1</sup>

### A. Introduction

1. **Credit in Brazil has been growing very rapidly in recent years.** Total credit to GDP has risen significantly in the last decade, by almost 25 percentage points of GDP—to about 49 percent of GDP. All credit categories have experienced strong growth rates but especially so consumer credit, which now represents 46 percent of total credit (compared to 43 percent in 2005 and 23 percent in 2002). Consumer credit, albeit decelerating slightly during 2011 with an annual growth rate of 20.7 percent compared to 22.4 percent during 2010, continues to expand at a strong rate. A structural transformation has helped raise the supply and demand of credit. Capital inflows providing liquidity to banks, and the development of the domestic capital market, have fueled the supply of credit. Economic stability, associated to a better business environment, strengthening labor markets and social mobility, have also raised the demand for credit by corporates and consumers.



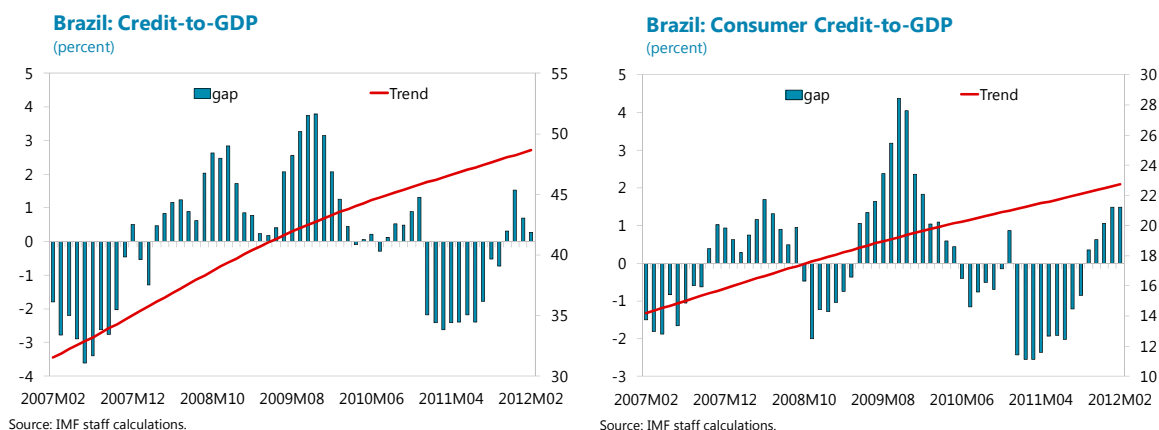
2. **International experience shows that periods of rapid credit expansion have often been associated with increased fragilities.** The growth of credit relative to GDP in Brazil has moderated during the past years, shrinking the credit-to-GDP gap that had emerged during 2008–09. However, trend credit growth remains strong. International experience points out that credit booms often end in busts. Expanding too fast may lead to vulnerabilities through looser lending standards, excessive leverage, and asset price bubbles. Dell’Ariccia et al. (2012) find that about one in three booms have been followed by a period of sub-par growth or a banking crisis. While recognizing that unhealthy booms are difficult to separate from healthy ones, these authors identify that duration and size of booms and the level of financial development are key early warning signals of the likelihood that a credit boom would end up badly. Larger and persistent booms, as well as those that start at a high credit-to-GDP ratio, are more likely to pose financial stability risks.

3. **The credit expansion in Brazil has been large and for a long duration but, banking sector risks appear well contained.** The size and duration of the credit expansion in Brazil are at the higher end of the international experience documented in Dell’Ariccia et al (2012). However, credit deepening in Brazil started at a relatively low level (credit to GDP stood at about 20 percent in 2004), and despite a decade of strong growth, credit-to-GDP (at the current level of 49 percent of GDP) remains relatively low by international standards.

<sup>1</sup> Prepared by Mercedes García-Escribano (WHD).

Further, as demonstrated in the recent Financial Sector Assessment Program (FSAP), the vast majority of Brazilian banks are in a position to withstand substantial levels of stress including sizable credit shocks.

**Figure 1. Brazil: Credit-to-GDP trend and gap**



4. **Nonetheless, some pressure points could be emerging amongst indebted consumers.** The expansion of credit has resulted in an increase in leverage and associated debt servicing costs at the aggregate household level. Signs of strain include increases in nonperforming loans on consumer credits as well as that, for example, the number of bounced checks has started to pick up. This raises an underlying concern about developments within the aggregate—that is, how are individual households in different economic circumstances faring?

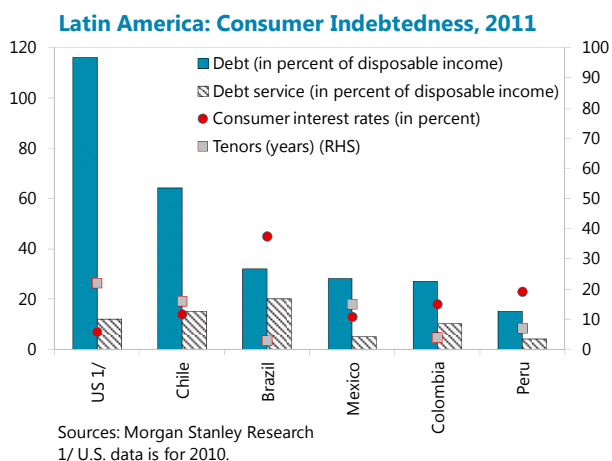
5. **Accordingly, this paper focuses instead on the evolution and distribution of debt related pressures across households.** A novel feature of the analysis here is that it uses household survey data to develop a snapshot of the financial structure of Brazilian households at different levels in income in two distinct periods, 2003 and 2008. Use of this granular data helps glean a better understanding of how financial deepening has evolved and the attendant strains at the household level. However, an important caveat to this analysis is that the last observation of the data is effectively 2008–09 since when consumer credit has continued to grow rapidly and aggregate indicators point to somewhat increased pressures.

6. **The rest of the paper is outlined as follows.** Section B provides a more detailed description of consumer credit developments, in Brazil. Section C explores, using household data, the distribution of lending products in the population and the extent to which credit growth reflects financial deepening or additional borrowing by a few households. Information on the penetration and accumulation of lending products would help us to assess the extent to which households are financially distressed. Section D analyzes recent indicators of household financial distress associated with the credit expansion that has taken place in the last couple of years. Section E concludes.

## B. Consumer Credit in Brazil—Stylized Facts

7. **In Brazil, the consumer credit boom has led to an accumulation of debt and high debt service ratios in the household sector.** Consumer indebtedness (as a percentage of disposable income) has steadily increased and currently exceeds 40 percent of income—according to Brazil Central Bank estimates.<sup>2</sup> Though this estimate of household leverage is in line with the levels observed in Mexico and Colombia, the consumer debt service ratio on Brazil (at 23 percent of disposable income) is significantly larger than in the other countries in the region. Higher interest rates and shorter loan tenors help explain the differences in debt service structure between Brazil and the other countries in the region:

- The interest rates levied on unearmarked loans are sizable and average around 50 percent, ranging from 30 percent for loans on durables to 175 percent for overdrafts.<sup>3</sup> On the contrary, housing credit carries lower interest rates.<sup>4</sup>
- Regarding the portfolio composition, mortgages are a small share of the consumer portfolio (about 20 percent of the total), compared to more than 60 percent in Mexico, Chile and Colombia.



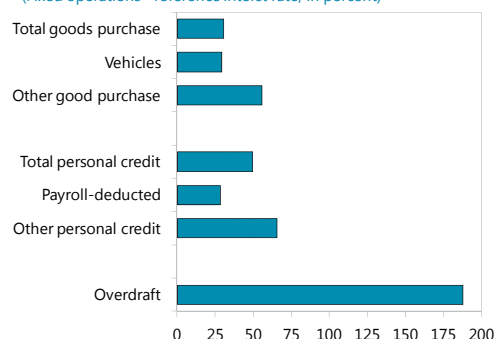
<sup>2</sup> The estimates for debt and indebtedness for Brazil are a lower bound. The Brazil central bank calculates debt and debt-service ratios associated to the lending products of the financial system, including through retail financing if these retailers offer the financing through a financial institution (this is the case for 85 percent of the retailers). However, other retail financing as well as direct financing extended by real estate developers, which at the moment is low, is not captured in the central bank estimates.

<sup>3</sup> The majority of consumer loans in Brazil are contracted at fixed-rates, hence, households are not vulnerable to fluctuations in the interest rates.

<sup>4</sup> Banks have to allocate 65 percent of the liquidity from *caderneta de poupança* to housing loans, of which, 52 percent are extended at subsidized rates (carrying interest rates between 4 and 12 percent) and 13 percent at a free rate (which at the moment ranges between 13–14 percent).

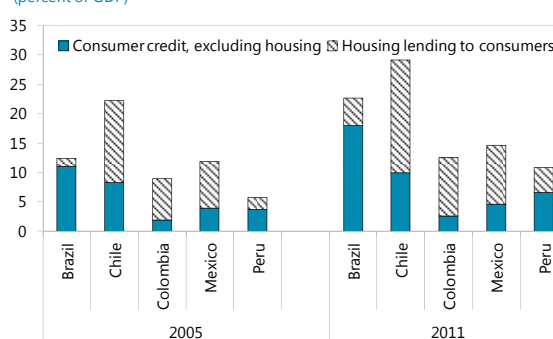
**Figure 2. Brazil: Interest Rates and Consumer Credit Portfolio as Determinants of High Debt Service in Brazil**

**Brazil: Lending rates household credit**  
(Fixed operations--reference interest rate, in percent)



Source: Banco Central Brazil and IMF staff calculations.

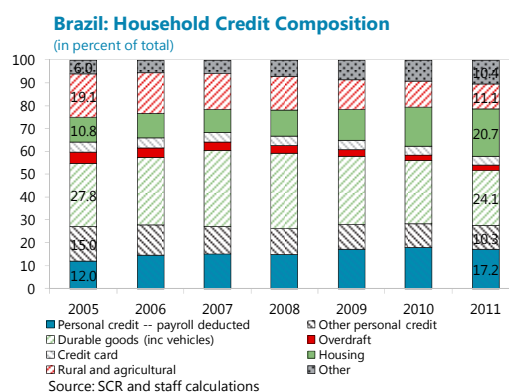
**Latin America: Consumer Lending by Depository Institutions**  
(percent of GDP)



Source: Central Banks and IMF staff calculations.

8. **While all types of consumer loan products have expanded rapidly, mortgages have been the fastest growing.** Housing (which is mostly directed lending) has expanded at robust rates during the past years, including during the 2008–2009 crisis. During 2010–11, housing credit increased by 50 percent per year, and now accounts for about 20 percent of consumer credit compared to around 11 percent in 2005.<sup>5</sup> Other types of consumer credit, comprising personal credit (two thirds of which is payroll deducted loans), durables credit (including vehicles loans), credit cards and overdraft accounts, have also exhibited strong growth rates during the period. Unlike housing credit, consumer lending has been slightly more sensitive to cyclical conditions. On average, about 20 percent of consumer debt is secured with housing collateral, while an additional 40 percent are secured by a durable good or payroll deduction.

**Figure 3. Brazil: Consumer Credit Composition**



Source: SCR and staff calculations

Lending Products: Penetration and Debt Service

<sup>5</sup> The housing credit expansion has been accompanied by an asset price appreciation, indicating there may be signs of overvaluation in this market. Real house prices in Brazil—with the caveat of data limitations—have increased almost 20 percent during August 2010 to June 2011 (Igan, 2011).

9. **This section examines household data to assess the penetration of lending products and the distribution of the debt service—to income in the population.** The last two rounds of the Household Budget Surveys (*Pesquisa de Orçamentos Familiares*), which correspond to the period 2003–04 and 2008–09, respectively, are used to analyze the distribution of credit across income groups. Thus, the consumer credit expansion during the period 2010–2011, when consumer credit growth averaged 21 percent per year, is not reflected in the analysis presented in this section, but discussed later in the paper. The Household Budget Survey provides information on household total income, financial expenditures (including loan payments, mortgage payment, and banking fees such as those for credit card and “cheque especial,” a type of overdraft account), modalities for purchasing durables (including installments (in Portuguese, “a prazo”) and credit cards), and house ownership (with information on characteristics of the dwelling, if it was completely paid, and if it was financed in installments. Information on payments in installments, for the acquisition of housing and durables is important as it would capture non-bank lending such as financing extended by retailers. Importantly, the survey does not contain information on outstanding debt, which is an important data gap that the authorities may address in new surveys. Household groups are defined as follows according to the monthly income percentiles (Table 1).

**Table 1. Average monthly household monetary income (R\$) 1/**

percentile	5	10	25	50	75	90	95
2003	133	231	348	596	1,102	2,191	7,068
2009	243	433	641	1,051	1,809	3,305	9,366
% increase	82.7	87.9	84.1	76.5	64.1	50.8	32.5

1/ Includes monetary and nonmonetary income.

Source. Staff calculations using Pesquisa de Orçamentos Familiares.

10. **Lending penetration differs across products and across income groups.** Despite the recent increase in mortgage lending, mortgage penetration is still very low (Table 2).<sup>6</sup> Less than 1 percent of the low income households have accessed mortgage financing, and this situation has not changed significantly during the period 2003–2009.<sup>7</sup> Unlike mortgages, credit cards and overdraft accounts are widespread: about 25 percent of households are credit card holders and around 15 percent have overdraft accounts. Credit cards have experienced a robust expansion among all income groups (in particular, for the middle income) during the last years and their use for purchasing durables has become more common, especially for high income households—who use credit cards to purchase an array of products. Loans for the purchase of durables are very common, including their use to purchase an array of durable items—on average, 70 percent of the households use installments when purchasing durables. A more strict definition of loan, which refers to financial loan, has less penetration—16 percent and is concentrated among mid and high income groups.

<sup>6</sup> “Penetration” of a financial product refers to the share of low income households with access to this product.

<sup>7</sup> In more recent years, the “Minha Casa Minha Vida” program has addressed this issue by directing mortgage loans to lower income households.

Acquisitions of automobiles are still concentrated in the higher income groups, but reliance on automobile financing is similar across groups of households.

**Table 2. Lending Penetration--Financial and other Forms of Lending**

<b>2009 Survey</b>								
percentile	5	10	25	50	75	90	95	Total
Mortgage 1/	0.9	0.9	1.3	1.9	3.6	6.1	7.4	<b>3.3</b>
Mortgage 2/	0.5	0.4	0.8	1.1	1.8	2.6	2.9	<b>1.8</b>
Credit card holder 3/	4.8	6.3	10.6	17.5	28.8	44.2	64.4	<b>26.8</b>
Cheque especial holder	1.2	1.4	2.0	4.2	11.6	28.3	57.6	<b>14.4</b>
Loan (financial) 4/	2.7	4.6	8.2	13.1	18.0	23.3	27.1	<b>15.6</b>
Loan (some form of loan) 5/	49.4	52.6	60.7	68.1	75.9	79.8	78.9	<b>69.8</b>
<b>2003 Survey</b>								
Mortgage 1/	0.7	0.9	1.6	3.0	4.8	7.8	9.9	<b>4.4</b>
Credit card holder 3/	1.9	3.3	4.5	8.6	19.7	36.6	59.9	<b>19.5</b>
Cheque especial holder	0.7	0.7	0.9	2.5	9.6	30.3	61.9	<b>14.0</b>
Loan (financial) 4/	1.6	2.4	3.6	6.1	11.8	20.0	23.5	<b>10.6</b>
Loan (some form of loan) 6/	29.2	36.1	41.9	50.3	58.0	60.8	59.9	<b>51.5</b>
<b>Changes 2003-2009</b>								
Mortgage 1/	0.2	0.0	-0.2	-1.1	-1.2	-1.7	-2.5	<b>-1.1</b>
Credit card holder 3/	2.8	2.9	6.1	8.9	9.1	7.6	4.5	<b>7.3</b>
Cheque especial holder	0.4	0.8	1.1	1.7	1.9	-2.0	-4.2	<b>0.4</b>
Loan (financial) 4/	1.0	2.3	4.6	7.0	6.2	3.4	3.6	<b>5.0</b>
Loan (some form of loan) 6/	20.2	16.5	18.8	17.7	17.9	19.0	18.9	<b>18.3</b>

Source. Staff calculations using *Pesquisa de Orçamentos Familiares*.

1/ Home ownership and not yet fully paid.

2/ Reporting housing payments and acquisition "monetaria a prazo".

3/ Credit card holder but not necessarily with credit card expenses.

4/ Reporting loan payments.

5/ Reporting buying durables during 2006-09 with acquisition "monetary a prazo".

6/ Reporting buying durables during 2003-05 with acquisition "monetary a prazo".

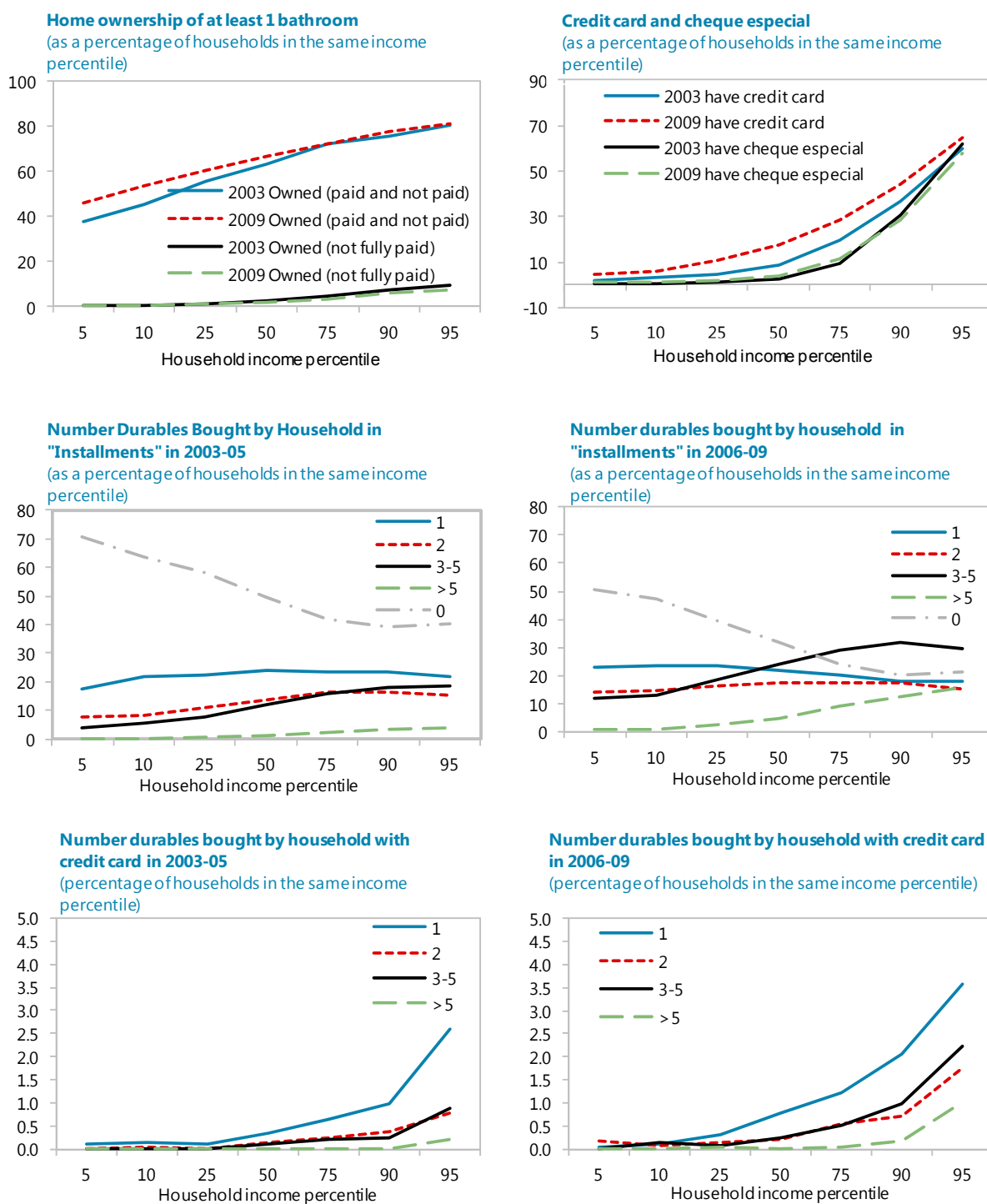
11. **Lending penetration was widespread during 2008–09 but more limited when considering only banking products.** On average, about 28 percent of households had some type of financial debt service obligations, ranging from 5 percent of households in the low income groups to 60 percent in the higher income groups. Including other forms of borrowing (for example, purchasing in installments through retailers), lending penetration increases to 63 percent and is more evenly spread in the population.

**Table 3. Lending Penetration--  
Percentage of the Total Income  
Percentile with a Loan**

Income Percentile	Banking Products	Including other Lending Products
5.0	4.8	39.4
10.0	6.3	42.0
25.0	12.1	49.9
50.0	20.2	58.3
75.0	31.9	69.2
90.0	46.7	77.6
95.0	59.8	83.0
<b>Total</b>	<b>28.5</b>	<b>63.4</b>

Source. Staff calculations using *Pesquisa*

*de Orçamentos Familiares*, 2008-2009 survey.

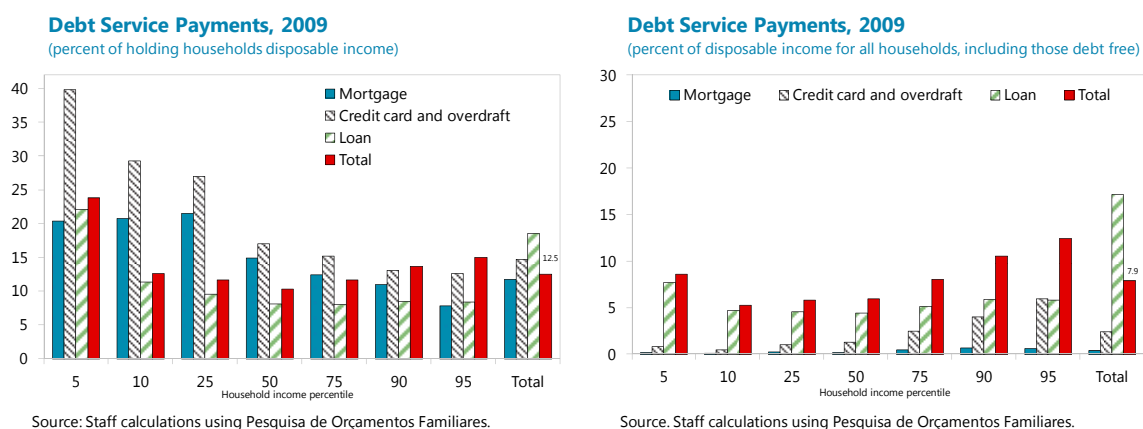
**Figure 4. Penetration of Lending Products: 2003 - 2009**

Sources: Staff calculations using Pesquisa de Orçamentos Familiares.



12. **Financial inclusion and accumulation of loan products by households has resulted in an increase in the share of households' disposable income earmarked for servicing debt payments.** Among those with some form of leverage in the sample survey, total debt service to income ratio averages about 12 percent (compared to the central bank's estimate of about 16 percent during 2008–09).<sup>8</sup> Mortgages and loans (financial costs and payments) weight heavily as a percentage of disposable income, and the latter is important given that the access to loans is more widespread. Financial costs for the use of credit cards and overdraft accounts is also elevated for those households that use these lending products.

**Figure 5. Distribution of Debt Service Commitments in the Population, 2008–2009.**



13. **Household level data provides valuable information on the distribution of financially distressed households in the population as well as the distribution across income groups.** For our purposes, financially distressed households are defined as those with debt-service-to income exceeding 20 percent. This threshold is tighter than many used in the literature.<sup>9</sup> Table 4 shows that at the time of the survey, in 2008–09, about 16 percent of the households holding some form of debt had debt-service commitments above 20 percent of their disposable income, and these are concentrated in the middle and mid-high income percentiles as these groups benefit from high loan penetration levels and accumulate several loan products, as well as among lower income groups. Moreover, it is important to keep in

<sup>8</sup> Note the methodology used by the Central Bank to calculate the average debt service to income ratio differs from that used in this paper. While this paper estimates the debt-service to income ratio for each household, and then, calculates the unweighted average for those households with some form of leverage, the Central Bank's figure is calculated as a ratio of an estimate of aggregate debt service divided by aggregate disposable income which would correspond more closely to a weighted average concept using household survey data. See "Box: Endividamento e Comprometimento de Renda das Famílias com Dívidas Bancárias," in Brazil Central Bank Relatório de Estabilidade Financeira, September 2011, for a detailed explanation on the Central Bank methodology.

<sup>9</sup> Ruiz-Arranz (2011) uses a stress threshold of 40 percent with the objective of identifying those households that are truly vulnerable, while other papers, such as May and Tudela (2005) find that a ratio of debt-service to income exceeding 20 percent is associated with higher probabilities of facing mortgage payment difficulties.

mind that with high interest rates prevailing in Brazil, small changes in the duration of lending can quickly transform into sizable increases in debt-service.

**Table 4. Household debt-service to disposable income**

Income percentile	Percentage with some type of loan	Debt service to household disposable income (in percent of disposable income)				
		>0-10	10-20	20-40	>40	Total
<b>5</b>	39.4	52.1	21.8	14.6	11.5	100.0
<b>10</b>	42.0	64.3	20.3	10.6	4.8	100.0
<b>25</b>	49.9	66.8	20.3	9.5	3.4	100.0
<b>50</b>	58.3	66.8	21.8	8.3	3.0	100.0
<b>75</b>	69.2	60.4	24.8	10.5	4.3	100.0
<b>90</b>	77.6	48.2	32.6	13.8	5.4	100.0
<b>95</b>	83.0	37.5	40.7	16.2	5.6	100.0
<b>Total</b>	<b>63.4</b>	<b>57.3</b>	<b>26.9</b>	<b>11.4</b>	<b>4.5</b>	<b>100.0</b>

Source. Staff calculations using Pesquisa de Orçamentos Familiares, 2008-2009 Survey.

14. **The sensitivity of households' debt servicing capacity across income groups is analyzed.** As households are very sensitive to employment conditions, we undertake a simple stress test of the impact of a 30 percent drop in income on their debt servicing capacity. The number of households at risk would increase by nearly 12 percent, bringing the total number at risk at about 28 percent of the total households with a loan. One caveat of this analysis—given the data limitations—is that ignores if households could use some of their assets to pay-off some of their debt.

**Table 5. Change in debt-service: shock of 30 percent drop in disposable income**

Income percentile	Debt service (in percent of disposable income)			
	>0-10	10-20	20-40	>40
<b>5</b>	-12.5	1.5	5.0	6.0
<b>10</b>	-11.1	2.8	4.7	3.5
<b>25</b>	-10.3	0.3	6.9	3.2
<b>50</b>	-9.7	0.0	6.8	2.9
<b>75</b>	-8.2	-3.6	8.2	3.6
<b>90</b>	-6.6	-8.4	9.9	5.1
<b>95</b>	-4.9	-11.5	9.4	7.0
<b>Total</b>	<b>-8.3</b>	<b>-3.9</b>	<b>8.0</b>	<b>4.2</b>

Source. Staff calculations using Pesquisa de Orçamentos Familiares, 2008-2009 Survey

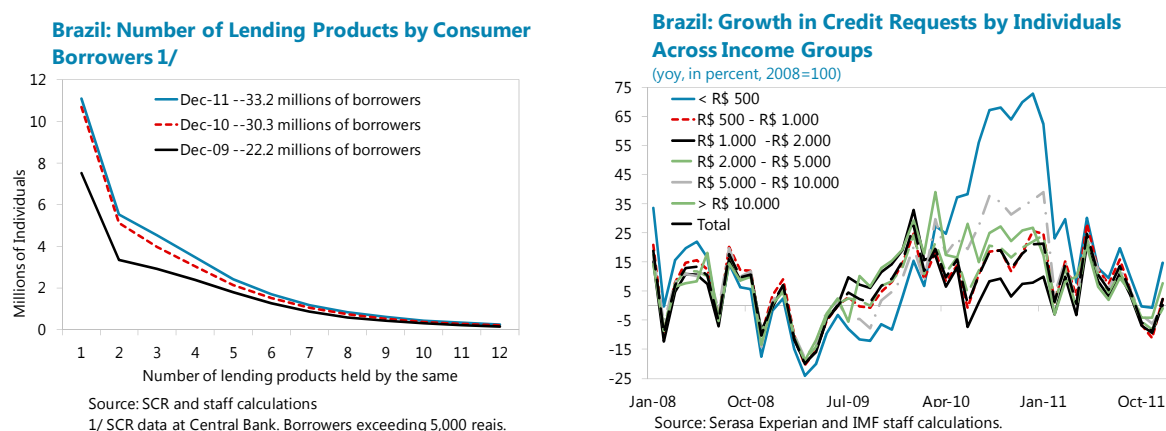
### C. Recent Consumer Credit Developments

15. **Recent information on credit developments complements the findings of the survey data and helps us assess how household financial distress has evolved during the past years.** As mentioned above, since the last household survey data available is 2008–09, the credit expansion that re-started in 2010 is not captured in the results shown above.

16. **More recent data on credit growth reflects the extension of credit to new households as well as the accumulation of loans by others.** Data from the *Nova Central de Risco* shows that during 2010 the number of new individuals borrowing from the banking

sector increased, with the rate of increase decelerating during 2011 (Figure 6).<sup>10,11</sup> The increase in credit during 2009–11 also reflects an increase in the number of borrowers holding several lending products. According to the data in *Nova Central de Risco*, the average number of lending products per borrower with loans exceeding R\$5,000 was 3.4 by December 2011. Data from Serasa Experian on credit report requests show that during 2010 demands for credit by low-income households (those with less than R\$500 per month) significantly increased followed by demands for credit by mid-high (R\$5,000–10,000) and high income (more than R\$ 10,000) households.<sup>12</sup> Hence, Serasa Experian data is consistent with the fact that financial inclusion advanced during the past years while at the same time some groups of households accumulated different loan products.

**Figure 6. Financial Inclusion and Additional Indebtedness Underlying Credit Growth**

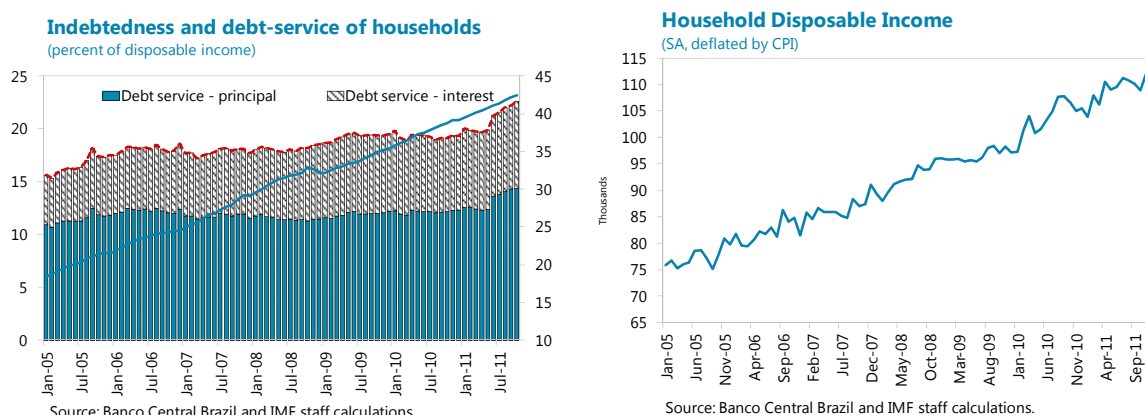


17. **The recent credit expansion has been accompanied by an increase in household leverage.** The debt service-to-income calculated by the central bank was broadly stable till mid-2008, coinciding with the extension of loan maturities. However, during 2011, debt service-to-income picked-up reflecting additional credit, some financial tightening and the higher use of more expensive lending products (such as credit cards and overdraft accounts).

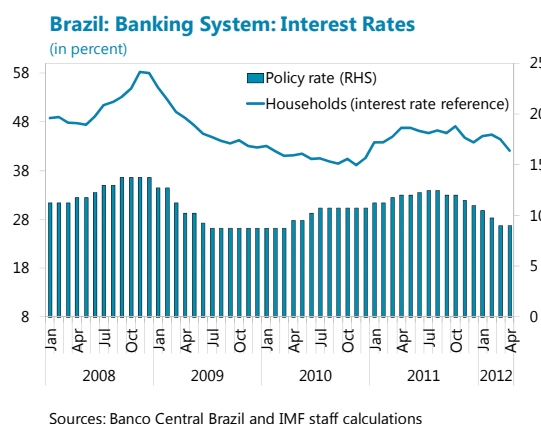
<sup>10</sup> *Sistema de Informações de Crédito (SCR)*, which is the central bank's credit information system, registers all positive and negative information on corporate and consumer loans granted by commercial banks and provides information on the distribution of interest rates by loan size. For loans exceeding R\$5,000, the SCR identifies individuals and corporations. Starting in January and with the aim of better monitoring credit developments and associated risks, the SCR also registers information on individuals income and enterprises revenues and the threshold for recording detailed information on loans has been lowered to R\$1,000. Transactions of credit portfolios between banks will also have to be reported. See Annex 1 for the list of the main variables in SCR and changes implemented in January 2012.

<sup>11</sup> The number of borrowers with loans exceeding R\$5,000 increased by 36 percent during 2009–2010, and by 9.5 percent in 2011.

<sup>12</sup> Note that Serasa data reflects credit requests, and not actual extension of credit to these income groups.

**Figure 7. Recent Evolution of Households' Debt and Debt-Service to Income**

- Tighter financial conditions.* Since mid-2010 through mid-2011, the central bank hiked policy rates. In addition, in response to the rapid increase of certain types of consumer loans and loosening lending standards (such as lack of down-payment or excessive loan tenors), the central bank tightened macroprudential measures in specific lending products since late 2010.<sup>13</sup> In December 2010, the central bank announced an increase of the minimum payment for credit card bills (effective in June 2011) and increased capital requirements for long term consumer loans (Annex 2). In April 2011, the IOF on consumer credit operations was increased to 3 percent (previously 1.5 percent).

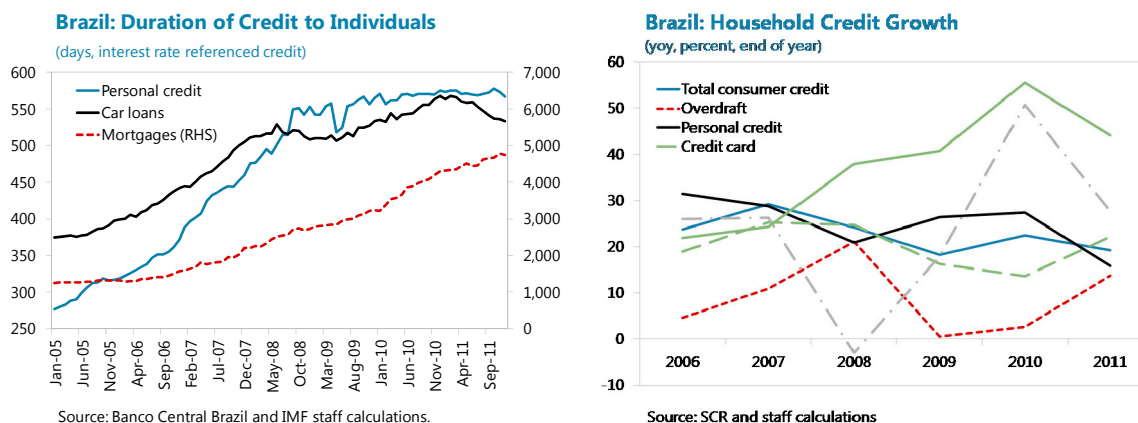


- Credit continued expanding albeit at a decelerating rate.* Following the tightening of financial conditions, new credit concessions decelerated in 2011. The stock of credit to consumers decelerated slightly during 2011 growing by 20.7 during compared to 22.4 during 2010, with new credit decelerating to 13 percent in 2011 from 22 percent in 2010.
- Credit portfolio changes.* While the macroprudential measures resulted in a decline in the duration and volume of new concessions of loans for durables, consumers increased usage of credit cards and overdraft borrowing. The surge in the use of these

<sup>13</sup> The maturity of car loans had been increasing very strongly, and by end-2011, about 55 percent of the car loans had maturities exceeded 5 years (compared to about 20 percent by end-2008). The term of the payroll-deducted loans exceeding 60 months also increased.

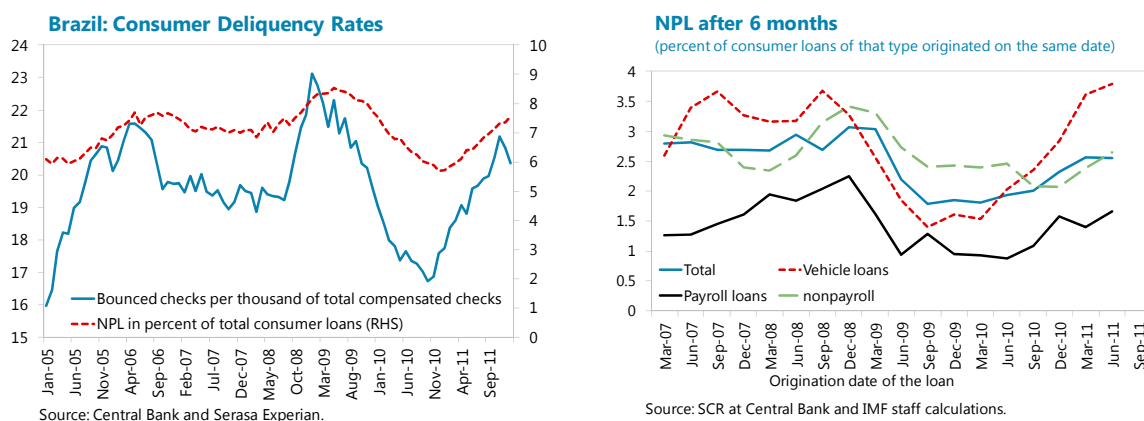
two expensive lending products, coincident with the financial tightening, while disposable income has continued growing strongly, may reflect that some households were under financial distress.

**Figure 8. Recent Evolution of Vehicle, Credit Cards and Overdraft Accounts**



18. **At the same time, since late 2010, delinquency rates have increased.** By early 2012, the non-performing loans ratio for unearmarked consumer credit reached 7.6 percent (up by 1.9 since December 2010 and only slightly below the 8½ percent ratio achieved in mid-2009). The surge in non-performing loan rates is common across all categories of consumer credit, and it is particularly sharp for loans for durables, overdraft accounts and credit cards. While the denominator of the NPL ratio (and hence, the ratio) is affected by credit dynamics, there are other indications of increased household distress: (i) bounced checks picked up, and (ii) delinquency rates by origination of the loans increased in particular for vehicle loans.

**Figure 9. Indicators of Underlying Households' Financial Distress**



## D. Conclusion

19. **Brazil has experienced a robust expansion in consumer credit during the last decade which raises concerns about the build-up of vulnerabilities for the household**

**sector.** Though the overall level of credit-to-GDP ratio remains relatively low by international standards, the rapid increase poses concerns, not so much for the Brazilian financial sector right now, but for households. The credit growth during this decade has been the result of financial inclusion of new consumer segments and further accumulation of loans by some consumers. As a result of these developments, aggregate household leverage has increased. More importantly, this is associated with high debt service burdens given the high interest rates and short loan maturities, which mostly reflect that mortgages continue to be only a small share of the total consumer credit portfolio.

20. **There are indicators of financial distress in at least some segments of the household sector.** The Household Budget Surveys show that financial sector credit penetration was still limited in 2008–09, in particular for low and mid-low income groups, but other forms of credit were widespread. The central bank data shows that the most recent expansion of credit growth is driven by further financial inclusion and accumulation of loans. With average debt service-to-income estimated above 20 percent, there are indications that some households are already under financial distress. Recent data on delinquency rates and bounced checks suggests that at least some households may have reached or exceeded the limit of their debt-carrying capacity.

21. **Though consumer credit does not pose an immediate risk to the banking or household sector, monitoring continues to be key to avoid the building up of additional vulnerabilities.** Continued tight monitoring by the central bank will help also in the design of macroprudential tools that may be needed to targeted to specific lending products, as was the case in late 2010 when certain features of consumer and vehicle loans (maturities and loan to value) started to raise concerns about sustainability. Broad-based macroprudential tools could also be needed to limit the sensitivity of credit to the economic cycle. In addition, to better contain potential risks, the credit risk scoring undertaken by commercial banks could incorporate information on indebtedness for potential customers. In this regard, the recent changes to the SCR, in particular, the lowering of the size of the loan threshold that identifies individuals, would help banks identify highly indebted individuals and incorporate information, such as the array of products they hold, in the risk scoring models. Last, caution is also warranted in the mortgage market as this lending product is experiencing very strong growth rates and commercial banks see in this sector a niche to gain market share.

## Annex I. Brazil: Central de Risco

Information	Before	starting in	Companies	Individuals
	2012	2012		
<b>Threshold for recording all the variables listed below (R\$)</b>	<b>5,000</b>	<b>1,000</b>		
Customer Identification	yes	yes	yes	yes
Type of client (individual person / company)	yes	yes	yes	yes
Authorization for query	yes	yes	yes	no
Company size (Companies)	yes	yes	yes	no
Control Type (private, state)	yes	yes	yes	no
Beginning of the customer relationship with the financial institution	yes	yes	yes	yes
<b>Revenue (Companies)</b>	<b>no</b>	<b>yes</b>	<b>yes</b>	<b>no</b>
<b>Income (individual person)</b>	<b>no</b>	<b>yes</b>	<b>no</b>	<b>yes</b>
Contract code	yes	yes	yes	yes
Zip code of FIs Agency	yes	yes	yes	yes
Funding	yes	yes	yes	yes
Benchmark rate or index (Fixed, post, floating and other kinds of rate)	yes	yes	yes	yes
<b>Percentage if the index applied to the operation</b>	<b>no</b>	<b>yes</b>	<b>yes</b>	<b>yes</b>
Annual interest rate	yes	yes	yes	yes
Contract currency				
Nature of the facility	yes	yes	yes	yes
.Own operations	yes	yes	yes	yes
.Operations transferred	yes	yes	yes	yes
Facility type	yes	yes	yes	yes
Operation's Risk rating	yes	yes	yes	yes
Maturities	yes	yes	yes	yes
Dates				
.date of the beginning of the operation	yes	yes	yes	yes
.date of the ending of the operation	yes	yes	yes	yes
Guarantees				
.Guarantor identification	yes	yes	yes	yes
. <b>Percentage exposure covered by the guarantor</b>	<b>no</b>	<b>yes</b>	<b>yes</b>	<b>yes</b>
Collaterals				
.type	yes	yes	yes	yes
. <b>Initial collateral value</b>	<b>no</b>	<b>yes</b>	<b>yes</b>	<b>yes</b>
.Current collateral value	yes	yes	yes	yes
.Date of collateral revaluation	yes	yes	yes	yes
<b>Initial Value of the operation</b>	<b>no</b>	<b>yes</b>	<b>yes</b>	<b>yes</b>
Operation provision	yes	yes	yes	yes
<b>Outflows</b>				
. <b>Total payment</b>	<b>no</b>	<b>yes</b>	<b>yes</b>	<b>yes</b>
. <b>Transfer to other institution with no guarantee</b>	<b>no</b>	<b>yes</b>	<b>yes</b>	<b>yes</b>
. <b>Transfer to a non financial institution with no guarantee</b>	<b>no</b>	<b>yes</b>	<b>yes</b>	<b>yes</b>
. <b>Renegotiation</b>	<b>no</b>	<b>yes</b>	<b>yes</b>	<b>yes</b>

Source: Brazil Central Bank.

## Annex II. Brazil: Summary of Recent Changes to the Macroprudential Measures Targeted on Consumer Credit

### December 2010

- Announced an increase of the minimum payment for credit card bills to 15 percent (previously 10 percent) (effective in June), and anticipates another hike to 20 percent by December 2011.
- Increase of capital requirements for long term consumer loans. The risk weight for such exposures was increased from 100 percent to 150 percent.

Operation	Maturity and LTV	Capital requirement
Vehicles (financing and leasing)	Maturity between 24 and 36 months and LTV > 80%	16.50%
	Maturity between 36 and 48 months and LTV > 70%	
	Maturity between 48 and 60 months and LTV > 60%	
	Maturity higher than 60 months and any LTV	
Payroll deduction loans	Maturity higher than 36 months	11%
Personal loans	Maturity higher than 24 months	
Other consumer loans		11%
Other consumer loans classified as retail		8.50%

Note. The risk weight was kept at 75 percent for agricultural loans, payroll deduction loans with maturity under 36 months, home financing, and loans funded by government programs.

### April 2011

- Increase of the IOF on consumer credit operations to 3 percent (previously 1.5 percent).

### November 2011

- Maintain the minimum payment for credit card bills at 15 percent (previously programmed to be increased to 20 percent in December).
- Redefinition of risk weights applied to consumer loan exposures involving longer maturities, regardless of loan-to-value amounts. Reduce capital requirements for consumer loans with maturity between 24 and 60 months, albeit increasing capital requirements for those with maturity above 60 months. Eliminate the different capital requirements for car loans with maturities between 24 and 60 months according to down payment.

Operation	Maturity and LTV	Capital requirement
Vehicles	Maturity under 60 months and classified as retail (RW 75%)	8.25%
	Maturity under 60 months and not classified as retail (RW 100%)	11%
	Maturity higher than 60 months (RW 150%)	16.50%
Consumer loans	Maturity under 36 months* (RW 75%)	8.25%
	Maturity between 36 and 60 months (RW 150%)	16.50%
	Maturity higher than 60 months (RW 300%)	33%
Other consumer loans (risk weight: 100 percent)		11%
Other consumer loans classified as retail (risk weight: 75 percent)		8.50%

\* Includes agricultural loans, payroll deduction loans, home financing, and loans funded by government programs.

### December 2011

IOF tax on credit for consumption (from 3 to 2.5 percent).



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