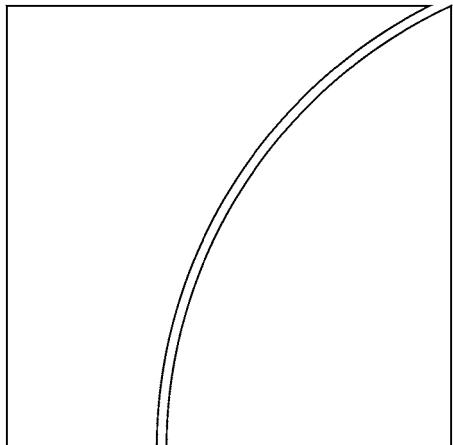


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monetary policy in emerging
market economies



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Fiscal policy, public debt and monetary policy in EMEs: an overview

M S Mohanty¹

1. Introduction

During the 1980s and 1990s, the vulnerability of EMEs to shocks was often exacerbated by high fiscal deficits, underdeveloped domestic bond markets, and large currency and maturity mismatches. In many cases fiscal and monetary responses were procyclical. Debt management policy played very little part in either the choice of an optimal debt maturity or in stabilising the economy.

Since the beginning of 2000s, however, the role of fiscal and monetary policy has started to become more active. Fiscal deficits and public debt levels in EMEs as a whole have declined substantially. Domestic financing has increased, and the share of foreign currency debt has fallen dramatically. And the average public debt maturity has lengthened significantly. What do these developments mean for monetary policy, particularly in the context of the recent global financial crisis? Has the threat of fiscal dominance in EMEs lessened, just when it has grown in the advanced economies (BIS (2012))? Have fiscal and monetary policies in EMEs become more countercyclical than in the past? Has the development of domestic bond markets helped? What role have central banks played in debt management and what are the implications for monetary policy?

These questions were the focus of discussion at the 17th Annual Meeting of Deputy Governors from major EMEs held at the BIS in Basel on 16–17 February 2012. The meeting addressed three issues: (i) the fiscal constraints on monetary policy; (ii) the impact of local currency bond markets on central bank policies; and (iii) the role of central banks in public debt management. The current volume brings together the papers prepared by the BIS staff for the meeting as well as the contributions of central banks.²

One major finding emerging from the meeting was that improved fiscal positions helped many EMEs to rely on countercyclical fiscal and monetary policies to stabilise their economies during the recent global financial crisis. Anchoring medium-term fiscal expectations was crucial, but it was not by itself sufficient to insulate the economy from the shock. Greater access to domestic financing and the consequent reduction of currency mismatches, enabled by the domestic currency bond market, played an important role.

Yet these conclusions came with a number of caveats. Although fiscal dominance has fallen in many EMEs, contingent liabilities and the costs of ageing populations pose serious medium- to long-term fiscal risks to many EMEs. In addition, although government debt levels have moderated, the volume of securities issued by central banks has expanded substantially, largely reflecting interventions in the foreign exchange market. Not only is the combined gross debt of the official sector (the government and the central bank) now large in many countries, but a considerable part of this debt consists of short-term securities, which are not characteristically very different from monetary financing. The implications of these balance sheet developments for price and financial stability require careful monitoring.

¹ I am thankful to Ken Miyajima and Előd Takáts for their contributions to this overview, and to Philip Turner for comments.

² The last time the Deputy Governors discussed fiscal/monetary interaction was in 2002 (see BIS (2003)).

The rest of this overview summarises the key points from the discussion and the background papers along the three organising themes of the meeting.

2. Fiscal constraints on monetary policy

For much of the past three decades, fiscal policy remained a major concern for monetary policy in EMEs. Unsustainable fiscal deficits and public debt levels created the spectre of fiscal dominance in many countries, leading to high and volatile inflation and elevated risk premia on government debt. An unfavourable exchange rate dynamic – linked to weak fiscal and monetary policy credibility – exposed EMEs to destabilising capital outflows. As summarized by Yörüköglü and Kılıç in their paper, such a fiscal setting was associated with low levels of financial development, a high degree of dollarisation, and high exchange rate pass-through. The consequence was that both fiscal and monetary policies tended to be procyclical in many countries, accentuating rather than damping economic volatility.

Shift to countercyclical fiscal and monetary policy

However, as argued in this volume by Montoro, Takáts and Yetman in their BIS background paper on “Is monetary policy constrained by fiscal policy?”, many EMEs have grown out of this procyclical policy bias over the past decade. A significant decline in fiscal deficits and public debt has reduced the problem of fiscal dominance, and made countercyclical policies more feasible. While EMEs’ average fiscal deficits as a percentage of GDP fell through the 1990s and the 2000s, reaching 1.8% during 2000–07, the period before the recent financial crisis, the reduction in gross public debt as a share of GDP was even more impressive. By measuring the degree of policy cyclical from two separate fiscal and monetary policy reaction functions (from a Taylor rule), the authors show that in a majority of EMEs both fiscal and monetary policies were used to smooth output volatility during 2000–11. The scale of monetary and fiscal easing implemented by several EMEs in the worst phase of the recent global financial crisis was simply unthinkable during the 1980s and 1990s.

Several country papers in this volume discuss the factors heralding this change. In most cases, measures to strengthen medium-term fiscal sustainability and monetary policy credibility played a decisive role. Brazil provides an interesting example of a dramatic turnaround in an economy that was once considered to be very vulnerable to crisis and procyclical policies. As noted in the paper prepared by Araújo, Azevedo and Costa, Brazil’s policy flexibility was enhanced by a number of critical policy reforms in the 1990s and 2000s, including the switch to an inflation targeting regime; concerted actions by the central bank and the Treasury to reduce the magnitude of short-term and various types of index-linked debt in the economy; and the introduction of the 1999 Fiscal Responsibility Law to strengthen financial institutions and transparency as well as to reinforce the goal of maintaining consistent primary surpluses.

The paper by Braude and Flug demonstrates the marked difference in Israel’s responses to the 2001–03 and 2008–09 global shocks, which were dictated largely by the initial fiscal conditions facing the country. In the earlier period, high public debt and weak fiscal credibility meant that any increase in the fiscal deficit quickly translated into higher government bond yields. Even a modest reduction in the policy rate was considered by investors as unsustainable, causing sharp currency depreciations and subsequent monetary tightening. By contrast, during the 2008–09 global recession, the government allowed its fiscal deficit to rise and the central bank cut policy rates sharply. Improved fiscal and monetary credibility ensured that financial markets had little doubt about the sustainability of countercyclical policies.

The discussion and country papers also confirmed that many commodity-exporting countries have been able to reduce their vulnerability to the potential volatility associated with

commodity price cycles. In Chile's case, as discussed in the paper by Claro and Soto, the introduction of the Fiscal Responsibility Act in 2006 proved to be a major turning point for the economy. It mandated the government to adopt a structural budget balance target, ie a fiscal balance corrected for fluctuations in revenue and expenditure due to business cycles. Similarly in Peru, as discussed by the paper by Rossini, Quispe and Loyola, fiscal rules providing for a nominal deficit target and a maximum limit for growth in non-financial public sector expenditure were critical in reducing the net debt of the public sector (public sector liabilities minus public sector assets). Together with accumulated surpluses in a separate fiscal stabilisation fund, the new fiscal framework has strengthened the role of monetary policy.

The meeting also focused on the challenges facing economies with fixed exchange rate regimes. As is well known, when the exchange rate is fixed, fiscal policy is often the sole macroeconomic instrument that the authorities can use to address output volatility. But there was a view that, to mitigate risks to the fixed exchange rate regime, countercyclical fiscal policy should be used sparingly and only under exceptional circumstances. And, such stimulus must not compromise the medium-term sustainability of fiscal policy.

The paper from the Hong Kong Monetary Authority discusses the central role of fiscal reserves in Hong Kong's currency board arrangement. Historically, the government has followed a very prudent fiscal policy with a view to accumulating substantial fiscal reserves. An essential purpose of such reserves has been to underpin investors' confidence in the fixed exchange rate, but they have also helped to cushion the economy against adverse shocks. Saudi Arabia has followed a somewhat different strategy. As noted by Al-Hamidy in his paper, the government has pursued an active fiscal stabilisation strategy by paying off debt when oil prices are high and spending more when they are weak.

Notwithstanding the recent positive role of fiscal policy, there was a broad agreement that, beyond allowing the automatic stabilisers to work, the use of countercyclical fiscal policy should be limited. Some participants argued that crisis times are very different from normal cyclical downturns, when monetary policy is expected to do much of the output smoothing. To the extent that extraordinary monetary easing in advanced economies has helped many EMEs to pursue an aggressive stabilisation policy, it is unlikely that they would be able to repeat the recent experience in other times. In addition, authorities should try to avoid the unintended consequences of fiscal policy on the economy, which could arise from difficulties in measuring the cyclical stance in real time, uncertainty about fiscal multipliers and lags in fiscal policy. The paper prepared by Tomšík provides several measures of cyclically adjusted budget deficits for the Czech Republic, highlighting some of these issues.

Nevertheless, there was a view that countercyclical fiscal policy could be used selectively to reduce some of the monetary policy challenges stemming from capital flows. For instance, fiscal tightening could be substituted for monetary tightening to address inflation pressures when capital inflows are attracted by large interest rate differentials. As Araújo, Azevedo and Costa show in the case of Brazil, a contractionary fiscal policy brought about by spending cuts could have significant, persistent effects on inflation. Yörüköglü and Kilinç make similar arguments for using countercyclical fiscal tightening in Turkey.

Fiscal policy and interest rates

Another aspect of fiscal and monetary policy interaction explored at the meeting was the impact of fiscal policy on interest rates. In theory, the impact depends on whether the private sector is Ricardian or non-Ricardian. In a Ricardian world, fiscal deficits and debt have no consequences for interest rates, as the private sector saves the full extent of discounted tax liability implied by a rise in the fiscal deficit. In a non-Ricardian world, however, changes in fiscal deficits can lead to changes in interest rates.

The classical mechanism is the "crowding out" hypothesis, where higher fiscal deficits, with an unchanged money supply, lead to higher interest rates. In economies with fiscal

dominance and a reliance on foreign credit, the mechanism that prevails is the default risk premium on government debt. For instance, in Turkey, as noted by Yörüköglü and Kilinç, external bond spreads had risen above 10 percentage points during the 2001 Turkish fiscal crisis. Several Latin American economies saw similar bond spreads during the 1990s and 2000s.

Several country papers and Deputy Governors found that stronger fiscal balances and lower debt levels were followed by lower interest rates in EMEs. Indeed, one of the findings of Montoro, Takáts and Yetman is that the estimated equilibrium interest rates for EMEs (represented by the constant term of the Taylor rule) have been negatively correlated with the budget balances as a percentage of GDP. Although the link is weak, their results are consistent with a permanent reduction in interest rates in EMEs.

Vargas, González and Lozano reach similar conclusions for Colombia. They note that not only have the country's sovereign spreads fallen sharply following the recent fiscal consolidation, but they have also become less sensitive to global risk aversion. According to their estimates, about 60% of the decline in Colombia's EMBI spread between 2002 and 2011 (excluding 2008 and 2009) could be attributed to local factors, particularly reductions in government currency mismatches and the government debt-to-GDP ratio. As noted by the authors, a permanent reduction in the long-term interest rate would have important implications for monetary policy not only by driving down the natural interest rate (the rate that would prevail with zero inflation and output gaps) but also by leading to changes in the equilibrium real exchange rate.

Nevertheless, there was also a view that the recent developments in long-term interest rates should be interpreted with caution. Real long-term interest rates have fallen across the world, and disentangling global and local factors is difficult. A prolonged period of very easy monetary policy in industrial countries, the strong demand of EME central banks for highly rated bonds, and global risk aversion have driven real long-term rates to zero, or even negative. These conditions will not last forever.

Future fiscal risks

Worries about the medium-term sustainability of fiscal policy in EMEs surfaced prominently in the discussions. First, fiscal deficits and public debt levels are still high in a number of EMEs (for instance, in Hungary and India). Second, questions remain about the measurement of fiscal balances and public debt in several countries. The paper prepared by the People's Bank of China points to a number of issues regarding the coverage of the fiscal balance. In China, although the government budget covers central and local finances, not all items of local government revenue and expenditure are included; in addition, the reported budget balance excludes the profits and losses of state-owned enterprises.

Third, although explicit government liabilities have moderated in many EMEs, contingent liabilities remain high. Future liabilities related to implicit government guarantees to the financial system are difficult to assess accurately in many countries. As pointed out in the paper prepared by Kirakul, in Thailand growing state-sponsored programmes have led to a sharp rise in implicit liabilities in recent years. In China, the People's Bank of China notes that some of the local government liabilities, which are not covered by government debt statistics, require careful monitoring.

Finally, many EMEs are ageing fast, and a large part of population, currently outside any social security systems, has to be ultimately covered by a formal pension system. This will put considerable pressure on the fiscal system in future. As Montoro, Takáts and Yetman summarise in the annex to their paper, the old-age dependency ratio in EMEs is expected to rise from an average of 11% in 2011 to 27% in 2040. While the impact of this rise will vary across regions and countries, depending on pension systems, going by the experience of industrial countries, the share of health and pension expenditure in GDP is expected to rise steadily in EMEs in the next decade. However, public policy reform can greatly reduce the

fiscal burden of ageing populations. As the paper by Jędrzejowicz and Koziński shows, ageing-related expenditures are projected to decline in Poland thanks to pension fund reforms, while in all other EU member countries they are set to increase.

3. Local currency bond markets and central bank policies

Following a series of financial crises in previous decades, many EMEs started to develop local currency bond markets in the beginning of the 2000s. Local currency bond markets help achieve several objectives: completing markets; reducing currency and maturity mismatches; diversifying financing sources; and strengthening the monetary transmission mechanisms. In many EMEs, central banks have often played a critical role in nurturing these markets. One important issue is how far these markets have developed in the past decade and what difference they have made to central bank policies, particularly in the conduct of monetary and financial stability policies. The meeting provided an opportunity to study these issues.

The BIS background paper on “Developments of domestic government bond markets in EMEs and their implications” by Mehrotra, Miyajima and Villar provides a brief review of developments in this market. As reliance on foreign debt declined, the total stock of domestic debt securities issued by emerging market governments increased from about \$1 trillion in 2000 to \$4.4 trillion by 2010. The average remaining maturity of government local currency debt has roughly doubled over this period, from 3.5 years to seven years, with the longest debt maturity issued by EMEs being 28 years in 2010 compared to 14 years in 2000. The authors note that the expansion of domestic currency bond markets has been led by many factors including better domestic policies, lower inflation, reduced external financing needs and higher domestic saving in EMEs.

Implications for the conduct of monetary policy

One reason why local bond markets matter for monetary policy is that they increase the scope for long-term domestic currency financing, thus reducing currency and maturity mismatches. With borrowers’ and lenders’ financial health becoming less sensitive to changes in the exchange rate and interest rate, monetary policy can squarely focus on stabilising output and inflation. In the past, to prevent widespread bankruptcy among firms, many EMEs with large foreign currency debt were forced to raise interest rates during a downturn.

Several country papers and the discussion at the meeting confirmed that the development of domestic bond market has led to a reduction in currency mismatches in many EMEs. Mehrotra, Miyajima and Villar present a number of indicators for currency mismatches in EMEs (Table 3 in their paper). Their finding is that since 2000 currency mismatches have fallen sharply, particularly in Asia and Latin America where most countries now enjoy net foreign currency asset positions. The paper from Peru (Rossini, Quispe and Loyola) argues that the government’s switch from external to domestic financing prompted the de-dollarisation of the banking system, shifting the focus of monetary policy away from the exchange rate. The papers from Israel and Colombia discuss similar evidence for the impact of recent reduction of currency mismatches on monetary authorities’ response to adverse shocks.

The discussion also pointed to a number of challenges facing EMEs in monitoring currency mismatches and reducing the risk of future build-ups of foreign currency debt. One source of concern was that demand for foreign currency loans could increase on expectations that interest rates in emerging economies would remain above those in advanced economies causing EM currencies to appreciate. A second source of concern was that speculation about future exchange rates could prompt firms to shift currency mismatches to imperfectly monitored and regulated derivative markets. One view was that commitment to a floating

exchange rate was essential to prevent excessive currency speculation. Another was that central bank intervention in the foreign exchange markets should be made more predictable, so that markets have less scope for speculating on the exchange rate.

Implications for the monetary transmission mechanisms

A well developed sovereign yield curve is important for pricing risker assets and strengthening the interest rate and wealth channels of monetary policy. It also increases the role of the expectations channel of monetary policy as anticipation of central bank actions gets priced into forward curves, with implications for the borrowing and lending rates in the economy.

The discussion was generally supportive of the view that the recent initiatives to deepen bond markets have strengthened the transmission channels of monetary policy. In most EMEs, governments have made efforts to reduce reliance on indexed-debt and floating-rate debt and increase financing through fixed rate debt, leading to the development of a domestic yield curve. Based on econometric work, the paper from Colombia argues that lower government currency mismatches and a deeper fixed rate domestic public bond market seem to have strengthened the response of market interest rates to monetary policy shocks.

However, as noted in the paper by Guinigundo from the Philippines, possible interest rate repression stemming from reduced issuance of government securities could lead to distortions of the yield curve. In the Philippines, yields on Treasury bills, which are often used as a reference rate for pricing other loans, have fallen sharply because the government has rejected bids in auctions. This had led to confusing signals about monetary policy. This problem is likely to be even more severe in countries with persistent fiscal surpluses. Mainly to develop a domestic yield curve, some fiscal surplus governments have opted to issue bonds by overfunding their budgets. As noted by the paper from the Monetary Authority of Singapore (MAS), the government of Singapore is an interesting example of this trend in that its debt issuance is wholly unconnected to its fiscal requirements. While the MAS issues government bonds regularly to develop the yield curve, supplemented recently by its own bonds, it retains the proceeds from the sale of securities in a special government account to meet interest payments and repayments.

Most Deputy Governors felt that diversification of the investor base is critical in boosting liquidity and reducing bond market volatility. As noted in the paper by Sidaoui, Santaella and Pérez, a more diversified investor base in Mexico has reduced the impact of idiosyncratic shocks on bond prices. The authors attribute this development to the growth of domestic institutional investors (particularly pension and mutual funds), leading to reduced concentration of bond holdings in the hands of any one investor category. A diversified investor base has contributed to a more stable pattern of investment by institutional investors.

Several participants argued that greater foreign participation in domestic bond markets can on balance have positive financial stability implications, particularly in the long run. However, other participants highlighted that foreign inflows could numb monetary policy transmission and increase financial stability risks. In many EMEs, strong foreign capital inflows have compressed domestic yields, reducing the impact of monetary policy tightening. In addition, foreign inflows could be driven by carry trade incentives and are inherently volatile as highlighted in several country papers (eg Indonesia, South Africa and Thailand). Therefore Thailand has introduced a withholding tax on non-resident investors, while Indonesia has adopted measures to manage capital inflows and resultant excess liquidity. In this respect, the paper from Chile suggested that short-term financial volatility from foreign ownership may be mitigated by allowing domestic funds to invest abroad. As home bias increases during times of stress, domestic pension funds in Chile can absorb the foreign selling of domestic bonds.

4. Central banks and public debt management

The meeting's final session focused on central banks' involvement in debt management and its macroeconomic and monetary policy implications. Presently, the issue is being debated in advanced and the emerging market economies, as central banks have expanded their balance sheets sharply. Views differ widely about the role central banks should take in debt management (see BIS (2012)).

In the advanced and emerging market economies alike, governments – or central banks on their behalf – manage public debt with several objectives in mind: eg to keep interest costs and refinancing risks to a minimum, ensure an adequate supply of risk-free assets in the economy and maintain a stock of short-term securities so that banks can adequately manage their liquidity risks. Yet microeconomic objectives are not the sole purpose behind an active debt management policy. In recent years, central bank interventions in debt markets have been motivated by macroeconomic considerations too; that is, to gain more control over the long-term interest rate or the exchange rate. The working assumption behind this motivation is that different assets held by private agents are imperfect substitutes for each other. Consequently, the central bank affects their relative prices (ie the asset returns) by changing the quantity of their supply. In the case of the yield curve, the central bank can alter the relative supply of short- and long-term bonds to manage the term structure.

In emerging markets, as noted by Filardo, Mohanty and Moreno in their BIS background paper on "Central bank and government debt management: issues for monetary policy", central banks have become a major issuer of domestic debt securities in the past decade. The authors highlight three salient trends about the size, issuance and maturity of the outstanding stock of debt securities. First, official debt securities issued by EMEs (government plus central banks) as a whole have increased from 19% of GDP at the end of 2000 to 29% of GDP at the end of 2010; the debt securities issued by central banks constitute 10–40% of GDP in several countries. Second, most debt securities issued by the central banks are short-term, with an average maturity of less than one year. Finally, partly reflecting central bank issuance, the share of outstanding short-term debt securities in total official debt securities remains high in EMEs, at about 37% of GDP at the end of 2010.

Several perspectives on these developments were discussed at the meeting. One concerned the primary motivations behind central bank debt management and whether such motivations systematically differed from those of the government. There was a consensus that in many economies, central bank debt issuance has been driven by exchange rate and monetary policy considerations. When central banks intervene in the foreign exchange market to resist appreciation pressures on the exchange rate, they issue their own debt securities to banks to ensure that short-term interest rates do not fall below their policy rate target.

At an operational level, the participants emphasised the need for central banks to have sufficient financial resources to absorb potential financial losses when altering the size and composition of the debt. On the one hand, debt issuance by central banks exposes them to interest rate risks, potential losses stemming from the positive interest rate carry (issuing high-yielding domestic bonds to finance low-yielding foreign assets) and the costs of rolling over debt at inopportune times. On the other hand, the increased scarcity of government securities implies that central banks have to rely increasingly on their own securities for sterilised intervention.

Despite the potential benefits of actively managing the debt structure, some central banks have recently reduced or suspended issuance of their own securities. For instance, as noted in the paper by Sidaoui, Santaella, and Pérez, the Bank of Mexico has stopped issuing its own securities in order to allow for more domestic issuance by the government. This is expected to enhance market liquidity for government debt and lead to further reductions in currency and maturity mismatches. Similar efforts have been taken by the Bank Indonesia to reduce issuance of its own securities (see the paper by Hendar).

A second perspective that arose in the discussion was the role of short-term debt securities in influencing the effectiveness of monetary policy. There is a long-standing view that issuance of short-term government securities is akin to monetary deficit financing. Banks can, in particular, easily sell or leverage up on short-term securities and then expand credit to the private sector (Tobin (1963)). Converting short-term debt into long-term bonds (“funding”) reduces the liquidity of these assets because bonds cannot be liquidated without a capital loss. This is why selling long-term government bonds is regarded as non-monetary financing. For instance, the authorities in many advanced economies have adopted limits on short-term debt issuance by the government.³

In order to assess the magnitude of this potential source of liquidity, Filardo, Mohanty and Moreno update Tobin’s analysis for EMEs. They find that the share of highly liquid liabilities (the sum of monetary base and short-term debt of maturity of less than one year, adjusted for mandatory reserve requirement on banks) in official sectors’ combined liabilities ranged between 15% and 90% in EMEs at the end of 2010. They also find a positive correlation between this liquidity measure and the expansion of bank credit to the private sector.

The paper by Gandhi notes that, in the Indian context, large government borrowing requirements have created significant challenges for the Reserve Bank of India in coordinating debt management and monetary policy. The RBI typically has to cope with persistent structural liquidity in the banking system, which needs to be managed carefully to ensure smooth transmission of monetary policy actions.

Central banks that issue debt can use it to help reduce their reliance on other, more distortionary monetary policy tools. While the issuance of short-term debt may be seen as inflationary in some situations, it also reduces the need to resort to non-market policy instruments such as reserve requirements that impede the development of financial markets over time. In addition, the development of a market in short-term local currency debt can have positive effects on that of the inter-bank market for collateralised lending.

A final perspective discussed was the role of active debt management in influencing the yield curve, particularly in volatile financial market conditions. The relevant channel is the term premium, which can change depending on the relative demand and supply for various securities. In emerging markets, as noted by Filardo, Mohanty and Moreno, given their relatively underdeveloped bond markets and a shortage of EME high-quality assets, the term premium is likely to be more sensitive to changes in demand for various debt maturities. A rising share of foreign investors in EME local currency bond markets has added further complexities. There is significant evidence that the spread between the short- and long-term yields has fallen sharply in many EMEs in recent years, although it is not immediately clear whether such a trend reflects an anticipation of future monetary easing or a reduction in the term premium associated with strong demand for long-term government paper.

The discussion at the meeting also highlighted the impact of strong capital flows on domestic capital markets and raised the possibility that active debt management could be used as a policy tool to enhance financial stability. As noted by Oh in his paper, the recent drop in term spreads in Korea because of increased demand by foreign investors created significant challenges for the monetary authority as it was raising policy rates in response to upward inflation pressures. It remains an open question whether more active debt management could achieve a better balance of supply and demand for various debt maturities.

³ Provided, of course, that the authorities do not support the bond market. Patel’s classic paper is lucid on this point (reprinted in Khatkhate and Reddy (2012)). Until the late 1970s, many central banks used a liquid asset ratio to control bank credit. The policy was based on the view that long-dated bonds absorb liquidity from the banking system, thereby acting to tighten monetary policy (see Allen (2012) for an application to the UK).

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Is monetary policy constrained by fiscal policy?

Carlos Montoro, Előd Takáts and James Yetman¹

Abstract

In this paper we analyse how fiscal policy has affected monetary policy in the emerging market economies (EMEs). We find that most EMEs have pursued countercyclical fiscal and monetary policy over the past decade, with little evidence of fiscal dominance, in contrast to earlier periods. Our results also suggest that stronger fiscal positions are weakly associated with lower equilibrium real interest rates, and smaller deficits with lower inflation. Overall, improvements in fiscal policy in EMEs appear to have increased the effectiveness of monetary policy.

Keywords: Fiscal policy, monetary policy, Taylor rule

JEL classification: E63, H63

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1. Introduction

Fiscal policy and public debt matter for monetary policy. Not only can they influence interest rates and the level of aggregate demand, but they may also affect monetary authorities' ability to control inflation. During the 1980s and 1990s, public debt levels in many emerging market economies (EMEs) remained high, constraining monetary policy. However, over the past decade fiscal positions in EMEs have generally improved. Public debt levels have fallen or moderated and governments in several economies have accumulated large holdings of financial assets. Many economies have adopted formal fiscal rules and most have abolished direct central bank financing of deficits, reducing the threat of fiscal dominance.

Notwithstanding their strong medium-term growth prospects, EMEs' fiscal positions are still exposed to financial and external demand shocks. In addition, many EMEs are likely to face significant fiscal pressures from ageing populations over the long term. Furthermore, contingent liabilities from government-owned corporations and the financial sector require careful monitoring.

What are the implications of fiscal developments for monetary policy? In this note, we discuss three key aspects of this question. First, have EMEs left behind the era of fiscal dominance? Do they consistently pursue countercyclical monetary and fiscal policies? We argue that the ability of EME policymakers to conduct countercyclical economic policies represents a major advance, and one that contributes to global economic stability. But of course, countercyclical monetary and fiscal policies are not sufficient by themselves for good macroeconomic outcomes – in fact, many advanced economies facing economic crises today do so in spite of their countercyclical policies in the past. Second, is the long-run real interest rate related to fiscal deficits and the level of government debt? If so, further improvements in fiscal sustainability measures might lower real interest rates. Conversely, poor fiscal performance may have negative implications for long-run growth. Further, a fiscal deterioration could raise the spectre of a return to fiscal dominance and so complicate central banks' efforts to control inflation. And third, what is the relationship between inflation and the government deficit? Are fiscal policies an important determinant of monetary stability?

The rest of the note is organised as follows. In Section 2 we discuss factors influencing the relationship between fiscal and monetary policy. In Section 3 we present some preliminary empirical evidence on the three questions set out above. Using estimated Taylor rules, we show that both monetary and fiscal policy were generally countercyclical in EMEs over the past decade. Furthermore, equilibrium real interest rates are generally lower when fiscal deficits or government debts are lower. Finally, lower fiscal deficits are also associated with lower inflation in EMEs. The final section concludes.

2. Factors influencing the relationship between fiscal and monetary policy

Countercyclicality of fiscal policy

Some components of the budget balance vary with the business cycle, independently of policy decisions. Such automatic stabilisers include many types of tax revenue and social transfers. The structural, or cyclically adjusted, fiscal deficit is a measure of the hypothetical fiscal stance if output were to equal potential.

Table 1 shows general government fiscal deficits and cyclically adjusted deficits as a percentage of GDP in EMEs. For 2011, by the latter measure, the fiscal stance in EMEs appears to be more expansionary than suggested by fiscal deficits, with some exceptions such as China and the Czech Republic. Also, headline fiscal surpluses invert to deficits in

Chile, Hungary and Hong Kong SAR in 2011 after controlling for the effects of the business cycle.

Table 1
General government fiscal and cyclically adjusted deficit¹

	Fiscal deficit						Cyclically adjusted deficit			
	1990–99 ^{2, 3}	2000–07 ^{2, 4}	2008	2009	2010	2011	2008	2009	2010	2011
Emerging Asia ⁵	0.2	1.0	0.0	2.7	1.2	1.2	0.2	2.2	1.4	1.8
China	2.3	1.8	0.4	3.1	2.3	1.2	0.0	2.4	1.5	0.0
Hong Kong SAR	-2.0	0.0	-0.1	-1.6	-4.5	-3.7	-0.2	2.2	1.4	2.2
India	7.7	8.0	7.2	9.8	9.2	8.7	9.3	10.8	9.7	9.1
Indonesia	...	1.0	0.0	1.8	1.2	1.6	0.2	1.7	1.2	1.6
Korea	-2.0	-2.1	-1.6	0.0	-1.7	-2.3	-1.8	-0.7	-1.7	-2.4
Malaysia	-0.1	3.7	3.2	5.3	3.7	5.1	4.9	5.8	6.1	5.4
Philippines	0.5	2.4	0.0	2.7	2.2	0.8	1.7	3.5	3.5	2.1
Singapore	-21.0	-10.1	-5.6	0.5	-5.1	-7.3	-5.3	0.1	-4.8	-7.1
Thailand	2.2	0.4	-0.1	3.2	0.8	1.9	0.8	2.1	0.4	1.8
Latin America ⁵	2.2	1.8	0.8	3.6	2.8	2.6	1.2	2.1	2.1	2.9
Argentina	2.7	4.6	0.8	3.6	1.6	3.3	1.1	1.7	0.7	3.3
Brazil	5.9	3.5	1.4	3.1	2.8	2.6	2.2	2.6	3.8	3.2
Chile	-0.6	-2.4	-4.1	4.1	0.3	-1.2	1.1	4.1	2.0	1.2
Colombia	1.6	1.8	0.0	2.5	3.1	2.1	2.1	0.7	2.2	2.5
Mexico	3.1	2.1	1.1	4.7	4.3	3.4	1.3	3.8	3.8	3.2
Peru	...	0.4	-2.2	2.1	0.3	-1.9	-0.8	0.9	1.1	-0.9
Venezuela	1.8	-0.1	2.6	8.1	5.9	5.3	...	...	...	...
CEE ⁵	4.8	4.3	2.4	5.8	4.3	0.3	3.9	4.0	3.9	3.1
Czech Republic	5.6	4.0	2.2	5.8	4.8	3.8	3.2	4.5	3.9	3.1
Hungary	3.3	6.6	3.7	4.5	4.3	-4.0	5.2	2.7	4.8	4.6
Poland	4.1	4.3	3.7	7.3	7.8	5.2	4.7	6.9	7.9	5.5
Russia	5.9	-4.6	-4.9	6.3	3.5	-1.6	-3.9	3.4	2.2	-1.6
Turkey	...	5.0	2.4	5.6	2.7	0.3	3.9	4.0	3.2	1.8
Other EMEs ⁵	2.5	0.6	0.5	5.3	4.6	4.0	3.2	5.2	4.4	4.2
Israel	...	5.0	3.4	6.0	4.6	4.0	4.0	5.3	4.3	4.2
Saudi Arabia	2.5	-10.8	-34.4	4.6	-6.6	-15.2	...	...	...	...
South Africa	...	0.6	0.5	5.3	4.9	4.6	2.3	5.1	4.5	4.2
EMEs ⁵	2.3	1.8	0.4	4.3	2.8	1.7	1.5	3.1	2.7	2.4

¹ Overall fiscal deficit as a percentage of GDP and overall cyclically adjusted deficit as a percentage of potential GDP, respectively. ² Mean ³ For Hong Kong SAR, 1991–99; for the Philippines, 1994–99; for Korea, Thailand, the Czech Republic, Hungary and Poland, 1995–99; for Brazil and Chile, 1996–99; for Argentina, 1997–99; for Russia, 1998–99; for Saudi Arabia, 1999. ⁴ For Turkey, 2002–07. ⁵ Simple median of the economies shown.

Sources: IMF, *World Economic Outlook* and Fiscal Monitor Databases, April 2012.

Even so, there are issues with the accuracy of cyclically adjusted balance measures in EMEs. As discussed in the background paper from the Czech Republic, they can be very sensitive to underlying assumptions about the level of potential output. A second problem relates to the adjustment of budget balances for commodity price changes. To be

meaningful, the structural budget balance must correct for exceptional movements in the terms of trade. This factor is particularly important in economies with a large share of production related to commodities such as mining, energy (including oil) and agricultural products. The methodology for adjusting for commodity prices parallels that used to construct a cyclically adjusted deficit, and amounts to adjusting tax revenues to those that would be received were commodity prices at equilibrium levels.

Some economies already use an estimate of equilibrium commodity prices to estimate structural budget balances. Since 2002, Chile has used a rule-based fiscal policy whereby the structural budget balance is adjusted for cyclical movements in the prices of copper and molybdenum. According to the background paper by the Central Bank of Chile, an escape clause on the fiscal rule was put in place in 2009 to allow more scope for countercyclical fiscal policy during the recent global financial crisis. In 2010, Colombia introduced a targeting rule on the structural primary balance adjusted for the effects of cyclical oil prices. And Peru uses the structural budget balance adjusted for the cyclical effects of mining and energy prices as a guideline for multi-annual macroeconomic planning. According to the IMF (2009b), variation in commodity prices from equilibrium levels reduced the fiscal deficit by 0.7 percentage points of GDP in 2008 and raised it by 1.8 percentage points in 2009 across EMEs.

Fiscal sustainability

Fiscal sustainability is often defined in terms of measures of gross or net debt, as well as the change in debt given by the current and the expected future primary balance. Data for gross debt are more readily available than for net debt, and represent the total stock of outstanding government debt. Net debt is the difference between gross debt and financial assets owned by the government, although precise definitions vary by economy.² Gross debt influences interest rates because it represents the total stock of debt that governments need to roll over. However, investors' perceptions could also depend on net debt, especially in economies where the government holds a large stock of financial assets.

In general, central banks regard net debt as the more appropriate measure of underlying government indebtedness since the financial holdings of the government can be liquidated to offset a portion of the gross debt. The difference between gross and net debt widened in many developed economies in the wake of the international financial crisis as a result of government purchases of financial assets, a process that is likely to reverse in the coming years as governments reduce their holdings of such assets.

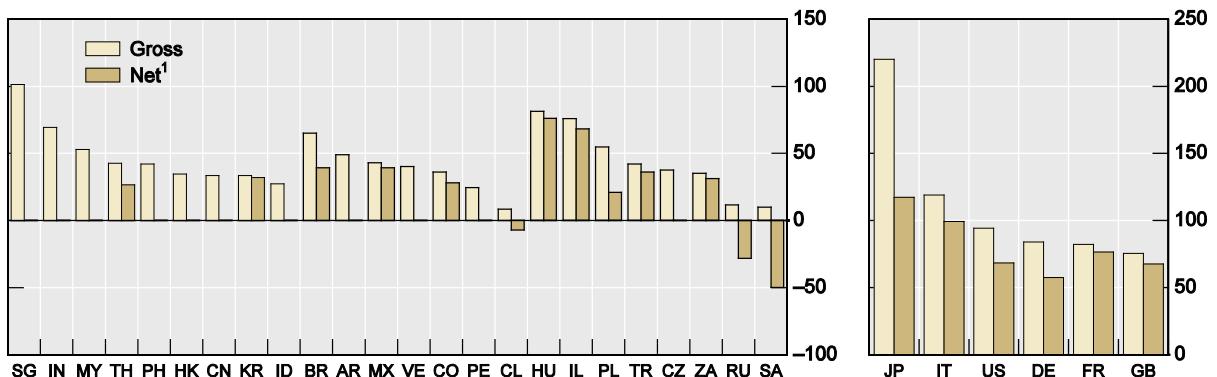
However, there are limitations to net debt as a measure of fiscal sustainability. In some cases, a portion of the government's financial assets represents the government's future obligations – government debt held by pension funds for government employees, for example. While these holdings may clearly be used to offset debt issued by the government, the future pension obligations that they are intended to finance would then need to be funded from some other source. Also, gross debt may be an important indicator of short-term fiscal vulnerability if there are limits to markets' ability to absorb the sale of financial assets held by the government, especially during times of financial stress. As the government needs to refinance its gross (rather than net) debt as it matures, its ability to refinance its existing debt stock depends not only on the total level of debt but also on its maturity structure.

As Graph 1 shows, gross debt in major EMEs varies widely. The graph also shows that, while net debt is a little lower than gross debt for most economies, in some cases the

² For economy-level data, please refer to Tables A3-A4 in the Appendix.

difference between the two is very large. Poland's net debt is less than half of its gross debt, and in Saudi Arabia gross debt of 10% compares with net debt of -50%.

Graph 1
General government debt 2010
As a percentage of GDP



AR = Argentina; B = Brazil; CL = Chile; CN = China; CO = Colombia; CZ = Czech Republic; DE = Germany; FR = France; GB = United Kingdom; HK = Hong Kong SAR; HU = Hungary; IL = Israel; ID = Indonesia; IN = India; IT = Italy; JP = Japan; KR = Korea; MX = Mexico; MY = Malaysia; PE = Peru; PH = Philippines; PL = Poland; RU = Russia; SA = Saudi Arabia; SG = Singapore; TH = Thailand; TR = Turkey; US = United States; VE = Venezuela; ZA = South Africa.

¹ As of 2009 for Russia; net debt data of Argentina, China, Czech Republic, Hong Kong SAR, India, Indonesia, Malaysia, Peru, Philippines, Singapore and Venezuela are not available.

Sources: IMF, *Government Finance Statistics*; IMF, *World Economic Outlook*; CEIC; national data.

Comparable data for the six largest advanced countries (by GDP) is reported in the right-hand panel of the graph. All the advanced economies are more indebted than all but two of the EMEs in net terms. This suggests that the EMEs are currently in much better shape than the major advanced economies in terms of debt sustainability.

As fiscal sustainability is primarily about the expected future path of public debt, it is natural to consider public debt projections as a measure of fiscal sustainability. Current debt levels provide the starting point for such projections. These are then combined with assumptions about the future. The key variables are the economy's expected growth rate, government spending levels and interest rates. Given the inherent uncertainties regarding these variables, any debt projections should be interpreted with caution, and the major underlying assumptions critically examined.

Table A2 in the Appendix contains past and projected levels of public gross debt published by the IMF for EMEs. Debt levels increased in many economies between 2006 and 2010 as a result of the international financial crisis. However, in almost all EMEs gross debt is projected to be lower as a percentage of GDP in 2016 than in 2010. In terms of levels, the projections in the tables suggest some vulnerability. Gross debt is projected to remain close to 60% of GDP in India, Brazil and Israel beyond 2016, and above 70% in Hungary. This leaves fiscal sustainability in these economies somewhat vulnerable to a spike in interest rates, for example. In Singapore, high gross debt is less of a concern due to the large offsetting asset positions held by the government.

Overall, the projections suggest that debt remains sustainable in most EMEs, at least for the next five years. However, ongoing population ageing that is projected to accelerate beyond then (see the discussion in the Annex and Graph A1) may pose a challenge further down the road.

Contingent liabilities of the government

One key factor that all the previous analysis ignores is “invisible” public debt that may not be captured in standard debt statistics and may be very difficult to forecast. This latent debt reflects obligations to public corporations as well as explicit or implicit government guarantees. These contingent liabilities may also reduce balance sheet transparency and increase the risk of negative debt surprises, as the note from Thailand argues.

Large state-owned corporations are a major source of invisible debt. These corporations play an important role in many EMEs, especially in sectors considered to be natural monopolies. For example, Indonesia’s state-owned Pertamina is the world’s largest exporter of liquefied natural gas, while Indian Railways is the country’s largest employer. State-owned entities benefit from the expectation of backing from the fiscal authority, resulting in lower financing costs. PetroChina, which is 87% state-owned, pays a spread of 160 basis points over Chinese sovereigns; by comparison, the private sector ExxonMobil pays 265 basis points over US sovereigns. Lenders have come to expect the government to prevent failures of state-owned firms, implying a potential liability for the fiscal authority. However, the debt of state-owned corporations does not generally appear in government debt statistics.

Banking is another source of invisible public debt. State-owned banks account for a large share of many EME banking systems. China’s largest banks are majority-owned by the government. In India, state-owned banks hold over 75% of all deposits, a market share that has been growing since the beginning of the international financial crisis. While the debts of these institutions are not counted as part of public debt, the fiscal authority is likely to bail them out if necessary. As the background note for the case of Hungary shows, foreign currency-denominated private debt can also create challenges.

Even private sector banks may benefit from implicit government guarantees. In India, private sector banks are largely free from the fear of failure as the government guarantees to take over banks’ uncovered liabilities if necessary. In late 2008, many governments in advanced economies resorted to significant bailouts of private sector banks, substantially swelling public sector debt. In earlier crises, Turkey’s public debt-to-GDP ratio rose from around 30% in 1999 to nearly 70% in 2001, and that of Thailand increased by two thirds as a result of the Asian financial crisis. While it is impossible to predict the potential cost of implicit guarantees to the financial sector in future, clearly a well regulated and well capitalised banking system plays an important part in ensuring fiscal sustainability. More generally, maintaining a precautionary debt buffer below the limit of what is sustainable is prudent in the light of implicit liabilities.

3. Consequences for monetary policy

In this section, we formally analyse the three questions asked at the outset. First, we examine the cyclical properties of fiscal and monetary policies. Second, we examine how fiscal deficits and outstanding debt stocks might affect the real interest rate. Finally, we take a look at how fiscal deficits might affect inflation.

Monetary and fiscal stabilisation

In the past, EMEs often found it difficult to implement countercyclical policies. This was particularly the case for central banks. Monetary policy was frequently subordinated to the requirements of an expansionary fiscal policy, a condition described by Sargent and Wallace (1981) as fiscal dominance. And fiscal expansion during economic upturns left little scope for countercyclical policies during downturns. However, the era of fiscal dominance appears to have ended in most EMEs; monetary and fiscal policies appear to be countercyclical. We now examine this question further with statistical analysis.

One way to measure how far monetary policy is countercyclical is to estimate the correlation between the business cycle and the real policy interest rate, controlling for other relevant factors. The Taylor (1993) rule offers a straightforward way to do so. The policy rate is modelled as responding to several variables:

$$i = p + a(y - y^*) + b(p - p^*) + r^* \quad (1)$$

where i is the nominal policy interest rate, p is the rate of inflation, p^* is the (explicit or implicit) inflation target, $y - y^*$ is the output gap, r^* is the “equilibrium” real interest rate; a and b are parameters that represent the degree to which a central bank responds to output and inflation developments, respectively. The intuition behind the Taylor rule is straightforward: a monetary authority should adjust the policy rate one-for-one for changes in inflation (p) and should respond positively to business cycle fluctuations ($y - y^*$) and the deviation of inflation from the inflation target ($p - p^*$). In particular, a larger a captures a more countercyclical monetary policy, while a negative value would imply a procyclical monetary policy.³

For fiscal policy, Taylor (2000) provides an analogous approach. The fiscal balance, measured as a percentage of GDP, is split into structural and cyclical factors:

$$b = b^* - g(y - y^*) \quad (2)$$

where b denotes the general government budget balance as a percentage of GDP, b^* the cyclically adjusted deficit, $y - y^*$ the output gap and g the degree of sensitivity of budget balance to the output gap. The coefficient g can be used to measure for the degree of countercyclicality; the larger g becomes, the more countercyclical is fiscal policy. Similarly, as in the case of monetary policy, a negative g would imply procyclical fiscal policies.

The degree to which monetary and fiscal policies are countercyclical is estimated over the 2000–11 period for a subset of EMEs that have adopted inflation targeting. To better match the data in the EMEs under investigation, equation 1 is extended to include an exchange rate term to reflect EME concerns about exchange rates in monetary policy-setting. In addition, an autoregressive term is added representing the preference of policymakers for smoothing interest rates. The two modifications yield the following empirical specification:

$$i = f i_{-1} + (1 - f)[p^* + a(y - y^*) + b(p - p^*) + d(e - e_{-1}) + r^*] + e \quad (3)$$

where, in addition to the variables defined in equation 1, the subscript (–1) denotes one-quarter lagged variables, f is an autoregressive parameter reflecting the preference of a monetary authority to smooth policy rate adjustments over time, e is the bilateral nominal exchange rate vis-à-vis the US dollar, d is the parameter reflecting the monetary policy response to exchange rate movements, and e is the error term. The time and country subscripts are omitted for ease of representation.⁴ Notice that a remains the parameter of interest, because it captures the long-run countercyclicality of monetary policy.

³ Furthermore, a larger b might also signal that monetary policy is more countercyclical in responding to output deviations to the extent that these output deviations also appear in the inflation rate (via, for instance, the relationships captured in the Phillips curve).

⁴ Potential output (y^*) is estimated on quarterly output data (y) between 1999 Q1 and IMF projections up to Q4 2013 using the Hodrick-Prescott filter.

In an analogous way, equation 2 is also modified to incorporate policy preferences for smoothing:

$$b - b^* = y(b - b^*)_{-1} - (1 - y)g(y - y^*) + x \quad (4)$$

where, in addition to the variables defined in equation 2, y represents the policy-smoothing preference for fiscal policy and x is the error term. The time and country subscripts are again omitted for ease of representation.⁵ As in equation 3, g remains the parameter of interest because it captures the long-run countercyclical of fiscal policy.

For each inflation targeting EME, equations 3 and 4 are estimated jointly using the method of seemingly unrelated regression for the 2000–11 period. In order to provide some context, similar estimates – without the exchange rate term in equation 3 – are also obtained for advanced economies.⁶ Table A5 in the Appendix shows the estimation details.

Graph 1 presents the point estimates of a and g and offers a cross-country perspective on the countercyclical characteristics of monetary and fiscal policies during the 2000–11 period. The vertical axis measures a , the degree of countercyclical for monetary policy, while the horizontal axis measures g the degree of countercyclical for fiscal policy. Consequently, policies which fall into the first quadrant ($a > 0, g > 0$) are countercyclical and policies which fall into the third quadrant ($a < 0, g < 0$) are procyclical. Policies in the second ($a < 0, g > 0$) and fourth ($a > 0, g < 0$) quadrant are ambiguous and their cyclical depends on the relative strength of monetary and fiscal policies.

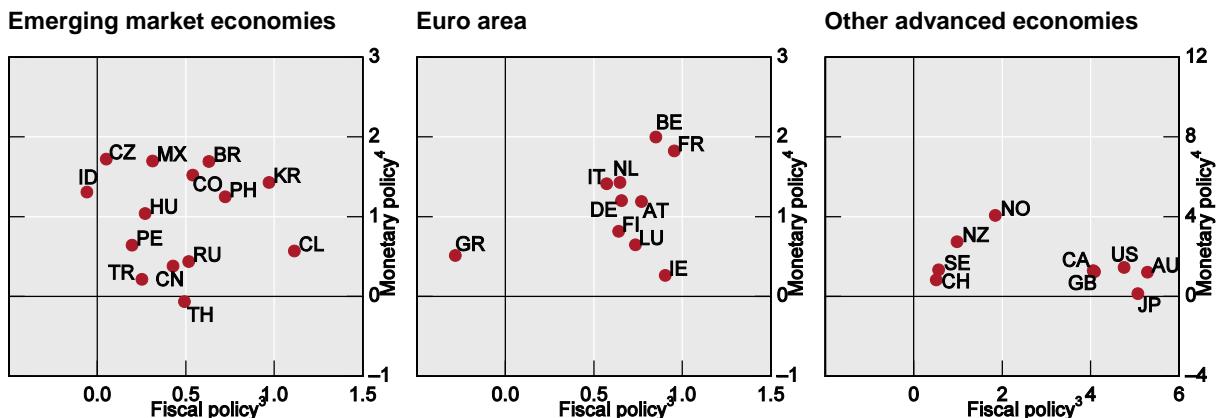
The results show that most EMEs were able to pursue countercyclical policies during the decade as the dots representing individual economies are either in the first quadrant or near its border. This impression is confirmed by a more formal statistical analysis. The last column on Table A5 in the Appendix shows the probability that both monetary and fiscal policies were countercyclical (ie $a > 0$ and $g > 0$). The probabilities are close to unity for around half of the EMEs in the sample, and are below one half in only two cases. The evidence suggests that EMEs as a group were able to pursue countercyclical monetary and fiscal policies.

Naturally, the policy mix varies considerably. While most EMEs used both monetary and fiscal policy to lean against the business cycle, some relied more heavily on one policy than the other. For example, Thailand and Turkey relied heavily on fiscal policy while the Czech Republic and Indonesia looked more to monetary policy. The degree of countercyclical also varied markedly from country to country. For instance, Chile pursued the most countercyclical fiscal policy among EMEs. This may reflect policy preferences for output stabilisation (as laid down by Chile's fiscal responsibility law) and also the need to stabilise output in the face of volatile copper prices. Yet, fiscal policy is not necessarily dictated by commodity prices: Russia pursued a less countercyclical fiscal policy despite its exposure to oil prices. It seems that policy preferences as well as economic and institutional frameworks have all shaped the policy mix applied by EMEs over the past decade.

⁵ Quarterly budget balances are seasonally adjusted and, where not available, are extrapolated from yearly figures. The structural budget balance (b^*) is estimated on quarterly budget balance data between Q1 1999 and IMF projections up to Q4 2013 using the Hodrick-Prescott filter on quarterly budget balances (b). This estimate of b^* is used because it is available for all countries, allowing a consistent methodology. This choice does not seem to affect the results: using OECD estimates where available instead does not materially affect the estimates of g .

⁶ The exchange rate term is not used for advanced economies, because exchange rate concerns appear to be less relevant for policymakers there. Importantly, this estimation choice does not materially affect the estimates of a and thus our conclusions.

Graph 2
Countercyclical monetary and fiscal policies¹
 2000-2011²



AT = Austria; AU = Australia; BE = Belgium; BR = Brazil; CA = Canada; CH = Switzerland; CL = Chile; CN = China; CO = Colombia; CZ = Czech Republic; DE = Germany; FI = Finland; FR = France; GB = United Kingdom; GR = Greece; HU = Hungary; ID = Indonesia; IE = Ireland; IT = Italy; JP = Japan; KR = Korea; LU = Luxembourg; MX = Mexico; NL = Netherlands; NO = Norway; NZ = New Zealand; PE = Peru; PH = Philippines; RU = Russia; SE = Sweden; TH = Thailand; TR = Turkey; US = United States.

¹ Seemingly unrelated regression estimation of equations (3) and (4). For details, see Appendix Table A5.

² Years without an (implicit) inflation target were excluded. ³ The horizontal axis shows how countercyclical fiscal policy is in output stabilisation (g of equation (4)). ⁴ The vertical axis shows how countercyclical monetary policy is in output stabilisation (a of equation (3)).

Sources: IMF, *World Economic Outlook*; OECD, *Economic Outlook*; Bloomberg; Datastream; JPMorgan Chase; national data; BIS calculations.

To put the EME results into perspective, the centre and the right-hand panels show the results for the advanced economies. The centre panel confirms that policies were also countercyclical in the euro area. Not only did the common monetary policy turn out to be countercyclical in all countries for which estimates were possible, but fiscal policy was also countercyclical in all countries except Greece. Interestingly, the estimates show that, on average, countercyclical in the euro area was similar to that of the EMEs, although slightly stronger. Unfortunately, further interpretation of the euro area results is not straightforward, as euro area countries do not have monetary policy independence.

Policies among other advanced economies were so much more countercyclical that the scales needed to be recalibrated on the right-hand panel. In particular, Japan and some English-speaking economies (Australia, Canada, the United Kingdom and the United States) stand out for their markedly countercyclical fiscal policies. For most of these countries, the phenomenon seems to be explained by the huge scale of the fiscal packages enacted after the Lehman failure. In any case, policy, especially fiscal policy, seems to be substantially more countercyclical in most of these economies than in EMEs.

In sum, both monetary and fiscal policy was countercyclical in most EMEs over the past decade. Although the estimates vary from country to country, the degree of countercyclical compares with that in many advanced economies.

Fiscal deficits and government debt: effects on interest rates

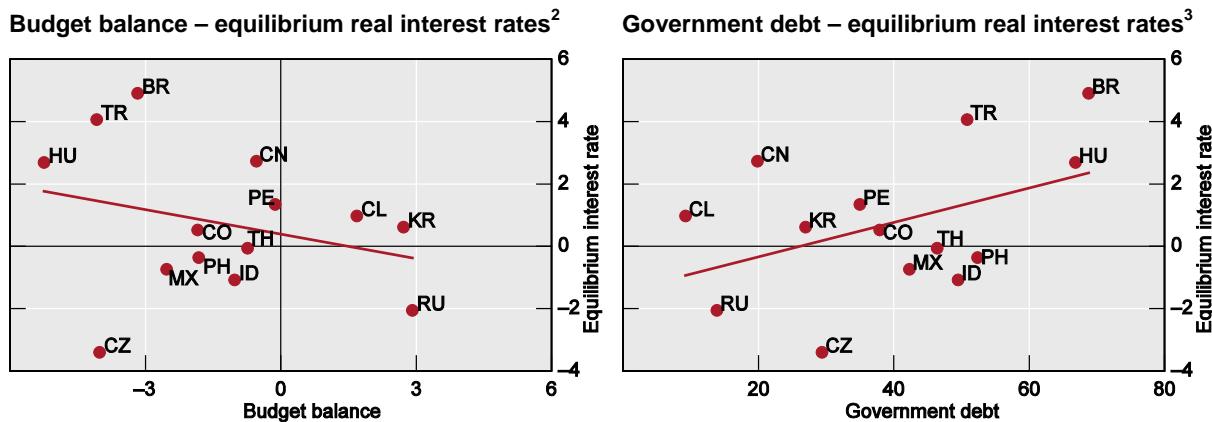
Fiscal policy might have substantial effects on monetary conditions, and thus on monetary policy, beyond its direct countercyclical effects. In particular, sustainability concerns due to large deficits or high debt levels might put upward pressure on long-term interest rates.

The left-hand panel of Graph 3 shows that budget balances display a weak, inverse relationship to estimated equilibrium real interest rates. The horizontal axis shows the estimated structural general government balances as a percentage of GDP (b^* from equation 2) while the vertical axis displays the estimated equilibrium real interest rate (r^* from equation 3). The negative trendline implies that larger surpluses (or smaller deficits) are associated with lower real interest rates, as the crowding out hypothesis would suggest, although the relationship is weak.

Graph 3

Budget balance, government debt and equilibrium real interest rates

2000–11¹



BR = Brazil; CL = Chile; CN = China; CO = Colombia; CZ = Czech Republic; HU = Hungary; ID = Indonesia; KR = Korea; MX = Mexico; PE = Peru; PH = Philippines; RU = Russia; TH = Thailand; TR = Turkey.

¹ Years without an (implicit) inflation target were excluded. ² The horizontal axis shows b^* from equation (2), ie the average general government net lending as a percentage of GDP, averages based on annual data. The vertical axis shows equilibrium real interest rates, ie r^* from equation (3), averages based on quarterly data. ³ The horizontal axis shows the average general government debt as a percentage of GDP, averages based on annual data. The vertical axis shows equilibrium real interest rates, ie r^* from equation (3), averages based on quarterly data.

Sources: IMF, *World Economic Outlook*; OECD, *Economic Outlook*; Bloomberg; Datastream; JPMorgan Chase; national data; BIS calculations.

Furthermore, the right-hand panel of Graph 3 shows that equilibrium real interest rates are positively associated with government debt. The horizontal axis displays general government debt as a percentage of GDP while the vertical axis shows the estimated equilibrium real interest rate (r^* from equation 3). Higher government debt is associated with higher real interest rates and vice versa as the crowding-out hypothesis would predict. In a similar vein, the background paper from Colombia finds that lower structural deficits lead to lower risk premia. However, the relationship is weak – and the underlying theory ambiguous. While government debt can crowd out private investment, strong private balance sheets might also enable the government to maintain large debt levels with low interest rates. High UK government debt throughout the 19th century could be one example of this. Again, in spite of some general trends, EMEs display large heterogeneity as both panels of Graph 3 confirm.

The inflation effects of fiscal deficit

Fiscal policy choices may affect the ability of monetary policy to achieve inflation stability. The well known extreme case is fiscal dominance, when fiscal policies force the central bank to abandon its price stability goal. Under a fiscally dominant regime, as defined in Sargent and Wallace (1981), central banks may not be able to counter inflationary pressures effectively. For this reason, Blanchard (2005) argues that inflation targeting would not have

been appropriate in Brazil in the early 2000s. In contrast, in a monetarily dominant regime, fiscal policy accommodates monetary policy, rather than being subsumed by it. The background note from Singapore outlines a special case of this. There, sound fiscal policy allows the central bank to manage the exchange rate, which is its primary monetary policy instrument.

Many EMEs have taken steps to reduce the threat of fiscal dominance, especially in the last 10 years. However, even in the absence of direct monetisation, fiscal policy might still affect inflation. Excessive fiscal deficits can contribute to economic overheating and higher inflation. For instance, spending may be systematically higher in election years, as Drazen (2004) documents. Furthermore, inflation expectations might increase when the medium-term path of public debt is perceived to be unsustainable.

More conservative fiscal policies are indeed weakly associated with lower inflation. Graph 4 shows average fiscal deficits (on the vertical axis) and average inflation (on the horizontal axis) during the 1990s (left-hand panel) and the 2000s (right-hand panel). The positively sloped trend (blue line) shows that a higher fiscal deficit is associated with higher inflation. Interestingly, the relationship is more positive when high-inflation economies such as Venezuela and Russia are excluded from the sample (lower two panels), although there is substantial variation across EMEs.

4. Conclusions

Returning to our three questions: first, can EMEs consistently pursue countercyclical monetary and fiscal policies? Our analysis suggests that, indeed, most EMEs have been able to pursue countercyclical policies over the past decade. Furthermore, EMEs which leaned against the business cycle generally relied on both monetary and fiscal policy to do so. In fact, the degree of countercyclicality is only slightly below that seen in most euro area countries, suggesting that EME policy frameworks have matured substantially – although it must be noted that EMEs vary considerably in their policy preferences, economic structures and institutional frameworks.

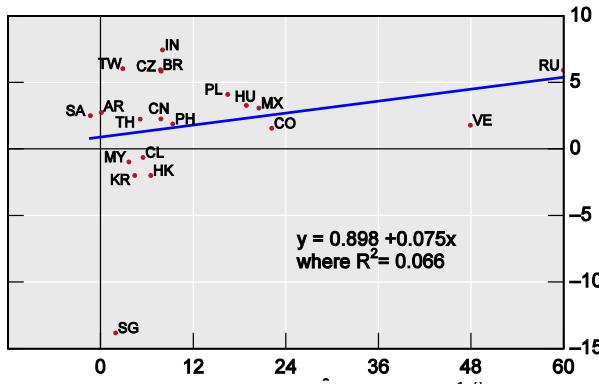
Second, is the long-run real interest rate related to fiscal deficits or the level of government debt? Our results suggest that stronger fiscal positions (lower deficits and lower debt levels) are weakly associated with lower equilibrium real interest rates. This implies that further improvements in fiscal sustainability could also yield lower interest rates. Conversely, deteriorating fiscal outcomes would be likely to have negative implications for long-run growth, as higher interest rates crowd out domestic investment, complicating the stabilisation role of central banks.

And third, is steady-state inflation related to the government deficit? Empirical evidence suggests that conservative fiscal policies are weakly associated with lower inflation, especially once high-inflation outliers are excluded from the sample. This suggests a cautionary interpretation to recent evidence of declining fiscal dominance in EMEs: the apparent decline may simply reflect a run of good fiscal outcomes. The corollary is that deterioration in fiscal performance may see a return to fiscal dominance.

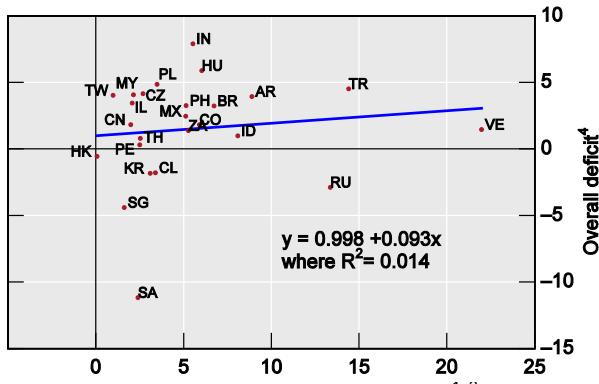
Graph 4
Fiscal and monetary policy interaction

In per cent

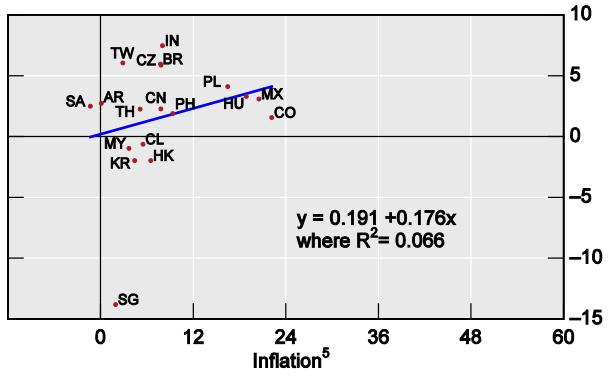
1990s^{1, 2}



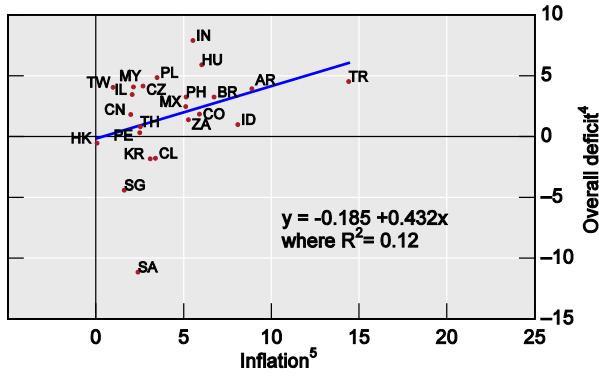
2000s^{1, 3}



1990s excluding Russia and Venezuela^{1, 2}



2000s excluding Russia and Venezuela^{1, 3}



AR = Argentina; BR = Brazil; CL = Chile; CN = China; CO = Colombia; CZ = Czech Republic; HK = Hong Kong SAR; HU = Hungary; ID = Indonesia; IL = Israel; IN = India; KR = Korea; MX = Mexico; MY = Malaysia; PE = Peru; PH = Philippines; PL = Poland; RU = Russia; SA = Saudi Arabia; SG = Singapore; TH = Thailand; TR = Turkey; TW = Chinese Taipei; VE = Venezuela; ZA = South Africa.

¹ Simple average. ² For Hong Kong SAR, 1991–99; for Korea, Thailand, the Czech Republic, Hungary and Poland, 1995–99; for Brazil and Chile, 1996–99; for Argentina, 1997–99; for Russia, 1998–99; for Saudi Arabia, 1999; 1990–99 otherwise. ³ For Turkey, 2002–10; 2000–10 otherwise. ⁴ Corresponding to general government; as a percentage of GDP. ⁵ Annual changes in CPI.

Sources: IMF, *World Economic Outlook Database*, September 2011; national data.

Annex: Additional fiscal sustainability issues in EMEs

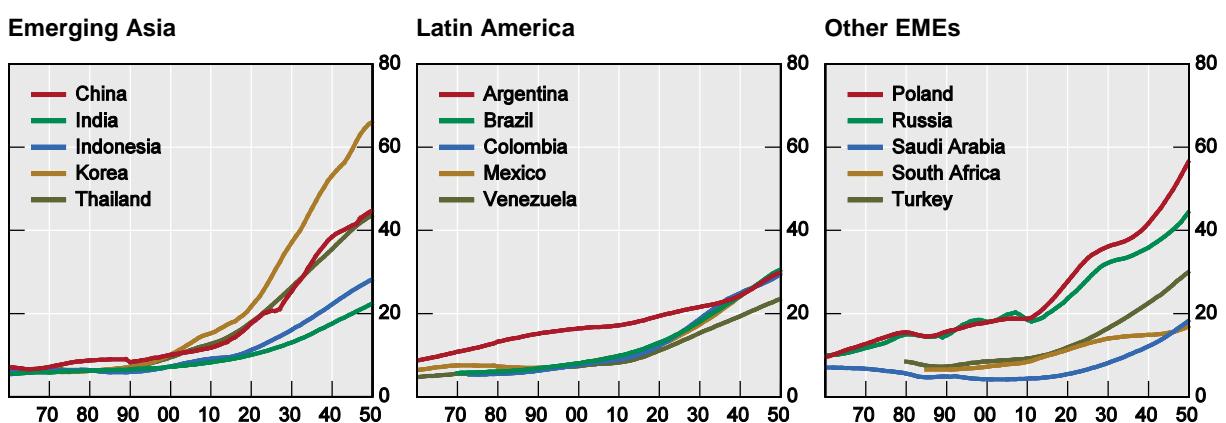
Pension liabilities and demographics

Additional caveats to debt as a measure of fiscal sustainability are pension obligations and changing demographics. In some economies, pension plans operate on a “pay-as-you-go” basis, with contributions used to fund immediate obligations. When underlying demographics were favourable, due to high birth rates or immigration, these appeared to be self-funded for many years. But ageing populations make this pension model unviable, as has been well documented for advanced economies in Cecchetti (2011), for example.

Although many EMEs currently enjoy a relatively favourable demographic situation, populations there are also expected to age rapidly in the coming years (Graph A1). Old-age dependency ratios are expected to increase from an average of 11% in 2011 to 27% in 2040 in the listed economies, and to more than treble in China and Korea.

Graph A1
Old-age dependency ratio¹

In per cent



¹ Ratio of the population aged 65 years or over to the population aged 15–64.

Sources: US Census Bureau; World Bank.

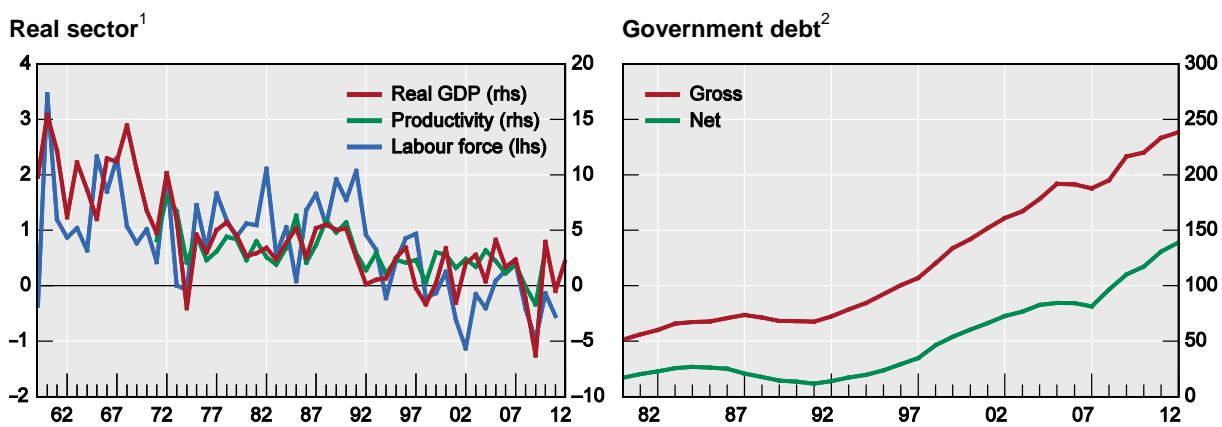
The effect of ageing populations on debt sustainability will vary widely. In Latin America, the rate of ageing is expected to be relatively low and pensions are generally well funded. The background note from Poland provides another positive example: even though Poland is expected to experience one of the fastest ageing processes in the European Union, age-related expenditure is expected to fall over the next 50 years due to pension reforms enacted in 1999 that provide for a switch from defined benefit to partly defined contribution plans. In contrast, ageing will occur rapidly in emerging Asia over the next two decades and current pension plans are generally too small to provide a secure, sustainable and adequate retirement income for current workers. In addition, underlying demographic developments will translate into increased fiscal demands for health care funding to meet the needs of growing numbers of retired workers, as the note from Hong Kong SAR outlines.

Demographic developments are also likely to put strains on fiscal sustainability due to slower future growth. As the note from China argues, ageing populations will result in lower economic growth rates and therefore a diminished future tax base. Persistent fiscal deficits

that appeared to be sustainable because debt-to-GDP ratios were stable may become unsustainable.

The case of Japan may be instructive. While productivity growth in Japan has matched or exceeded that of many other advanced economies in recent years, GDP growth has appeared anaemic due to low capital accumulation and a shrinking labour force (Graph A2, left-hand panel). Thus the rapid increase in debt-to-GDP ratios (right-hand panel) reflects not just significant deficits driving up the numerator, but slowing growth in the denominator as well. From the late 1980s, when Japan was growing at around 5% and net debt was a mere 13% of GDP, it took only 20 years to deteriorate to the point where net debt stood at 117% in 2010. Japan may serve as a cautionary tale as to how quickly debt sustainability can erode away when population growth stalls and demographic trends start to work against economic growth.

Graph A2
The case of Japan
In per cent



¹ Year-on-year changes. ² As a percentage of GDP.

Sources: IMF *World Economic Outlook*; OECD; CEIC; national data.

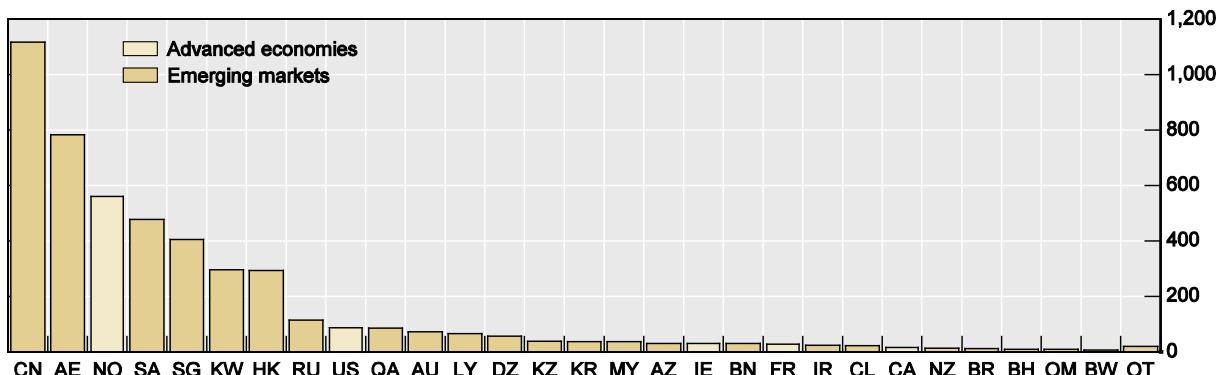
Sovereign wealth funds

One important variable that is typically excluded from debt sustainability calculations is the sovereign wealth fund (SWF). SWFs are government investment vehicles that are typically funded by foreign exchange assets but managed separately from the official foreign exchange reserves of the monetary authorities. The investment horizon of SWFs is longer than that of the official reserves, mainly because the primary goals of the latter are liquidity and security rather than long-run investment returns.

Graph A3 displays the size of total SWFs, by economy. SWFs play a particular role in fiscal sustainability for non-renewable resource exporters. Any economy where concurrent government spending is supported with such revenues faces sustainability issues as available resources are extracted. Well designed SWFs can provide the mechanism to transform resources into sustainable and stable future income. The background paper from Saudi Arabia outlines how such assets are part of an intergenerational swap, transforming natural resource revenues into monetary reserves for the benefit of future generations. Following this model, Algeria, Russia and Venezuela also have stabilisation funds funded with revenues from oil, while Chile has a stabilisation fund and a pension reserve fund funded with earnings from copper. As noted by the background paper for Chile, the administration of these two funds was delegated to the Central Bank of Chile.

Graph A3
Main sovereign wealth funds (SWFs) by economy and size

December 2011, in billions of US dollars



AE = United Arab Emirates; AU = Australia; AZ = Azerbaijan; BH = Bahrain; BN = Brunei Darussalam; BR = Brazil; BW = Botswana; CA = Canada; CL = Chile; CN = China; DZ = Algeria; FR = France; HK = Hong Kong SAR; IE = Ireland; IR = Iran; KR = Korea; KW = Kuwait; KZ = Kazakhstan; LY = Libya; MY = Malaysia; NO = Norway; NZ = New Zealand; OM = Oman; OT = other economies, including among others (by SWF size) Mexico, Italy, Venezuela and Indonesia; QA = Qatar; RU = Russia; SA = Saudi Arabia; SG = Singapore; US = United States.

Source: Sovereign Wealth Funds Institute.

Fiscal rules

Historically, EMEs have faced debt sustainability issues due to aggressive fiscal policies. However, over the past decade a number of economies have implemented fiscal rules to improve fiscal behaviour by increasing accountability, transparency and the quality of fiscal policies, as Fatás (2005) argues. Table A1 shows that 13 out of the 24 listed EMEs have some type of fiscal rule, and 10 of them have a numerical target for one or more fiscal variables.

Table A1
Fiscal rules

Feature	Number of economies	Economies
Fiscal rules	13	AR, BR, CL, CO, CZ, HK, HU, ID, IL, IN, MX, PE, PL
Numerical target	10	AR, BR, CO, CZ, ¹ HU, ID, IL, IN, MX, ² PE
Escape clause	7	AR, BR, CZ, ³ IL, ⁴ IN, PE, PL ⁵
Sanctions	5	AR, BR, CO, PE, PL ⁶
Monetary financing prohibited by law	4	BR, CL, PE, ⁷ PL

AR = Argentina; BR = Brazil; CL = Chile; CO = Colombia; CZ = Czech Republic; HK = Hong Kong SAR; HU = Hungary; ID = Indonesia; IL = Israel; IN = India; MX = Mexico; PE = Peru; PL = Poland.

¹ Expenditure limits are inserted in a medium-term expenditure framework. ² Balanced budget on a cash basis

³ The government may change the medium-term expenditure framework only in defined cases. ⁴ The Deficit Reduction Law excludes public investment or other priority items from ceiling. ⁵ Rules exclude public investment or other priority items from ceiling at sub-national levels. ⁶ The Public Finance Act includes triggers for corrective actions when the debt ratio reaches thresholds of 50%, 55% and 60% of GDP. ⁷ Prohibited from granting credit to the government, except for the purchase, in the secondary market, of securities issued by the Public Treasury these securities cannot exceed 5% of the money base.

Sources: Canales-Kriljenko et al (2010); IMF (2009a); BIS (2009).

However, the empirical evidence for the effectiveness of fiscal rules in enhancing discipline is inconclusive. On the one hand, some studies suggest that fiscal rules have been an important ingredient in successful fiscal consolidation: economies with fiscal rules have managed to reduce their public debt levels more significantly than others (IMF (2009a)). On the other hand, the recent experience of the euro area demonstrates the potential limitations of fiscal rules.

Appendix: graphs and tables

Table A2
General government gross debt
As a percentage of GDP

	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Asia ¹	46.8	45.0	45.2	48.5	48.6	46.9	46.1	44.8	43.8	42.9	41.9
China	16.2	19.6	17.0	17.7	33.5	25.8	22.0	19.4	17.1	14.8	12.6
Hong Kong SAR	33.0	32.8	30.6	33.2	34.6	33.9	33.2	30.4	29.7	29.0	28.4
India	78.5	75.4	74.7	75.0	69.4	68.1	67.6	66.8	66.2	65.8	65.3
Indonesia	39.0	35.1	33.2	28.6	27.4	25.0	23.2	21.1	19.2	17.6	16.4
Korea	31.1	30.7	30.1	33.8	33.4	34.1	32.9	30.8	28.7	26.7	24.9
Malaysia	43.2	42.7	42.8	55.4	52.9	52.6	53.1	54.0	54.8	55.6	56.3
Philippines	51.6	44.6	44.2	44.3	42.2	40.5	40.1	38.7	37.2	35.8	34.4
Singapore	86.4	85.8	96.9	103.3	101.2	100.8	98.0	95.7	92.6	90.2	87.6
Thailand	42.0	38.3	37.3	45.2	42.6	41.7	44.4	46.3	49.0	50.3	51.2
Latin America ¹	42.7	39.5	37.7	40.0	37.7	36.7	35.7	35.0	34.2	33.5	32.9
Argentina	76.5	67.1	58.5	58.7	49.1	44.2	43.3	41.9	41.6	40.1	39.4
Brazil	66.7	65.2	63.5	66.9	65.2	66.2	65.1	63.1	61.5	59.9	57.7
Chile	5.0	3.9	4.9	5.8	8.6	9.9	10.1	9.8	8.7	7.6	7.1
Colombia	36.8	32.7	30.8	35.9	36.1	34.7	32.3	32.3	31.4	31.6	31.7
Mexico	38.4	37.8	43.1	44.6	42.9	43.8	42.9	42.9	43.0	43.1	43.1
Peru	33.1	30.4	25.2	28.4	24.6	21.6	20.7	19.8	19.2	18.7	18.3
Central and eastern Europe ¹	37.7	37.1	39.1	44.0	46.4	46.7	46.1	46.1	46.1	45.7	45.4
Czech Republic	28.3	28.0	28.7	34.3	37.6	41.5	43.9	45.4	46.2	46.6	46.9
Hungary	65.9	67.0	72.9	79.7	81.3	80.4	76.3	76.0	75.4	74.3	73.1
Poland	47.7	45.0	47.1	50.9	54.9	55.4	55.7	55.2	53.9	52.2	50.5
Russia	9.0	8.5	7.9	11.0	11.7	9.6	8.4	7.9	9.0	9.7	11.3
Other emerging markets ¹	47.8	41.2	39.4	43.2	40.9	40.0	39.0	38.3	37.6	36.6	35.4
Israel	84.7	78.1	77.0	79.4	76.1	74.3	74.0	72.6	70.8	69.1	67.4
Saudi Arabia	27.3	18.5	13.2	15.9	9.9	7.5	5.9	5.2	4.6	3.9	3.4
South Africa	32.6	28.3	27.4	31.5	35.3	38.8	40.0	40.8	41.5	40.7	38.8
Turkey	46.5	39.9	40.0	46.1	42.2	39.4	36.0	34.6	33.5	32.8	32.1

¹ Simple average of the economies shown.

Source: IMF, *Fiscal Monitor*, April 2012.

Table A3
Gross and net general government debt¹
As a percentage of GDP

	2000		2005 ²		2010	
	Gross	Net	Gross	Net	Gross	Net
China	...	...	18.0	...	17.0	...
Hong Kong SAR	...	...	...	...	1.4	-0.1
Korea	18.3	...	28.6	...	33.4	...
Philippines	60.5	...	68.5	...	52.4	...
Singapore	26.6	...	37.4	...	43.6	...
Thailand	14.5	...	26.1	...	29.7	...
Argentina	52.5	...	88.3	...	52.5	...
Brazil	...	...	56.4	46.1	54.7	40.7
Chile	13.6	3.2	7.3	-0.1	9.2	-7.5
Colombia	38.8	36.5	44.2	39.1	40.2	35.7
Mexico	21.5	...	21.8	...	29.9	...
Peru	45.5	46.0	37.7	30.1	23.5	11.6
Czech Republic	17.8	-33.9	28.4	-16.6	37.6	-4.6
Hungary	56.1	50.8	61.7	57.5	81.3	73.5
Israel	84.3	71.6	93.7	83.8	76.1	68.2
Saudi Arabia	87.2	...	38.9	...	9.9	...
South Africa	43.4	42.6	34.7	30.2	35.1	29.6
Turkey	...	...	51.1	...	42.9	...

¹ For China, Philippines, Saudi Arabia, Singapore, Thailand, Turkey and South Africa central government debt.

² For Brazil, 2006.

Source: Results taken from central bank questionnaire, complemented where necessary with information from IMF, *World Economic Outlook*.

Table A4
Gross and net general government interest payments¹
As a percentage of GDP

	2000		2005		2010	
	Gross	Net ²	Gross	Net ³	Gross	Net
Hong Kong SAR	...	...	...	...	0.0	-0.1
Korea	...	...	1.2	0.30	1.2	-0.8
Philippines	3.9	...	5.3	...	3.3	...
Thailand	1.1	...	1.2	...	1.1	...
Argentina	3.7	...	2.3	...	1.8	...
Brazil	...	...	...	6.5	5.9	5.7
Chile	1.2	1.1	0.8	0.6	0.5	0.2
Colombia	3.5	...	3.1	...	2.7	...
Peru	2.4	...	1.9	...	1.1	...
Czech Republic	0.8	0.2	1.1	0.7	1.4	1.2
Hungary	6.1	5.3	4.2	3.6	4.4	3.8
Israel	5.3	4.5	4.9	4.2	3.4	3.1
South Africa	5.2	...	3.5	...	2.6	...
Turkey	...	...	7.0	5.7	4.4	4.0

¹ For Philippines, Thailand, Turkey and South Africa central government interest payments.

² For Chile,

2001.

³ For Brazil, 2006.

Source: Results taken from central bank questionnaire.

Table A5
Countercyclical policy parameter estimates

2000–11

Emerging economies	<i>a</i>	<i>g</i>	standard error (<i>a</i>)	standard error (<i>g</i>)	covariance (<i>a,g</i>)	probability (<i>g>0,a>0</i>)
Brazil	1.69	0.63	0.96	0.19	-0.01	0.96
Chile	0.57	1.11	0.20	0.20	0.01	1.00
Colombia	1.52	0.54	0.46	0.16	0.02	1.00
Mexico	1.70	0.31	1.00	0.04	0.00	0.95
Peru	0.64	0.20	0.40	0.32	0.03	0.70
Indonesia	1.31	-0.06	1.69	0.43	0.12	0.37
Korea	1.43	0.97	0.36	0.30	0.00	1.00
Philippines	1.25	0.72	1.37	0.43	0.13	0.79
Thailand	-0.06	0.49	0.12	0.31	0.00	0.28
Czech Republic	1.72	0.05	1.15	0.34	0.06	0.53
Hungary	1.04	0.27	1.21	0.77	0.07	0.52
Turkey	0.21	0.25	0.68	0.18	-0.01	0.57
China	0.38	0.43	0.11	0.22	0.00	0.97
Russia	0.44	0.52	0.28	0.29	0.01	0.91
Advanced economies	<i>a</i>	<i>g</i>	standard error (<i>a</i>)	standard error (<i>g</i>)	covariance (<i>a,g</i>)	probability (<i>g>0,a>0</i>)
Australia	1.22	5.29	0.24	1.44	0.12	1.00
Canada	1.30	4.06	0.35	0.54	0.05	1.00
United Kingdom	1.24	4.09	0.21	0.74	0.04	1.00
Norway	4.06	1.85	3.03	0.59	0.19	0.91
New Zealand	2.75	0.98	0.68	0.44	0.07	0.99
Sweden	1.34	0.56	0.52	0.16	0.00	1.00
Austria	1.19	0.77	0.25	0.19	0.01	1.00
Belgium	2.00	0.85	0.32	0.22	0.01	1.00
Germany	1.20	0.66	0.33	0.15	0.01	1.00
Finland	0.82	0.64	0.20	0.06	0.01	1.00
France	1.82	0.95	0.36	0.11	0.01	1.00
Greece	0.51	-0.28	0.37	0.33	0.03	0.18
Ireland	0.26	0.90	0.07	0.84	-0.01	0.86
Italy	1.41	0.57	0.38	0.10	0.01	1.00
Luxembourg	0.65	0.74	0.17	0.19	0.01	1.00
Netherlands	1.43	0.65	0.81	0.27	0.05	0.95
Switzerland	0.82	0.51	0.15	0.06	0.00	1.00
Japan	0.13	5.07	0.05	0.87	0.00	1.00
United States	1.46	4.75	0.50	0.50	0.07	1.00

Note: Seemingly unrelated regression estimation of equation 3 and 4 (without exchange rate adjustment for advanced economies). Estimates excluded where the null hypothesis that $f < 1$ or $y < 1$ could not be rejected. Years without (implicit) inflation target were excluded; for China, CPI inflation target set by the Central Economic Working Conference; for euro area countries, euro area inflation target; for the United States, 2%. Probability is calculated assuming normality of distribution.

Sources: IMF, *World Economic Outlook*; OECD, *Economic Outlook*; Bloomberg; Datastream; JPMorgan Chase; national data; BIS calculations.

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Developments of domestic government bond markets in EMEs and their implications

Aaron Mehrotra, Ken Miyajima and Agustín Villar¹

Abstract

During the past decade, domestic government bond markets in EMEs have developed further. Market depth has increased, maturities have lengthened and the investor base has generally broadened, although the degree of progress has varied across countries and several deficiencies remain. The expansion can be attributed to improvements in domestic policy management and a reduction in external financing needs.

The commensurate reduction in currency mismatches has increased the scope for countercyclical monetary policy. Financial stability has broadly benefited from this development, but the volatility stemming from derivatives markets and greater foreign holding of domestic currency debt present some additional risks.

Keywords: Financial markets and the macroeconomy, international lending and debt problems, financial aspects of economic integration

JEL classification: E44, F34, F36

¹ The authors thank Philip Turner and Madhusudan Mohanty for comments and Tracy Chan, Emese Kuruc, Marjorie Santos and Agne Subelyte for valuable assistance.

1. Introduction

Since this topic was first discussed at the Deputy Governors' Meeting a decade ago, domestic government bond markets in EMEs have developed further.² Market depth has increased, maturities have lengthened and the investor base has generally broadened, although the degree of progress has varied across countries and several deficiencies remain.

In this paper we address three interrelated questions. First, what are the factors promoting these developments and how much further is it possible for these markets to evolve? Second, what are the implications for monetary policy? In particular, has the development of domestic government bond markets reduced the potential for currency mismatches and enhanced monetary policy effectiveness? In the 1990s, for example, when foreign currency debt remained high, many EM central banks had to raise interest rates in the midst of a recession. The experience during the 2008–09 global recession appears to be quite different.

Third, how have the domestic bond markets influenced financial stability? In principle, a better developed yield curve for domestic government bonds and improved market infrastructure should help the corporate sector issue more bonds in domestic markets and diversify funding risks, increasing the economy's resilience to external shocks. In practice, however, the record has not been straightforward, although substantial progress can be seen in some countries. Also, recent bouts of market volatility have highlighted potential new risks as the investor base for domestic bonds becomes more global. These risks need to be managed.

The rest of the paper is organised as follows. Section 2 documents the development of domestic government bond markets (excluding central bank issuance) in EMEs. Section 3 discusses potential reasons for these developments. Section 4 addresses the implications for monetary policy. Finally, Section 5 discusses the impact on financial stability.

2. How far have domestic government bond markets developed in EMEs?

Over the past decade, domestic government bond markets have expanded in EMEs. To gauge how far these markets have developed and deepened, we focus on the following aspects: (i) size; (ii) composition in terms of maturities, type of instrument, and investor base diversity; and (iii) market liquidity.

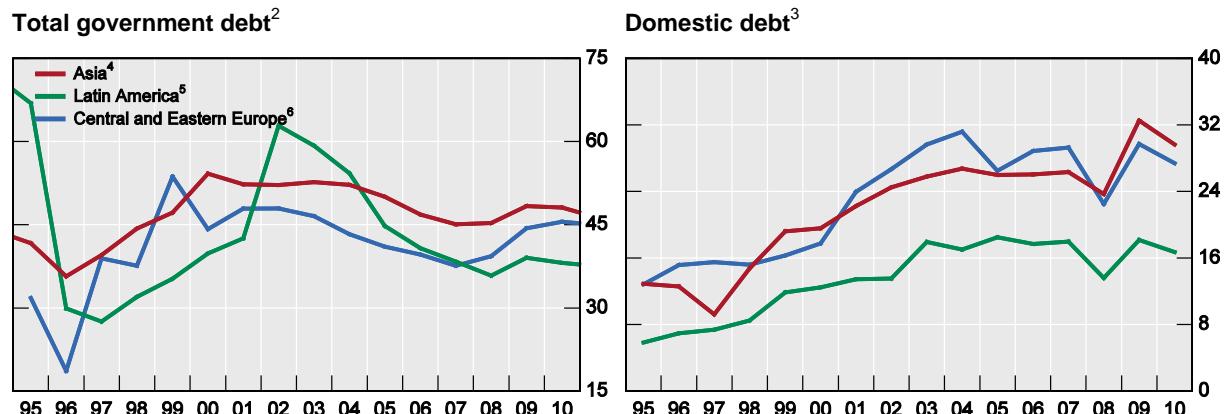
(i) Size

As Graph 1 shows, the stock of domestic bonds as a percentage of GDP has increased in all regions between 2000 and 2010. And this has happened as overall government debt levels have declined or stabilised, suggesting a shift away from foreign currency debt.

Domestic currency bonds have grown by about 10 percentage points of GDP to some 30% of GDP in Asia and central and eastern Europe (CEE), and by a few percentage points to some 15% of GDP in Latin America (Graph 1, right-hand panel). In absolute terms, the dollar value of these debts in EMEs as a whole has quadrupled from \$1 trillion in 2000 to more than \$4 trillion in 2010. Table A1 provides country details, along with evidence that the amount of tradable bonds is, in many cases, typically smaller than the total amount of outstanding domestic debt.

² See BIS Papers, no 11, 2002.

Graph 1
Government debt securities outstanding in EMEs¹
As a percentage of nominal GDP



¹ Simple averages across the countries listed. ² General government gross debt. ³ Domestic debt securities issued by government; central bank issues are excluded. ⁴ China, Hong Kong SAR, India, Indonesia, Korea, Malaysia, the Philippines, Singapore and Thailand. ⁵ Argentina, Brazil, Chile, Colombia, Mexico, Peru and Venezuela. ⁶ Czech Republic, Hungary, Poland, Russia and Turkey.

Sources: IMF, *World Economic Outlook*; BIS securities statistics.

(ii) Composition

Maturity

A second dimension of market development is the maturity. The remaining maturity of general government local currency debt in EMEs as a whole has increased on average by more than three years, from 3.5 years in 2000 to seven years in 2010. This was partly due to the extension of the longest maturity, which has increased by 14 years to 28 years on average, led by a 30-year extension in Latin America (to 40 years). Table A2 shows country details. This has happened at a time when average maturities of government debt have declined in advanced economies. That said, the maturities of domestic currency government bonds are considerably shorter than those of foreign currency bonds in many EMEs, as highlighted by central bank papers from Colombia, Mexico and Turkey.

Type

A third dimension is a move away from types of debt that would increase interest rate and currency risks. *Fixed rate issues* have become increasingly important, representing around 90% or more of total in Asia in 2010 (Table 1). Despite steady increases, the share of fixed rate issues remains at around 40% of total in Latin America. *Inflation-indexed bonds* remain important in some Latin American economies. The Central Bank of Chile's contribution mentions that a long history of inflation explains the prevalence of indexation in the sovereign's long-term issuance. Inflation-indexed bonds also constitute a large share of total domestic debt in Israel.

In contrast, the share of *floating rate bonds* issued by governments (which exposes them to interest rate risks) has declined over the past decade. However, floating rate government bonds remain relatively common in Latin America, particularly in Brazil and Mexico (30% and 29% of total, respectively). More importantly, the share of *domestic foreign currency bonds* has fallen notably and is no longer significant in Russia and Brazil, which relied on them heavily in the 1990s. However, in some Latin American economies, part of domestic debt

remains either denominated in or linked to foreign currencies (eg Argentina, Peru and Venezuela). Tables A3 and A4 report similar data for a larger number of issuers.

Table 1
Instrument and maturity structure of general government debt outstanding in 2010 (in local currency)¹

	Overall				Long-term (more than one year)				Short-term debt ³
	Floating rate	Fixed rate	Inflation-indexed ²	Foreign currency	Floating rate	Fixed rate	Inflation-indexed ²	Foreign currency	
Asia⁴	7	87	1	5	6	88	0	5	18
China	1	99	0	0	0	100	0	0	16
Indonesia	18	57	4	21	19	58	0	23	9
Korea	0	97	1	2	0	97	1	2	0
Singapore	0	100	0	0	0	100	0	0	52
Thailand	15	84	0	2	13	86	0	2	14
Latin America⁴	14	39	19	28	15	34	21	30	17
Argentina	10	8	24	57	11	0	27	61	16
Brazil	30	36	26	8	32	30	28	9	20
Colombia	0	65	21	13	0	64	22	15	13
Mexico	29	51	13	6	31	43	17	9	26
Peru	0	34	11	55	0	31	12	57	9
CEE⁴	7	74	0	19	9	69	0	23	17
Czech Republic	7	74	0	19	9	69	0	23	17
Other EMEs⁴	14	54	25	7	12	57	25	8	18
Israel	7	29	50	14	7	29	50	15	9
Saudi Arabia	21	79	0	0	16	84	0	0	26
Total of above⁴	11	63	12	15	11	61	12	17	17

¹ As a percentage share; the total of the shares may fall below or exceed 100% due to rounding. For Indonesia, zero-coupon bonds. ³ As a percentage share of the overall debt outstanding. ⁴ Simple averages across listed countries.

Source: Central bank responses to the BIS questionnaire.

Investor base

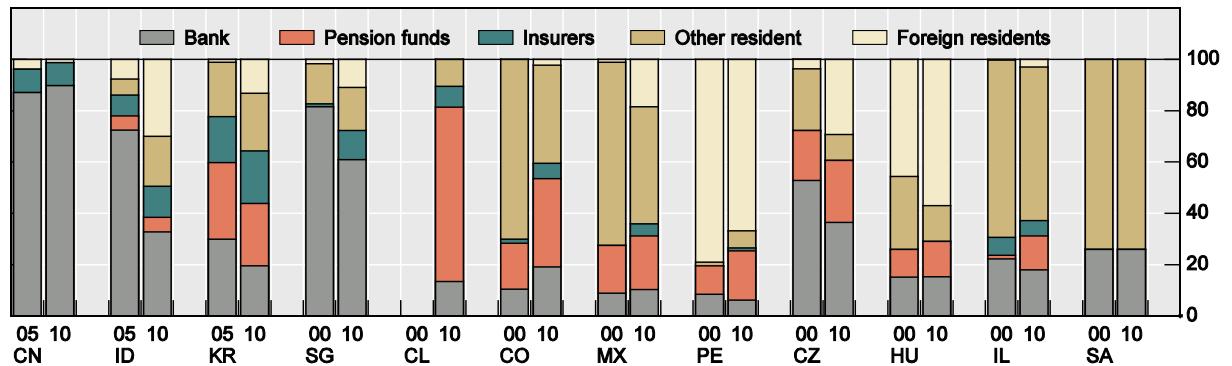
A fourth and welcome development is that the investor base for domestic government bond markets in EMEs is now more diversified than it was five to 10 years ago. As Graph 2 shows, the share of pension funds and insurers has risen as the gradual development of funded pension systems has helped stimulate demand for domestic bonds. The share of pension funds in 2010 exceeded one fifth of total in Chile, Colombia, the Czech Republic, Korea and Mexico, although even at that level it remains lower than in industrial countries. And, the share of foreign holdings has generally increased, including in Indonesia, Korea and Mexico. Foreign holdings remain generally high in CEE (eg the Czech Republic and Hungary), reflecting the region's increasing financial integration with the rest of Europe.

Despite these developments, banks are reported as the remaining key holders of domestic government bonds in EM Asia. In China, banks are almost the sole investor in government bonds and this has not changed over the past five years. The share of bank holdings exceeds 60% in Singapore. Elsewhere, the reported share of bank holdings is typically smaller. However, in some cases, the data may require careful interpretation. For instance, in

Colombia and Mexico, part of “other residents” may represent brokers, which are typically owned by banks.

Such shifts in investor composition should change the mix of maturities in demand, which could in turn affect the maturity structure of government debt, the shape of the yield curve, and interest rate level.³

Graph 2
Investor base for general government debt¹
In percent



¹ The shares are based on the data reported in local currencies.

Source: Central bank responses to the BIS questionnaire.

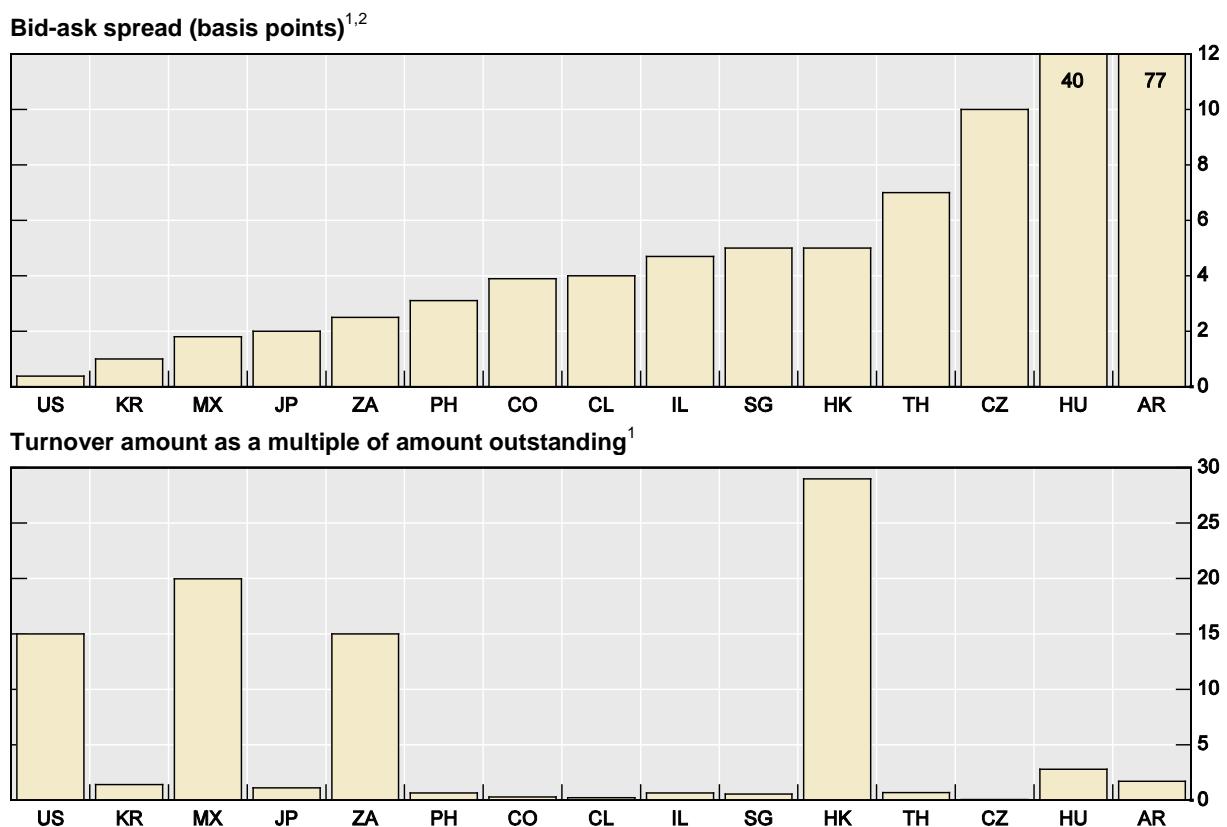
(iii) Market liquidity

A final dimension is liquidity. Trading of domestic government bonds in EMEs has become more active. According to the Emerging Markets Trade Association, in the past decade, trading of these securities surged fivefold in EMEs, reaching some \$4.7 trillion in 2010. As a result, trading volume of domestic debt securities as a share of total debt securities doubled during the same period, reaching 70% of total debt traded.

However, liquidity remains an issue for many EME bond markets. Graph 3, which summarises data provided by central banks to the meeting, indicates that bid-ask spreads are often in single-digit basis points, especially in Asia and Latin America, suggesting that the costs of executing trades are not elevated. However, even for the most liquid maturities, turnover remains low relative to the average amount outstanding in many EMEs. The turnover ratios, computed as the ratio of the amount traded to the amount outstanding, are relatively high in Hong Kong SAR (29), Mexico (20) and South Africa (15). Market liquidity data from the recent Bond Market Liquidity Survey for Asian economies, and JP Morgan’s Local Markets Guide for a larger number of EMEs, broadly confirm the observations, despite differing in several details.

³ The issue is explored in the background paper “Central bank government bond markets: issues for monetary policy and coordination”.

Graph 3
Indicators of liquidity in government bond markets in 2010



¹ For the most liquid issue. See Table A5 for the underlying data. ² Bid-ask spreads are expressed in basis points. For Japan, the United Kingdom and United States, average bid-ask spreads of generic 10-year government bonds in 2010.

Sources: Bloomberg; central bank responses to the BIS questionnaire.

3. What factors have contributed to bond market development?

The expansion of domestic government bond markets over the past 10 years can be attributed to improvements in domestic policy management and a reduction in external financing needs. Questions, nevertheless, arise about the sustainability of debt levels and whether EMEs have grown out of “original sin”.

Many central banks have been able to keep inflation at low levels. As a result, nominal interest rates have fallen and become more stable. Over the last decade, yields on domestic government bonds have declined by some 4 percentage points to 6.5%, and their volatility has declined by two thirds (Table 2). In Brazil, domestic government bond yields came down from 26.1% to 11.8%, and, more impressively, their volatility fell from 11.2% to 0.9% during the same period. In Turkey, yields fell from 23.8% to 8.7% and their volatility from 7.7% to 1.1% during the same period.

Low and stable inflation has helped to reduce the need for foreign currency borrowing. In the past, investors often preferred foreign over local currency debt to hedge themselves against inflation risks, as they feared that governments would generate surprise inflation to reduce the value of debt.

Public debt sustainability has improved considerably owing to sounder fiscal policy, increasing the attractiveness of domestic currency bonds (see the background paper “Is monetary policy constrained by fiscal policy?”). Several EMEs have also taken advantage of these favourable developments to bring onto the government balance sheet some (non-marketable) debt that was previously concealed in various ways. In addition, vulnerabilities associated with foreign currency funding may have prompted several governments to consciously switch to domestic funding. Several EMEs have sought to avoid the consequences of sudden interruptions in capital flows as experienced during the 1990s, which led to major macroeconomic adjustments and episodes of financial crisis.

Table 2
Domestic government bond yields¹

	Average			Standard deviation		
	2002 ²	2005	2010	2002 ²	2005	2010
Asia³	6.5	6.0	5.3	1.0	0.8	0.6
China	4.7	3.5	3.3	1.9	0.7	0.4
India	7.4	7.1	7.9	0.9	0.5	0.4
Indonesia	12.2	12.1	8.9	1.2	1.9	1.3
Korea	6.2	4.6	4.4	0.9	0.9	0.8
Malaysia	4.0	4.1	3.7	0.5	0.3	0.2
Thailand	4.3	4.8	3.4	0.5	0.7	0.6
Latin America³	16.4	12.1	8.6	4.9	1.6	0.8
Brazil	26.1	17.5	11.8	11.2	2.0	0.9
Colombia	13.5	9.7	7.2	1.7	1.8	0.8
Mexico	9.6	9.1	6.9	1.7	1.0	0.7
Central Europe³	6.8	5.1	5.3	1.0	1.8	0.9
Czech Republic	4.6	3.3	3.5	0.7	3.3	0.5
Hungary	8.0	6.7	7.0	1.3	1.1	1.6
Poland	7.8	5.2	5.3	0.9	0.9	0.6
Other EMEs³	17.7	11.7	8.5	4.8	1.9	1.0
South Africa	11.5	7.8	8.3	1.9	1.0	0.9
Turkey	23.8	15.6	8.7	7.7	2.8	1.1
Total of above³	10.3	7.9	6.5	2.4	1.4	0.8

¹ GBI EM Broad Diverse, or GBI all maturities. Based on daily data. Standard deviation of daily percentage point change, annualised. ² 2003 for Indonesia and Colombia, 2004 for China and Turkey. ³ Simple averages across listed countries.

Source: Datastream.

Increased domestic saving has boosted the pool of resources for investment in domestic capital markets and reduced the need for external borrowing.⁴ IMF data suggest that gross national savings as a percentage of GDP increased by 9 percentage points in EMEs as a whole (to 34%) during 2000–11. The increase was most pronounced in Asia where the average saving rate reached 46% in 2011.

⁴ Central banks have accumulated foreign exchange reserves, part of which has been financed by issuing their own securities. Table A6 shows that, in a number of countries, central bank debt securities now account for large shares of GDP.

The growth of government bond markets raises two interrelated issues: how far domestic bond markets can or should expand? Have EMEs grown out of so-called “original sin”? As for the first question, Reinhart, Rogoff and Savastano (2003) argue that many EMEs experience extreme duress with overall debt levels that may be considered low by the standard of advanced economies. In their view, EMEs face “debt intolerance”, and can accumulate only a relatively small amount of debt, be it external or domestic. Countries can improve their creditworthiness, but the process is typically arduous and slow. In countries suffering debt intolerance, the threshold for domestic government debt would be low, and any attempt to breach it would expose the economy to considerable risks. In addition, domestic government borrowing could crowd out private sector borrowing. As a result, governments would end up borrowing in domestic bond markets, forcing the private sector to access external markets.

Evidence over the past decade has not been quite consistent with this prediction. Many EMEs now have public debt ratios above the 40% mark that was once considered unsustainable. This is because these EMEs have improved the health of their banking system, strengthened their fiscal positions, and accumulated large foreign currency reserves, which have improved their sovereign credit ratings.

Turning to the second question, the proponents of original sin held the view that EMEs cannot borrow abroad in their own currencies (Eichengreen, Hausmann and Panizza (2005)). However, the increased take-up by global investors of domestic government bonds appears to have made this proposition less relevant today. For most EMEs, the share is in the range of 10–30% of total government debt, which remains low relative to the 50–70% range for major industrial countries.^{5,6} Foreign participation in domestic bond markets could accelerate in future as more EMEs have been included in a benchmark local currency government bond index for international investors, and as global investors reassess credit risk in favour of EMEs more generally.^{7,8}

4. Implications for the conduct of monetary policy

In the past, heavy burdens of foreign currency debt have limited the use of countercyclical monetary policy. As currency depreciation increased the liabilities of residents with large amounts of foreign currency debt, monetary policy had to focus on propping up the exchange rate rather than stabilising the economy. This was done by raising the policy rate, often very sharply. Matters were often made worse by debt with short maturities or floating rates.

The growth in domestic government bond markets and the changes in their composition have contributed to a reduction in currency mismatches within the broader economies of many, if not all, countries. Table 3 reports three sets of indicators to help assess currency mismatches for 18 selected EMEs:

⁵ The shares are larger for some EMEs, as they are based on the amount of bonds included in the benchmark index or tradable debt, which is smaller than the total domestic government debt outstanding.

⁶ See “Global fixed income strategy”, 11 January 2012, JP Morgan Securities.

⁷ The Czech Republic, Hungary, Israel, Korea, Mexico, Poland and South Africa have been included in the JP Morgan GBI Broad Index.

⁸ However, the tendency of the price volatility on EM local debt to surge during times of stress could discourage foreign participation. This is partly because such characteristics reduce so-called collateral capacity – the scope for the underlying securities to be pledged as collateral for financing. Turner (2012) reports that the Sharpe ratios of EM government bonds have been higher than those of developed economies in relatively calm periods (such as 2002–06), but that they tend to fall sharply during periods of global financial stress.

- The first four columns show the share of foreign currency debt in total outstanding debt. The ratio fell for 13 EMEs during the last decade, reflecting the increased importance of local currency government debt.
- As the extent of risk stemming from foreign currency debt depends in part on the country's net foreign currency liability position (that is, foreign currency liabilities minus foreign currency assets), the middle four columns show this measure as a share of exports. A country with a significant net positive position suffers a balance sheet loss when its currency depreciates. During the last decade, 15 EMEs either reduced net foreign currency liabilities or turned to holders of net foreign assets.
- Finally, the net international investment position (NIIP) as a share of GDP, reported in the last column, represents a measure of an economy's balance sheet. The sign is reversed such that, consistent with the first two indicators, positive values signify net liabilities. In 2011, only six EMEs had either net assets or small net liabilities. The rather noticeable discrepancy with the first two measures may stem partly from the fact that, in NIIP, the share of net non-financial and/or non-debt positions could be relatively large.

Table 3
Measuring currency mismatches¹

	Foreign currency share of total debt outstanding ²				Net foreign currency liabilities as a percentage of exports ^{2, 3}				Net IIP as a percentage of GDP ³
	2000	2005	2010	2011	2000	2005	2010	2011	
Asia									
China	4.2	2.7	2.5	2.9	-81.1	-110.7	-196.0	-189.5	-27.2
India	6.3	6.6	8.9	10.2	-46.5	-80.7	-57.1	-43.3	13.4
Indonesia	23.9	16.8	17.2	18.0	9.7	-11.2	-30.1	-20.9	40.8
Korea	9.7	7.8	9.8	10.1	-19.5	-31.3	-9.7	-7.5	8.7
Malaysia	15.2	16.2	9.0	9.5	-11.8	-15.5	-25.9	-29.8	-1.8
Philippines	34.3	34.9	26.9	25.2	36.6	30.1	-30.8	-46.4	5.3
Thailand	15.7	10.4	6.4	5.9	-5.7	-36.9	-66.9	-61.7	11.4
Latin America									
Argentina	46.5	34.4	27.2	25.2	275.3	80.2	-8.1	3.9	-12.5
Brazil	18.1	11.0	7.1	8.3	159.3	49.8	-33.7	-27.8	29.5
Chile	22.1	20.1	20.9	21.5	10.5	14.2	15.2	8.3	4.4
Colombia	29.2	19.6	14.5	15.4	29.9	-7.5	-18.9	-7.6	23.9
Mexico	26.5	17.0	17.0	18.8	...	4.9	-0.2	-3.4	28.5
Peru	34.1	34.9	35.3	35.7	-28.1	-33.1	-45.5	-35.9	20.0
Central Europe									
Hungary	33.5	30.5	34.3	34.9	43.5	38.0	46.2	30.9	85.5
Poland	15.2	20.0	20.5	21.0	-41.8	-1.0	32.0	24.6	55.1
Other EMEs									
Russia	45.3	41.3	21.4	18.9	18.9	-32.1	-90.1	-76.6	-1.1
Turkey	30.9	19.7	17.5	20.2	72.2	45.2	54.0	51.9	41.9
South Africa	10.2	6.9	7.2	8.8	16.1	-33.9	-34.5	-32.4	19.4

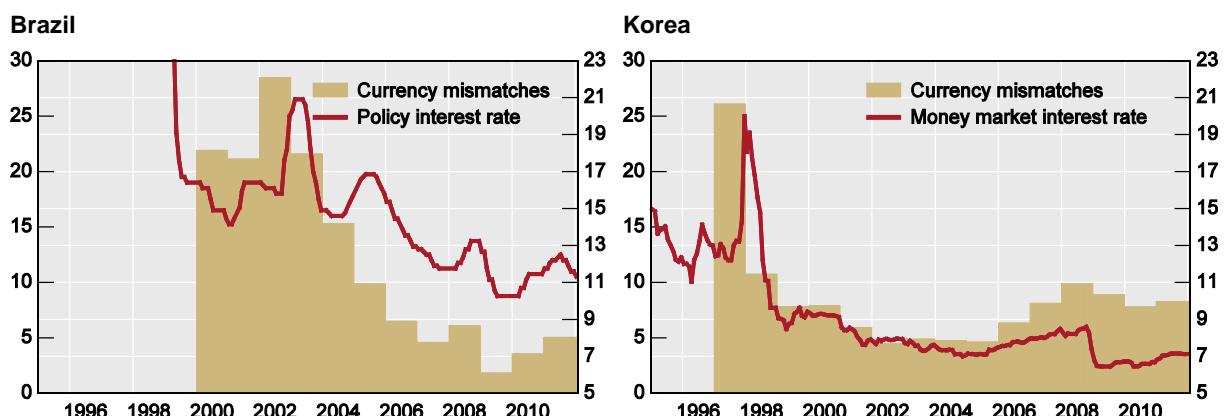
¹ Using estimates of the currency of denomination of aggregate debt liabilities and assets (domestic as well as foreign). The net international investment position includes non-debt variables as well. Data in other columns represent mainly bonds, deposits and bank loans, but may include non-debt variables as well. ² For detailed methodology, see *Controlling currency mismatches in emerging markets*, Goldstein and Turner (2004). ³ A negative sign indicates that international assets exceed liabilities. ⁴ For Argentina, Indonesia, Malaysia, the Philippines, Russia, South Africa and Thailand, 2010; for Chile, China, India and Peru, latest available quarter.

Sources: IMF; national data; BIS.

In sum, economy-level currency mismatches have broadly declined in most Asian, Latin American and other EMEs. This contrasts with central Europe (Hungary and Poland), where currency mismatches appear to have increased. Nevertheless, the actual degree of such mismatches could depend on how far these balance sheet exposures are hedged in derivatives markets.

Notwithstanding the reduction in currency mismatches, the choice of funding in local or foreign currency depends on several factors.⁹ The desirable level of foreign currency borrowing should be assessed against the country's foreign currency revenues and assets (Goldstein and Turner (2004)). Also, the relative costs of borrowing in different currencies matter. In addition, the issuance of long-dated local currency bonds could be very costly if investors charged higher interest rates to compensate for inflation, currency depreciation and default risks as well as broader macroeconomic volatility.

Graph 4
Currency mismatches and short-term domestic interest rates¹



Sources: Datastream and BIS estimates.

¹ Policy and money market interest rates are in percent, shown on the left-hand scale. Currency mismatches represent foreign currency debt as a percentage of total debt, shown on the right-hand scale.

Has the broad reduction in currency mismatches increased the scope for countercyclical monetary policy? Many EMEs cut interest rates rather sharply during the 2008–09 global recession which may have been difficult without past declines in their foreign currency liabilities. Brazil is a case in point. While the central bank raised interest rates during the 2001 global recession, it cut rates during the 2008–09 recession (Graph 4, left-hand panel). Korea is a similar case, if one compares developments during the 1998 crises with the more recent external shocks (Graph 4, right-hand panel).

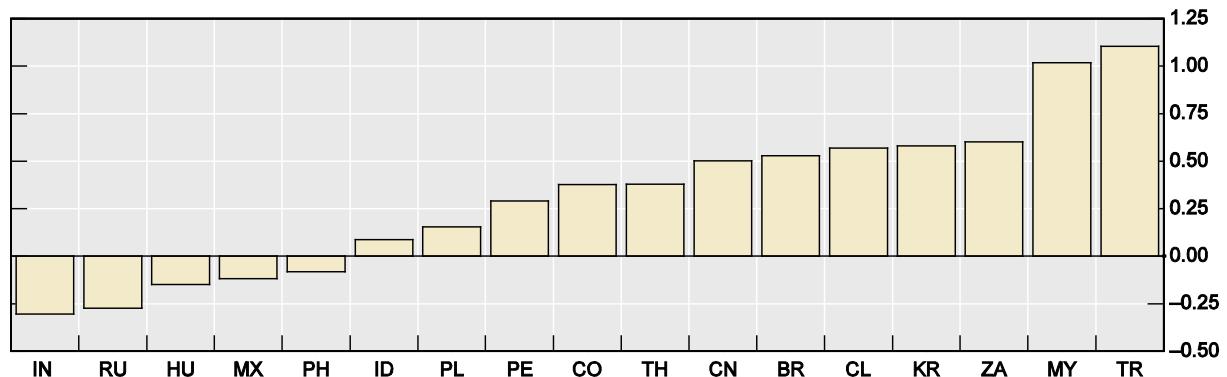
Indeed, our analysis suggests that monetary policy has become more countercyclical in many EMEs over the last decade. The cyclicalities of monetary policy is gauged by the correlation coefficients between the cycle of the short-term interest rate around its trend and the output gap during 2000–11, in similar fashion to Végh and Vuletin (2012). A positive correlation coefficient indicates that monetary policy is countercyclical: interest rates decline as growth slows.¹⁰ Graph 5 shows the change in the correlation coefficients from 2000–05 to

⁹ Panizza (2009) discusses such trade-offs.

¹⁰ The analysis uses quarterly data for interbank interest rates and real GDP. The interest rate cycles and the output gap are constructed by extracting the cyclical component of the interest rate and real GDP series, respectively, with a conventional Hodrick-Prescott filter and smoothing parameter of 1,600.

2006–11 for the various EMEs. In most economies, monetary policy has become more countercyclical over time, as the change in the correlation coefficients is positive for most economies, and highest for Malaysia and Turkey.

Graph 5
Changes in countercyclicality of monetary policy from 2000–05 to 2006–11



Note: Countercyclicality of monetary policy is proxied by the correlation coefficient between short-term interest rate cycle and output gap. A positive value indicates that monetary policy became more countercyclical from 2000–05 to 2006–11.

Sources: IMF; national data; BIS calculations.

5. Impact on financial stability

Financial stability should have benefited from the development of domestic government bond markets described above – longer maturities, larger shares of fixed-rate issues, lower currency mismatches and greater market liquidity. It will also be affected by the two additional factors highlighted in this section, namely credit market diversification and the volatility related to greater foreign holding of domestic currency debt and derivatives markets – the former reducing risks and the latter presenting some additional risks.

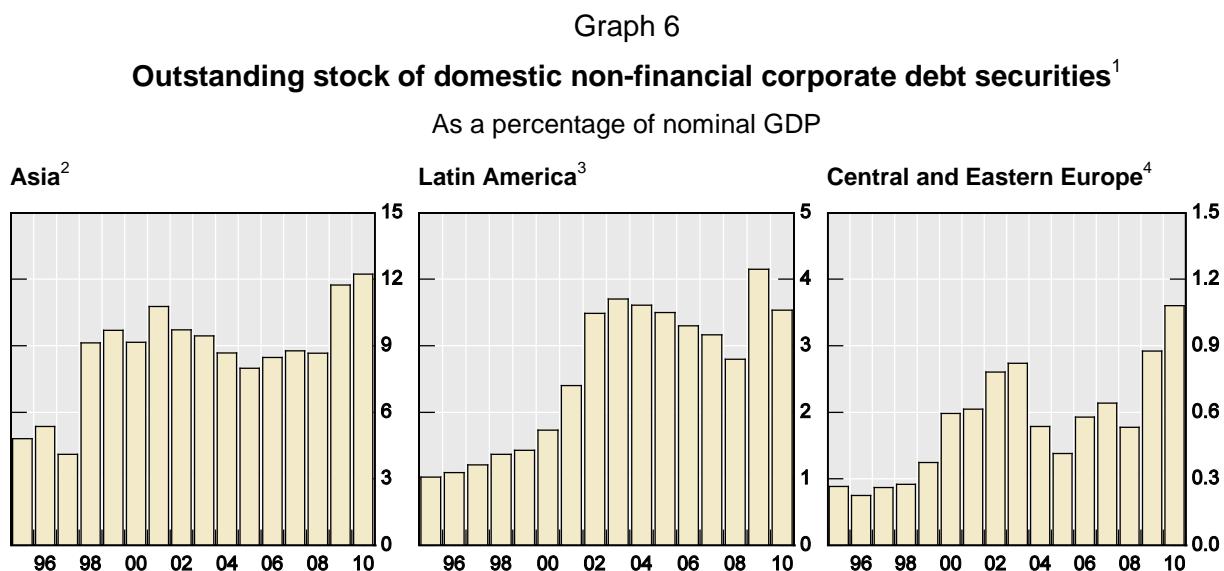
Diversification of credit risk

A developed government yield curve allows the private sector to issue its own debt in the market, making the financial system and the broader economy more resilient to shocks. This is because domestic corporate bond markets help diversify credit risks away from banks and serve as an alternative form of intermediation to short-term credit markets.

Such diversification has become increasingly apparent in EMEs. The outstanding stock of corporate bonds in most regions has increased since the mid-1990s, thus reinforcing their ability to serve as spare tyres (Graph 6). For instance, when banks in advanced economies tightened lending standards following the 2008 collapse of Lehman Brothers, non-financial corporate borrowers in EMEs turned to domestic markets for funding, taking the amount of domestic bonds outstanding to record levels. The Bank of Mexico notes in its paper that corporate domestic issuance has surged, and that mortgage-backed securities have particularly benefited from longer risk-free reference rates.¹¹

¹¹ See Figure 4.5 in “Banco de Mexico and recent development in domestic currency public debt”.

Notwithstanding the progress made so far, domestic corporate bond markets in EMEs remain underdeveloped. For instance, Goswami and Sharma (2011) note that, in emerging Asia, even large EMEs with sizeable corporate bond markets suffer from low trading volumes and very high transaction costs that inhibit arbitrage and active position-taking.



¹ Simple averages across the countries listed. ² China, Hong Kong SAR, India, Indonesia, Korea, Malaysia, the Philippines, Singapore and Thailand. ³ Argentina, Brazil, Chile, Colombia, Mexico, Peru and Venezuela.

⁴ Czech Republic, Hungary, Poland, Russia and Turkey.

Sources: IMF, *International Financial Statistics*; IMF, *World Economic Outlook*.

Foreign holdings and derivatives markets

Recent episodes of market volatility have highlighted two kinds of risks associated with more developed domestic government bond markets. First, large foreign holdings may increase financial market volatility during times of stress. As suggested by the Reserve Bank of South Africa, foreign portfolio inflows may be driven by carry trade incentives against the backdrop of very low interest rates in advanced economies. Some foreign investors leave their currency risk unhedged for higher total returns on the expectation that particular EM currencies are managed at relatively weak levels and should appreciate, or in order to benefit from diversification. Such a strategy makes carry trade flows inherently sensitive to currency performance in EMEs.

A second source of worry is the potential risk in the derivatives markets.¹² As the Bank of Mexico points out, derivatives add liquidity and depth to domestic bond markets as they offer hedging possibilities and expand the demand for the underlying assets. However, to the extent that residents hedge their financial risk with other residents without involving foreign counterparties, exposures are shifted across balance sheets within the economy. In addition, financial stability risk would be greater if exposures ended up concentrated in a small number of residents. Derivatives products allow both residents and non-residents to take complex and leveraged positions that may be rapidly unwound in the event of market turmoil.

¹² The expansion of derivatives markets in EMEs has been documented by Mihaljek and Packer (2010) and Saxena and Villar (2008).

These risks have prompted many EMEs to beef up existing measures and introduce alternative instruments to limit vulnerabilities in the domestic bond markets and safeguard financial stability. As one line of defence, EMEs have accumulated precautionary official reserves that could be drawn down in times of market stress. A second and complementary line of defence in some cases has been to establish currency swap lines with the major central banks. For instance, in 2008–09, Brazil, Korea, Mexico and Singapore established currency swap lines with the Federal Reserve. These agreements, which expired in April 2009, played a pivotal role in calming markets over possible foreign currency shortages, particularly where the precautionary function of official reserves was believed to be limited, as in the case of Korea. Finally, many countries have introduced measures to help increase the resilience of their domestic financial systems to credit exposures. In some cases, measures to manage capital inflows have also been established (eg taxes on inflows, minimum holding periods and currency-specific reserve requirements).

Table A1
Outstanding stocks of domestic government debt securities¹

	Billions of US dollars						Average annual percentage change				Tradable debt ²
	2000		2005		2010		2000–04		2005–10		
	Short-term ³	Long-term ⁴	Short-term ³	Long-term ⁴	Short-term ³	Long-term ⁴	Short-term ³	Long-term ⁴	Short-term ³	Long-term ⁴	
Asia	32	402	58	1010	107	2311	12	17	18	14	44
China	0	111	0	335	0	1006	0	30	0	24	37
Hong Kong SAR	9	6	9	9	18	12	1	8	62	7	22
India	4	108	18	250	27	581	33	19	13	18	38
Indonesia	0	45	0	40	3	65	0	2	43	8	56
Korea	0	62	0	231	0	331	0	27	0	12	78
Malaysia	1	27	1	50	1	124	0	14	4	18	53
Philippines	9	11	12	28	12	50	-1	18	3	13	2
Singapore	8	17	13	34	44	58	11	18	25	11	51
Thailand	1	15	5	33	2	84	49	18	13	18	59
Latin America	211	145	393	246	634	712	12	16	19	28	42
Argentina	5	28	0	48	0	31	-23	10	0	2	1
Brazil	173	46	328	88	520	429	17	3	17	40	22
Chile ⁵	-	1	-	3	-	17	-	41	-	50	68
Colombia	12	4	34	6	66	4	18	19	19	-3	61
Mexico	19	56	28	87	46	201	11	12	14	19	42
Peru	0	4	0	6	0	14	0	6	0	20	60
Venezuela	2	6	3	8	2	16	16	23	63	37	-
CEE	14	42	19	145	23	247	18	38	1	11	69
Czech Republic	5	3	5	21	6	46	10	57	-1	17	76
Hungary	3	13	7	36	8	42	23	27	0	2	67
Poland	6	26	7	88	9	159	21	31	1	13	64
Other EMEs	6	104	19	263	26	395	32	24	14	13	40
Russia	0	8	0	25	0	67	0	26	0	22	37
South Africa	3	44	6	68	20	105	22	11	28	10	60
Turkey	3	52	13	170	6	223	74	34	-12	8	24
Total of above	263	693	489	1664	790	3665	16	21	16	18	47

¹ Central bank issues are excluded. Domestic debt securities in the BIS securities statistics are defined as issues by residents in the local market in local currency, targeted to resident investors. Some foreign currency issues are included in these data, but they are small. The size of the debt stock often reflects circumstances unique to the respective economies. In Mexico, the numbers include debt resulting from the rescue of the banking sector, originally issued off-balance sheet but now included in the government balance sheet. In Brazil, part of the increase in debt represents conversion of former central bank issues into government debt. ² As a percentage share of total debt outstanding. The tradable amounts used are the end-2010 par values taken from JP Morgan Government Bond Index-EM, except for the Czech Republic, Hong Kong SAR, Korea and Singapore (Global Bond Index). ³ Bonds and notes. ⁴ Money market instruments. ⁵ For Chile, figures were taken from the Ministry of Finance: for more information please see [http://www\[minhda.cl/oficina-de-la-deuda-publica/estadisticas/composicion-de-la-deuda.html\]](http://www[minhda.cl/oficina-de-la-deuda-publica/estadisticas/composicion-de-la-deuda.html]).

Sources: BIS securities statistics; JPMorgan Chase; national data.

Table A2
Maturities of general government local currency debt¹
 In years

	Average			Longest		
	2000	2005	2010	2000	2005	2010
Asia	3.7	4.8	5.7	15.4	16.9	24.5
Indonesia	5.0	7.0	8.1	8.6	14.7	27.2
Korea	2.6	3.9	5.0	19.0	13.3	20.0
Philippines	3.3	3.0	6.2	24.9	24.6	25.0
Singapore	2.7	3.6	3.3	10.0	15.0	20.0
Thailand	4.9	6.4	5.7	14.5	16.9	30.5
Latin America	2.1	7.9	9.6	9.1	39.2	39.7
Argentina	2.1	13.4	11.1	7.0	84.0	79.0
Brazil	2.7	2.3	3.4	—	—	—
Chile	—	17.0	14.0	—	—	—
Colombia	2.5	3.8	5.1	11.4	14.6	13.6
Mexico	1.0	3.0	6.0	9.0	19.0	30.0
Peru	—	—	18.0	—	—	36.0
Central Europe	2.6	4.7	5.0	18.0	18.0	31.5
Czech Republic	1.5	4.9	5.7	10.0	15.0	47.0
Hungary	3.7	4.5	4.2	26.0	21.0	16.0
Other	5.1	5.1	5.7	13.5	15.8	19.5
Israel	6.2	6.1	6.2	15.0	20.0	31.0
Saudi Arabia	4.3	4.5	2.5	10.0	10.0	7.0
South Africa	8.7	7.8	10.3	27.0	28.0	30.0
Turkey	1.2	2.1	3.6	2.0	5.0	10.0
Total	3.5	5.8	7.0	13.9	21.5	28.2

¹ Data for Argentina, Colombia, Philippines, South Africa and Turkey represent central government debt. Annual data on the maturity of domestic central government debt spanning 1995–2010 are available at <http://www.bis.org/statistics/qcsv/cqfs28d4.pdf>

Source: Central bank responses to the BIS questionnaire.

Table A3
Domestic bonds by instrument¹
As percentage of total outstanding

	2000				2005				2010			
	Floating rate	Straight fixed rate	Inflation-indexed	Exchange rate-linked	Floating rate	Straight fixed rate	Inflation-indexed	Exchange rate-linked	Floating rate	Straight fixed rate	Inflation-indexed	Exchange rate-linked
Asia	12	88	1	0	9	91	0	0	4	96	0	0
China	46	54	...	...	19	81	...	...	...	...	...	...
Chinese Taipei	0	100	0	0	0	100	0	0	0	100	0	0
Hong Kong SAR	0	100	0	0	3	97	0	0	0	100	0	0
India	0	100	0	0	5	95	0	0	2	98	0	0
Indonesia	51	42	8	0	53	47	0	0	22	78	0	0
Korea	8	92	0	0	3	96	0	0	3	95	0	1
Malaysia	0	100	0	0	0	100	0	0	0	100	0	0
Philippines	8	92	0	0	4	96	0	0	2	98	0	0
Singapore	0	100	0	0	0	100	0	0	0	100	0	0
Thailand	4	96	0	0	3	97	0	0	3	97	0	0
Latin America	30	12	25	27	23	28	29	19	18	41	28	13
Argentina	12	0	0	88	1	10	68	18	18	16	38	26
Brazil	58	15	6	21	60	21	16	3	44	31	24	1
Chile	0	0	92	8	0	18	64	18	0	24	76	0
Colombia	0	50	41	7	0	70	29	1	0	75	25	0
Mexico	43	6	16	0	58	27	15	0	39	39	22	0
Peru	0	14	18	68	0	53	12	35	6	66	8	20
Venezuela	100	0	0	0	44	0	0	56	22	36	0	42
Central Europe	18	80	2	0	9	90	1	0	11	86	1	2
Czech Republic	0	95	5	0	0	100	0	0	10	90	0	0
Hungary	34	66	0	0	10	90	0	0	9	86	0	5
Poland	20	80	0	0	17	81	2	0	14	83	3	0
Other	9	62	12	16	15	61	15	9	14	65	16	2
Israel	11	17	61	11	16	26	50	6	6	26	52	6
Russia	0	37	0	63	0	76	3	22	0	96	1	3
Turkey	24	70	0	6	31	42	11	15	36	47	15	2
Saudi Arabia	9	91	0	0	17	83	0	0	15	85	0	0
South Africa	1	97	0	0	9	77	9	0	11	71	14	0
Total EMEs	17	61	10	11	14	67	12	7	11	72	12	4

¹ Comprises only bonds and notes and excludes money market instruments. Regional totals based on the simple averages of the countries listed in the table. Asia and total emerging markets exclude China for all periods. Totals do not add up to 100% due to the exclusion of hybrid instruments. Ratio calculated taking the central government and all other issuers as reported in Table 2d of the Working Group questionnaire.

Source: Update of CGFS Papers no 28 on local currency bond markets; Working Group survey.

Table A4
Domestic exchange rate-linked bonds¹
As percentage of total outstanding

	2000	2005	2006	2007	2008	2009	2010
Asia	0	0	0	0	0	0	0
Korea	0	0	0	1	2	1	1
Latin America	27	19	11	18	18	13	13
Argentina	88	18	20	22	25	26	26
Brazil	21	3	1	1	1	1	1
Chile	8	18	13	2	0	0	0
Colombia	7	1	0	0	0	0	0
Peru	68	35	29	17	25	19	20
Venezuela	0	56	14	82	74	43	42
Central Europe	0	0	0	2	2	2	2
Hungary	0	0	0	5	6	5	5
Other EMEs	16	9	7	5	4	3	2
Israel	11	6	7	8	9	7	6
Russia	63	22	14	10	4	3	3
Turkey	6	15	13	9	8	5	2
Total EMEs	11	7	4	6	6	4	4

Note: For China, Chinese Taipei, Czech Republic, Hong Kong SAR, India, Indonesia, Malaysia, Mexico, Philippines, Poland, Saudi Arabia, Singapore, South Africa and Thailand percentage shares are equal to zero throughout the years shown.

¹ Comprises only bonds and notes and excludes money market instruments. Regional totals based on the simple averages of countries listed in the table and the footnote. Ratio calculated taking the central government and all other issuers as reported in Table 2d of the Working Group questionnaire.

Source: same as Table A3.

Table A5
Indicators of liquidity in government bond markets¹

	Ratio of turnover to average outstanding stocks in 2010	Most liquid (important) maturities	Typical bid-ask spread on the most liquid issue ²
Asia			
Hong Kong SAR	29.0	2, 5, 10 years	5
Korea	1.4	3 years	1
Philippines	0.7	2, 5, 7, 10 years	3
Singapore	0.5	2 years	5
Thailand	0.7	5 years	7
Latin America			
Argentina	1.7	2015 ³	77
Chile	0.2	10 years	4
Colombia	0.3	9–10 years	4
Mexico	20.0	Dec 2024 ³	2
Central and Eastern Europe			
Czech Republic	0.1	2024 ³	10
Hungary	2.8	2015; 2019 ³	40
Other emerging markets			
Israel	0.6	7–11 years	5
South Africa	15.0	2016 ³	3

¹ Only the maturity with the highest turnover for each country is shown. ² In basis points. ³ Maturing in the indicated year.

Source: Central bank responses to the BIS questionnaire.

Table A6
Central bank bonds
As percentage of GDP

	2005	2010
Asia¹		13.3
Hong Kong SAR	9.2	37.4
Indonesia	2.6	3.1
Korea	18.2	14.2
Thailand	8.3	24.8
Latin America¹	4.6	3.0
Argentina	4.8	5.1
Brazil	0.3	0.0
Chile	16.3	9.4
Mexico	2.8	2.9
Peru	3.3	0.9
Central Europe¹	11.5	15.3
Czech Republic	22.9	19.4
Hungary	0.1	11.1
Other¹	4.4	8.9
Israel	14.1	17.5
Saudi Arabia	3.3	16.8
South Africa	0.3	1.2

Note: For Colombia, Philippines, Singapore and Turkey percentage shares are equal to zero for the years shown.

¹ Simple averages of economies listed.

Sources: Central bank questionnaires; IMF, *World Economic Outlook*.

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Central bank and government debt management: issues for monetary policy

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Abstract

The size and maturity structure of the government debt market have important implications for monetary policy, especially in EMEs. This paper documents the remarkable growth of the market over the past decade in terms of size, issuance and maturity structure of combined government and central bank debt, and notes that a large part of the official sector debt constitutes short-term securities issued by central banks to sterilise their foreign exchange interventions. The paper then explores what these trends imply for the yield curve and for bank lending behaviour, and highlights potential conflicts that may arise when the mandates of government debt managers differ from those of the central bankers.

Keywords: Debt management, monetary policy

JEL classification: H63, E52

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Introduction

In most emerging market economies, both governments and central banks are active in sovereign bond markets. Governments issue debt of various maturities to finance fiscal deficits. Central banks issue their own securities to finance the acquisition of assets (particularly foreign exchange reserves). They also conduct open market operations, which involve sales and purchases of government debt. As a result, both the government and the central bank directly influence the mix of short- and long-term securities held by the public.

The actions of debt managers in choosing the maturity structure of their debt could have effects that are akin to monetary policy. In principle, the maturity decisions of debt managers are not influenced by explicit macroeconomic or financial market objectives. In practice, however, debt management decisions are to some extent discretionary – and depend on an assessment of market conditions.

From this perspective, decisions about the consolidated debt of the official sector (government and the central bank) will determine the size and the maturity structure of debt held by the private sector and, given imperfect substitutability of assets along the maturity spectrum, this will normally influence the shape of the yield curve. For a given path of expected future short-term interest rates, the term premia will thus be affected. This was central to Tobin's (1963) portfolio balance model.² A further complication is that banks' lending behaviour may be influenced by the scale of government bond holdings on their balance sheets.

A practical challenge is that debt issuances by the central bank and by the government might at times work at cross purposes. Central banks are assigned the goal of macroeconomic stabilisation (ie price stability) while debt managers are typically mandated to keep the government's funding costs to a minimum. Thus, while the government would like to issue most of its debt in long-term paper to reduce the need to roll it over, central banks may have a strong preference for short-term bills for their day-to-day liquidity operations. This could lead to undesirable consequences for the monetary transmission mechanism through the term structure.

The rest of the note is structured as follows. Section 1 provides a brief review of the developments in the size and the maturity structure of government and central bank debt. Section 2 presents estimates of consolidated public sector debt. Section 3 discusses the potential consequences of debt maturity for the monetary transmission mechanism. Section 4 concludes with some remarks on potential coordination challenges facing the central bank and the government.

1. The size and maturity structure of government and central bank debt

In this section, we touch only briefly on government debt, since this topic has been extensively covered in the background paper *Developments of domestic government bond markets in EMEs and their implications*. We highlight the central bank issuance of bills and bonds, before presenting estimates of consolidated public debt securities.

² Modigliani and Sutch's (1966) "preferred habitat" hypothesis points in a similar direction (see also Friedman (1978)). The portfolio balance channel is absent in the standard New Keynesian models.

The size and maturity of government debt

Table 1 summarises the main facts about government debt – the amount is growing and the maturity lengthening. The outstanding stock of domestic debt securities issued by emerging market (EM) governments as a percentage of GDP has increased in all regions over the past decade.

Table 1
Government debt and its maturity¹

	Outstanding domestic government debt securities, as a percentage of GDP ²			Average maturity, in years ³		
	2000	2005	2010	2000	2005	2010
Asia	19.0	25.8	29.4	4.3	4.7	5.7
China	9.2	14.9	17.1	8.0	6.6	8.1
Hong Kong SAR	9.0	9.9	13.7			
India	23.4	33.1	37.3			
Indonesia	25.1	14.2	10.3			
Korea		26.2	32.9	2.6	3.9	5.0
Malaysia		34.9	48.6			
Philippines	25.5	39.0	30.9	3.3	3.0	6.2
Singapore	26.5	37.4	46.1	2.7	3.6	3.3
Thailand	13.9	22.3	27.7	4.9	6.4	5.7
Latin America	11.6	26.5	26.2	2.1	7.9	9.6
Argentina	11.6	26.1	8.4	2.1	13.4	11.1
Brazil		58.0	65.2	2.7	2.3	3.4
Chile					17.0	14.0
Colombia	16.7	27.2	24.3	2.5	3.8	5.1
Mexico	11.2	13.6	23.9	1.0	3.0	6.0
Peru	6.8	7.6	9.1			18.0
Central & eastern Europe	21.8	23.6	26.5	2.5	4.2	4.9
Czech Republic	13.8	20.9	27.0	1.5	4.9	5.7
Hungary	32.7	38.9	38.4	3.5	3.6	4.0
Poland	18.7	31.5	35.9			
Russia		3.3	4.6			
Other	33.0	34.9	38.8	5.4	5.3	6.7
Israel	31.2	42.4	51.1	6.2	6.1	6.2
South Africa	34.8	30.2	34.5	8.7	7.8	10.3
Turkey		32.1	30.6	1.2	2.1	3.6
Total average	19.4	26.8	29.4	3.6	5.8	7.2

¹ Outstanding government debt (taken from China Central Depository & Clearing Co Ltd, BIS debt securities statistics and national data) and average maturity taken from central bank questionnaire. ² Data for Argentina, Hong Kong SAR, Peru, the Philippines, Poland and Russia represent central government debt.

³ Data for Argentina, Colombia, Indonesia, the Philippines and Turkey represent central government debt.

Sources: Central bank questionnaires; China Central Depository & Clearing Co Ltd; IMF, *World Economic Outlook*; BIS debt securities statistics.

In addition, there has been a significant rise in the average maturity of outstanding government debt, from 3.6 years in 2000 to 7.2 years in 2010. This is most striking in Latin

America and, to a lesser extent, in Asia and central and eastern Europe (CEE). Nevertheless, differences across countries are large. In 2010, the average maturity of government debt was above 10 years in Argentina, Chile, Peru and South Africa, but was much shorter in Brazil, Hungary, Korea, Singapore and Turkey (between three and five years). Taking EMEs as a whole, the proportion of government debt with maturity below one year declined from about 28% in 2000 to around 18% in 2010.

The size and the maturity structure of central bank debt

Table 2, based on central bank questionnaire responses, shows that many EME central banks are major issuers of their own bills and debt securities. Most central bank issuance has had short maturities, with a heavy concentration below one year. In recent years, some central banks have tried to lengthen the maturity, but low investor appetite for duration has represented a challenge.

Table 2
Central bank securities

	Total outstanding			Maturity distribution at end-2010			
	2000	2005	2010	Below 1 year	Between 1 and 3 years	Above 3 years	Average remaining maturity
	As a percentage of GDP			Percentage of the total outstanding			In years
Asia							
China ¹	0.0	12.2	10.3	70.3	29.7	0.0	...
Hong Kong SAR	8.2	9.2	37.5	91.9	4.5	3.6	0.5
Korea	11.0	17.9	13.9	63.5	36.5	0.0	0.8
Thailand	n/a	8.4	23.6	68.0	26.0	6.0	1.0
Latin America							
Argentina	0.0	4.6	4.7	88.1	11.9	0	0.5
Brazil ²	7.3	0.3	...	...	...	...	...
Chile	29.9	15.0	8.6	25.9	36.6	37.6	3.4
Colombia ³	...	...	...	...	...	...	...
Mexico ⁴	0.0	2.7	2.7	61.0	36.0	3.0	1.1
Peru ⁵	0.7	3.4	0.8	100.0	0.0	0.0	0.3
Other EMEs							
Czech Republic	18.3	23.5	19.1	100.0	0.0	0.0	0.0
Hungary ⁶	3.5	0.2	11.3	100.0	0.0	0.0	0.0
Israel	5.7	14.5	18.4	100.0	0.0	0.0	0.5
South Africa	...	0.3	1.0	100.0	0.0	0.0	...

¹ www.chinabond.com.cn/Site/cb/en. ² Pursuant to the Brazilian Fiscal Responsibility Law, since 2002 the Central Bank of Brazil has not been able to issue its own securities. ³ The central bank can issue its own debt securities, but it has not issued any yet. ⁴ The Bank of Mexico can issue its own debt to meet its objectives. However, the federal government issues bonds on behalf of the central bank so that the bank can undertake open market operations. At the end of 2010, debt issued by the federal government for monetary regulation purposes represented about 99% of the outstanding central bank bonds. ⁵ Includes all types of certificates of deposit. ⁶ Currently, the only debt security issued by the central bank (Magyar Nemzeti Bank, MNB) is the main liquidity-absorbing policy instrument, namely the two-week MNB bill.

Source: Central bank questionnaires; China Central Depository & Clearing Co Ltd.

There is significant cross-country variation, with the proportion of central bank debt to GDP ranging from lows of around 1% in Peru and South Africa to highs of 24–38% in Hong Kong SAR and Thailand. Between 2005 and 2010, when there were extended periods (with some sharp interruptions) of capital inflows, there were large increases in the amount of central bank debt issued in some jurisdictions, such as Hong Kong SAR, Hungary, Israel and Thailand.

In some cases (eg Singapore and to some extent Chile), growth in the overall issuance of central bank securities has reflected an objective, shared by finance ministries, to deepen government debt markets and establish an effective benchmark yield curve. This has particularly been the case where the outstanding supply of marketable domestic government bonds has been rather limited.

In most countries, however, central bank debt issuance in recent years has been a by-product of exchange rate objectives. The sterilisation of the massive central bank purchases of foreign currency assets requires tools to drain the associated increase in domestic money market liquidity. While central banks have many tools to address this need, the issuance of central bank bills has been a relatively attractive option. There are several reasons for this.

- *Government deposits:* In principle, government deposits can play an important role in helping a central bank achieve its policy rate target.³ Indeed, many central banks have sought arrangements with governments that improve the predictability of government deposits. Nevertheless, government deposits remain volatile, reflecting variation in the timing of tax payments and government expenditures as well as portfolio allocation decisions by debt managers.
- *Operations with government securities:* During periods of large capital inflows, the supply of bank reserves initially rises in response to foreign asset accumulation, and the demand for bank reserves will tend to fall as domestic banks and non-banks find cheaper funding from abroad. Central banks in this situation sometimes find themselves running short of government securities to drain liquidity via repo operations or outright sales and must seek alternatives.
- *Required reserves:* Reserve requirements remain an attractive option for various reasons: (i) they may be easier to implement; (ii) they do not tend to attract capital inflows as much as higher interest rates; and (iii) they provide some financial stability benefits (for a discussion, see Moreno (2011)). However, required reserves cannot be used as flexibly by commercial banks as central bank securities, which can be pledged as collateral. Furthermore, unremunerated bank reserves impose costs on banks.

Finally, the motives for issuing short-term central bank debt deserve to be noted. First, some central banks and finance ministers have agreements to segment markets by maturity so as not to compete for the same investors. Second, the short end of the yield curve is often the most liquid, which reduces funding costs and hence carrying costs and interest rate risks for central banks. Third, short-term securities provide operational flexibility as liquidity conditions change in money markets; for example, during periods of financial stress, the central bank can supply liquidity in part by not rolling over its short-term debt.

³ For example, in some countries where the government budget is in surplus, such as Singapore, government deposits with the monetary authority can contribute to the draining of liquidity. Filardo and Grenville (2011) show that in 2010 government deposits accounted for 6–10% of total central bank liabilities in China, Indonesia and Korea. In some cases (eg India and Mexico), government deposits are part of an explicit arrangement with finance ministries to assist central banks in stabilising monetary conditions; see eg the contribution of the Bank of Mexico to this meeting.

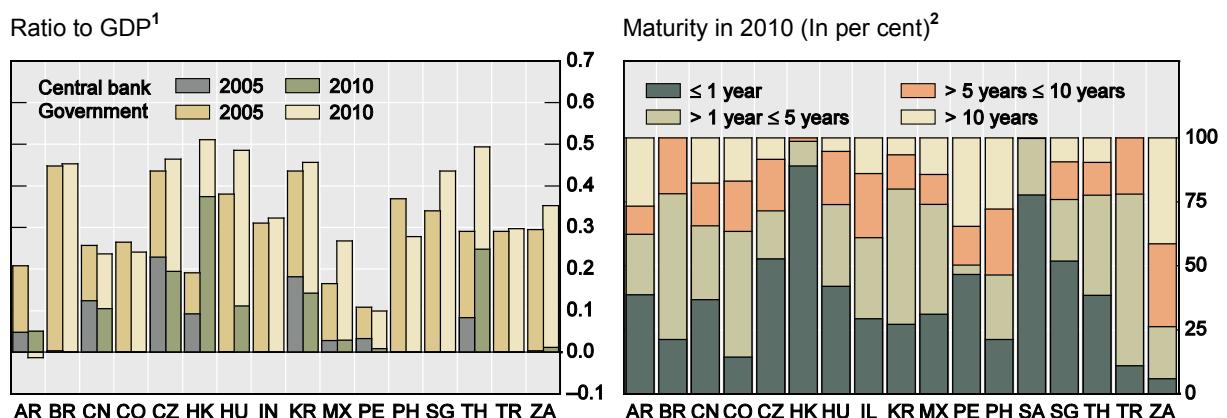
2. The consolidated official debt held by the public

The actions of government debt managers and central banks jointly determine the size and maturity of sovereign debt held by the public. To illustrate this point, note that if the central bank were to purchase the debt directly from the debt managers or indirectly from markets, there would be no change in the size or maturity of outstanding stocks held by the public.⁴

The left-hand panel of Graph 1 shows estimates of the consolidated official debt (central bank and government) held by the public as a percentage of GDP for 2005 and 2010. The right-hand panel shows the approximate maturity distribution of that debt at the end of 2010 (based on unconsolidated debt). Two facts stand out from the graph.

First, consolidated official debt held by the public relative to GDP has increased in several, but not, all economies. Consolidated official debt held by the public is generally smaller in economies where central banks do not issue their own securities (eg India) but hold a significant share of government bonds on their balance sheets. In economies where both the government and the central bank issue their own securities, consolidated official debt as a share of GDP has increased significantly, especially in Hong Kong, Hungary, Mexico, Singapore, South Africa and Thailand.

Graph 1
Outstanding central bank and government debt



AR = Argentina; BR = Brazil; CN = China; CO = Colombia; CZ = Czech Republic; HK = Hong Kong SAR; HU = Hungary; IL = Israel; IN = India; KR = South Korea; MX = Mexico; PE = Peru; PH = Philippines; SA = Saudi Arabia; SG = Singapore; TH = Thailand; TR = Turkey; ZA = South Africa.

¹ The government debt is subtracted by central bank claims on central government (IMF, *International Financial Statistics* line 12a). ² Central bank bonds with a maturity of greater than three years are assumed to have a maturity of less than or equal to five years.

Sources: Results taken from central bank questionnaire, complemented where necessary with information from IMF *World Economic Outlook*; China Central Depository & Clearing Co, Ltd; BIS debt securities statistics.

Second, the share of outstanding official short-term debt is high in many countries. Debt with maturity of less than one year accounted for about 37% of total EM consolidated official debt in 2010. The ratio is much higher than the average in Hong Kong SAR and Saudi Arabia. In several countries (eg Korea, Brazil and Turkey), there is a high concentration of debt with maturity below five years. The share of debt with maturity above five years is more significant in Argentina, Israel, Peru, the Philippines and South Africa than in other countries.

⁴ See Appendix Table A1 for a simple stylised public sector balance sheet.

Short-term debt and money

One fundamental question in thinking about the consequences of the maturity structure for monetary policy is the relationship between short-term government debt and monetary conditions. Short-term government debt can be a close substitute for money. Historically, the monetary authorities have often expressed their concerns about the impact of the sovereign issuance of very short-term treasury bills on the monetary policy stance. Until the mid-1990s, for instance, the Deutsche Bundesbank took the view that the government should finance itself with medium- and long-term securities only. Several countries have imposed issuance ceilings on bills.

Table 3
Composition of central bank and government debt held by the public in 2010

	Central bank and government debt ¹		Monetary base ²	Total	Monetary base and short-term debt
	≤ 1 year	> 1 year			
	(a)	(b)			
	In billions of US dollars				
China	533	857	426	1816	0.53
Hong Kong SAR	96	19	58	172	0.89
Indonesia	24	36	25	85	0.58
India	23	503	180	707	0.29
Korea	126	338	29	492	0.31
Malaysia	38	99	13	150	0.34
Philippines	11	45	11	67	0.33
Thailand	64	91	24	179	0.49
Brazil	292	241	42	574	0.58
Colombia	10	65	17	91	0.29
Mexico	64	213	-13	263	0.19
Czech Republic	43	46	15	104	0.56
Hungary	22	41	6	70	0.41
Poland	35	159	31	225	0.29
South Africa	24	103	-6	122	0.15
Turkey	59	160	37	255	0.37
<i>Memo</i>					
Japan	1,677	7,744	1,111	10,532	0.26
United Kingdom	87	1,561	298	1,946	0.20
United States	1,679	9,243	1,650	12,572	0.26

¹ Central bank debt (taken from central bank questionnaire, complemented for China with information from China Central Depository & Clearing Co Ltd and for Indonesia, Japan, Malaysia, Poland, the United Kingdom and the United States with BIS debt securities statistics and national data) and government debt (taken from BIS debt securities statistics and national data, complemented for Colombia with central bank questionnaire data, and China from China Central Depository & Clearing Co Ltd) less central bank claims on central government (as reported in IMF IFS, line 12a, except for Hong Kong SAR and the United Kingdom for which these data are not available). ² Monetary base less central bank liabilities to central government (taken from IMF IFS, lines 14 and 16d; NB: line 16d is not available for the United Kingdom) less required reserves from national sources. For China required reserves are proxied by bank deposits with the central bank (taken from national data) and for Colombia, Czech Republic, Hungary, Philippines, Poland and Thailand proxied by central bank liabilities to other depository corporations (as reported in IMF IFS, line 14c).

Sources: Central bank questionnaire; IMF, *International Financial Statistics*; China Central Depository & Clearing Co Ltd; national data; BIS debt securities statistics; BIS calculations.

Tobin (1963) provided a framework to study the effects of debt maturity from a monetary policy point of view. In his view, banks consider short-term government bonds as close substitutes for excess reserves because they are subject to little capital loss and can be easily sold to finance new lending. Given this view, a complete analysis of monetary conditions should focus on both short-term government debt and base money.

As an illustration, Table 3 provides estimates of the short-term official sector liabilities (ie central bank and government debt and the monetary base). The first two columns provide a breakdown of consolidated public debt into short- and long-term securities in US dollar terms. The third column reports the base money after netting out government deposits with the central bank as well as required reserves of commercial banks, which are, for all practical purposes, liquidity lost to the banking system. The fourth column shows the total liabilities, which are the sum of base money and total official sector debt securities. The last column reports the ratio of the sum of short-term debt and base money to total liabilities.

It is clear from Table 3 that shares of short-term official sector liabilities are high in many EMEs, and generally exceed those seen in industrial countries. This is not surprising given that the average debt maturity is shorter in emerging market economies than in industrial economies. It also suggests that, taking a wider perspective, monetary conditions in many EMEs are more accommodative than suggested by the monetary base alone.

Focusing on Asia, by this measure about 53% of official sector liabilities in China are short-term. In Hong Kong SAR, the ratio is close to 90%, but for a special reason. Under the currency board arrangement, all interventions are, in principle, unsterilised: monetary base therefore closely mirrors the Hong Kong Monetary Authority's purchase and sale of foreign currency. In the rest of Asia, the share of short-term official liabilities is above 65% in Indonesia and close to 50% in Thailand. In Latin America, Brazil's short-term financing ratio is significantly higher than other countries. In CEE, the same is true for the Czech Republic and Hungary.

3. Implications for the monetary transmission mechanism

How do these changes in the size and maturity of official debt held by the public affect the monetary transmission mechanisms? While not attempting to measure the impact, in what follows we briefly discuss the potential implications for the short end and shape of the yield curve as well as bank credit.

The short end of the yield curve

In principle, the short end of the yield curve is pinned down by the policy rate, which determines other borrowing and lending rates. In practice, however, in several countries an excess supply of bank reserves appears to have driven the interbank rate below the policy rate. A case in point is Colombia (Graph 2). From March to June 2007, the central bank bought foreign assets in response to capital inflows in order to stem the peso's appreciation, resulting in increased liquidity in domestic markets. In this setting, the short-term interbank rate persistently fell below the policy rate target. In Colombia the floor is set by a Lombard-type facility⁵ at a rate 1 percentage point below the policy rate target.

To expand the analysis, Graph A1 in the appendix shows interbank spreads for a number of other EMEs. In several cases, the interbank rates have deviated significantly from the policy

⁵ In Colombia, facilities that set a ceiling and a floor to movements in interbank rates around the target are both called Lombard facilities. At other central banks, the facility that sets the floor is a deposit facility.

rate target. For example, short-term rates rose above the policy target in some countries after the Lehman Brothers bankruptcy in mid-September 2008. Outside such crisis periods, however, short-term rates in some EMEs have remained below the policy rate target for extended spells. This stands in contrast to the experience of industrial countries, where the spread between the short-term rate and the policy rate is usually positive and relatively small, suggesting a persistent shortage of liquidity in interbank markets; the spread, nonetheless, became negative following exceptional monetary easing in 2009 and 2010.

Graph 2
Colombian short-term interest rates



¹ In per cent. ² Minimum expansion rate. ³ Overnight rate. ⁴ In basis points.

Sources: Datastream; national data.

The curvature of the yield curve

Along with macroeconomic and monetary policy factors, the demand for and supply of long-term securities can influence the curvature of the yield curve. An excess demand for long-term securities may thus reduce the term premia, leading to a flatter yield curve; conversely, an excess supply may increase the term premia, steepening the yield curve. In both cases, without corrective action by the central bank, monetary conditions would deviate from those set by the policy rate.

An oft-cited example was the strong demand for US treasury securities by the Asian central banks leading to a “conundrum” of low US long-term interest rate prior to the recent financial crisis (Bernanke (1995)). Monetary authorities may also have an explicit objective in influencing the term premia, as demonstrated by the Federal Reserve’s and the Bank of England’s quantitative easing programmes. Recent studies generally suggest that debt maturity can have a significant effect on long-term interest rates. For instance, D’Amico et al (2011) note that real-term premia for US Treasuries fell following the Fed’s large-scale purchase of medium- to long-term securities. Other studies have given similar results.⁶

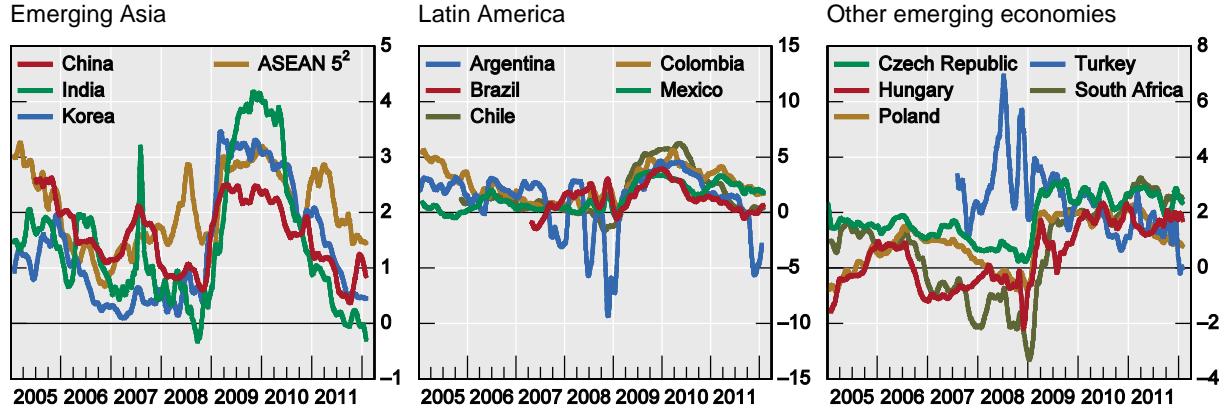
Given a shortage of high-quality EM assets and rather illiquid EM market conditions, the impact of any given change in debt maturity is arguably much more significant in emerging market economies than in industrial economies. And the growing investor base for emerging market assets makes the role of debt maturity even more important in the determination of the yield curve. For example, banks will have to hold government bonds of different

⁶ Krishnamurthy and Vissing-Jorgensen (2011) and Meaning and Zhu (2011). For the spillovers of quantitative easing on yield curves in emerging Asia, see Chen et al (2012).

maturities to satisfy new liquidity regulations. Their demand for bonds may also be conditioned by potential exposure to market risks. In terms of the changing demands at different points along the yield curve, foreign investors may prefer to invest in short- to medium-term maturity debt to avoid exposure to interest rate risks. Domestic pension funds, in contrast, may demand longer-term bonds.⁷ Taken together, these trends in emerging market economies suggest that the various supply and demand forces influencing the yield curve are getting stronger and may become more volatile over time.

Graph 3
Spread between long-term¹ and short-term rates²

Four-week moving averages, in percentage points



¹ Ten-year government bonds; for Argentina, one-year; for Brazil, three-year; for Chile and South Africa, nine-year; for Turkey, two-year. ² Three-month government bonds. For Colombia, one-year; for Argentina, the Czech Republic and Poland, money market rates. ³ Simple average of Indonesia, Malaysia, the Philippines, Singapore and Thailand.

Sources: Bloomberg; national data.

Graph 3 shows that the spread between the yields on three-month and 10-year government securities for several EMEs has been quite volatile in recent years. In several countries, the term spread is now very low or even negative. As term spreads measured in this way are significantly affected by investors' expectations about the future stance of monetary policy and about macroeconomic prospects,⁸ the behaviour of spreads suggests expectations of low short-term rates in the future. However, it is apparent that spreads fell during 2009–10 even as many countries were tightening monetary policy. This may partly reflect the stronger demand for government paper associated with strong capital inflows during this period. The background paper from Korea notes the dilemma posed to the central bank by large capital inflows. Even though the Bank of Korea has raised its policy rate several times, long-term rates have fallen. The central bank has referred to this as a “conundrum”, akin to the one witnessed in the United States during the first half of the 2000s.

This evidence underscores the view that the effect of the maturity structure of official debt held by the public has implications for the conduct of monetary policy in emerging market economies. To the extent that central banks actively manage the maturity structure, they can

⁷ The paper from the Bank of Mexico shows that foreigners' holdings of Mexican local currency debt have tripled since 2009 and that their share of the market has more than doubled. Pension system reforms have sharply increased the net assets of these funds, thereby increasing the demand for long-term bonds.

⁸ A more appropriate way to measure the term spread is to take the difference between the long-term rate and an average of expected future short rates.

shape the yield curve to better reflect their policy intentions over the medium and long terms. Indeed, authorities in EMEs have adopted different strategies for managing the maturity structure of their bill and bond issuance. For example, as the background paper from Chile notes, authorities seek to minimise the impact of their actions on bond yields, implying a relatively neutral response to bond market demand and supply conditions. Another approach seeks to actively reshape the yield curve from what would result from the actions of the private financial markets alone. For instance, the background paper from the Reserve Bank of India notes the challenges the RBI faced from a significant widening of fiscal deficits in recent years. To prevent a sharp rise in the long-term interest rate, the RBI added more market liquidity through its daily liquidity adjustment facility and shortened the average maturity of government debt considerably, from 14.9 years in 2007–08 to 11.2 years in 2009–10.

Short-term debt and bank credit

Another potential implication of the debt structure relates to the growth of bank credit. In the conventional monetary transmission mechanism, bank credit is determined primarily by demand factors, so that the issuance of short-term debt (or bank reserves) should play little role in determining the level of financial intermediation. In this case, when banks increase their holdings of government bonds, they may crowd out credit to the private sector (Kuttner and Lown (1998)).

Under imperfect market conditions, however, debt maturity can affect banks' lending behaviour. There are several channels. The first is that banks may face financing constraints. Short-term government and central bank bills could then act as liquidity buffers (bank reserves in waiting), relaxing these constraints and enhancing banks' capacity to lend.⁹ The size of the likely impact depends on the sensitivity of banks' holdings of bills and securities to the level of interest rates. When interest rates are low, banks have a greater incentive to seek finance by liquidating their holdings of short-term paper rather than by borrowing from the central bank.

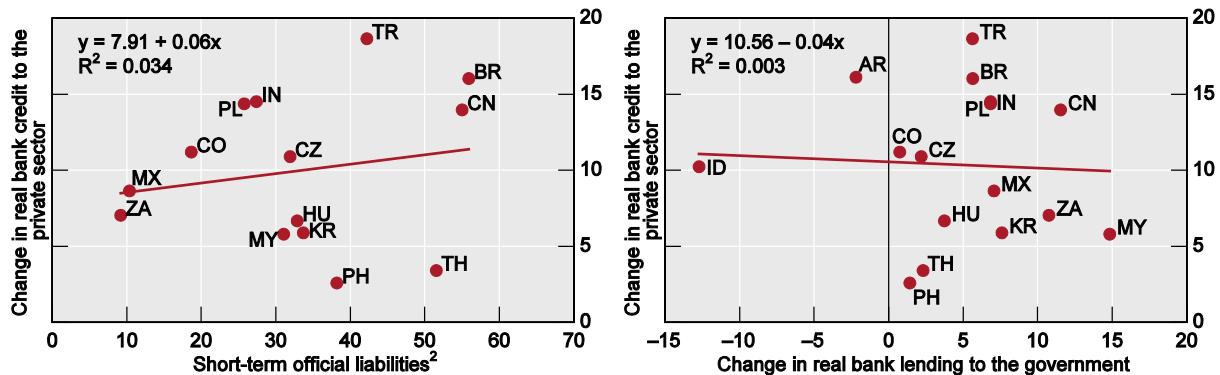
A second is that liquid assets provide an easy way for investors to leverage up their balance sheets. Banks and other investors may use their bond holding to build riskier exposures (see Borio and Zhu (2008)). Liquidity and risk-taking may interact in a mutually reinforcing way, increasing the strength of the monetary transmission mechanism and creating a destabilising credit boom.

Finally, the desired asset maturity may matter. Bank managers may want a certain asset maturity structure, and if the government does not supply enough long maturity assets banks may create them by making loans, even though such lending may not be a perfect substitute; in other words, the shorter debt maturity of sovereign bonds may lead banks to finance a greater amount of long-term projects.

In emerging market economies, the evidence appears to provide some support for the view that strong growth in short-term official sector debt is associated with credit growth. The left-hand panel of Graph 4 plots the percentage change in bank credit to the private sector and the ratio of short-term official liabilities presented in Table 3 (as a proxy for banks' holdings of liquid assets). Both variables are averages for 2005–10. The right-hand panel shows the relationship between changes in bank credit to the government and that to the private sector.

⁹ A number of recent studies have highlighted the potential link between short-term debt securities and bank credit; see Mohanty and Turner (2006), Filardo and Grenville (2011) and Mehrotra (2011).

Graph 4

Bank credit and short-term sovereign liabilities¹

AR = Argentina; BR = Brazil; CN = China; CO = Colombia; CZ = Czech Republic; HU = Hungary; ID = Indonesia; IN = India; KR = Korea; MX = Mexico; MY = Malaysia; PH = Philippines; PL = Poland; TH = Thailand; TR = Turkey; ZA = South Africa.

¹ Annual averages between 2005 and 2010, in per cent. ² Short-term central bank and government debt plus monetary base as a percentage of central bank and government debt plus monetary base (for details, see Table 3).

Sources: IMF, *World Economic Outlook and International Financial Statistics*; national data; BIS debt securities statistics; BIS questionnaire; BIS calculations.

The graph suggests that a positive relationship exists between short-term liabilities and bank credit. By contrast, there is no evidence of the “crowding-out” view. While a more systematic analysis is needed to fully assess the role of short-term debt, the overall conclusion is that government debt may stimulate lending while acting more as a complement to than as a substitute for private sector lending.

4. Conclusion and comments on policy coordination

The maturity structure of government debt has potential implications for monetary policy, especially in emerging market economies. With EM central banks becoming major issuers of short-term debt, the yield curve is increasingly being shaped by their actions and by the decisions of government debt managers. Increased demand from different investor classes for EM sovereign bonds means that different segments of the yield curve are becoming more sensitive to supply and demand. This has important implications for monetary conditions. In addition, the maturity profile of public debt can have important effects on banks' lending behaviour.

This raises the possibility of occasional conflicts of interest between debt managers and central banks. At the most basic level, good information-sharing between agencies is essential if adverse market reactions to issuance, redemption and purchase schedules are to be avoided. The prospects for potential conflicts might call for a review of arguments for an independent debt management authority (see Appendix for models of information-sharing and institutional arrangements).

The conflict of interest most relevant for monetary policy relates to differing mandates. Consider the case of debt managers charged with keeping financing costs to a minimum. If the central bank is trying to steepen the yield curve by lowering the policy rate in order to

achieve its macroeconomic objectives, debt managers would enjoy very favourable pricing when issuing short-dated securities.¹⁰ But such issuance would conflict with the efforts of the central bank. On the other hand, when central banks issue large amounts of shorter-term bonds, they might crowd out governments from this market, forcing them to seek additional long-term financing, possibly at higher cost.

One way to resolve such potential conflicts is to align the objectives of the two decision-makers. In particular, debt managers may need a mandate that extends beyond standard debt management considerations (eg cost mitigation) and includes the orderly functioning of financial markets and overall macroeconomic stability.

In a similar vein, central banks may need to factor in additional objectives as long as they do not compete with core monetary policy objectives. In particular, EM central banks have traditionally played a role in promoting the development of government bond markets. But, for some, this objective may at times interfere with their need to use central bank securities to mop up liquidity, especially as a result of foreign reserve intervention. The use of central bank securities can even lead to segmentation of rather shallow domestic sovereign bond markets. On this point, Bank Indonesia has recently indicated its willingness to scrap its SBI programme and to rely more heavily on government bonds in conducting monetary policy.

It is important that governance structures evolve in order to accurately address potential conflicts and to mitigate the risks associated with any misalignment in the objectives of central banks and debt managers. Enhanced consultations may be an effective option, along the lines of those recently set up by Turkey. What we have learned in recent years about the governance of financial stability responsibilities by setting up cross-agency committees may now be applicable to debt management concerns. (Arrangements for selected economies are summarised in the Appendix (pp 15–17)).

¹⁰ See CGFS (2011) and Hoogduin et al (2010).

Appendix: Coordinating central bank and government debt management

Information coordination

Good information flows between central banks and debt managers can prevent many avoidable day-to-day stresses in financial markets. For example, advanced notice of upcoming debt sales and purchases, the breakdown of paper to be issued by maturity, the types of holders being targeted and currency denomination all helps central banks to forecast liquidity needs in the money markets. Likewise, information about upcoming monetary policy operations is helpful to debt managers as they plan their auction schedules. In general, information about each other's timetable and strategies goes a long way to preventing operational conflicts.

Various arrangements to promote the two-way flow of information have been adopted to reduce the potential for such conflicts. Typically, they take the form of separating the responsibility for managing the Treasury's financing needs from the operational issues associated with administration and settlement of government bond purchases and sales. In many jurisdictions, the central bank has been given responsibility for settlement and administration. For example, in the case of Colombia, the Ministry of Finance and Public Credit regulates the overall level of government financing but leaves the timing of the auctions, settlement and other operational details to the central bank. In Korea, where the debt management unit has been consolidated inside the Ministry of Finance, the Bank of Korea oversees the issuance, sale and purchase of bonds on the government's behalf.

This information-sharing between debt managers and central banks will continue to be particularly valuable in periods of heavy capital outflows, ie when markets are particularly skittish and stresses easily develop; capital flows in the regions have been getting more volatile. Conflicts may also arise when issuance schedules for both central banks and governments are particularly busy; therefore, EMEs with large outstanding debts and high deficits are more likely to need a higher level of information-sharing. Likewise, EME central banks that need to roll over a substantial portion of their portfolio of assets or need to issue central bank bills to drain liquidity may find it difficult to avoid creating volatility in financial markets.

Centralised debt management units in central banks and explicit prohibitions

Some potential conflicts may be too costly for information-sharing and general governance rules to be the sole means of aligning the objectives of debt managers and central banks. The potential for future conflicts suggests that several questions will need to be revisited, including whether to house centralised debt management units in central banks and how to build stronger walls between the activities of debt managers and central banks.

Embedding debt management units inside the central bank, as at the Reserve Bank of India, is a traditional way to ensure that the activities of the central bank and the debt managers are well coordinated. That said, there is a current proposal to shift this function outside the central bank in India. Arguments in favour of this proposal have been that debt management responsibilities bias a central bank towards low interest rates in order to reduce sovereign debt costs even if this compromises the central bank's anti-inflation stance. A similar conflict may also distort the central bank's open market operations.¹¹ In central banks with strong

¹¹ For further details, see "Central bank governance issues – some RBI perspectives" by Governor Subbarao, May 2011.

price stability credibility, such theoretical arguments appear overstated. In contrast, arguments based on potential debt management conflicts appear to be a more important consideration for deciding the level of central bank coordination.

Alternatively, potential conflicts may call for the building of stronger walls between the activities of debt managers and central banks. This has been the approach to past episodes of fiscal dominance, ie where finance ministries have pressured central banks to finance government operations at relatively low interest rates. As a consequence, EME central banks have been either discouraged or prohibited from making outright purchases of government debt in primary markets. In Turkey, for example, the central bank was barred from purchasing bonds in the primary market after the 2001 crisis and also from granting advances and extending credit to the Treasury or to public establishments and institutions. Such bans are common in many jurisdictions. To help prevent fiscal dominance, the Philippines goes one step further: the Monetary Board of the Bangko Sentral ng Pilipinas (BSP) must by law give its approval before the government can issue bonds in domestic or foreign currency.

There are other ways of segregating the activities of central banks and debt managers. One is for central banks and debt managers to agree that, during periods of heavy domestic currency bond issuance, the central bank will rely on reserve requirements or FX repos to drain liquidity instead of issuing central bank bills or selling the government bonds on its balance sheet. Alternatively, debt managers and central banks might strategically target different borrowers, ie debt managers might target residents while central banks target non-residents. Or, as in some jurisdictions, central banks might confine themselves to operating at the shorter end of the yield curve while debt managers operate at the longer end. While all these options are technically possible, they may require formal agreements to be effective if debt management units are not housed in central banks.

Debt management arrangements and role of central banks, selected economies

		Arrangements	CB securities	CB settlement & admin services of government bonds
Sovereign bonds				
ID	<p>Government debt securities (treasury bills and government bonds) are issued by the Ministry of Finance. Bank Indonesia (BI), as an implementing agency, stipulates and administers the regulations regarding the issuance, sale and purchase of these debt instruments.</p> <p>BI is appointed by the government as an auction agent on the primary market to facilitate issuance of government securities. BI may engage in purchase of these securities on the primary market only in respect of treasury bills. The purchase must be non-competitive and placed directly but not through an authorised bidder. On the secondary market, BI may be appointed as an agent for sale and purchase of these securities. In this case, BI shall conduct the sale and purchase of these securities on the secondary market at the request of the Minister of Finance of the Republic of Indonesia.</p>		Bank Indonesia certificates (SBI)	<p>Settlement services: yes; via Bank Indonesia – Scripless Securities Settlement System (BI-SSSS)</p> <p>Administrative services: yes</p>
IN	<p>Government debt securities comprise dated securities issued by the Government of India and state governments as well as treasury bills issued by the Government of India. The Reserve Bank of India (RBI) manages and services these securities through its Public Debt Offices (PDOs) as an agent of the government.</p> <p>The PDO of the RBI acts as the registry/depository of government debt securities and deals with the issuance, interest payments and repayment of principal at maturity. These securities are managed by the Internal Debt Management Department of the RBI, which also regulates and supervises the primary dealer system and has the responsibility of developing the government securities market.</p>		n/a	<p>Settlement services: no; via the Clearing Corporation of India (CCIL)</p> <p>Administrative services: yes</p>
PH	<p>The Department of Finance, through the Bureau of the Treasury, regulates issuance of government securities, which are treasury bills and treasury bonds. The Bureau of the Treasury auctions the government securities on the primary market through its auction system to eligible dealers or over the counter for specific investors.</p> <p>The Secretary of Finance, with the approval of the President and after consultation with the Monetary Board of the Bangko Sentral ng Pilipinas (BSP), is authorised to issue government securities in domestic or foreign currencies.¹ Foreign/foreign currency-denominated borrowings of the public sector require approval and registration with BSP to help control the size of the country's obligations, to keep the debt service burden at manageable levels, to channel loan proceeds to priority purposes/projects supportive of the country's development objectives, and to promote the best use of the country's foreign exchange resources. BSP also offers short-term special deposit accounts (SDAs).</p>		n/a	<p>Settlement services: yes; via the Philippine Payment and Settlement System (PhilPASS)</p> <p>Administrative services: no</p>
BR	<p>The National Treasury Secretariat is an agency of the National Treasury in charge of management and administration of the domestic and external public debts. Most of the domestic government debt is issued through auctions held by the National Treasury, making public offerings to financial institutions. The other types of issuance are: direct issuances used to meet specific requirements defined by law, and public offerings to individuals, through the Tesouro Direto programme, which allows individuals to purchase public bonds directly through the internet. Regarding issuance of government debt on the international market (external debt), the proceeds may be used for paying both domestic and external debt for which the National Treasury is liable.</p> <p>The Central Bank of Brazil uses treasury bonds to implement monetary policy, through the purchase and sale of securities on the secondary market.</p>		n/a ²	<p>Settlement services: yes; via the Special System for Settlement and Custody³ (SELIC)</p> <p>Administrative services: no</p>

Debt management arrangements and role of central banks, selected economies (cont)

Arrangements		CB securities	CB settlement & admin services of government bonds
	Sovereign bonds		
CO	<p>The Ministry of Finance and Public Credit (MFPC) regulates issuance of government debt securities. The Ministry determines the target amount of total financing and periodically announces the level of compliance with the established targets, but it does not provide the market with a specific calendar showing the dates of the auctions. Treasury bonds have been the main source of local financing for the central government.</p> <p>The central bank acts as an agent of the central government in the issuing and administration of domestic bonds. On behalf of the MFPC, it announces the date, size and nominal value of the auction. The central bank has been authorised to carry out its monetary policy with government bonds since 1990. The Constitution left open the possibility of the central bank acquiring government bonds on secondary markets.</p>	n/a	Settlement services: yes; via the Electronic Negotiation System (ENS) Administrative services: yes
CL	<p>The International Finance Unit of the Finance Ministry is in charge of proposing and implementing strategies regarding public debt through the Public Debt Office. The government issues peso- and Unidad de Fomento-denominated bonds in the domestic market.</p> <p>The Central Bank of Chile carries out monthly bond auctions on dates published in a calendar in the amounts established by the Finance Ministry. Both the central bank and the Finance Ministry periodically coordinate their planned debt issues. The central bank is prohibited from purchasing government debt in the primary market. The central bank is the largest individual bond issuer in Chile; these bonds are used in open market operations and to determine the benchmark yield curve of the economy.</p>	Central bank certificates with maturities ranging from 30 days to 20 years	Settlement services: no; via the Superintendencia de Valores y Seguros (SVS) of Chile Administrative services: yes
MX	<p>The Federal Government of Mexico, through the Ministry of Finance and Public Credit, is responsible for management and issuance of government securities.</p> <p>The Bank of Mexico (BM) operates as the financial agent for the Federal Government of Mexico and undertakes primary auctions of government securities on a weekly basis. The Federal Government, through the Ministry of Finance and Public Credit, is responsible for the management and issuance of government securities. The BM is prohibited from purchasing government securities on the primary market.</p>	n/a ⁴	Settlement services: no; via the Central Securities Depository (INDEVAL) Administrative services: yes
HU	<p>The Hungarian government issues government bonds and discount treasury bills. In the late 1990s, the responsibility for debt management was moved out of the central bank into the Ministry of Finance as a separate public debt office. The office, which was first created as a partly independent organisation within the Treasury and then transformed into a corporation currently owned by the Ministry for the National Economy (Government Debt Management Agency Pte Ltd (ÁKK)), is responsible for domestic and foreign debt management, financing the central government and liquidity management of the state's account balance. The majority of government securities – discount treasury bills and government bonds – are sold through public issues. Primary dealers – eligible investment companies or credit institutions – may buy government securities directly at the auctions, while investors must order them from primary dealers. Government securities can be obtained on the secondary market, amongst others from primary dealers or in the branch network of the Treasury.</p>	Two-week MNB bill	Settlement services: no; via ÁKK (Gov't Debt Management Agency Pte Ltd) Administrative services: yes

Debt management arrangements and role of central banks, selected economies (cont)

		Arrangements	CB securities	CB settlement & admin services of government bonds
Sovereign bonds				
IL	<p>The Government Debt Management Unit comes under the Ministry of Finance. The government is authorised, with the agreement of the Bank of Israel, to obtain services from banks or financial entities, provided this is done only in order to manage the government's debt and fiscal activity.</p> <p>The Bank of Israel is responsible for the registration, clearing and payment of debts. The central bank administers the government's domestic loans, both non-compulsory (negotiable or non-negotiable) and compulsory. It is also responsible for the redemption in Israel of foreign loans (State of Israel Bonds); and records receipts from the sales of bonds and payments to bond and securities holders, maintains the register of holders of non-negotiable state loans and securities traded on the stock exchange, and in this regard acts as the coordinating bank for short-term government securities.</p>	Makam (up to one year)		<p>Settlement services: no; via the Development Corporation for Israel (DCI)</p> <p>Administrative services: yes</p>
PL	<p>The Republic of Poland, via the Ministry of Finance on behalf of the State Treasury, issues treasury bills of up to one year and bonds of up to 10 years to cover the budget deficit. The Treasury is currently the largest issuer of bonds in Poland.</p> <p>The National Bank of Poland (NBP) plays an important role in the securities clearing and settlement systems. The NBP is the owner and operator of two securities settlement systems: the Register of Securities and the National Depository for Securities. The NBP can purchase treasury bonds in the secondary market only exceptionally, in the case of a severe crisis threatening the stability of the domestic financial system.</p>	SEBOP central bank bills		<p>Settlement services: yes; via SKARBNET of the Register of Securities; and the National Depository for Securities</p> <p>Admin services: yes</p>
TR	<p>The Undersecretariat of the Treasury, which is the issuer of government bonds and treasury bills, is responsible for the method and terms of issuance as well as debt management. On behalf of the Undersecretariat, the Central Bank of the Republic of Turkey (CBRT) issues bonds and bills in accordance with the financial services agreement with the Treasury. The CBRT is the central securities depository, and all securities transfers are registered with the CBRT's TIC-ESTS system.</p> <p>Turkey has a coordination committee for debt management, but it does not include central bank representatives. Nonetheless, the Treasury meets regularly with the central bank with respect to CBRT market liquidity management, as part of its coordinated debt management strategy. The central bank, as the fiscal agent of the Treasury, also organises the auctions by collecting bids, and sorting and submitting the lists to the Treasury on auction day. Auctions of domestic debt securities are open to all investors (either institutional or individual). Since April 2001, the law has prohibited the central bank from granting advances and extending credit to the Treasury and to public establishments and institutions, and from being a purchaser, in the primary market, of the debt instruments issued by the Treasury and public establishments and institutions.</p>	Liquidity bills ⁵		<p>Settlement services: yes; via the Electronic Securities Transfer and Settlement System (TIC-ESTS)</p> <p>Administrative services: yes</p>

This table was compiled from publicly available sources.

¹ The Philippine Constitution authorises the President to incur and guarantee foreign loans on behalf of the Republic of the Philippines with prior concurrence of the Monetary Board; all foreign borrowing proposals of the government, government agencies and financial institutions have to be submitted for approval in principle by the Monetary Board before commencement of actual negotiations, or before a mandate of commitment is issued to foreign funders/arrangers. ² Since May 2000, the Central Bank of Brazil has no longer been authorised to issue its own securities. ³ The Central Bank of Brazil manages SELIC and operates it jointly with ANBIMA. ⁴ Brems, "Bank of Mexico Monetary Regulation Bonds", were issued from August 2000 to July 2006. ⁵ Maturity shall not exceed 91days; first issued in July 2007.

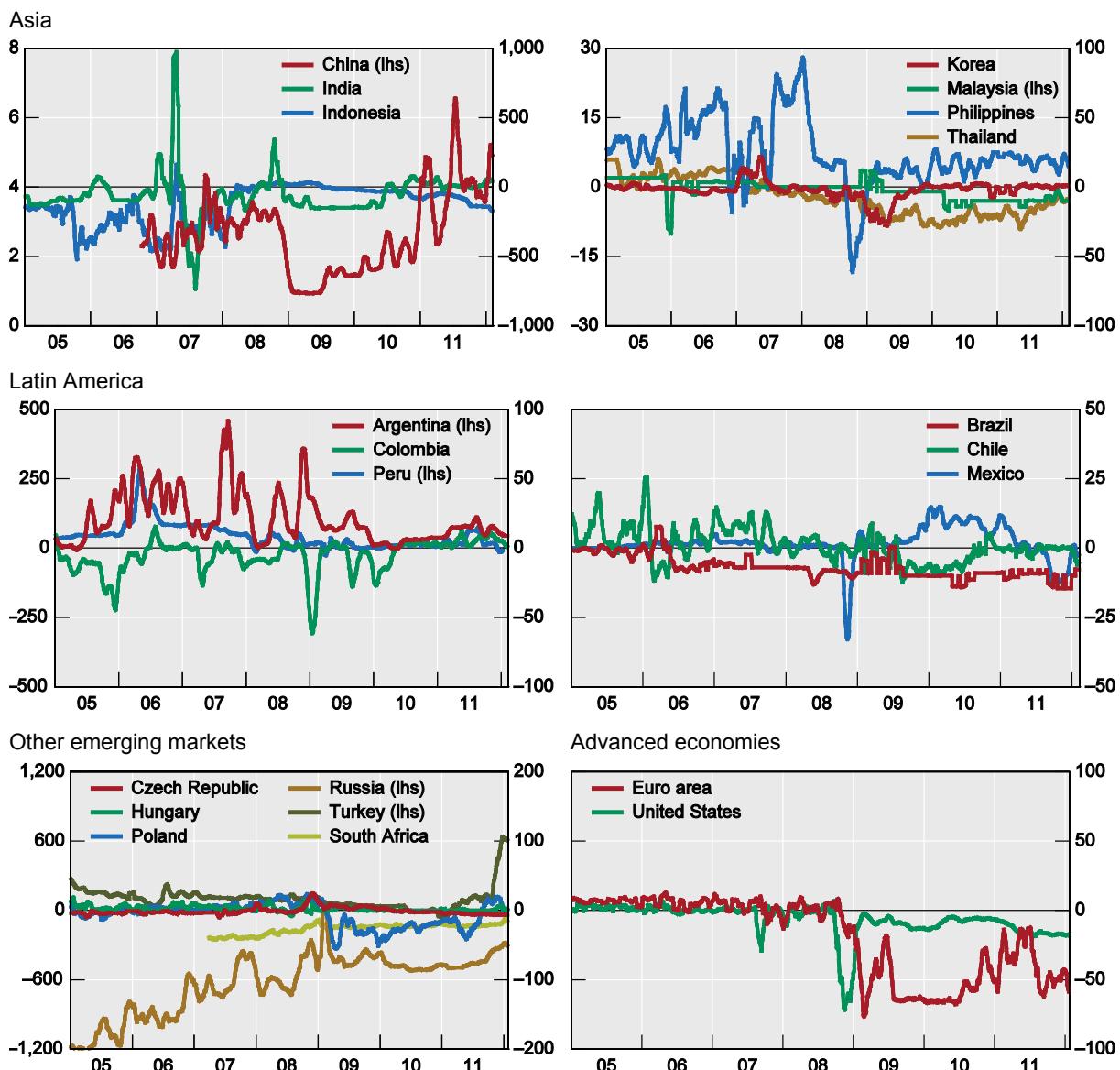
Table A1
The consolidated public sector balance sheet

A		B	
General government		Central bank	
Assets	Liabilities and net worth	Assets	Liabilities and net worth
1. Deposit with the central banks	5. Gross debt Net worth (4–5)	1. Foreign assets	5. Currency
2. Other financial assets		2. Government bonds	6. Bank reserves
3. Capital stock		3. Claims on other sectors	7. Government deposits
4. Total assets		4. Total assets	8. Central bank bonds
			9. Other liabilities
			10. Capital
			11. Total liabilities
			Net worth (4–11)

C

Consolidated balance sheets	
Assets	Liabilities
1. Foreign assets (B1)	5. Currency (B5)
2. Financial assets (A2 + B3)	6. Net bank reserves (B6 – B7)
3. Capital stock (A3)	7. Government bonds (A5 + B8 – B2)
4. Total assets (C1 + C2 + C3)	8. Other liabilities (B9)
	9. Total liabilities (C5 + C6 + C7 + C8)
	Consolidated net worth (C4 + B10 – C9)

Graph A1
Short-run interbank rate: spread to reference rate or level¹
 22-day moving average



On right-hand side scale unless otherwise indicated; in basis points unless otherwise indicated.

¹ For Argentina, seven-day interbank (BAIBOR) rate and BCRA seven-day reverse repo agreement rate (<http://www.bcra.gov.ar/pdfs/estadistica/tasser.xls>); for Brazil, financing overnight SELIC rate and SELIC target rate; for Chile, Central Bank of Chile daily midday nominal interbank rate and official monetary policy rate; for China, one-week SHIBOR (level; in per cent); for Colombia, overnight interbank rate and minimum expansion rate; for the Czech Republic, two-week interbank rate and two-week repo rate target; for the euro area, EONIA rate and ECB main refinancing rate; for Hungary, two-week interbank rate and base rate; for India, Mumbai overnight interbank rate and repo rate; for Indonesia, overnight interbank rate and BI rate; for Korea, brokered overnight call rate and base rate; for Malaysia, Kuala Lumpur overnight interbank rate and overnight policy rate; for Mexico, overnight bank funding rate and overnight interbank rate target; for Peru, one-month interbank (LIMABOR) rate and reference interest rate; for the Philippines, interbank call loan rate and reverse-repo rate; for Poland, one-week interbank rate and reference rate; for Russia, overnight interbank (MIBOR) rate and refinancing rate; for South Africa, SABOR rate and official repo rate target; for Turkey, one-week interbank rate target (overnight interbank rate prior to May 2010) and one-week repo lending rate (overnight borrowing rate prior to May 2010); for Thailand, overnight interbank rate (Bangkok one-week interbank rate prior 17 January 2007) and overnight repo rate target (14-day repo rate target prior to 17 January 2007); for the United States, federal funds effective rate and federal funds rate target.

Sources: Bloomberg; Datastream; national data.

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Fiscal policy, public debt management and government bond markets: issues for central banks

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Abstract

The global financial crisis showed that both authorities and markets failed to properly assess the size and the evolution of the public debt stock in various economies. In some countries the monetary authorities focused excessively on inflation, without taking into account other key macroeconomic variables and ratios. That said, it is important to ask why some macroeconomic variables were able to follow such unsustainable paths for lengthy periods. Part of the explanation is the scenario of strong growth, with high international liquidity and low inflation, that prevailed before the crisis. In addition, EU countries, especially the less-developed ones, were able to reduce their financing costs after the introduction of the euro.

In this paper, we also examine the role played by economic authorities, and the inter-relationships among them in the design and implementation of fiscal policy and debt management in response to the crisis. Rigid central bank goals and inflexible boundaries between the central bank and the treasury were erased, allowing the economic authorities to behave in a pragmatic way. Finally, we discuss the role played by credit rating agencies and regulatory frameworks.

Keywords: Monetary policy, public debt

JEL classification: E42, E52, E63

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1. Introduction

The current global financial crisis has made it clear that economic authorities and markets in various countries have not properly considered the effects that the size and evolution of the stock of public debt and the government primary surplus can trigger. And some authorities have focused their assessment view of the economy exclusively on inflation.

In this sense, it is important to analyze the reasons that could explain why some macroeconomic variables were able to follow unsustainable medium- and long-term paths for a long period. At the same time, it is also important to see the role played by economic authorities, central banks among them, and their institutional arrangements for the design and implementation of fiscal and monetary policy and debt management.

2. Some macroeconomic thoughts

Following the crisis of the late nineties that mainly affected Southeast Asian countries, Russia and other emerging economies (EMEs), economic authorities began to implement policies basically aimed at reducing their dependence on foreign capital and promoting fiscal robustness. At the same time, EU countries, especially the ones with a relatively lower degree of development, were benefited financially by the introduction of the euro as a common currency in early 1999. This allowed those countries to effectively reduce their costs of indebtedness.

In both cases, those changes took place within a framework characterized by ample international financial liquidity, which in domestic financial markets was reflected in a high growth rate of monetary aggregates and increases in asset values. Usually the consequences of the latter were underestimated due to the importance given, in implementing monetary policies, to domestic inflation indicators that do not incorporate asset prices.²

On the other hand, it is important to stress that in the last 30 years the world economy has experienced structural changes. Some of these have had deep consequences for the role played by different variables over the inflationary process, such as the robust growth of international trade, with the growing importance of low-cost manufactured products provided by EMEs and the continuous decrease in tariff trade barriers that on average went down from 26% in 1986 to 8.8% in 2007. As a result, the world experienced a period of strong real growth combined with low levels of inflation.³

In this regard, many economies had controlled domestic inflation while other macroeconomic variables, such as debt ratios as a percentage of GDP, current account or fiscal deficits (or both), showed disruptive trajectories. This evolution has not affected all economies to the same extent, as the restrictions they faced were not similar. In fact, countries or areas with currencies that are internationally accepted – used in trade or international reserves – enjoy higher degrees of freedom than economies that do not possess such currencies.

As shown in Table No. 1, comparing the average of 2008–11 with that of 1998–2007 it is clear that, while industrialized countries and EU members showed a rise in their levels of

² In relation to this, Axel Leijonhufvud maintains that inflation targeting implies “a central banking doctrine that requires an exclusive concentration on keeping consumer prices within a narrow range with no attention to asset prices, exchange rates, credit quality or (of course) unemployment” (“Keynes and the crisis”, *CEPR Policy Insight*, no. 23, May 2008). We would add to this list a lack of attention to fiscal deficits and public debt levels.

³ M Pesce, “Monetary policy and measures of inflation”, *BIS Papers*, no. 49, December 2009.

public debt relative to GDP (some of them a very sharp one), the EMEs had, in general, reduced this ratio. It can also be seen in Table No. 2 that, for the first group of countries, with the exception of Japan, while the sum of the primary fiscal balance for 1998–2007 was positive, it became negative during 2008–11. In the case of the EMEs the evolution was in the same direction, although in the second period primary fiscal balances still were positive or showed small negative values. Combined with the figures on public debt interest presented in Table No.3, we can say that the fiscal stance in EU and other developed countries worsened, and was not much better in EMEs.

Several factors explain the evolution of macroeconomic variables, which obviously differs for each economy. It is clear that different public deficits and debt levels have different effects on medium- and long-term economic performance: debt and fiscal balance levels and their paths have impacts on the stability of the economic and financial systems.

From the data presented, it is possible to say that some economies showed primary fiscal results that were not enough to cope with rising debt levels and interest burdens. In this sense, some economies shifted from “speculative” to “Ponzi” situations as their fiscal primary balances were insufficient to cover the interest payments.

In this context, and as has been widely reported in recent months, credit rating agencies have played an important role in the evolution of the crisis. In Table 4 we can see the evolution of sovereign debt ratings assigned to a group of countries in the period December 2000–December 2011. For some countries, strong swings in sovereign ratings can be observed during very short periods. Though they had different macroeconomic frameworks, the positive assessments and ratings given to EU countries early in the process of introducing the common currency can also be noted. However, when comparing these countries' fundamentals with those of some EMEs, it appears that the EMEs showed better and more sustainable indicators. Yet those healthier fundamentals were not reflected in EMEs' credit ratings. Favorable sovereign bond ratings allowed banks in a number of financial systems to increase their assets without imposing pressures for increased capital integration or loan loss provisions. At the end of the day, it allowed pro-cyclical lending behavior to develop.

Table 1
Public Debt
percentage of GDP

Source	Country	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2011 - 1998
FMI	United States	64.6	60.8	54.8	54.7	57.1	60.4	61.5	61.7	61.1	62.3	71.6	85.2	94.4	100.0	59.9
	Euro Zone	72.9	71.9	69.3	68.3	68.1	69.3	69.7	70.3	68.6	66.4	70.1	79.7	85.8	88.6	69.5
	Euro Zone (Excluding Germany)	78.1	76.7	73.2	72.0	71.0	71.1	70.9	70.8	68.7	66.8	71.3	81.7	86.4	90.7	71.9
	Germany	60.5	61.3	60.2	59.1	60.7	64.4	66.2	68.5	67.9	65.0	66.4	74.1	84.0	82.6	63.4
	Italy	114.9	113.7	109.2	108.8	105.7	104.4	103.9	105.9	106.6	103.6	106.3	116.1	119.0	121.1	107.7
	France	59.5	58.9	57.4	56.9	59.0	63.2	65.0	66.7	64.0	64.2	68.2	79.0	82.3	86.8	61.5
	Spain	64.1	62.4	59.3	55.5	52.6	48.7	46.2	43.0	39.6	36.1	39.8	53.3	60.1	67.4	50.7
	Portugal	50.4	49.6	48.5	51.2	53.8	55.9	57.6	62.8	63.9	68.3	71.6	83.0	92.9	106.0	56.2
	Greece	96.6	102.5	103.4	103.7	101.5	97.3	98.8	100.3	106.1	105.4	110.7	127.1	142.8	165.6	101.6
	Ireland	53.0	48.0	37.5	35.2	31.9	30.7	29.1	27.1	24.7	24.9	44.4	65.2	94.9	109.3	34.2
	United Kingdom	46.3	43.7	40.9	37.7	37.2	38.5	40.2	42.1	43.1	43.9	52.0	68.3	75.5	80.8	41.4
	Japan	120.1	133.8	142.1	151.7	160.9	167.2	178.1	191.6	191.3	187.7	195.0	216.3	220.0	233.1	162.4
	Brazil	43.8	55.5	66.7	70.2	79.8	74.7	70.6	69.1	66.7	65.2	63.6	68.1	66.8	65.0	66.2
	Chile	12.5	13.8	13.7	15.0	15.7	13.0	10.7	7.3	5.3	4.1	5.2	6.2	9.2	10.5	11.1
	Colombia	27.5	34.1	36.3	40.9	43.9	45.6	42.9	38.5	36.8	32.7	30.8	35.8	36.0	35.9	37.9
	Mexico	45.4	47.4	42.6	42.0	45.7	45.6	41.4	39.8	38.4	37.8	43.1	44.7	42.9	42.9	42.6
	Perú	34.4	47	42.4	41.5	43.2	47.1	44.3	37.7	33.2	30.9	25.0	27.1	24.5	21.5	40.2
	Russia	69.9	99	59.9	47.6	40.3	30.4	22.3	14.2	9.0	8.5	7.9	11.0	11.7	11.7	40.1
	Turkey	44.8	51	51.3	77.6	73.7	67.4	59.2	52.3	46.1	39.4	39.5	46.1	42.2	40.3	56.3
	China	11.4	13.8	16.4	17.7	18.9	19.2	18.5	17.6	16.2	19.6	17.0	17.7	33.8	26.9	16.9
	India	65.8	68.0	71.8	76.2	80.6	81.7	81.0	78.7	75.4	72.7	73.1	69.4	64.1	62.4	75.2

Source: IMF, IFS

Table 2
Public Debt
percentage of GDP

Source	Country	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	Sum Period	Annual Average
FMI	United States	3.4	3.4	3.9	2.0	-1.8	-2.9	-2.5	-1.2	-0.1	-0.7	-4.5	-10.9	-8.4	-8.0	3.6	-31.7
	Euro Zone	1.9	2.3	3.5	1.5	0.6	-0.1	-0.1	0.2	1.2	1.9	0.6	-3.8	-3.6	-1.5	12.8	-8.3
	Euro Zone (Excluding Germany)	2.4	2.7	3.2	2.2	1.2	0.5	0.4	0.6	1.4	1.6	-0.1	-4.9	-4.4	-2.2	16.3	-11.6
	Germany	0.8	1.3	4.0	-0.3	-1.2	-1.5	-1.3	-1.0	0.8	2.7	2.5	-0.8	-1.2	0.4	4.3	0.9
	Italy	4.7	4.6	5.2	2.9	2.4	1.4	1.1	0.1	1.1	3.3	2.2	-1.0	-0.3	0.5	26.9	1.5
	France	0.4	0.9	1.1	1.1	-0.6	-1.5	-1.0	-0.5	0.0	-0.3	-0.6	-5.3	-4.9	-3.4	-0.3	-14.3
	Spain	0.7	1.9	2.0	2.1	2.0	1.9	1.5	2.5	3.3	3.0	-3.1	-9.9	-7.8	-4.4	20.9	-25.2
	Portugal	0.9	1.7	1.3	0.0	1.5	2.3	2.1	-0.3	2.2	-0.4	-0.7	-7.4	-6.3	-1.9	11.4	-16.2
	Greece	4.6	4.5	3.6	2.1	0.8	-0.7	-2.5	-0.7	-1.5	-2.0	-4.8	-10.3	-4.9	-1.3	8.2	-21.4
	Ireland	5.6	4.9	6.6	2.3	0.8	1.5	2.4	2.7	3.9	0.8	-6.5	-12.4	-28.9	-6.8	31.4	-54.5
	United Kingdom	2.3	2.9	3.2	2.1	-0.6	-1.9	-1.9	-1.8	-1.1	-1.1	-3.3	-8.5	-7.7	-5.6	2.2	-25.1
	Japan	-4.3	-6.1	-6.3	-5.0	-6.8	-6.8	-5.1	-4.1	-3.5	-1.9	-3.4	-9.4	-8.1	-8.9	-49.9	-29.7
JP Morgan	Brazil	0.0	2.9	3.2	3.4	3.2	3.3	3.8	3.9	3.2	3.4	3.5	2.1	3.3	3.3	30.3	12.2
	Chile	-0.5	-0.6	0.2	0.6	-0.8	0.2	3.8	6.1	8.8	9.4	6.1	-3.8	-0.9	-0.2	27.2	1.2
	Colombia	0.8	-0.3	0.3	0.6	0.8	1.8	3.3	2.9	3.5	3.4	3.6	1.0	-0.4	0.2	17.1	4.4
	Mexico	1.6	2.3	2.4	2.3	1.6	1.9	2.2	2.2	2.5	2.2	1.8	-0.1	1.3	1.4	21.2	4.4
	Peru	1.2	-0.9	-0.8	-0.2	-0.1	0.4	1.0	1.6	4.0	4.9	3.7	-0.6	0.2	0.7	11.1	4.0
	Russia	-0.6	2.3	4.9	5.6	3.5	3.4	5.5	8.4	8.0	5.8	4.5	-5.4	-3.4	-2.2	46.8	-6.5
	Turkey	4.5	2.0	4.4	5.2	3.3	4.0	4.9	6.0	5.4	4.1	3.5	0.1	0.7	1.0	43.8	5.3
	China	-1.1	-1.9	-2.5	-2.3	-2.6	-2.2	-1.3	-1.2	-0.8	0.6	-0.4	-2.3	-2.7	-1.8	-15.3	-7.2
	India	-3.5	-0.1	0.4	-1.5	-1.5	-2.9	-1.3	-0.6	0.5	0.5	-2.4	-4.7	-2.8	-1.9	-10.0	-11.8

Source: IFS, IMF and EM Debt and fiscal indicators JPM.

Table 3
Interest on Public Debt
percentage of GDP

Source	Country	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
OECD	United States	3.1	2.7	2.5	2.2	2.0	1.8	1.8	1.8	1.8	1.9	1.9	1.6	1.7	2.0
	Euro Zone	4.2	3.7	3.5	3.3	3.1	2.9	2.8	2.7	2.6	2.6	2.6	2.5	2.4	2.6
	Euro Zone (Excluding Germany)	4.7	4.0	3.8	3.6	3.4	3.1	2.9	2.8	2.6	2.7	2.7	2.5	2.6	2.8
	Germany	3.0	2.8	2.7	2.6	2.5	2.6	2.5	2.5	2.5	2.5	2.4	2.3	2.1	2.0
	Italy	7.8	6.3	6.1	6.0	5.4	4.9	4.6	4.5	4.4	4.7	4.9	4.3	4.2	4.5
	France	3.0	2.7	2.6	2.7	2.7	2.6	2.6	2.5	2.4	2.5	2.7	2.2	2.3	2.4
	Spain	3.8	3.3	2.9	2.6	2.4	2.1	1.8	1.6	1.3	1.1	1.1	1.4	1.5	1.5
	Portugal	3.1	2.9	2.9	2.9	2.8	2.7	2.6	2.4	2.7	3.0	3.1	2.9	3.0	4.2
	Greece	7.3	6.4	6.6	5.9	5.2	4.7	4.6	4.4	4.5	4.5	4.8	5.0	5.7	6.9
	Ireland	3.2	2.2	1.8	1.2	1.1	1.1	1.0	0.9	0.7	0.6	0.8	1.4	2.7	3.2
JP Morgan	United Kingdom	3.0	2.5	2.4	2.0	1.7	1.7	1.7	1.8	1.7	1.8	1.8	1.6	2.6	2.6
	Japan	1.5	1.5	1.5	1.4	1.4	1.3	1.2	0.8	0.6	0.6	0.9	1.1	1.4	1.6
	Brazil	7.9	8.2	6.6	6.7	7.6	8.4	6.6	7.3	6.7	6.1	5.4	5.4	5.5	6.0
	Chile	-0.9	1.5	0.9	1.1	0.4	0.6	1.7	1.4	1.1	0.6	0.8	0.8	0.6	0.6
	Colombia	4.1	3.3	4.0	4.4	3.9	4.1	3.8	3.3	3.9	3.8	3.1	3.2	3.2	3.2
	Mexico	2.7	3.3	3.4	3.0	2.7	2.5	2.4	2.3	2.4	2.2	1.9	2.2	3.9	3.9
	Peru	2.2	2.3	2.5	2.3	2.2	2.1	2.0	1.9	1.9	1.8	1.6	1.4	1.2	1.2
	Russia	5.7	3.4	3.5	2.6	2.1	1.7	1.2	0.9	0.6	0.4	0.4	0.5	0.6	0.8
	Turkey	11.8	13.8	12.3	17.1	17.5	12.8	10.1	7.1	6.0	5.7	5.2	5.6	4.3	3.6
	China	5.8	8.5	8.7	9.2	8.5	6.5	5.9	6.3	6.8	5.2	7.3	5.4	5.2	5.3

Source: IFS, IMF and EM Debt and fiscal indicators JPM. Own calculation based on Primary surplus and Fiscal Surplus.

Table 4
Long term Sovereigns Ratings S&P

Country	Dec.00	Dec.01	Dec.02	Dec.03	Dec.04	Dec.05	Dec.06	Dec.07	Dec.08	Dec.09	Dec.10	Dec.11
United States	AAA	AA+										
Germany	AAA											
France	AAA											
Spain	AA+	AA+	AA+	AA+	AAA	AAA	AAA	AAA	AAA	AA+	AA	AA-
Italy	AA-	AA-	AA-	AA-	AA-	A+	A+	A+	A+	A+	A+	A
Greece	A	A	A+	A+	A	A	A	A	A	BBB+	BB+	CC
Ireland	AAA	AA	A	BBB+								
Portugal	AA-	A-	A-	BBB-								
India	BB+	BBB-	BBB-	BBB-	BBB-	BBB-						
Turkey	B+	B-	B-	B+	B+	BB-	BB-	BB-	BB-	BB-	BB	BB
Russia	B-	B	B+	BB+	BB+	BBB	BBB+	BBB+	BBB	BBB	BBB	BBB
China	BBB	BBB	BBB	BBB	BBB+	A-	A	A	A+	A+	AA-	AA-
Brazil	B+	BB-	B+	B+	BB-	BB-	BB	BB+	BBB-	BBB-	BBB-	BBB
Mexico	BB+	BB+	BBB-	BBB-	BBB-	BBB	BBB	BBB+	BBB+	BBB	BBB	BBB

Source: S&P

Table 5

Government Securities - BCRA's Own Portfolio - Total as of

	Balances in Argentine Pesos	Balances in US Dollars	Exchange Rate USD/\$
	(in thousands)		
12/31/2007	4,798,811	1,522,949	3.1510
12/31/2008	6,216,129	1,799,846	3.4537
12/31/2009	14,242,300	3,751,231	3.7967
12/31/2010	20,167,413	5,072,542	3.9758
12/31/2011 (1)	16,519,320	3,838,846	4.3032

Source: BCRA

(1) subject to adjustments

Securities issued by the BCRA - LEBAC and NOBAC – Total as of

Outstanding Stock as of	Total	Domestic Holders	Foreign Holders
		(in Nominal Value)	
12/31/2007	51,497	44,131	7,366
12/31/2008	36,698	35,799	899
12/31/2009	46,828	46,823	5
12/31/2010	74,352	74,307	45
12/31/2011	68,725	68,725	0

Source: BCRA

Table 6
Financial Systems Total Assets
 In millions of USD

	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
United States	-	-	-	9,521	10,004	10,598	11,442	12,591	13,986	15,649	17,335	16,880	16,817
Euro Zone	15,457	14,246	14,266	14,719	18,219	23,098	26,872	25,338	31,043	39,105	39,174	40,312	37,090
United Kingdom (*)	3,625	3,645	3,988	4,212	4,933	5,991	7,343	7,608	9,660	12,179	10,194	10,537	10,518
Japan	-	-	-	9,608	10,331	11,535	11,847	10,663	10,207	10,606	13,734	13,429	15,574
Brazil	-	-	-	462	341	476	579	788	1,037	1,578	1,394	2,094	2,593
Chile	-	-	-	58	56	68	84	104	116	152	143	182	201
Colombia	-	-	-	37	29	33	46	56	67	89	92	107	126
Mexico	-	-	-	330	326	312	321	365	414	467	405	444	518
Peru	21	20	20	21	20	20	22	26	28	41	50	53	66
Russia	-	-	86	103	122	174	241	297	476	736	885	895	1,014
Turkey	-	-	-	92	118	162	208	278	323	451	435	514	591
China	1,396	1,552	1,738	1,947	2,399	2,858	3,261	3,692	4,426	5,724	7,093	8,945	11,181
India	151	180	201	222	274	333	424	478	587	801	790	952	1,194

Source: own elaboration based on IFS/IMF.

Table 7
Financial Sector Exposure to public sector (*)
 In millions of USD

	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
United States	-	-	-	643	696	639	604	623	664	872	1,283	1,138	1,147
Euro Zone	2,274	1,952	1,695	1,681	2,051	2,608	2,893	2,660	2,753	3,171	3,081	3,601	3,650
United Kingdom (*)	24	18	-8	1	20	11	28	25	-6	-19	-20	42	129
Japan	-	-	-	1,581	1,865	2,471	2,677	2,439	2,469	2,527	3,459	3,854	4,702
Brazil	-	-	-	196	135	221	275	379	462	594	458	704	812
Chile	-	-	-	1	1	1	1	1	1	2	2	3	4
Colombia	-	-	-	10	5	9	13	16	13	13	13	20	23
Mexico	-	-	-	101	92	89	95	101	121	142	127	161	174
Peru	1	2	1	2	2	2	2	2	2	2	2	3	2
Russia	-	-	22	22	26	30	34	30	38	47	40	55	74
Turkey	-	-	-	44	57	81	94	118	115	149	133	182	188
China	60	73	89	133	164	184	223	246	291	397	442	557	657
India	53	51	48	46	47	49	51	50	51	57	46	48	50

(*) Public sector net assets of the own jurisdiction

Source: own elaboration based on IFS/IMF.

Table 8
Financial Sector Exposure to public sector (*)
In % of total assets

	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
United States	-	-	-	6.8	7.0	6.0	5.3	4.9	4.7	5.6	7.4	6.7	6.8
Euro Zone	14.7	13.7	11.9	11.4	11.3	11.3	10.8	10.5	8.9	8.1	7.9	8.9	9.8
United Kingdom (*)	0.7	0.5	-0.2	0.0	0.4	0.2	0.4	0.3	-0.1	-0.2	-0.2	0.4	1.2
Japan	-	-	-	16.5	18.0	21.4	22.6	22.9	24.2	23.8	25.2	28.7	30.2
Brazil	-	-	-	42.3	39.5	46.3	47.6	48.0	44.6	37.6	32.9	33.6	31.3
Chile	-	-	-	1.5	1.4	1.2	1.2	1.3	0.9	1.2	1.4	1.9	1.9
Colombia	-	-	-	27.9	18.1	27.0	27.9	28.8	18.9	15.0	14.0	18.9	18.5
Mexico	-	-	-	30.6	28.0	28.6	29.5	27.6	29.1	30.4	31.4	36.3	33.6
Peru	5.9	7.4	7.4	9.7	10.0	10.0	8.9	7.5	5.5	4.1	3.1	4.9	3.8
Russia	-	-	25.4	21.7	21.2	17.4	13.9	10.1	8.0	6.4	4.6	6.2	7.3
Turkey	-	-	-	48.0	48.1	49.6	45.1	42.5	35.5	33.1	30.6	35.4	31.8
China	4.3	4.7	5.1	6.9	6.8	6.4	6.9	6.7	6.6	6.9	6.2	6.2	5.9
India	34.8	28.6	23.8	20.9	17.0	14.7	12.1	10.4	8.6	7.1	5.8	5.0	4.2

(*) Public sector net assets of the own jurisdiction

Source: own elaboration based on IFS/IMF.

It thus seems clear that it might be misleading to pay attention only to sovereign debt ratings when assessing sovereign credit risks. That variable gives insufficient information on its own and should be complemented with more attention to ratios such as fiscal primary balance/GDP, financial balance/GDP and debt service/GDP and their evolution.

With the benefit of hindsight, we know that in the period before the first phase of the international financial crisis in 2007, many central banks implemented policies that were not able to prevent the effects of a reversal of the cycle, and, in some cases, these policies amplified the inconsistent trajectories of some key variables and ratios. When the crisis broke out, they deployed a set of policies to try to support liquidity conditions in the financial systems and stabilize the market value of sovereign debt. In addition, some central banks modified their regulatory framework regarding the valuation of assets, including sovereign debt. All those goals were achieved through the implementation of unconventional monetary policy measures that included special programs granting credit lines, swaps and the extension of collateral, together with very active participation in secondary markets. In this sense, we can say that central banks played two roles simultaneously. On the one hand, they maintained, and in some cases recovered, their role of lender of last resort in financial systems. On the other hand, when most investors carried out strong sales of government bonds, they became lenders of last resort for some countries by buying public debt in secondary markets. In addition, some central banks transferred profits to treasuries which in many cases were originated in its purchases of sovereign securities in secondary markets.⁴

In the case of Argentina, starting in 2008 the central bank increased its open market operations by purchasing different government securities in the secondary market (see Table No. 5). This mechanism worked as an additional tool to provide liquidity beyond the banking sector, and at the same time enabled intervention in different segments of the yield curve, preventing market distortions. The central bank also authorized a new liquidity window that enables financial institutions to obtain funds with different sovereign bonds and assets. It has also decided that these securities can be used as collateral for inter-bank loans at a minimum seven-day term. This allowed a number of institutions that did not have central bank bills and notes – Lebac and Nobac – in their portfolios to access our liquidity provision mechanisms, by using treasury bonds as collaterals.

3. Aspects of the regulatory framework in relation to sovereign debt

3.1 Some features of the financial system regulatory framework may also explain the evolution of the crisis mentioned above. Prior to 2007, in a context of abundant international liquidity, the regulatory framework included favorable incentives, in terms of capital integration, for the voluntarily maintenance of sovereign debt as part of the assets of financial institutions. Table No. 6 shows the strong growth of total assets in financial systems. That rise clearly understates the increase in sovereign bond holdings shown in Tables No. 7 and No. 8. These tables show the significant growth in the period 2002–10 of financial systems' exposure to the public sector.

As I said before, it is important to remember that in the context of Basel II there were incentives for holding government securities in bank assets.

⁴ For instance, "The Federal Reserve in recent years has transferred net income to the US Treasury, by preliminary unaudited results ... the increase was primarily due to increased earnings on securities holdings during 2009" (Federal Reserve, press release, January 12, 2010).

In the case of the capital requirement for credit risk under the standardized method,⁵ even when it incorporates different risk weights for loans to sovereign states and their central banks (Paragraph 53), in Paragraph 54 introduces a degree of discretion for national regulators to apply lower weights to those assets – even zero for cases in which they are denominated and financed in the domestic currency. Some countries implemented such regulations in this way.⁶

As I mentioned, under the Basel II standardized approach, the calculation of credit risk requirements mechanically rests on the ratings issued by credit rating agencies or export credit agencies. In the case of sovereign debt in particular, recent international experience shows that rating agencies have not been effective in pointing out, well in advance, credit risks that arise from economic or fiscal weaknesses (their failure in the subprime crisis has also been evident). This fact, coupled with favorable treatment – i.e. lower weighting of sovereign risk exposures given to domestic currency expressed in euros – resulted in low capital requirements to cover these exposures, while at the same time, it may have also acted as an incentive to increase sovereign debt exposures.

In the case of Argentina, during the nineties there was favorable regulatory banking treatment for public sector asset holdings. Until March 2000, both domestic holdings of government securities and public sector loans did not face, in practice, minimum capital requirements for credit risk. After March 2000, public sector asset holdings have been subject to minimum capital requirements in terms of their modified duration, although lower than those of the private sector assets.

Since 2003, capital requirements for credit risk – exposure to the public sector – have been similar to those for non-financial exposure to the private sector, 8% of the capital compliance. In addition, the central bank established two limits for assistance to the non-financial public sector:

1. *Regarding their total assets, a maximum of 40% (reduced to 35% in 2007)*
2. *Regarding their regulatory capital, 50% (for national bodies), 10% (for provinces) and 3% (for municipalities), with the three levels in combination amounting to no more than 75% of the regulatory capital.*
- 3.2 *Another macroprudential instrument implemented to deal with the dollarization and currency mismatch that may affect financial stability was the decision to issue Lebacs and Nobacs (Com. A 4715, September 2007) which can only be traded locally (known as domestic Lebacs and Nobacs). This measure sought to prevent short-term foreign investors from acquiring these securities, which tended to distort their value in the secondary market, affecting their function as a source of liquidity.*

The issue of domestic Lebacs and Nobacs had more than one aim: the one mentioned above, as well as to indirectly help deal with the mixed blessing of short-term capital

⁵ Basel Committee on Banking Supervision, *International convergence of capital measurements and capital standards* (Basel II), Part 2, section II: "Credit risk approach: the standardised approach", paragraphs 53 and 54 says "Credit Risk weight A. Exposures to central governments and central banks. 1. The exposures to the Central Government, the Bank of Spain and other central governments and central banks of other countries of the EU, denominated and funded in the local currency of the Member State concerned, as well as against the European Central Bank, shall be weighted at 0%" (own translation).

⁶ For example, in the case of Spain's interpretation of Basel II, Circular 3/2008 of the Bank of Spain says: "Credit Risk weight A. Exposures to central governments and central banks. 1. The exposures to the Central Government, the Bank of Spain and other central governments and central banks of other countries of the EU, denominated and funded in the local currency of the Member State concerned, as well as against the European Central Bank, shall be weighted at 0%" (own translation)..

inflows. In this sense, there is consensus that when capital flows take the form of short-term financial capital they are mostly driven by international investors' appetite for risk and international liquidity conditions, and tend to lead to currency appreciation, asset price bubbles, and indebtedness levels that are not compatible with the receiving countries' productive capacity. These kinds of effects are more important in small open economies with limited banking and capital markets.

When capital flows turn – sudden stops – employment and activity levels are severely damaged, and serious financial crises could break out.⁷

In order to partially avoid the side effects of short-term capital inflows on monetary equilibrium, the Argentine central bank carried out sterilized operations in the FX market. Domestic Lebacs and Nobacs play a key role in this process. Moreover, those instruments' "domestic" characteristic helps prevent a problem like the one that recently affected the Bank of Israel, where the debt instruments that the central bank was using to sterilize were heavily demanded by foreign investors, producing, at the end of the day, a negative feedback loop.

Regarding securities valuation, the Argentine central bank established that the sovereign bonds launched in the debt swap of 2005 could be recorded by banks as: (1) the book value of net-delivered instrument regularization, or (2) the value of the sum of nominal cash flow until the final maturity of the bonds. The analysis was based on US accountancy rules (FASB 15), which allow financial institutions to register government securities in order not to incur accounting losses. Accounting for government securities at technical and non-market value has the advantage of removing volatility in banks' income statements, helping reduce financial market panic at times of crisis (Com A 5180, April 2011).

4. Institutional arrangements: interaction between central banks and Treasuries during periods of crisis

In this section we discuss institutional arrangements during the crisis between national Treasuries and central banks, focusing on the role of the latter. This is important, as was already pointed out, considering that public debt paths have a direct impact on monetary and financial stability conditions that ultimately must be addressed by the monetary authorities.

One of the usual analyses focuses on the formal objectives, the mandate established in central banks' charters. While some of them have price stability as their main goal, for example the ECB ("the primary objective ... shall be price stability") and the Bank of England, in others this objective is complemented with other aspects of the economy, as in the case of the Bank of Canada, the Bank of Japan⁸ or even the Federal Reserve.

As regards central bank independence in formulating and implementing monetary and financial policies, formal frameworks can differ. On the one side, there are banks that have significant autonomy to implement monetary policy and in relation to other authorities such as those in charge of fiscal policy and the executive or legislative branches. They have to

⁷ Read more about this in the Box in BCRA, *Recent measures taken by Central Banks from emerging economies in view of capital inflow*, Inflation Report, Second Quarter 2011, www.bcra.gov.ar.

⁸ "Article 4. (Relationship with the Government): The Bank of Japan shall, taking into account the fact that currency and monetary control is a component of the overall economic policy, always maintain close contact with the government and frequently exchange views, so that its currency and monetary control and the basic stance of the government's economic policy shall be mutually compatible."

communicate decisions and to report them, at least formally, only at a given frequency. This is the case of the ECB⁹ or the Bank of England.

In the case of the ECB, in accordance with paragraph 3 of Article 284 of the Treaty on the Functioning of the European Union, it must submit annually to the Parliament, the Council, the Commission and the European Council a report on the activities of the ESCB (European System of Central Banks) and the development of monetary policy in the previous and the current year. Also, ECB authorities, usually the President, attend quarterly hearings at the European Parliament (Committee on Economic and Monetary Affairs). In some cases, other members of the Executive Committee may also be asked to attend to these hearings.

Furthermore, once a year, following its practices and customs, the ECB presents to the Members of Parliament the previous year's Annual Report. Until 2009 the report was presented to the Committee on Economic and Monetary Affairs. Since 2010 the Annual Report has been presented by the ECB President to the plenary of the European Parliament. The ECB President also gives speeches on different economic issues, including fiscal policies.¹⁰

Moreover, some central banks have in their legal frameworks special provisions for their interaction with the Treasuries and have more formal links with legislative bodies. This group includes the Federal Reserve and the Bank of Japan.¹¹ For instance, the BoJ authorities, usually the President, attend twice-yearly hearings in the Japanese parliament, in both the House of Representatives and the House of Councilors, before the Committee on Finance.

In addition, during the crisis, some regulations were modified in order to clarify the legal relationship between government agencies, as was the case of the Federal Reserve and the US Treasury regarding unconventional monetary policies.¹²

These examples show that some central banks departed informally and to a certain extent from their institutional arrangements, following an eclectic strategy to foster economic activity and employment.

⁹ "Article 7. Independence. As set out in Article 130 of the Treaty on the Functioning of the European Union, when exercising the powers conferred by the Treaties and this Statute and carrying out the functions and duties, neither the ECB nor the national central banks or any member of its governing bodies shall seek or take instructions from union institutions, bodies or agencies, from any government of a Member State or from any other body. The institutions, bodies or agencies of the Union and the Governments of the Member States undertake to respect this principle and not seek to influence members of the governing bodies of the ECB or national central banks in the exercise of their functions."

¹⁰ As an example, on December 8, 2011, Mario Draghi stated: "Turning to fiscal policies, all euro area governments urgently need to do their utmost to support fiscal sustainability in the euro area as a whole. A new fiscal compact, comprising a fundamental restatement of the fiscal rules together with the fiscal commitments that euro area governments have made, is the most important precondition for restoring the normal functioning of financial markets. Policy-makers need to correct excessive deficits and move to balanced budgets in the coming years by specifying and implementing the necessary adjustment measures. This will support public confidence in the soundness of policy actions and thus strengthen overall economic sentiment ... To accompany fiscal consolidation, the Governing Council has repeatedly called for bold and ambitious structural reforms. Hand in hand, fiscal consolidation and structural reforms would strengthen confidence, growth prospects and job creation. Key reforms should be immediately carried out to help the euro area countries improve competitiveness, increase the flexibility of their economies and enhance their longer-term growth potential. Labour market reforms should focus on removing rigidities and enhancing wage flexibility. Product market reforms should focus on fully opening up markets to increased competition" (extracted from M. Draghi and V. Constâncio, introductory statement to the press conference of 8 December 2011, Frankfurt).

¹¹ Board of Governors of the Federal Reserve System, Federal Reserve Act, Section 10.

¹² Board of Governors of the Federal Reserve System, Federal Reserve Act, Section 13.

As mentioned before, taking into account recent experiences, in Argentina the central bank's charter was modified by Congress this year. It changed the unique goal of preserving the value of the currency to a multiple mandate which provides that (Article 3), under policies set by national authorities, its aims are to promote monetary stability, financial stability, and economic development with social equity. Financial stability and monetary stability were added, which are goals that many countries have explicitly incorporated after the devastating effects of the financial crisis.

Through the changes introduced, the central bank can regulate credit conditions regarding terms, interest rates, commissions, and other charges, as well as guide the granting of credit through reserve requirements, differential reserves, and other appropriate means.

The central bank continues to enjoy autonomy and is not subject to orders or instructions of the executive branch, although it aims for greater coordination with other government policies.

The Charter also establishes that the Bank shall perform, among others, the following duties, some of them relating to its relationship with the rest of the government. Article 4 provides that the central bank shall:

- c) act as a financial agent for the Nation, and as depository and agent for the country before international monetary, banking and financial entities, of which the Nation is a member
- f) implement an exchange policy in accordance with such legislation as the National Congress may lay out
- h) provide for the protection of the rights of users of financial services and competition

According to Article 10, the BCRA's president shall:

- I) submit an annual report on the BCRA's transactions to the National Congress for consideration. In addition, the president shall attend public and joint sessions of the Budget and Treasury Committees of both Chambers, the Economy Committee of the Senate, and the Finance Committee of the House of Representatives at least once during the general term or whenever any of these Committees may ask him to attend for reporting on the scope of the monetary, exchange and financial policies under way.

Articles 12, 26, and 29 relate to the relationship between the central bank and the Economy Ministry. They provide that the Economy Ministry shall participate on the central bank Board with voice but without vote, that the Bank shall inform the Economy Ministry on monetary, financial, exchange, and credit regimes, and that the Bank shall advise the Ministry and Congress on the exchange system, and establish the relevant general regulations.

5. Final comments

It seems to be clear that in different countries, economic authorities and markets have not properly considered the size and evolution of the stock of public debt and the government primary surplus required to have a sustainable path. Moreover, in some countries the monetary authorities focused their economic assessment excessively on inflation. Under that approach, it seems that there was some disregard of key macroeconomic variables and ratios.

In this paper we have analyzed the reasons that could explain why some macroeconomic variables were able to follow unsustainable medium- and long-term trends for a long period. We also examined the role played by economic authorities, and the inter-relationships among them in the design and implementation of fiscal policy and debt management.

In this sense, the crisis that took place during 2008–11 shook the paradigm that ruled macroeconomic theory, and specifically monetary policy, in a way that has not been observed since the Great Depression. Consequently, rigid central bank goals and inflexible boundaries between the central bank and the Treasury were erased, letting economic authorities behave in a pragmatic way.

In the paper we also discussed the role played by credit rating agencies and regulatory frameworks. The former showed pro-cyclical behavior, producing strong swings in ratings well after the crisis erupted. With regard to the latter, in a context of broad liquidity, regulatory frameworks included favorable incentives, in terms of lower capital integration, for the maintenance of sovereign debt as an important part of assets in some financial systems.

Fiscal consolidation and macroeconomic challenges in Brazil

Carlos Hamilton Araújo, Cyntia Azevedo and Sílvio Costa¹

Abstract

This paper explores two important points regarding the Brazilian fiscal framework. The first part analyses the significant improvement of the fiscal stance in the last decade as the result of the promotion of fiscal discipline and debt management policies. This consolidation is argued to be one of the reasons why Brazil has not been subject to the same concerns about debt sustainability that have become a focal point in most developed economies. The second part studies how the coordination between monetary and fiscal policies is important in dealing with the issues that arose in the aftermath of the recent crisis. By using models simulated with Brazilian data, we show that the implications for inflation of implementing a fiscal retrenchment policy crucially depend on which instrument is being used and on the behaviour of monetary policy.

Keywords: Fiscal consolidation, fiscal policy, debt management, monetary policy, macroeconomic stabilization

JEL classification: E52, E62, E63

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1. Introduction

The financial crisis has highlighted the importance of coordination between monetary, macroprudential, and credit policies. Fiscal policy proved to be outstanding in tackling the urgent challenges that arose following the financial bump, attenuating the depth of the crisis and ensuring the resilience of the financial system. Indeed, governments of many developed countries² have used fiscal instruments to supply broad liquidity for firms, banks, and credit markets, while traditional fiscal policies have also been employed to stimulate the economic recovery. These actions helped reverse the recessionary process, improve financial conditions and contributed to the upturn in market confidence (IMF, 2009). Unfortunately, these measures are never without cost, and some countries built up such unsustainable public account imbalances that a structural solution is dramatically needed³.

Acknowledged as the second stage of the financial crisis, the fiscal turmoil struck several developed countries, but Brazil has not undergone the same difficulties⁴. That can be explained by a virtuous combination of effective policy reactions during the crisis and strengthened fiscal conditions in the years preceding the crisis. Countercyclical policies were implemented immediately after the tightening of financial conditions⁵. Moreover, some targeted fiscal measures were undertaken in order to stimulate the recovery of aggregate supply⁶. Nevertheless, at the current phase of the international crisis, Brazil is required to demonstrate its strong commitment to the fiscal framework by fully meeting the primary surplus target.

The set of measures were successful in getting the economy out of the initial negative impact on GDP in the fourth quarter of 2008. Only two periods ahead, quarterly output started recovering towards pre-crisis growth rates⁷. Real interest rates dropped markedly, from a 13.75% yearly rate in September of 2008 to 8.5% in August of 2009. On the other hand, the consumer price index ended 2009 at 4.3%, below the 4.5% inflation target. However, there were signs of rising pressures on prices, and the interest rate started to suddenly increase in April 2010, after remaining steady for eight months.

Managing internal pressures on aggregate demand and, at the same time, recessionary conditions abroad leading to lower international interest rates, is complicated. Indeed,

² In fact, the United States, the Euro Zone, Japan, the United Kingdom and Canada undertook a series of initiatives to stabilize the financial system, such as capital injections, asset purchases, loans to financial firms, guarantees of financial assets and bank liabilities and deposit insurance, all of them with significant effects on public debt (IMF, 2009).

³ Between 2007 and 2010, the net public debt outstanding in terms of GDP increased sharply in many developed countries, for example, the United States (from 42.9% to 68.3%), Germany (50.2% – 57.6%), Japan (81.5% – 117.2%), the United Kingdom (38.2% – 67.7%), and France (59.5% – 76.6%). See IMF (2011).

⁴ The Brazilian net public debt decreased from 45.1% to 40.2% in percent of GDP between 2007 and 2010.

⁵ For example, monetary policy easing, reduction of reserve requirement rates for banks, increase in directed credit policies, supplying liquidity in foreign currencies, and other policies were implemented between September 2008 and August 2009.

⁶ Taxes on industrial products (IPI) like vehicles, durable consumer goods, building materials, and capital goods were cut at the end of 2008. In turn, taxes on financial operations (IOF) for lending to households also dropped.

⁷ Quarterly GDP fell by 4.20% in the last quarter of 2008, and the drop in investment (-10.18%) led the results. In the first quarter of 2009, government consumption reacted by increasing 3.96%, in comparison to the fall (-3.66%) in the previous quarter. The effective countercyclical measures were important to reverse local expectations in spite of a volatile scenario abroad, and investment leapt to 5.99% in the second quarter of 2009, with high rates observed in following quarters as well. Likewise, output grew up by 2.01% in the second quarter of 2009.

emerging markets around the world showing strong growth and financial resilience share the same situation in which monetary policy could lead to higher interest rate spreads and attract large global capital inflows. In order to deal with this dilemma, Brazil adopted a series of policies that included strengthening the macroprudential framework to ensure that financial risks are contained, allowing appreciation of the exchange rate and accumulation of external reserves and adjusting the mix of monetary and fiscal policy in order to assure a sustained pace of demand growth and to keep inflation under control and converging towards the target.

Hence, there are two very interesting points to explore with regard to the Brazilian fiscal framework. The first is the fiscal consolidation that has been ongoing since 1999, which can explain to a large degree why Brazil has not been subject to the same concerns about debt sustainability that are currently a focal point in most developed economies. The second issue is the importance of coordination between fiscal and monetary policy to deal with the challenges of the present conjuncture. In fact, simulations performed by models estimated with Brazilian data show a tighter fiscal policy could lead to meaningful decreases in inflationary pressures, even when the effort is short-lived, and that a long-lasting policy could imply significant structural changes in the long run.

2. The Brazilian fiscal framework

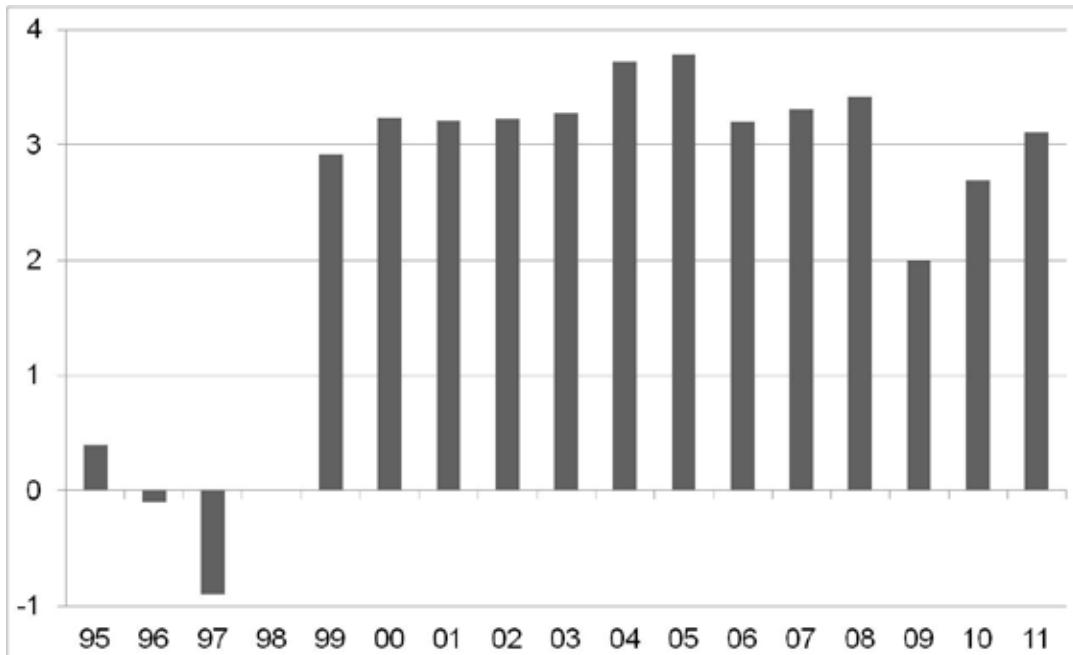
Brazil's recent economic policy can be described by a framework based on three main guidelines implemented in 1999: a floating exchange rate, an inflation target regime and fiscal austerity. In that year, targets for the fiscal surplus as a ratio of GDP (on average above 3%) were announced, and these have been an important guideline for policy since then. As shown in Graph 1, in the first year there was already a significant increase of the primary surplus to 2.92% after being null in 1998. The following year, the Fiscal Responsibility Law (FRL) was enacted to strengthen fiscal institutions and establish a broad framework of fiscal planning, execution, and transparency at the federal, state, and municipal levels. It reinforced the goal of promoting fiscal discipline and has helped to obtain consistent surpluses, even during the crisis.

The fiscal consolidation process has been the result not only of the implementation of the FRL and of meeting the primary surplus target, but also of the efforts made by the Central Bank of Brazil (BCB) and the Treasury Department regarding the management of public debt⁸. The government has been working to promote fiscal discipline meant to reduce indebtedness and is also following a set of guidelines to enhance the debt profile⁹. These include the reduction of short-term debt and lengthening of the average debt maturity, progressive replacement of overnight rate-indexed and dollar-indexed securities by fixed rate and inflation-indexed securities, the expansion and diversification of the investor base, and the stimulation of the secondary market for public debt.

⁸ Turner (2002) argues that an important reason for fostering debt markets is that such markets can contribute to the operation of monetary policy. The author points out how essential for the smooth transmission of policy this market is. Besides, the long-term market also gives relevant information about expectations of likely macroeconomic developments and about market reactions to monetary policy actions.

⁹ These improvements are a trend observed in most EMEs, as pointed out in the background paper "Developments of domestic government bond markets in EMEs and their implications".

Graph 1
Primary surplus
As a percentage of nominal GDP



Source: BCB.

The set of fiscal measures¹⁰ adopted has proven to be very effective in helping the government move towards these goals. Graph 2 shows the notable decrease in the net debt-to-output ratio since 2001. In 2002, in the middle of political turmoil, with significant currency depreciation, the debt-to-GDP ratio peaked at 62.86%. Since then, it has shown a downward trend, especially since mid-2006 when the country started accumulating external surpluses. In September 2011, the ratio reached 36.49%, the lowest value in the observed series.

The latest quarterly Inflation Report (BCB, 2011a) presents projections for selected fiscal variables, as in Table 1.

Table 1
Estimates of fiscal variables (% GDP)¹

	PSND	GGGD	Nominal deficit	Nominal interest
2012	35.7	51.9	1.2	4.3
2013	33.8	48.8	1.1	4.2
2014	31.3	45.7	0.5	3.6
2015	28.9	43.0	0.3	3.4
2016	26.1	40.4	-0.1	3.0

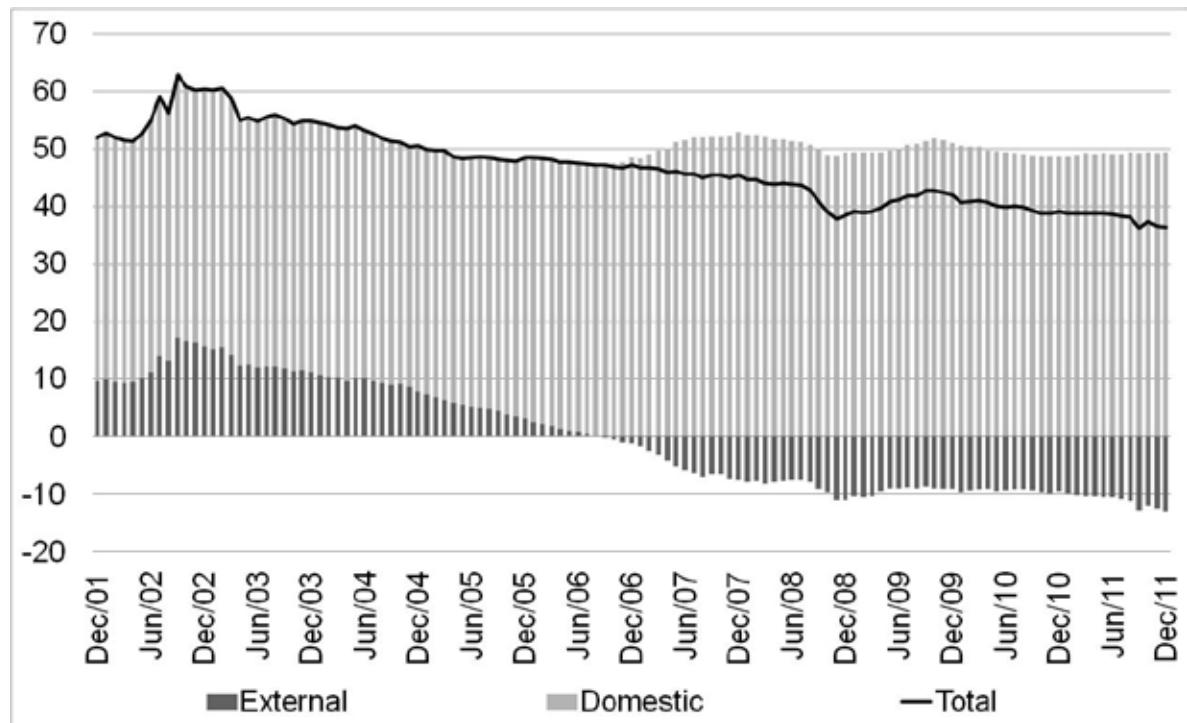
¹ Consider the primary surplus expected in Lei de Diretrizes Orçamentárias (Budget Guidelines Law) for 2012, and 3.1% of GDP for the other years.

Source: Inflation Report (BCB, 2011a).

¹⁰ See Figueiredo *et al.* (2002) for a description of the measures implemented in order to fulfill these guidelines.

They were formulated assuming the primary surplus target is met and using market perspectives for the main indexation indicators and projections for output presented in the same report. The public sector net debt (PSND) and general government gross debt (GGGD) are expected to continue their descending trajectory until 2016. The same is expected to happen to the nominal deficit and interest payments.

Graph 2
Public sector net debt
As a percentage of nominal GDP



Source: BCB.

Besides promoting debt reduction, fiscal consolidation has also achieved very positive results regarding the guidelines established to improve the domestic debt profile.

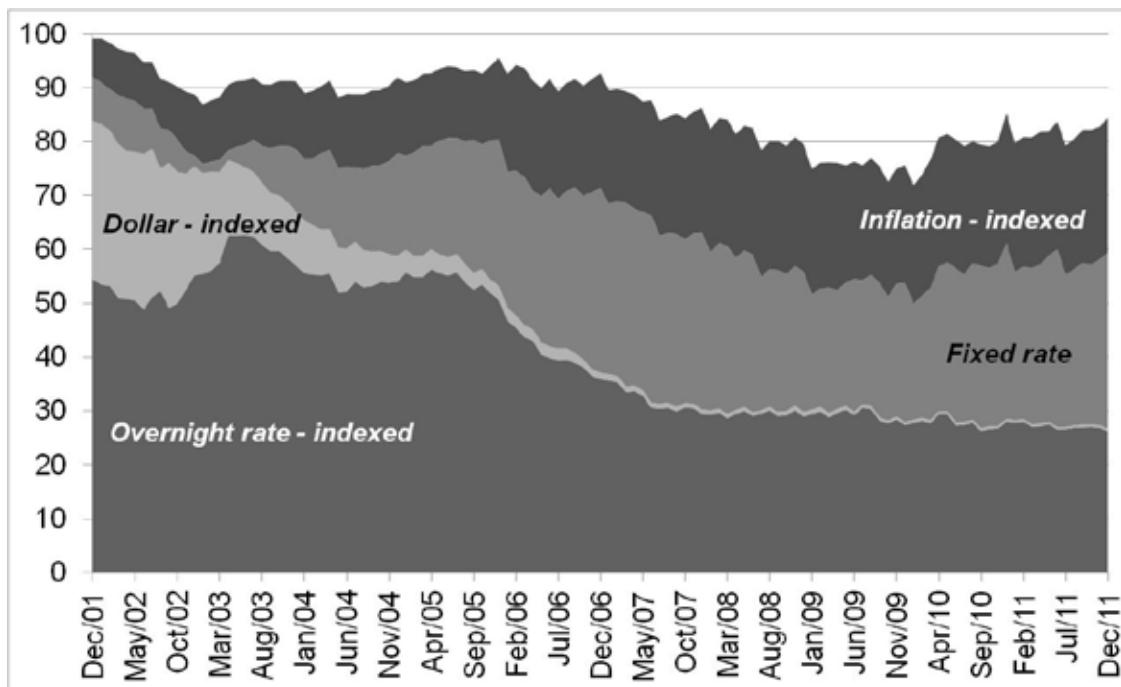
With regard to the composition of domestic debt outstanding, the guideline to increase the share of fixed rate securities and simultaneously reduce the share of dollar- and overnight rate-indexed securities has been clearly followed in the period, as shown in Graph 3. Although still high, the proportion of securities indexed to the overnight interest rate (Selic) dropped from 54.4% in December 2001 to 26.2% in December 2011. This was an important step towards fostering the efficacy of monetary policy, since this sort of security exacerbates the wealth effect generated by increases in the nominal interest rate.

Over the same period, the share of indexed securities dropped from 29.5% to 0.5%, reducing the exposure of domestic debt to exchange rate volatility. Besides the reduction in new issuance, the appreciation of the exchange rate¹¹ has also contributed to the reduction of the share of this type of security. Meanwhile, fixed rate and inflation-indexed securities significantly increased their share, from, respectively, 8.1% and 7.2% in December 2001 to

¹¹ It dropped from a peak of R\$3.89/US\$ in September 2002 to R\$1.74/US\$ in December 2011.

32.6% and 25.2% in December 2011. One aspect of economic policy that certainly contributed to the attractiveness of fixed rate securities was the downward trend of the nominal interest rate observed in recent years¹².

Graph 3
Composition of public debt outstanding
As a percentage of total debt



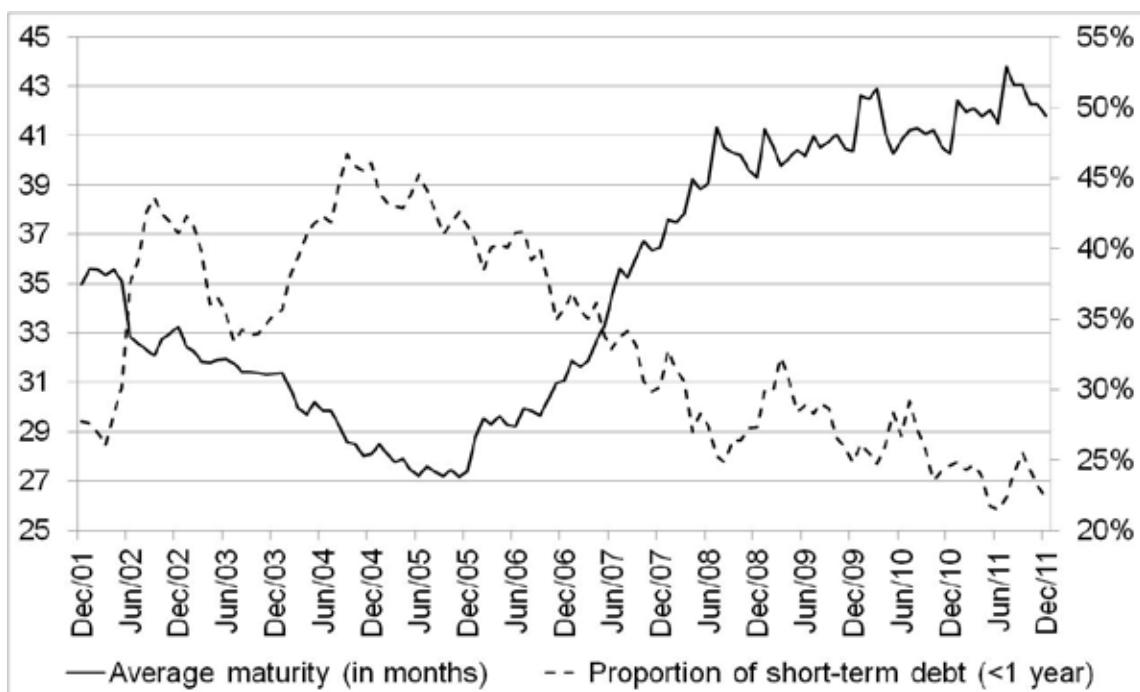
Source: BCB.

The average maturity and proportion of debt expiring in less than 12 months in total debt outstanding are presented in Graph 4. The average maturity (left axis) decreased until 2005, reaching a trough of 27 months in November. Since then, it has lengthened significantly, to 42 months in December 2011. At the same time, moving in the opposite direction, the proportion of short-term debt (right axis) was very volatile early in the period, but since mid-2004 has significantly improved, staying on average below 25% in 2011.

Another improvement was the expansion and diversification of the investor base, as shown in Graph 6. Data are not available prior to January 2007, but from then a prominent increase in holdings by foreign residents is observed. They jumped from 1.6% at the beginning of the series to 11.3% in December 2011. One aspect that certainly contributed to attracting foreign investment in domestic debt was the “investment grade” rating granted by Standard & Poor’s in April 2008, followed by Fitch, which granted the same rating to Brazil the following month. In 2009, Moody’s also raised Brazil’s rating to the “investment grade” category. In 2011, all three agencies increased the rating by one more level.

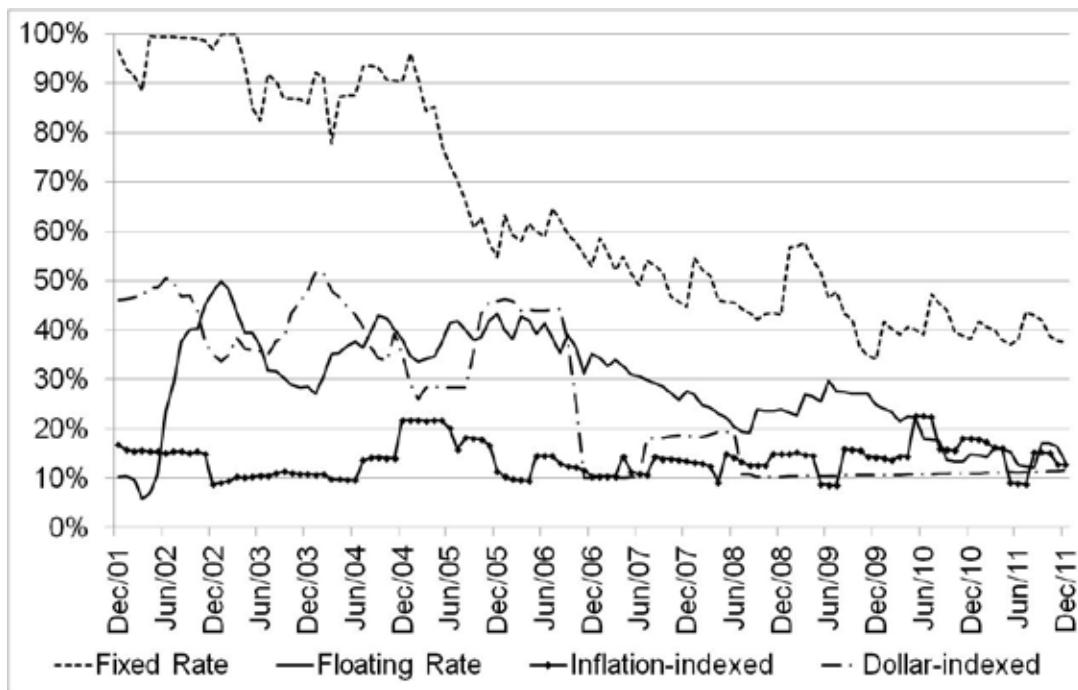
¹² In December 2001 the Selic rate was at 19%; it reached a peak of 26.5% in June 2003, but has been falling since then, reaching 11% in December 2011.

Graph 4
**Average maturity and proportion of short-term debt
in public debt outstanding**



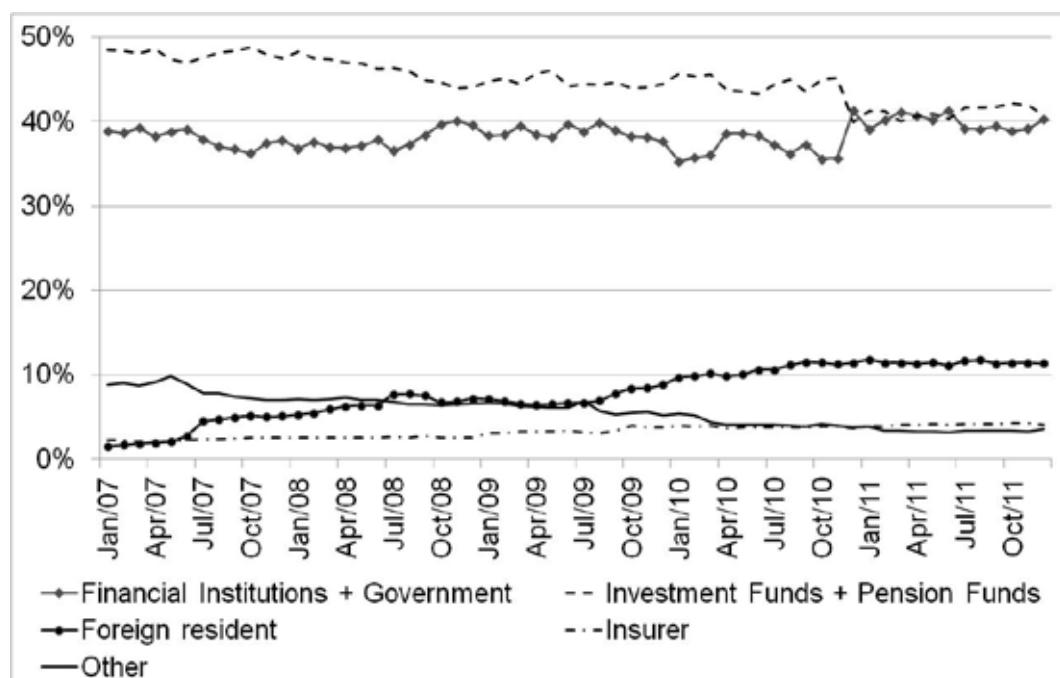
Source: BCB.

Graph 5
Short-term debt by indexation
As a percentage of total debt by indexation



Source: BCB.

Graph 6
Holdings of general government debt
As a percentage of total debt



Source: Tesouro Nacional.

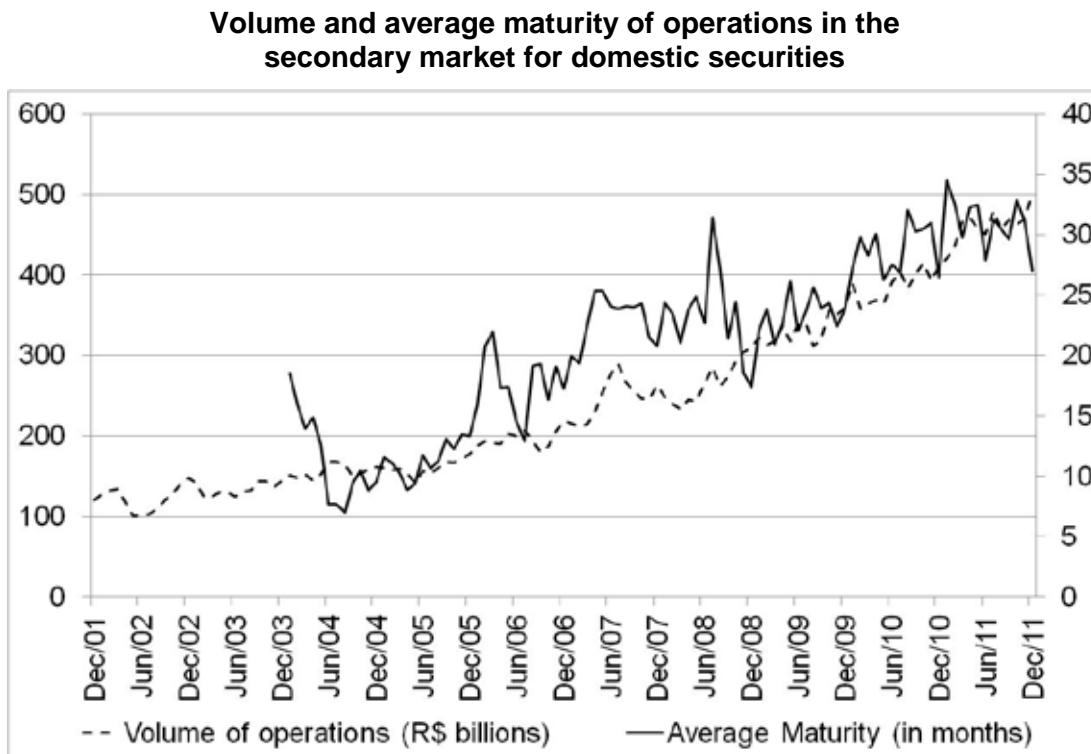
Obs.: Data for holdings by the government are available only after January 2011. Prior to that, the stocks were allocated between financial institutions and investment funds.

Changes were also observed regarding fostering the trading of domestic securities on the secondary market. The volume of operations (Graph 7, left axis) presented a steep upward trend over the past decade, with a significant boost after the implementation of the new payment system in 2002. The ratio between the volume of operations and outstanding debt jumped from an average of 19% in 2000 to 27% in 2011. The average maturity of operations¹³ (Graph 7, right axis) also increased following the improvement of liquidity in the secondary market.

This outlook shows how Brazil's debt management policy advanced in recent years, working towards the fulfillment of the guidelines established in the early 2000s. Since 2001, the Treasury Department has been publishing an annual borrowing plan ("Plano Anual de Financiamento" – PAF) for debt management, and the criteria analyzed above have been maintained as the main goals for domestic debt policy. The mission established in the plan is to ensure that the government's financial needs and payment obligations are met at the minimum possible cost in the medium and long term, while keeping risks at a prudent level, and to contribute to better operation of the debt market (Tesouro Nacional, 2011).

¹³ Data only available after January 2004.

Graph7



Source: BCB.

3. Effects of fiscal policy on inflation and output

Beyond the structural efforts of fiscal consolidation, Brazil has also faced challenges in terms of fiscal policy. Macroeconomic conditions have created a tension between foreign capital inflows and domestic factors, like high domestic growth. Specifically, capital inflows are quickly increasing the foreign capital share in bank funding sources, enabling small and medium-sized banks to scale their credit supply, and posing important issues about the stability of the financial system.

Besides the medium-term concerns about capital inflows, the rapid expansion of credit in Brazil also has significant effects on inflation today. Indeed, excess credit supply has driven lending rates down and lengthened the maturities of credit contracts, despite the lack of reasonable improvements in borrowers' profiles. In other words, current credit expansion generated by large capital inflows has boosted aggregate demand and amplified pressures on inflation.

For that reason, the BCB has implemented several macroprudential policies to contain the unsustainable credit expansion. But the current general scenario requires a vast and coordinated series of measures to decrease inflationary pressures and, at the same time, sustain the economic growth and prevent the formation of asset price bubbles. In this context, fiscal policy has a lot to contribute.

In order to analyze the effects of fiscal policy on inflation and output in quantitative terms, the BCB has been performing various simulations using some of the analytical models available. Two recent editions of the quarterly Inflation Report – March and December, 2011 – came up with noteworthy results.

In March's edition (BCB, 2011b), simulations were performed by running a medium-size semi-structural model¹⁴ estimated with Brazilian data. The fiscal tightening is exogenous, sized as equivalent to 1% of GDP, and lasts for four consecutive quarters. Two scenarios for monetary policy were considered: non-accommodative, in which the interest rate regularly follows the estimated Taylor rule reactions, and accommodative, in which the interest rate remains constant for four quarters but reacts according to the Taylor rule afterwards.

The results show that a contractionary fiscal impact can cause sudden, significant, and longstanding effects on inflation. The lack of action of an accommodative monetary policy can notably amplify the results since the nominal interest rate is unable to respond to the deflationary pressures. The transmission mechanism considered by the model is essentially the direct aggregate demand reduction, which is amplified if the interest rate is not allowed to go down to stabilize the economy.

A more structural analysis regarding the transmission channels can be addressed by performing simulations in medium-sized dynamic stochastic general equilibrium (DSGE) models. The standard model used by the BCB for forecasting and policy analysis is known as SAMBA¹⁵. Besides enabling the same scenarios, the structural model allows us to distinguish clearly between government consumption and public tax revenue changes, although the impact on the primary surplus is the same. The December Inflation Report (BCB, 2011c) gave those results.

In line with the results of the semi-structural model, in SAMBA a tightening of fiscal policy causes an initial and consistent drop in inflation whose effects last for several periods. The non-accommodative monetary policy also shows lower impacts in comparison to the reactive interest rate rule scenario. Contraction of public spending is interpreted as a temporary movement of the primary surplus target, which leads to an immediate reduction in demand for consumer goods and a direct fall in aggregate demand. So, second-order effects in the adjustment dynamic take place following the contraction in demand, such as downfalls in labor, wages, and rule-of-thumb¹⁶ households' consumption. Reduction of production inputs leads to lower marginal cost, which explains much of the fall in inflation.

By raising taxes equivalently instead of cutting public spending, the fiscal authority will face other challenges in terms of timing and magnitude because the transmission channels involved are quite different. For instance, an increase in the rule-of-thumb households' tax rate produces an immediate reduction in demand, but the products purchased by households consist of both domestic and foreign goods, whereas government consumption is based on domestic goods only. The initial contractionary impacts on consumption¹⁷ thus partially spread abroad, which reduces the second-order effects passing through the supply side. Not surprisingly, marginal cost and inflation fall less than when the fiscal policy is built on spending cuts.

Graph 8 compares the magnitudes of the effects on inflation of those shocks on both sides of government balance sheet. Although the timing of transmission seems quite similar in all scenarios, with maximum effects taking place between the fourth and fifth quarters after the

¹⁴ See Minella and Souza-Sobrinho (2009) for further details.

¹⁵ Stochastic Analytical Model with a Bayesian Approach; see Castro *et al.* (2011). The model was developed and estimated by the BCB.

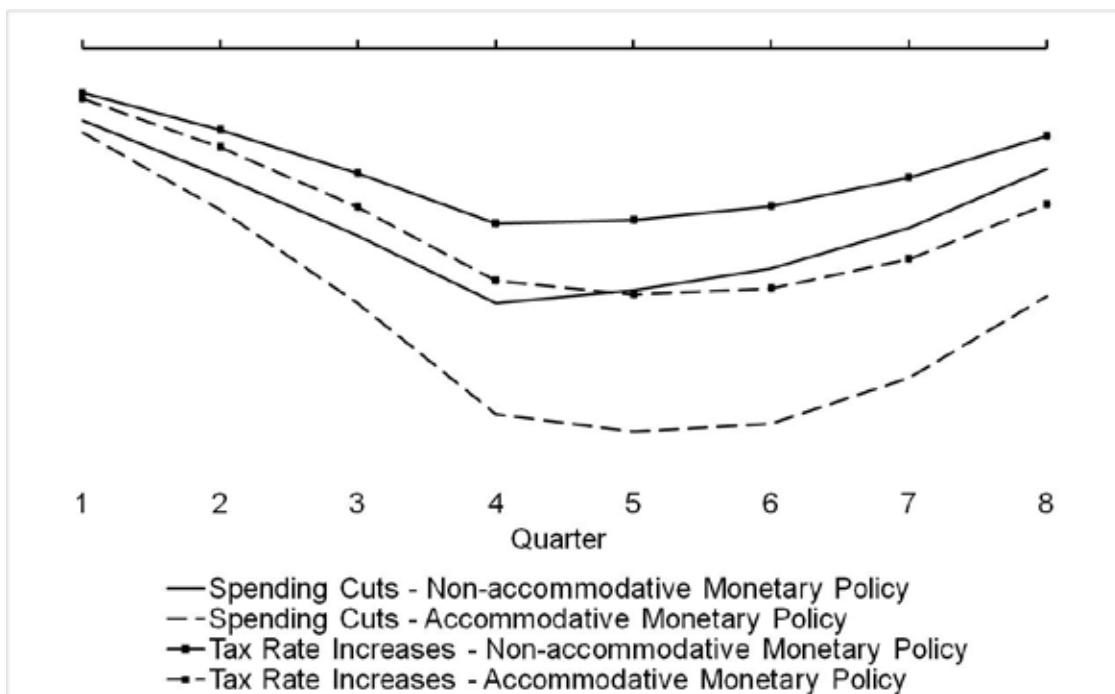
¹⁶ Rule-of-thumb households (equivalently, non-Ricardian or hand-to-mouth households) are agents which face technological restrictions to transfer resources from one period to the next. Models usually have a certain fraction of non-Ricardian households as a kind of abstraction to simulate actual constraints on a fraction of consumers. In SAMBA, this group consumes all disposable income each period.

¹⁷ The current version of SAMBA does not have as comprehensive an approach for taxation as some macro models focused on fiscal issues. Therefore, tax rate increases will primarily impact only household consumption.

impact, the fall in inflation caused by public spending cuts is more intense than when increases in tax rates are used as a fiscal instrument. For purposes of comparison, the overall effect on inflation of cuts in government spending is, on average, 1.6 larger than an equally sized impulse driven by increasing public revenue.

Graph 8

Effects on inflation of a tightening in fiscal policy equivalent to 1% of GPD and lasting for 4 quarters



Source: BCB.

The lower effects of incentives on taxation should be considered carefully. Tax revenues are collected by wage taxes that directly impact only non-Ricardian households' consumption. Traditional distorting mechanisms like taxation on investment and production are not factored into the model, nor are public investment and other aspects of government spending. In theory, this could explain why the effects of tax increases are smaller than expected.

Effects on output were also addressed. The public spending multiplier, measured by SAMBA, is around 1.2 under a non-accommodative monetary policy, and about 0.9 if calculated with the semi-structural model. In turn, the tax revenues multiplier is 0.9.

Results yielded by both the semi-structural and DSGE models used by the BCB are closely in line with the theoretical literature and the practical experience in central banks. Coenen *et al.* (2010) study fiscal multipliers and effects on inflation of several fiscal instruments by performing simulations in DSGE models used by seven international institutions, such as the Federal Reserve Board, European Central Bank, Bank of Canada, European Commission, OECD, and IMF. The effects on inflation depend to a great extent on what policy instrument is used. However, it is clear that a non-accommodative monetary policy always generates lower responses, because accommodative monetary policy allows real interest rates to fall further, leading to greater responses in consumption and investment.

4. Final remarks

Fiscal policy has an important role in the policy balance. Indeed, both public revenue and government spending can be effectively used to tighten aggregate demand, although their different transmission channels and total effects in the economy must be taken into account. The government's significant direct participation in the credit markets and historical role as an investment catalyst in Brazil are two factors that demonstrate the importance of consistent use of fiscal instruments as tools to help achieve macroeconomic stability.

Brazil's fiscal consolidation has demonstrated the effectiveness of the long-term framework, as seen during the financial crisis. Notwithstanding, a more sustained strengthening of fiscal conditions is needed for the Brazilian economy to reach a new baseline for monetary and fiscal frameworks in the medium term, by enhancing the sustainability of the public debt, the investment-savings dynamic, and the broad mechanisms of price setting.

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Macro policies and public debt in Chile

Sebastián Claro and Claudio Soto¹

Abstract

This note characterises the evolution of Chile's public debt, and discusses its implications for the management of the country's monetary policy. Historically, the main issuer of public debt in Chile was the central bank. The government, in turn, has recently started to engage in a more active debt policy, with the aim of deepening the market for risk-free securities and diversifying its funding sources. In general, the soundness and predictability of fiscal policy and the high degree of coordination between the government and the central bank has meant that the debt policy of the fiscal authority has posed no major challenge for the conduct of monetary policy. Moreover, the government's positive net asset position government has played an important role, allowing the central bank to fulfil its price and financial stability objectives in spite of a negative equity position.

Keywords: Monetary policy, fiscal policy, public debt

JEL classification: E52, E62, H6

¹ Board Member of the Central Bank of Chile and Head of Macro Analysis, respectively. The views expressed in this note do not necessarily represent those of the central bank. We thank Luis Oscar Herrera, Matías Bernier and Sergio Salas for their contribution to an earlier version.

I. Introduction

This note outlines the evolution of Chile's public debt and discusses its implications for monetary policymaking. Historically, the main issuer of the country's public debt has been the Central Bank of Chile (CBC). In the 1980s, a large amount of debt was issued by the monetary authority to finance operations resulting from the 1982–83 banking crisis. Later, in the 1990s, debt was issued to sterilise large reserves accumulations. The last two administrations, in turn, have engaged in a more active debt policy and the share of public debt issued by the treasury has increased.

In the last few years, two factors have shaped the evolution of Chile's public debt. On the one hand, the government has issued debt mainly with a view to deepening the market for risk-free securities. It has needed to issue only relatively small amounts of public debt to finance its operations and roll over existing debt. On the other hand, the CBC has issued long-term bonds to finance two massive reserve accumulation programmes, one in 2008 and the other in 2011.

Overall, the soundness and predictability of fiscal policy and the high degree of coordination between the government and the CBC have meant that the conduct of monetary policy has faced no major challenges. In this context, the country's positive net asset position has played an important role: it has allowed the central bank to fulfil its price and financial stability objectives in spite of a negative equity position.

II. The evolution of public debt in Chile

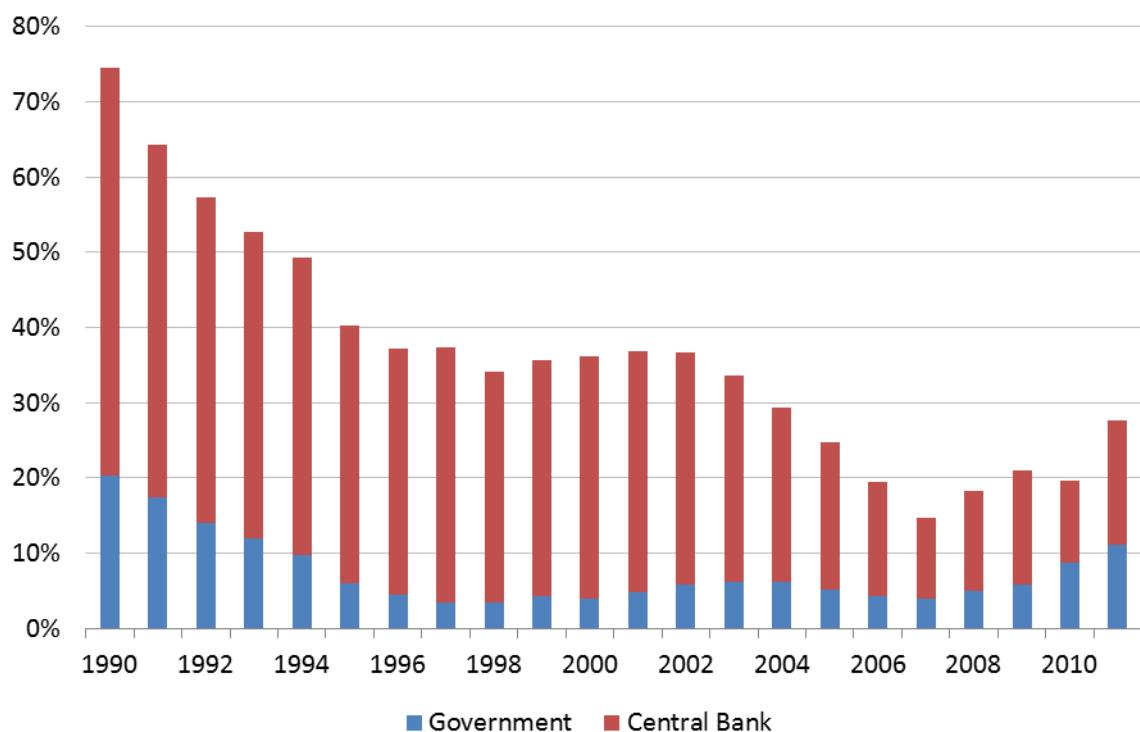
As mentioned, a large share of Chile's current stock of public debt was issued by the central bank (Figure 1). This debt reflects in part the operations implemented after the financial crisis of 1982, when the monetary authority issued large amounts of bonds in order to finance the rescue of the Chilean financial system. In this sense, although registered on the CBC's balance sheet, this debt has a fiscal origin. More precisely, the central bank acted on behalf of the fiscal authority in order to provide liquidity and to recapitalise the banking system at a time when the monetary authority lacked autonomy. Later, when the central bank was granted autonomy at the end of the 1980s and the size of its capital was defined, the value of the liabilities arising from the financial rescue were not fully recognised in its balance sheet.

Another significant share of the public debt issued by the CBC is related to the sterilisation of its massive accumulation of international reserves throughout the 1990s, just prior to the Asian crisis. This build-up occurred in the context of large capital inflows to the country, during a period in which the CBC maintained a target zone for the exchange rate.

Since the start of the last decade, total public debt as a share of GDP began to fall, declining from about 37% of GDP in 2001 to 27% of GDP in 2011. The main reason was the end of the CBC's massive accumulation of reserves. Without the large capital inflows of the 1990s, and after the target zone for the exchange rate band had been abandoned, the monetary authority stopped systematically intervening in the exchange market, obviating the need to sterilise such interventions. Nominal debt stabilised and, thanks to sustained growth, started to fall as a share of GDP. In 2011, due to an extraordinary programme of reserves accumulation and the corresponding sterilisation, the CBC's debt went from around 10% of GDP in 2010 to 16% of GDP by the end of 2011.

Government debt has remained more or less stable over the last 15 years, oscillating between 5% and 10% of GDP. It has increased in recent years due to explicit policy objectives to establish benchmarks for risk-free securities prices, and also to diversify the currency composition of public funding. In the next section, we discuss Chile's fiscal policy in greater depth and how it has determined the evolution of the government's debt. Then, we analyse the case of monetary policy.

Figure 1
Chile's public debt owed to the private sector
% of GDP



Sources: Central Bank of Chile and DIPRES (Budget Office).

III. Fiscal policy and public debt

Over the past several decades, the Chilean government has managed its fiscal policy rather conservatively, with positive balances in 14 out of the last 21 years. As a result, large stocks of public assets have been accumulated and the government has needed to issue only relatively small amounts of public debt to finance its operations and roll over existing debt.

Chile's prudent approach to the conduct of public finance was institutionalised in 2006 by the Fiscal Responsibility Act. This legislation obliges the government to adopt an explicit fiscal target for its structural budget so as to keep fiscal expenditure in line with long-term or structural fiscal revenues. A fiscal rule had previously been established, in 2001, albeit without any binding commitment. Since the adoption of this rule – and against the backdrop of a large terms-of-trade windfall – the government's net position has improved considerably, moving from a net debtor to a net creditor position. However, since 2003, the Treasury has made some significant public debt issuances, both domestically and internationally, with the aim of adding liquidity to the domestic bond market, helping to establish benchmark prices and diversify public financing sources. In addition, these domestic currency issuances have obviated the need for the government to immediately liquidate all the revenues it receives in foreign currency.²

² The Chilean government has a structural currency mismatch between its revenues and its expenditures. A significant part of its revenues are denominated in foreign currency while most of its expenditures are in local currency.

Since 2001, Chile's fiscal policy has been guided by a fiscal rule based on the concept of the structural balance. In Chile, government revenues are influenced not only by the level of economic activity but also by the price of copper and other minerals.³ With the main goal of smoothing fiscal policy over a medium-term horizon, government expenditure is set each year at a level compatible with a target for the structural balance, where revenues are adjusted according to the cyclical position of the economy and copper price deviations from the metal's long-run value.⁴

Shortly after the implementation of the structural budget fiscal rule in 2001, the government mandated two independent committees to provide the key variables on which the structural balance is computed: trend GDP and the reference or long-run price of copper. In 2006, the Fiscal Responsibility Act was enacted, further strengthening the fiscal rule by requiring each incoming government to (i) announce its target for the structural balance during its term; (ii) estimate the expected outcome of its fiscal policy on the structural balance for the public budget law; and (iii) annually report the actual outcome of the structural balance.

Between 2001 and 2006, the target for the structural balance was set at 1% of GDP. Then, for 2007 and 2008, the target was reduced to 0.5% of GDP and in 2009 it was originally set at 0% of GDP. During this period, expenditures moved in tandem with structural revenues and the government successfully met its target, except in 2008. In 2009, an escape clause was put in place so that a countercyclical fiscal policy could be implemented that would support aggregate demand in response to the global financial crisis. During that year, the structural deficit amounted to 3% of GDP. In 2010 and 2011, it was reduced but remains sizeable (Table 1). The present administration has announced that it expects to bring the structural deficit back to 1% of GDP by 2014.

Table 1
Public balance
% of GDP

	Expenditure	Revenues	Effective balance	Structural revenues	Structural balance
2001	22.3	21.8	-0.5	23.4	1.1
2002	22.3	21.1	-1.2	23.2	0.8
2003	21.1	20.7	-0.5	22.0	0.8
2004	19.9	22.0	2.1	21.0	1.0
2005	19.3	23.8	4.6	20.4	1.1
2006	18.1	25.8	7.7	19.5	1.4
2007	18.7	26.9	8.2	19.8	1.1
2008	21.2	25.5	4.3	20.4	-0.8
2009	24.8	20.4	-4.5	21.9	-3.0
2010	23.4	22.9	-0.4	21.3	-2.0
2011 (*)	23.3	24.5	1.2	21.7	-1.6

(*) Estimated. Source: DIPRES (2011).

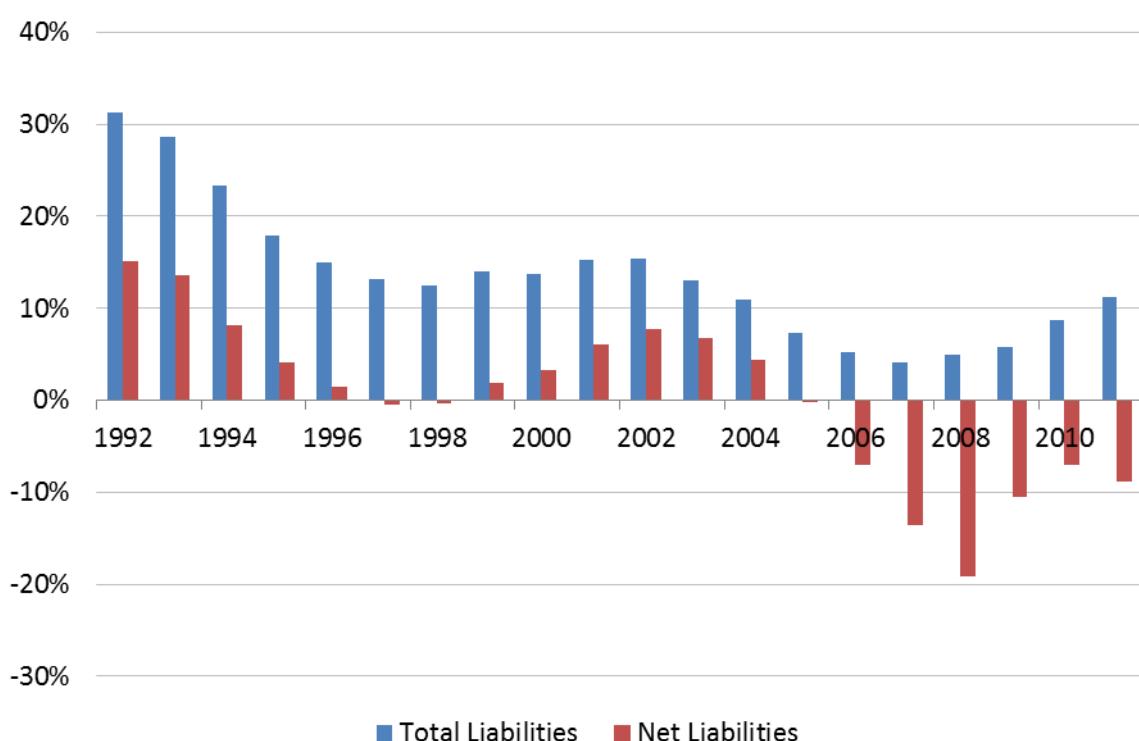
³ Income from copper and other minerals greatly influences revenues accrued through the profits of Codelco, the state-owned mining company, and from taxes on private mining companies, which started to make significant profits in 2005.

⁴ The current fiscal rule evolved from previous attempts to insulate fiscal policy from copper price fluctuations. A Copper Stabilisation Fund was set up as early as 1985 in order to help smooth public revenues.

Despite the fiscal expansion of 2009 and the subsequent public deficit in 2010, the government's net position is still positive. During the 1990s, net liabilities were reduced systematically until the Asian crisis hit. After that episode, the government posted deficits until 2003 with a consequent increase in net liabilities. Then, from 2005 onwards, the government's net position turned positive. Currently, its net assets amount to slightly less than 10% of GDP (Figure 2).

When the net position of the government became positive, two sovereign funds were created: the Pension Reserve Fund (PRF) established at the end of 2006 to fund fiscal pension obligations, and the Economic and Social Stabilisation Fund (ESSF), set up in early 2007 to help cover fiscal deficits and/or repay public debt. Given its experience in managing Chile's international reserves, the operation of the two funds was delegated to the Central Bank of Chile.⁵ In addition, an independent Financial Committee was set up to advise on investment policy. By March 2012, the two funds held aggregate assets of slightly more than USD 19 billion.

Figure 2
Total and net liabilities of the central government
% GDP



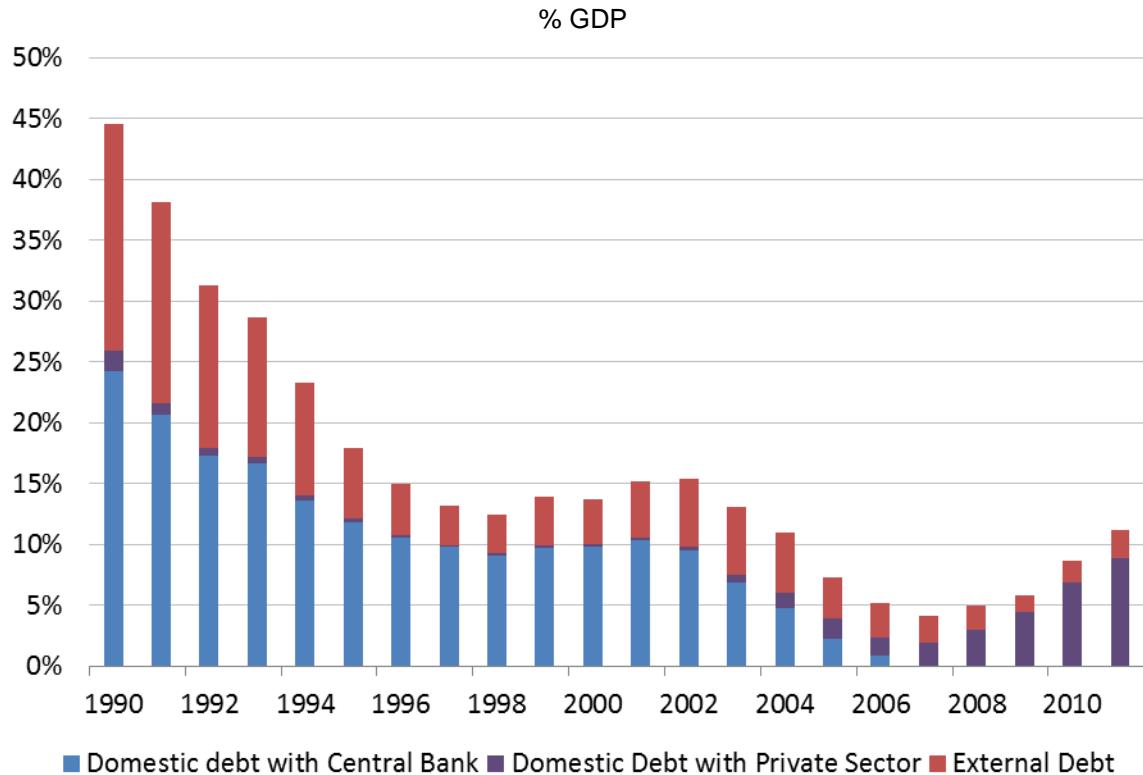
Source: DIPRES and Chile's Ministry of Finance.

As mentioned above, the government has regularly issued domestic bonds since 2003 regardless of its net creditor position. Two types of bonds have been sold: nominal bonds (Bono Tesorería en Pesos, BTP) and inflation-indexed bonds (Bono Tesorería UF, BTU). The stated aim of these issuances is to enhance bond market liquidity in Chile by setting

⁵ The central bank acts as the government's fiscal agent for the placement of bonds in the local market and their administration.

benchmarks to complete the yield curve. Most of the issuances have been at the long end of the yield curve.⁶ As a result, domestic public debt held by the private sector has risen from about 1% of GDP in 2004 to almost 9% of GDP at the end of 2011 (Figure 3).

Figure 3
Government domestic and external debt

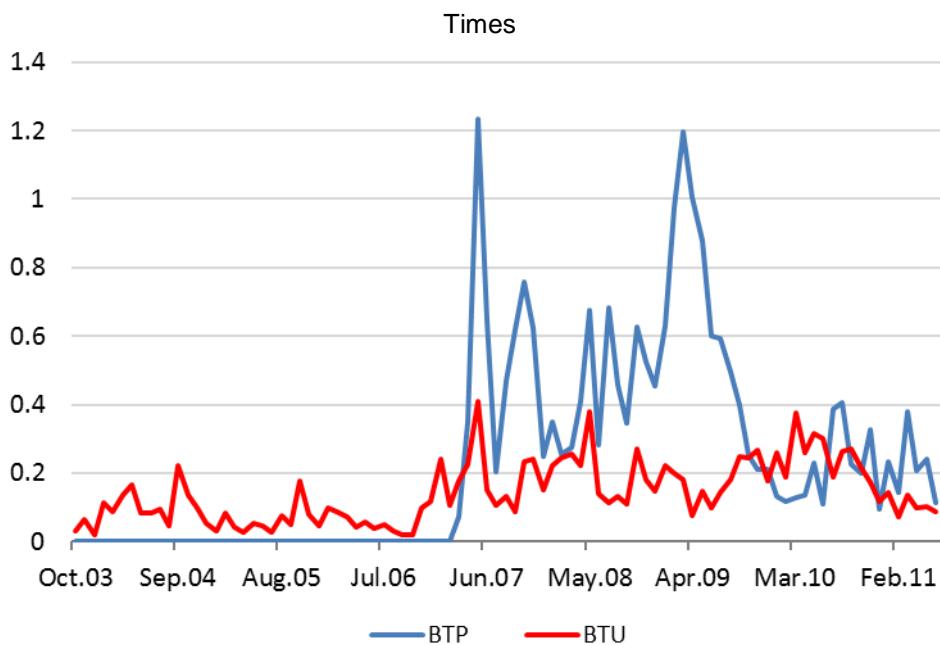


Source: DIPRES.

The market has considered these bonds to be risk-free instruments, similar to those of the central bank. Turnover has been sizeable, in particular for the nominal bonds or BTP (see Figure 4).

⁶ In 2003, the Ministry of Finance issued a BTU with a 20-year maturity. Then, together with the 20-year maturity bonds, it issued a BTP and a BTU with 10-year maturities. In 2008 and 2010, BTUs of seven- and 30-year maturities were issued. In 2011, a seven-year BTP was issued.

Figure 4
Monthly turnover of Treasury bonds



Source: Central Bank of Chile and Ministry of Finance.

IV. Monetary policy and public debt

The central bank was granted full autonomy in 1989. This means that the institution has its own legal status, independent of the government. The new constitutional law – Law 18 840 of October 1989 – provides for the central bank's independence in technical and financial terms, and defines its objectives as follows: to ensure the currency's stability and the normal functioning of domestic and foreign payments. One of the key aspects of the new constitutional law is that it prohibits any form of financing of the government by the monetary authority, except in extreme circumstances such as war or national emergency.

In this context, coordination between monetary and fiscal policy is key for the proper functioning of the economy. One benefit of Chile's fiscal rule is that it simplifies the task of policy coordination between the fiscal and monetary authorities. The central bank follows a flexible inflation targeting approach in conducting its monetary policy so that expected inflation plays a central role in defining monetary policy. For its part, the fiscal rule provides a predictable fiscal stance over a medium-term horizon. Thus, in making the projections on which monetary policy is based, the central bank can take as given the path for public expenditure that is consistent with the fiscal rule. Another dimension of the coordination between fiscal and monetary authorities is related to their respective debt policies. The Ministry of Finance and the central bank annually coordinate their debt issuance for the year, bearing in mind, among other aims, the need to promote the development of the local financial market.

To meet its inflation target, the central bank uses the overnight nominal interest rate as its main policy instrument. It sets a notional level for the monetary policy rate (MPR), and then adjusts market liquidity to bring the overnight interbank interest rate to around that level. It offers permanent overnight borrowing and lending liquidity facilities to commercial banks with a view to keeping the interbank lending rate close to the MPR. The central bank favours a policy of non-intervention in the interbank market. However, when liquidity pressures cause the overnight interbank interest rate to move significantly away from the MPR, the central

bank uses a range of instruments to accommodate liquidity. The main tools are traditional repo operations, where the central bank purchases its own securities with a buy-back clause for the next working day. These securities are discount promissory notes (PDBC) due in 30 to 360 days, nominal bonds with maturities of two, five and 10 years (BCP2, BCP5 and BCP10 respectively), and inflation-indexed bonds with maturities of five and 10 years (BCU5 and BCU10).

In addition to traditional repo operations, the central bank regularly performs open market operations, issuing short-term securities with the aim of supporting the smooth functioning of the money markets. The issuance of these securities is determined and pre-announced on a monthly basis. Other mechanisms to provide peso and dollar liquidity are also available. Some of them were used extensively during the 2008–09 financial crisis (see Annex A).

The issuance of the long-term securities that represent the bulk of central bank liabilities is done in such a way as to accommodate the increase in demand for monetary base. To define the size and composition of long-term debt issuance, an annual calendar sets out the securities falling due in more than one year and money demand increases are estimated. Hence, the net increase in money demand roughly corresponds to the net value of securities that are not re-issued. This programme interacts with the short-term security issuance programme in order to adequately manage liquidity at different maturities. This programme is pre-announced annually, but the central bank explicitly states that it may be subject to modification if conditions change.

Naturally, commercial banks account for a large part of demand for debt securities issued by the central bank. But a significant share of demand also comes from pension funds and insurance companies, which are typically “buy and hold” investors. This affects the turnover in secondary markets, so that bid-to-cover ratios vary from around 2.2 for nominal bonds to 2.7 for inflation-indexed bonds.

A long history of inflation in Chile explains the prevalence of indexation in most long-term issuance. However, since 2000, efforts have been made to issue nominal bonds. One reason to issue nominal bonds was to provide benchmarks with the aim of deepening the market (Table 2).

Table 2
Evolution of the debt stock by currency and term

	Dec'02	Dec'03	Dec'04	Dec'05	Dec'06	Dec'07	Dec'08	Dec'09	Mar'10	Jun'10	Sep'10	Dec'10	Jun'11
Short debt	(under 1 year)												
Total CBDN	6,307	4,264	3,457	4,096	3,648	2,178	2,289	7,213	8,122	4,770	6,140	3,355	6,140
Long debt	(over 1 year)												
CBP	772	3,148	3,711	3,457	3,680	4,090	4,432	3,751	3,921	4,479	4,584	4,543	6,018
CBU	606	2,458	3,276	4,008	4,770	5,203	11,015	9,773	9,414	4,479	7,572	8,209	12,656
Other inflation-linked	15,551	12,504	10,283	8,142	6,447	5,875	3,454	2,749	2,477	2,321	2,161	1,777	1,572
USD	5,868	6,270	5,519	3,288	790	435							
Total bonds	22,797	24,380	22,789	18,895	15,687	15,603	18,901	16,273	15,812	11,278	14,317	14,529	20,247
Peso long debt (%)	3%	13%	16%	18%	23%	26%	23%	23%	25%	40%	32%	31%	30%
Inflation-linked long debt (%)	71%	61%	59%	64%	72%	71%	77%	75%	60%	68%	69%	70%	
USD long debt (%)	26%	26%	24%	17%	5%	3%							
TOTAL DEBT CBC	29,103	28,644	26,246	22,992	19,335	17,780	21,189	23,486	23,933	16,048	20,457	17,884	26,387
% Short debt	22%	15%	13%	18%	19%	12%	11%	31%	34%	30%	30%	19%	23%
% Long debt	78%	85%	87%	82%	81%	88%	89%	69%	66%	70%	70%	81%	77%
Peso total (%)	24%	26%	27%	33%	38%	35%	32%	47%	50%	58%	52%	44%	46%
Inflation-linked total (%)	56%	52%	52%	53%	58%	62%	68%	53%	50%	42%	48%	56%	54%
USD total (%)	20%	22%	21%	14%	4%	2%							
Remaining maturity (years)													
Short debt	0.35	0.17	0.09	0.10	0.10	0.08	0.24	0.10	0.06	0.13	0.18	0.22	0.08
Long debt	3.66	3.42	3.23	3.47	3.59	3.28	4.76	4.10	3.97	3.88	4.14	4.05	5.48
Total CBC debt	2.94	2.94	2.82	2.86	2.93	3.28	4.27	2.87	2.64	2.77	2.95	3.33	4.22

Calculated with parities \$/USD 500 and \$/UF21,000.

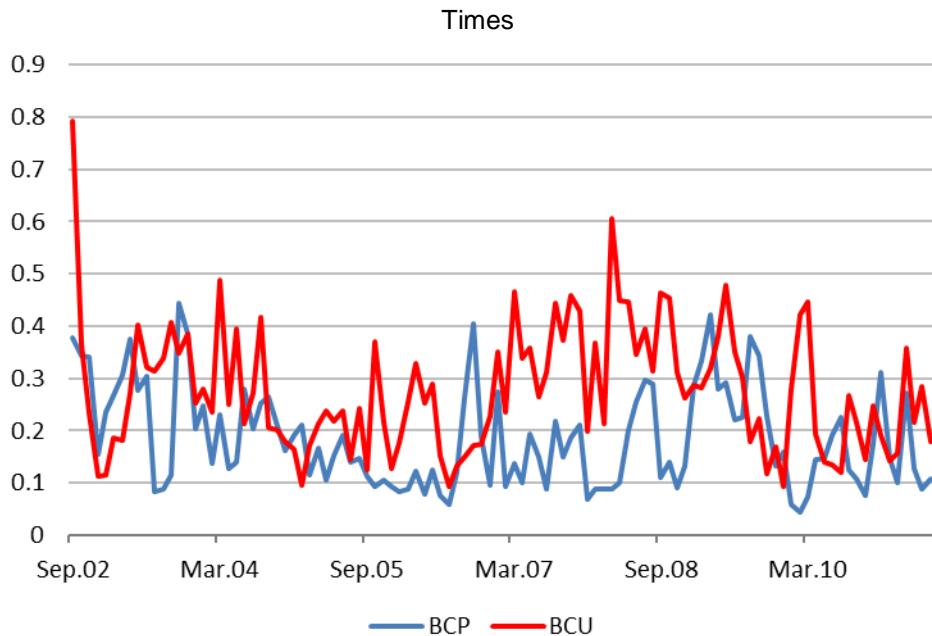
One implication of the large stock of public debt issued by the central bank is that its balance sheet is weak. As mentioned above, part of the debt was issued to finance the rescue of the

financial system at the end of the 1990s. But the return on the assets the bank received in exchange has been on average lower than the return on the bonds issued. In the case of the debt issued to sterilise the reserve accumulation, the return on international reserves has been also lower than the debt issued. As a result, the central bank's net worth has usually been negative since the mid-1990s. At the end of 2011, the bank's negative net worth position was equivalent to an estimated 3.5% of GDP.

However, this has not proved to be a problem for the conduct of monetary policy. The central bank has successfully issued domestic debt to manage liquidity in order to keep the monetary policy rate at its target level. Moreover, the debt issued by the central bank is considered to be a relatively risk-free asset. In fact, the monthly turnover of central bank's securities is relatively high, reflecting their liquidity (Figure 5).

The reasons for this are manyfold: first the government – which is perceived by the market as the guarantor of the central bank – has a strong financial position and is expected to remain that way in part due to the fiscal rule. Second, the adoption of the pay-as-you-go principle for the pension system has deepened the financial system and increased the demand for safe assets, including central bank securities. Third, banking and financial sector regulation and supervision have improved considerably since the banking reforms in the mid-1980s. This has helped to keep the risk of financial crises relatively low. Finally, despite its negative net worth position, the central bank has run a primary surplus due to gains from the inflation tax, low non-financial costs and the absence of quasi-fiscal commitments. Moreover, in the long run, thanks to the expansion of the monetary base, it is expected that the central bank's net worth will eventually become positive (see Restrepo et al (2009)).⁷ In sum, the government's solvency along with financial institutional developments has allowed the central bank's debt to be rolled over without difficulty.

Figure 5
Monthly turnover of central bank bonds



Source: Central Bank of Chile.

⁷ J Restrepo, L Salomó and R Valdés, "Macroeconomía, Política Monetaria y Patrimonio del Banco Central de Chile", *Revista Economía Chilena*, 12(1), April 2009. This paper's baseline forecast calls for the central bank's net worth to return to the positive domain in about 25 years.

Annex A:
Policy actions taken by the Central Bank of Chile
during the 2008–09 crises.

Peso Financial Facilities			
Fecha	Actions	Elegible Collateral	Actions Duration
Sep. 29 2008	Repo 28 days	Central Bank Bonds	
Oct. 10 2008	Repo 28 days Repo 7 days	Central Bank Bonds Bank Deposits	6 months 6 months
Dec. 10 2008	Repo 28 days Repo 7 and 28 days LCC (Line of Credit Collateralized)	Central Bank Bonds Bank Deposits Central Bank Bonds, Treasury Bonds	All 2009 All 2009 Indeterminate
Jul. 09 2009	Term Liquidity Facility (TLF) 3 and 6 months	Central Bank Bonds, Treasury Bonds, Mortgage Bills and Bank Deposits	Indeterminate
Nov. 18 2009	TLF 63 and 154 days, with further reductions of 30 days	Central Bank Bonds, Treasury Bonds, Mortgage Bills and Bank Deposits	Dic 14 th 2009 - May 2010

US Dollar Financial Facilities				
Fecha	Actions	Amounts	Program Duration	Rate
Sep. 29 2008	Swap 28 days	500 million dollars per week. Total of USD 2.000 million		libor + 100bp
Oct. 03 2008	Swap 28 days	500 million dollars per week. Total of USD 1.500 million	3 weeks	libor + 100bp
Oct. 09 2008	Foreign Currency Reserve		9 Oct'08 - 8 Apr'09	
Oct. 10 2008	Swap 60 and 90 days	500 million dollars per week. Total of USD 5.000 million	6 months	libor + 100bp
Dec. 03 2008	Swap 60, 90 and 180 days		December'08	
Dec. 10 2008	Swap 60, 90 and 180 days		All 2009	
Apr. 07 2009	Foreign Currency Reserve		Apr'09 - Feb'10	

Monetary policy, fiscal policy and public debt management

People's Bank of China

Abstract

This paper touches on the interaction between monetary policy, fiscal policy and public debt management. ***The first part*** looks at public debt sustainability and monetary policy. When measuring the fiscal stance, data such as current fiscal income and expenditure, the scale of public debt, and the coverage of budget revenue and expenditure should be properly monitored. In addition, factors that could influence the mid-term fiscal stance should be taken into consideration. Central bank assets may not be used to offset public debt, and pension funds are not in practice used to offset gross government debt in most economies. To some extent, oil and commodity stability funds held by resource-abundant economies may be used to offset gross government debt. Monetary policy is influenced by the financing of the fiscal deficit by way of bond issuance. ***The second part*** is about the development of money markets, the maturity and yield curves of domestic government bonds, and the deepening of domestic financial markets and financial stability in China. ***The concluding part*** concerns the central bank and public debt management. There is no need for the central bank in economies with a well developed treasury bond market to issue debt of its own. In emerging economies, a regular rollover issuance of central bank debt may help to form a consecutive short-term risk-free yield curve, serving as a benchmark for pricing in money and bond markets. Central banks involved in public debt management need to coordinate closely with the debt management agency on the policy objectives for various macro control instruments associated with fiscal policy, monetary policy and public debt management.

Keywords: Monetary policy, fiscal policy, public debt management, China

JEL classification: E52, H63

I. Public debt sustainability and monetary policy

(1) When measuring the fiscal stance, the following factors should be taken into consideration:

- The following data should be monitored:
 1. **Current fiscal income and expenditure.** In recent years, China's deficit has remained low, compared with those of the major developed economies. In 2009 and 2010, the fiscal deficit amounted to RMB 950 billion and RMB 1050 billion respectively, slightly less than 3% of GDP.
 2. **Public debt.** By the end of 2010, China's outstanding government debt stood at around RMB 7 trillion, or 20% of the GDP, a relatively safe level. However, some local government liabilities are not included in the statistics and thus need to be monitored closely as to their scale and potential impact on China's fiscal condition.
 3. **Coverage of budget revenue and expenditure.** In many economies for statistical reasons, not all public revenues and expenditures are included in the national budget. The revenues and outgoings of local governments and state-owned enterprises are a case in point. These should be taken fully into account when measuring the fiscal stance. China's government budget covers the revenue and expenditure of both the central and local governments but not all such items. Not included are some special funds (eg pension funds and land transfer funds etc), as well as the profits and losses of state-owned enterprises.
- Factors that could influence the mid-term fiscal stance, especially those that could increase contingent liabilities.

Among these factors is the ageing problem. It is estimated that, by 2030, China's elderly population will reach twice today's level. This calls for more fiscal input into related pension and healthcare services. This ageing trend will also offset the "demographic dividend" effect and thus indirectly influence future fiscal income. Moreover, the potential losses of government-led construction projects take a long time to show up in the balance sheet. This may increase government's mid-term contingent liabilities to a certain extent.
- Characteristics of emerging market economies.

Compared with developed countries, emerging markets enjoy faster growth but face higher inflation and more volatility, which may have significant negative implications for their mid-term fiscal stance.

(2) Public sector assets as offset to gross debt

Central bank assets cannot be used to offset public debts. Central bank assets are acquired by injecting base money, meaning that any increase in the central bank's assets implies a simultaneous and equal increase in its liabilities. Nor is it the practice in most economies for pension funds to be used to offset gross government debts. In reality, a large pension funding gap is a problem for most developed and emerging markets. Pension funds cannot be used as an offset to gross government debt, and the funding gap may even increase the government's contingent liabilities. **To some extent, oil and commodity stability funds held by resource-abundant economies may be used to offset gross government debt.** However, authorities should take a prudent approach if they choose to follow that course, and they should take into account that such funds may become contingent liabilities and could cause maturity and structure mismatches in the balance sheet. Thus, these funds should be duly discounted when used as offsets.

(3) The influence of fiscal deficit financing on monetary policy

Governments usually finance their deficits by levying taxes or issuing bonds. Taxation has basically no effect on monetary policy, whereas bond issuance has either a direct or indirect influence on monetary policy. Excessive government bond issuance will worsen the government's future fiscal condition, which could result in the central bank being forced to acquire government bonds and thus compromise the independence of monetary policy.

II. Domestic currency-denominated public debt in China's domestic market

(1) Money market development

The volume of interbank lending in China has steadily and rapidly increased since the beginning of this year. From January to October, interbank lending totalled RMB 26.6 trillion, up 18.3% year on year. From January to October, the total borrowing of the state-owned commercial banks — the main borrowers in the interbank market, reached RMB 16.2 trillion, up 35.3%, accounting for 60.9% of the total borrowing in the market. On the other hand, the total lending of the main lenders, namely joint-stock commercial banks, city commercial banks and state-owned commercial banks, registered RMB 19.4 trillion, up 2.20%, accounting for 72.9% of the total lending in the market. The lending of foreign-funded financial institutions totalled RMB 2.80 trillion, up 68.30%, and the lending of other financial institutions reached RMB 4.4 trillion, up 99.20%.

(2) Maturity and yield curves of domestic government bonds

The Chinese government started to issue treasury bonds with maturities of more than 10 years after the Asian financial crisis in 1997. Maturities of 15 years and 20 years were issued in 2001, of 30 years in 2002 and of 50 years in 2009. At the end of October 2011, 148 batches of bonds were outstanding in the interbank bond market, with a volume of RMB 5.84 trillion and maturities ranging from three months to 50 years.

The People's Bank of China has issued a series of rules and guidelines since 2001 on standardising yield calculations in the interbank bond market. In June 2011, the People's Bank of China and the Ministry of Finance issued a joint notice, with detailed guidelines for market-makers on market-making for treasury bonds with key maturities. This has improved liquidity as well as the quality of treasury bond quotations, and it has further extended the yield curve.

(3) Deepening domestic financial markets and financial stability

In recent years, China's bond market has continued to expand, with enhanced market liquidity and more foreign investors involved. The deepening of the bond market has contributed to the stability of China's financial system. First, by accelerating the transformation from indirect financing to direct financing, thus diversifying the risks in the banking system and lowering financing costs in the real economy. Second, financial institutions have been provided with tools to replenish Tier 2 capital and the resilience of financial institutions has been improved. Third, market participants have adopted investment and risk management tools, so that the risks faced by credit entities have been diversified. Fourth, with a diversified base of bond market investors and increased bond trading volumes, the bond pricing mechanism has become more market-oriented, which has improved capital allocation and promoted financial market stability.

III. Central bank and public debt management

(1) Whether the central bank can issue its own debt paper, and its coordination with the Ministry of Finance

Whether a central bank can issue its own debt paper depends on the development of domestic treasury bond market and its monetary management policies. In economies with well developed treasury bond markets, the issuance of the bonds may perform two functions: as a financing tool for the central government, and as an instrument for regulating and managing financial markets. There is no need for the central banks in these economies to issue debt paper of their own. However, in emerging economies with less developed bond markets, bond issuance serves solely as a financing tool for government activities. In this case, long-term bonds account for most of the total volume, whereas short-term bond issuance is inadequate. In these economies, a regular rollover issuance of central bank debt may help form a consecutive short-term risk-free yield curve, serving as a benchmark for the pricing in the money market and bond market. Moreover, in economies with excess liquidity, central bank bond issuance can effectively absorb any excess short-term liquidity in the banking sector, and create a favourable environment for economic growth and price stability. In this case, central bank debt issuance could itself be regarded as an important measure in strengthening the coordination between fiscal and monetary policies.

(2) Involvement of central banks in public debt management

Central banks may involve themselves in public debt management based on each country's specific circumstances. Central banks tend to engage more deeply in the management of short-term rather than long-term debt, because short-term debt is more useful as a policy instrument for adjusting the base money supply. Central banks can adjust market liquidity and the money market interest rate by purchasing short-term government bonds via open market operations or by issuing central bank bills. Sound communication and cooperation between the ministry of finance and the central bank should be maintained in managing foreign currency-denominated debt. If financial resources raised by issuing foreign currency-denominated bond are invested domestically, the debt-service risk arising from exchange rate movements should be fully taken into account. In this case, government plans for managing its foreign debt could have significant implications for the coordination of local and foreign currency policy by central banks.

Quasi-fiscal operations and unconventional monetary policy will expand central bank balance sheets and are likely to reduce, to some extent, the quality of central banks' assets and therefore their profits. Apart from direct financial losses, the excessive issuance of money as a consequence of quasi-fiscal operations is likely to drive up market expectations for inflation and therefore undermine the credibility of central banks in maintaining the value of the currency. In addition, the independence of central banks will be undermined if they take on responsibility for fiscal functions. As a consequence, central banks should attach great importance to the hidden threat of inflation, whether or not quasi-fiscal operations or unconventional monetary policy will directly affect their financial condition.

(3) Institutional arrangements for coordinating monetary policy and public debt management

First of all, the debt management agency and the central bank should reach a consensus on the policy objectives of the various macro control instruments associated with fiscal policy, monetary policy and public debt management. Principles should be established for public debt management that reinforce the coordination between public debt management and monetary policy. Second, choices about the scale, variety and pace of public debt issuance should be made with great consistency, and they should be fully coordinated with the central

bank so that the latter can carry out liquidity management effectively. Third, central banks and governments should step up their efforts to improve the bond market environment in order to enhance the liquidity of secondary markets for government bonds. This will provide a solid foundation for the formation of a reliable yield curve for risk-free market interest rates, thus enhancing the efficiency of the monetary policy transmission mechanism. Fourth, public debt issuance should not undermine the implementation of monetary policy and the stability of the currency's value. And if the government launches a plan for large-scale debt issuance to combat an economic and financial crisis, a fiscal consolidation programme should also be in place with a view to protecting the central bank's independence.

Macroeconomic effects of structural fiscal policy changes in Colombia

Hernando Vargas, Andrés González and Ignacio Lozano¹

Abstract

In the past decade the Colombian economic authorities undertook a series of measures that reduced the structural fiscal deficit, decreased the government currency mismatch and deepened the local fixed-rate public bond market. This paper presents some evidence suggesting that these improvements had important effects on the behavior of the macroeconomy. They seem to have permanently reduced the sovereign risk premium, increased the reaction of output to government expenditure shocks and strengthened the response of market interest rates to monetary policy shocks.

Keywords: Monetary policy, fiscal policy changes, public debt management, government expenditure, market interest rates, monetary policy shocks

JEL classification: E44, E6, E62

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1. Introduction

Over the last decade the Colombian government and congress undertook a series of measures and reforms that significantly shifted the trend of public debt, reduced the financial fragility of the government and deepened the domestic public bond market. First, starting from a rising, unsustainable debt path, several structural fiscal reforms were instrumental in the decline of the public debt to GDP ratio between 2003 and 2008, and its more recent stability. Second, an explicit policy of reducing the currency mismatch of public finances decreased their vulnerability in the face of a sharp depreciation following an adverse external shock. Third, there has been an effort to shift the composition of public debt toward fixed-rate, peso denominated bonds and to lengthen its maturity.

One would expect that this set of prudent policies had important effects on the behavior of the macroeconomy both in the long term and in response to exogenous shocks. After briefly highlighting some aspects of fiscal policy and public debt management in the past ten years, this paper assesses some of those effects. Specifically, the influence of fiscal policy changes on the country's sovereign risk premium, the short-run response of output to a fiscal shock and the transmission of monetary policy shocks to market interest rates are evaluated.

2. Fiscal policy in Colombia

The adoption of a new constitution in 1991 entailed a strong expansion of the size of government in Colombia. Increased demand for public spending in health, education and justice drove central government primary expenditure from 7.2% of GDP in 1990 to 12.4% of GDP in 2000. At the same time, the Constitution of 1991 and the law extended fiscal decentralization and imposed a regime in which an increasing fraction of central government current revenues was transferred to local governments. The tax increases adopted to pay for the additional expenditure were not sufficient and had to be shared with local governments, which, in turn, increased their spending. In addition, the intertemporal solvency of the pay-as-you-go national pensions system was in doubt, given its prevailing parameters and the co-existence of a defined-contribution private pension fund system.

By the end of the nineties, fiscal sustainability in Colombia was uncertain. The central government debt to GDP ratio was rising fast and several local governments were over-indebted. The external shocks of that period (especially the Russian crisis) triggered the largest output drop in Colombia since the Great Depression and a financial crisis. The cost of the latter had to be absorbed by the government, thus worsening an already weak fiscal situation.

Starting in the early 2000s, an adjustment had to be implemented that included four tax reforms, two reforms to the transfers to sub-national governments and other measures that substantially reduced the non-financial public sector (NFPS) deficit from 4.9% of GDP in 1999 to a balanced position in 2008. During this period, the deficit of the central government was reduced from 6% to 2.3% of GDP, while the remaining NFPS recorded surplus balances. As a result, the central government debt to GDP ratio declined throughout the 2000s and has been stable in recent years (Graph 1). Moreover, a reform to the general pension regime in 2003 made progress toward ensuring the sustainability of the pay-as-you-go system.

Since 2003, Colombia has been implementing its fiscal policy through a qualitative rule: Law 819 on transparency and fiscal responsibility. Under this mandate, the central government must prepare a *Medium Term Fiscal Framework (Marco Fiscal de Mediano Plazo, MFMP)* every year as its main tool for financial programming. The MFMP sets a numerical target for the primary balance of the NFPS for the following year as well as some indicative targets for the subsequent ten years, so that public indebtedness remains in line

with a sustainable path. Among other aspects, the MFMP includes an assessment of the contingent liabilities of the public sector, the cost of tax benefits, and some sections on the fiscal programming of sub-national governments. Fiscal forecasts are made based on macroeconomic assumptions jointly formulated by the Ministry of Finance, the central bank and the National Planning Department.

Even though the MFMP is a valuable tool for fiscal stance programming, it has some constraints from a macroeconomic perspective. On the one hand, the multi-annual primary balance targets are adjusted repeatedly for diverse reasons, thus lessening the initial commitments of the government. On the other hand, it does not assess explicitly the effects of the business cycle on tax revenues and expenditures, which increases the risk of procyclicality in fiscal policy. In fact, some studies have found some evidence of procyclicality of fiscal policy in Colombia and other emerging economies (Cárdenas et al., 2006, Lozano, 2011 and Ilzetzki and Végh, 2008).

To overcome the MFMP limitations, Law 1473, by which the central government adopted a quantitative fiscal rule, was passed in mid-2011. In addition to ensuring the sustainability of public debt and promoting a countercyclical fiscal policy stance, it is expected to alleviate the effects of exchange rate volatility on the economy's tradable activities, for it should foster better management of the resources generated by the mining and energy sectors. Furthermore, the framework of fiscal policy in Colombia was supplemented with a royalty law for the exploitation of natural resources, approved in 2011. This law aims at distributing royalty funds more equitably among the country's several regions and at saving their transitory component.

3. Public debt management in Colombia

Along with fiscal consolidation, in the last decade the Colombian authorities have sought to improve the composition of public debt in order to reduce the financial fragility of the government and to encourage the development of capital markets in the country. To that end, steps were taken to decrease the currency mismatch of the public sector, by shifting the composition of its debt from foreign currency denominated bonds and loans (mostly external debt) toward local currency denominated bonds (mostly internally issued). As a result, a substantial drop in a currency mismatch indicator was achieved for the central government (Graph 2)².

In turn, an effort has been made to change the composition of domestic debt from inflation or dollar indexed bonds toward fixed-rate peso denominated bonds (Graph 3). This process began in the late nineties with the inception of a market makers program, but was greatly enhanced by fiscal consolidation, the achievement of single digit inflation and a consistent convergence toward the long term inflation target (3%) in the 2000s. In September 2011 the stock of local, fixed-interest, peso denominated bonds (TES) accounted for 51.4% of total central government debt and represented 18.3% of GDP.

Besides increasing the participation of these instruments in total debt, government policy has successfully extended the maturity of the new issues throughout the last decade (Graph 4), a

² The indicator, inspired by Goldstein and Turner (2004) and Rojas-Suárez and Montoro (2011), attempts to capture the ability of the central government to serve its foreign currency-linked debt on the basis of its foreign currency-linked revenues. It is constructed as the ratio: $(FCD/TD) / (FCR/TR)$ for the central government. FCD = Foreign currency debt. TD = Total debt. FCR = Foreign currency-linked revenue, which includes external VAT, import tariffs, Ecopetrol (the state oil company) dividends, income taxes paid by mining companies and other exporting firms, and income derived from external assets. TR = Total revenue. Data sources: Banco de la República, DANE, DIAN, Ecopetrol, Supersociedades and Hamann et al. (2011).

sign of credibility in both fiscal and monetary policy (Hamann and González, 2011). The share of the outstanding stock of bonds with less than one year residual maturity has declined in the past ten years in favor of issues with maturity greater than five years, while the share of issues with residual maturity between three and five years has remained stable (Graph 5). Today the longest maturity in the TES market is fifteen years. This was important for the development of a fixed-rate mortgage loan market in the 2000s (Galindo and Hofstetter, 2008, and Hamann et al., 2010), and may have influenced the transmission of monetary policy shocks to other financial system interest rates, as will be discussed below.

4. The macroeconomic effects of the fiscal policy changes

The aforementioned improvements in fiscal and public debt management policy were large enough to have an impact on the behavior of the macroeconomy both in the long term and in response to exogenous shocks. This section explores some of those effects.

a. Effects on the sovereign risk premium

Among the most important goals of the structural adjustment process undertaken since the early 2000s were ensuring the sustainability of the public debt and strengthening the resilience of the economy in the face of external shocks. Specifically, the correction of structural imbalances and the shift in the trend of the public debt to GDP ratio reduced the probability of default of the Colombian government and the government's vulnerability to shocks impacting its revenues and expenses. Further, the fall of its currency mismatch reinforced the ability of the government to withstand a depreciation shock. At a more aggregate level, the decline in the government currency mismatch was part of a general trend that also included the private sector and allowed greater scope for exchange rate flexibility and the possibility of a countercyclical monetary policy response to external shocks. This, in turn, moderated the effect of those shocks on output and fiscal revenues.

Overall, the reduction in the public debt to GDP ratio and government currency mismatch decreased the credit risk of the government and the country. Hence, they contributed to a permanent drop in the sovereign risk premium and to a decline in its sensitivity to global risk aversion shocks.

To test the first implication, we estimated a model for the Colombian sovereign risk premium, measured by the EMBI Colombia, based on the following specification:

$$\text{embic}_t = a_0 + a_1 \text{gra}_t + a_2 (d/y)_t + a_3 \text{cm}_t + \epsilon_t$$

embic is the EMBI Colombia, *gra* is a measure of global risk aversion, *d/y* is the central government debt to GDP ratio and *cm* is the currency mismatch indicator calculated above. As measures of global risk aversion, the VIX and the 5-year high yield spread were used. All variables were expressed in logs and were non-stationary in the sample 1999.Q2-2011.Q4 (quarterly data). Cointegration was found for these systems based on the Hansen test (Hansen, 1992).

The long run relationships presented in Table 1 confirm the importance of local fiscal variables in the determination of the EMBI Colombia, beyond the effect of global risk aversion. In both specifications (with the VIX and the high yield spread as measures of global risk aversion) the government currency mismatch appears significant and with the expected positive sign. The debt to GDP ratio is also significant and with the expected positive sign in the specification that uses the VIX as the global risk aversion variable (Table 1, upper panel).

It is positive, but not significant in the specification that includes the high yield spread as the measure of global risk aversion (Table 1, lower panel)³.

The second implication, changing sensitivity of the sovereign risk premium to global risk aversion as a result of improved fiscal policy, is tested by Julio et al. (2012). Following Favero and Giavazzi (2004), these authors estimate a model in which the response of the EMBI Colombia to the spread between US BAA corporate bonds and 10-year US Treasury Bonds depends on the difference between the observed government primary surplus and the value of the primary surplus that would stabilize the debt to GDP ratio at each point in time. They posit a non-linear relationship in which large observed primary surpluses relative to their debt ratio-stabilizing values drive the sensitivity of the EMBI Colombia to global risk aversion toward zero, while the opposite situation increases that sensitivity.

Working on a monthly sample between 1998 and 2010, Julio et al. (2012) find that the sensitivity of the EMBI Colombia to their measure of global risk aversion does depend significantly on their fiscal health indicator. Furthermore, they find a structural break in the sensitivity function around mid-2006. After this period, there seems to be a substantial reduction of the sensitivity function, which the authors associate both with a permanent improvement in the Colombian fiscal health indicators and with the deterioration of public debt ratios in advanced economies.

In sum, the evidence presented in this section and in Julio et al. (2012) supports the hypothesis that the abovementioned improvements in fiscal policy and public debt management did permanently reduce the sovereign risk premium in Colombia and its sensitivity to global risk aversion shocks. The macroeconomic implications of this result are important.

First, it means that, *ceteris paribus*, the long term level of the real interest rate is lower today than a decade ago⁴. Based on the long run relationship presented in Table 1 (upper panel), on average, local factors (the decline in the government currency mismatches and the debt to GDP ratio) would imply roughly a 60% decrease in the EMBI Colombia between 2002.Q1-2006.Q4 and 2007.Q1-2011.Q4⁵.

Also, a permanent decrease in the risk premium entails a permanent adjustment in the long run level of the real exchange rate. Hence, it could be argued that part of the real appreciation of the Colombian peso in the past decade could be attributed to better fiscal policy. The permanent movement of the long run level of both the real interest rate and the real exchange rate has important consequences for the design and operation of monetary policy. It implies that the mean value of the *natural* interest rate is lower than ten years ago and that indicators of trend real exchange rates that give large weights to values from the early 2000s are probably biased.

Second, the empirical results suggest that the economy is generally less vulnerable to global risk aversion shocks because of the reduced sensitivity of the risk premium to them. This implies lower responses of the exchange rate and capital flows to those shocks, and, consequently, lower pressure on inflation, output and monetary policy.

³ Other factors that promote higher rates of long term growth may have also reduced the sovereign risk premium. In Colombia there were improvements in security, findings of large mineral and oil reserves, specific policies aimed at fostering investment and a permanent decrease in inflation throughout the decade.

⁴ Interestingly, the external real interest rate decreased in the same period, reinforcing the effect of a lower sovereign risk premium on domestic real interest rates. Also, the reduction in inflation volatility may have contributed to a decline in domestic long term real interest rates through smaller inflation risk premia.

⁵ We computed the changes in the logarithm of the average government currency mismatch indicator and the debt to GDP ratio between 2002.Q1-2006.Q4 and 2007.Q1-2011.Q4, and multiplied them by the corresponding elasticities from Table 1. We then added the calculated impacts.

b. Effects on the short-run response of output to government expenditure shocks

It is likely that the perception of households, firms and investors about the sustainability of the public debt and the financial fragility of the government influences their reaction to fiscal policy shocks. An unexpected increase in public expenditure may prompt an expectation of higher taxes in the short run in a dire financial situation of the government, thereby offsetting its possibly expansionary effect on output. Moreover, a similar shock in a small, open economy may sharply raise the sovereign risk premium, bringing about a tightening response of the monetary authority to curb currency depreciation and inflation, or a contraction of external finance and credit (Ilzetzki et al., 2009). When public debt sustainability is more certain or government currency or liquidity mismatches are low, the expansionary effects of a public expenditure shock may be greater.

To explore this hypothesis, the empirical strategy must carefully consider the problems of identification of a fiscal shock (finding the movement of fiscal variables that are *not* contemporaneous responses to output) and the anticipation of fiscal policy by the private sector. The first issue is crucial to avoid a bias in the estimation of the response of output to an exogenous fiscal shock and requires isolating the part of the movement in the fiscal variables that are purely discretionary, non-output related changes. The second issue is important because an anticipated fiscal policy shift may induce an anticipated response by the private sector consumption or output, so that the estimated response after the realization of the shift could be biased (Perotti, 2007).

SVAR models have been widely used in the literature to identify fiscal shocks⁶. Another technique, the so called “narrative approach”, uses dummy variables to measure the effects of fiscal policy shocks that are not related to movements of output (e.g. wars, “ideological” policy shifts, output-independent cross sectional effects, etc.)⁷. In Colombia, SVAR models used to estimate the effect of fiscal policy shocks on output have rendered results that range from negligible impacts (Restrepo and Rincón, 2006) to positive expenditure multipliers between 1.1 and 1.2 (Lozano and Rodríguez, 2011). However, these studies include a relatively long sub-period in which the exchange rate was not as flexible as after 1999 (crawling peg or target zone regimes). Consequently, their estimated impacts may be affected by a structural break related to the adoption of a floating exchange rate regime⁸.

Our approach differs from the previous work in three important dimensions. First, our sample covers only the floating exchange rate period (1999-2011). Second, we are interested in capturing a possibly changing effect of public expenditure shocks, as fiscal policy became sounder throughout the 2000s. This implies the use of a non-linear technique that allows for a smooth transition between regimes that are defined according to indicators of fiscal health. Third, since we do not estimate a SVAR, we identify the government expenditure shock based on innovations on the public spending announcements for the central government⁹.

⁶ See, for example, Blanchard and Perotti (2002) for the US, and Perotti (2004), and Caldara and Kamps (2008) for the OECD countries.

⁷ See Perotti (2007) and Romer (2011).

⁸ Standard Mundell-Fleming theory suggests that the exchange rate regime makes a difference regarding the effect of fiscal policy shocks in a small, open economy. See Ilzetzki et al. (2009) for some evidence about the differences of output responses to fiscal shocks in economies with flexible and pegged exchange rates.

⁹ We do not study the effects of tax shocks due to the difficulties involved in their identification and the problems derived from the sensitivity of the theoretical results to the time profile of distortionary tax responses (Perotti, 2007).

Following Auerbach and Gorodnichenko (2012), instead of estimating a SVAR and deriving standard impulse response functions, we approximate the non-linear impulse response function by the following linear projection:

$$Y_{t+h} = G(z_t) (Y_1^h F_t + L_1(L) Y_{t-1}) + (1-G(z_t)) (Y_2^h F_t + L_2(L) Y_{t-1}) + \epsilon$$

The impulse response function of output (Y_{t+h}) to an unexpected government expenditure shock (F_t) is estimated directly by $G(z_t) Y_1^h + (1-G(z_t)) Y_2^h$, where Y_1^h and Y_2^h are estimated by least squares (for details see Jordà, 2005).

Notice that the impulse response function depends on the value of the variable z_t . In our case, z_t is a fiscal health indicator. At a given point in time the impulse response function may be understood as a combination or “average” of the functions corresponding to the extreme states of the fiscal health indicators (e.g. “High Debt” vs. “Low Debt”, or “High Currency Mismatch” vs. “Low Currency Mismatch”). The weight of each extreme state will be given by the transition function $G(z_t) = e^{g z_t} / (1 + e^{g z_t})$, which measures how close the fiscal health indicator of the moment is to one extreme state or to the other.

The above technique requires the definition of an exogenous government spending shock, F_t , outside the model that meets the criteria of no anticipation and no contemporaneous correlation with output. To do so, we define the shock as the difference between the actual central government primary expenditures (overall spending without interest payments on public debt) and the forecast made of this variable¹⁰. For the OECD countries, these predictions are typically taken from professional forecasting surveys. Since this type of information is not available for Colombia, we derived it from the Ministry of Finance’s announced Financial Plans, as explained in Appendix 1. The fiscal shocks thus computed are not anticipated by construction, nor are they correlated with current output because of the lag with which output and other real activity data are available, and the lag with which expenditure decisions are executed¹¹.

As fiscal health variables, z_t , we used the central government debt to GDP ratio, the government currency mismatch and the difference between the observed government primary surplus and the value of the primary surplus that would stabilize the debt to GDP ratio at each point in time (Graph 6)¹². The impulse response functions of output to a government expenditure shock are estimated using quarterly data for the 1999-2011 sample.

The results in Graphs 7 and 8 suggest that there were important changes in the response of output to the fiscal shock throughout the decade, as fiscal health indicators improved markedly¹³. The responses in the beginning of the decade were, when positive, small and short-lived; in other cases, they were negative on impact and non-significant afterwards. When the debt to GDP ratio stopped rising or the primary surplus deviation from its debt-stabilizing level increased (2002-2003), output responses turned positive and remained significantly different from zero for several periods. Interestingly, the positive reactions seem

¹⁰ Due to data availability, we use central government primary expenditure, which corresponds roughly to two thirds of total general government primary expenditure.

¹¹ A potential drawback of our measure of expenditure shock is that we cannot separate public consumption, investment, transfers and subsidies expenses, since the government Financial Plans do not disaggregate the outlays in these categories. We are then capturing the effects of a shock to aggregate central government expenditure. This may be a problem if the macroeconomic effects of public consumption, investment and transfer shocks are very different, and if the composition of the aggregate shocks changes significantly from year to year.

¹² See Julio et al. (2012) for details on the construction of this series.

¹³ The technique used allows us to estimate the impulse-response functions with confidence intervals for each quarter in the sample. The results presented in Graphs 8 to 10 correspond to the average responses for each year with the confidence interval calculated appropriately. We used four lags of GDP in the estimation.

to be clearer and larger when the primary surplus is higher (2007-2008) (Graph 8), although in no case the estimated conditional government expenditure multipliers exceed one. Similarly, the output responses related to low government currency mismatches (2005-2011) were in general significantly positive for several quarters, unlike the responses observed in years of high currency mismatches (1999-2004) (Graph 9)¹⁴.

Hence, the stronger the financial position of the government, the greater the power of fiscal (expenditure) policy to affect output. The implication of this result for the assessment of the convenience of countercyclical fiscal policy is apparent; i.e., a sound public finance situation not only has benefits in terms of permanently lower real interest rates and lower vulnerability of the economy to global risk aversion shocks, but also seems to enhance the effectiveness of countercyclical fiscal policy.

c. Effects on the transmission of monetary policy shocks to market interest rates

As the fiscal situation improved structurally and monetary policy gained credibility throughout the 2000s (Hamann and González, 2011), the transmission of monetary policy shifts to financial market interest rates may have been strengthened. To begin, under a more credible monetary policy regime, a movement in overnight policy rates is more likely to be incorporated in longer term public bonds and financial system interest rates because the policy change will most probably be perceived by market participants as a persistent signal on the policy stance, instead of a noisy policy error to be undone in the near future.

Furthermore, as mentioned above, the enhanced credibility of a low and stable inflation rate as well as a stronger perception of public debt sustainability permitted the extension of the maturity of fixed-rate public bonds. Consequently, the depth and liquidity of longer term public bond markets may have been increased, thereby making their prices a better guide for interest rate setters in the financial system and allowing them to better filter the news from a monetary policy shock.

To explore the relevance of these hypotheses, we use the same non-linear model from the previous section to test whether the transmission of monetary policy shocks to public bond interest rates (TES) and deposit or loan rates changed as the maturity of the government fixed income market was expanded throughout the 2000s. Specifically, we estimate the following monthly models for TES and market interest rates:

$$ites_{t+h} = H(z_t) (P_1^h M_t + G_1(L) ites_{t-1} + Sr_t) + (1-H(z_t)) (P_2^h M_t + G_2(L) ites_{t-1} + Sr_t) + \epsilon_t$$

$$im_{t+h} = J(z_t) (F_1^h M_t + B_1(L) im_{t-1} + K_1(L) ites_{t-1}) + (1-J(z_t)) (F_2^h M_t + B_2(L) im_{t-1} + K_2(L) ites_{t-1}) + \epsilon_t$$

The response of TES rates, $ites_{t+h}$, to an unanticipated monetary shock, M_t , is approximated directly by $H(z_t) P_1^h + (1-H(z_t)) P_2^h$ in a linear projection estimated by least squares (Jordà, 2005)¹⁵. Notice that this response is allowed to change as a function of the maturity of the new issues of fixed-rate TES (z_t = long term component of the average maturity of new issues) (Graph 4). A similar model is estimated for the response of market (deposit or loan)

¹⁴ When interpreting the impulse-response functions presented in Graphs 8 to 10, it must be recalled that they are *conditional* on the state of the fiscal variable used to define the regime. For example, in 2004 the responses of output to the fiscal shock were generally positive when the fiscal variable regime was measured by the difference between the primary surplus and its debt-stabilizing level, but essentially zero when the fiscal variable regime was measured by the government currency mismatch. This means that the response of output *conditional* on the surplus variable of that year was significantly positive, but the response *conditional* on the currency mismatch observed in the same year was non-significant. Overall, it may be concluded that the probability of a positive impact of a fiscal shock on output increased in 2004 with respect to previous years in which all conditional responses were non-significant, but was smaller than in later years, when all conditional responses were statistically positive.

¹⁵ The equation for the TES rates controls for the influence of the EMBI Colombia, p_t .

interest rates, im_{t+h} , to an unanticipated monetary shock, M_t , but the controls include lagged values of both market and TES rates with similar maturities.

The definition of monetary shock is crucial to minimize the bias of the estimated impulse response functions. If a change in the policy interest rate is anticipated by market participants, then it would be incorporated in longer term TES or financial system interest rates before it happens. When the change occurs, the reaction of longer interest rates will be null, leading to an estimated negligible transmission of monetary policy. Therefore, the estimated monetary policy shock must be unanticipated and, so, orthogonal to all information that might be relevant to predict the policy rate at each point in time. Appendix 2 provides some details on the estimation of the monetary policy shock that is used in our estimations.

The results for the transmission of policy rates to TES interest rates are shown in Graphs 10 to 13¹⁶. There seem to be two clearly different regimes: one between 2002 and 2003, the other between 2005 and 2011, and a transition year in 2004. Between 2002 and 2003 there were *negative* monetary shocks (Graph 29), meaning that the market expected policy rate increases that did not happen. According to Graphs 10 to 13, 0-5 year TES rates increased and the zero coupon curve steepened up to the sixth month after the shock. TES rates for maturities greater than five years slightly declined on impact, but rose sharply afterwards¹⁷. In contrast, between 2005 and 2011, the monetary shock took both positive and negative values and its volatility was substantially smaller (Graph 29). In this period all TES rates rose with a positive monetary shock, while the zero coupon curve generally flattened afterwards, as can be seen by comparing the impacts across time and maturity.

A possible interpretation of these results is that the monetary policy response to the risk aversion shock, the peso depreciation and rising core inflation observed between 2002 and 2003¹⁸ was deemed insufficient by the market, so it was judged as a policy mistake that would require a correction over the short term (hence the response of the 0-3 year bond prices) or would risk a future rise of inflation (hence the response of the bonds with maturity greater than 3 years). Alternatively, there may be omitted variables that account for the negative response of the TES rates to the monetary policy shock, even though the econometric model controls for the effects of the contemporaneous sovereign risk premium shock¹⁹. After 2004 monetary policy shocks are smaller and the curve seems to shift upward and flatten after a positive shock, a plausible sign of greater credibility of monetary policy²⁰.

With respect to the transmission of monetary policy shocks to market interest rates, there is also evidence of a structural change linked to the average maturity of new issues of TES. The main findings in this regard may be summarized as follows:

- For all loan and deposit rates considered there are two regimes: In the first, between 2002 and 2003, a positive monetary shock produces non-significant or, in few

¹⁶ The technique used allows us to estimate the impulse-response functions with confidence intervals for each month in the sample. The results presented in Graphs 11 to 14 correspond to the average responses for each year with the confidence interval calculated as before. We used one lag of TES rates in the estimation.

¹⁷ Given the units of the TES rates and the monetary shock, an impulse-response value of 100 corresponds to a one-to-one transmission of the monetary shock.

¹⁸ Following a sharp increase in the EMBI the second semester of 2002, the COP depreciated by 23.3% between June 2002 and March 2003, while annual CPI (without food) inflation rose from 5.5% on average in the first semester of 2002 to 6.6% on average in the first semester of 2003.

¹⁹ In particular, during those years there was a strong disturbance in the TES market after a sovereign risk aversion shock because banks cut funding to brokers that had leveraged to invest in these securities. It is possible then that, due to fire-sales of TES, their prices fell beyond what could be explained by fundamentals.

²⁰ This response implies that the monetary surprise is expected to persist and is therefore transmitted to longer rates (i.e. is not considered a policy mistake).

cases, negative responses of market rates. In the other, between 2005 and 2011, there are generally positive, significant responses of market rates to a monetary shock. As in the case of the TES rate responses, 2004 seems to have been a transition year (Graphs 10-27).

- The response of commercial loan rates after 2004 is monotonically increasing, reaching values that indicate a reaction greater than one-to-one after one year. This contrasts with the responses of the TES rates at similar maturities and suggests that corporate credit risk premia may rise after a positive monetary shock.
- The response of consumer loan rates with maturity less than one year after 2004 is initially negative, but positive six months after the monetary shock and less than one-to-one. For longer maturities, the response is very small for the first five or six months after the shock, but increases afterwards, reaching values that indicate a reaction greater than one-to-one after one year.
- Deposit (CD) interest rates with maturities less than one year increase with the monetary shock, reaching values that indicate a reaction close to one-to-one. CD interest rates with maturity greater than one year show a response larger than one-to-one after one year.

The contrast between the responses before and after 2004 may be a sign of rising credibility of monetary policy throughout the decade, as in the case of the TES rate responses. The lengthening of the maturity of TES could serve as a proxy for this increased credibility. However, it is indicative that, unlike the TES rate reaction in 2002-2003, several market rates did not display a negative, significant response to the monetary shock in the same years. Thus, other phenomena could have influenced the estimated change in the transmission.

The extension of the maturity of new TES issues and the TES stock may have enhanced the role of the public debt market in the determination of financial system interest rates, by providing liquid, reliable “risk-free” benchmarks at more maturities than before. In turn, this may have reinforced the transmission of monetary shocks to lending and deposit rates. Without reliable “risk-free” benchmarks, interest rate setters had to produce an individual forecast of the future path of short term policy rates in order to determine longer term deposit or loan interest rates. Such a forecast could be compared with other agents’ forecasts only with lags and noise, through the examination of competitors’ interest rates. In these circumstances, future policy forecasts may be rather inaccurate, and a policy shock may be more frequently associated with a forecast error than with a signal of a changing policy stance. Hence, transmission could be low.

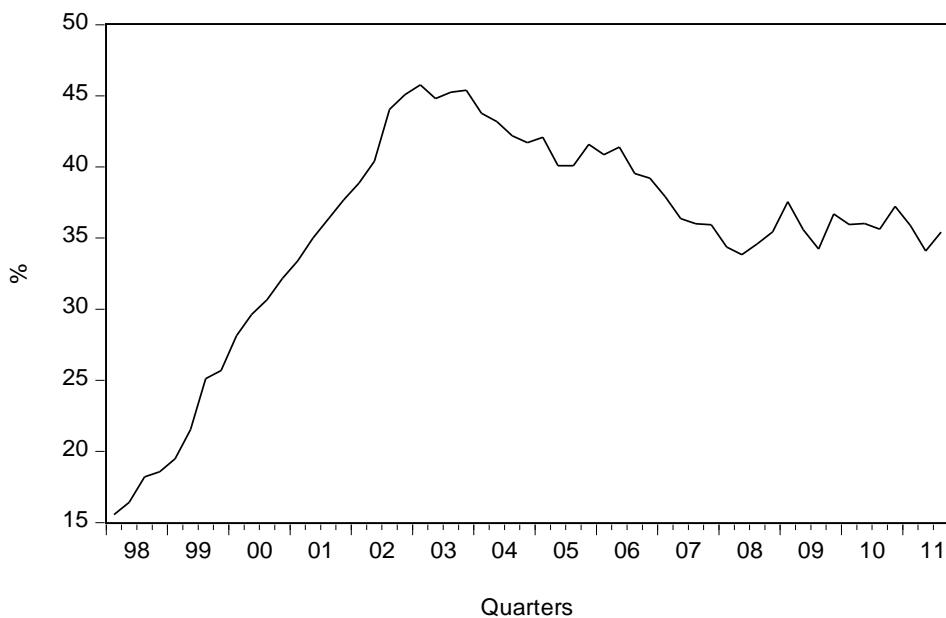
In the presence of a liquid TES market, interest rate setters could have an immediate, centralized source of information regarding others’ views on future monetary policy. As a consequence, the forecasts of future policy rates may have become more precise and a monetary policy shock could be more frequently interpreted as a signal of changing policy stance than as simple forecast error noise. Given that monetary policy shifts have some persistence (they are rarely undone in the short term), the surprise involved in the shock is informative of a path of future central bank interest rates that is likely to be higher or lower than previously expected. Hence, transmission could be greater.

5. Conclusion

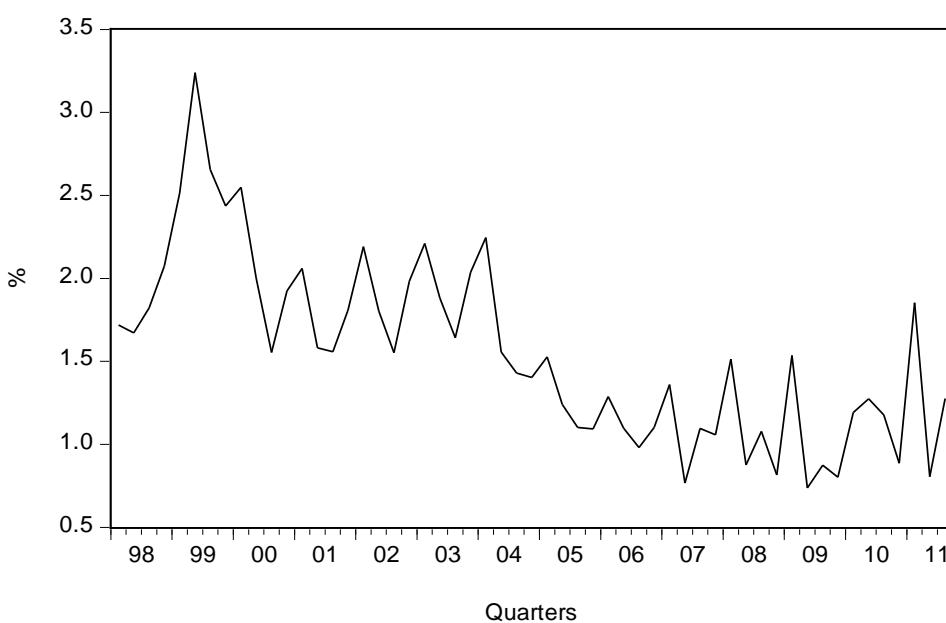
In the past decade the Colombian authorities undertook a series of measures that reduced the structural fiscal deficit, corrected a possibly unsustainable public debt path, decreased the government currency mismatch and deepened the local fixed-rate public bond market. The evidence in this paper suggests that these improvements had profound effects on the behavior of the macroeconomy. More specifically, they permanently reduced the sovereign

risk premium (with the ensuing effects on the real interest and exchange rates), increased the reaction of output to (unexpected) government expenditure shocks (but still with multipliers lower than one) and may have strengthened the response of market interest rates to (unanticipated) monetary policy interest rate shocks. As a corollary, increased soundness of fiscal policy may not only result in permanently lower costs of funding for all agents in the economy, but may also enhance the power of fiscal and monetary policy to act countercyclically.

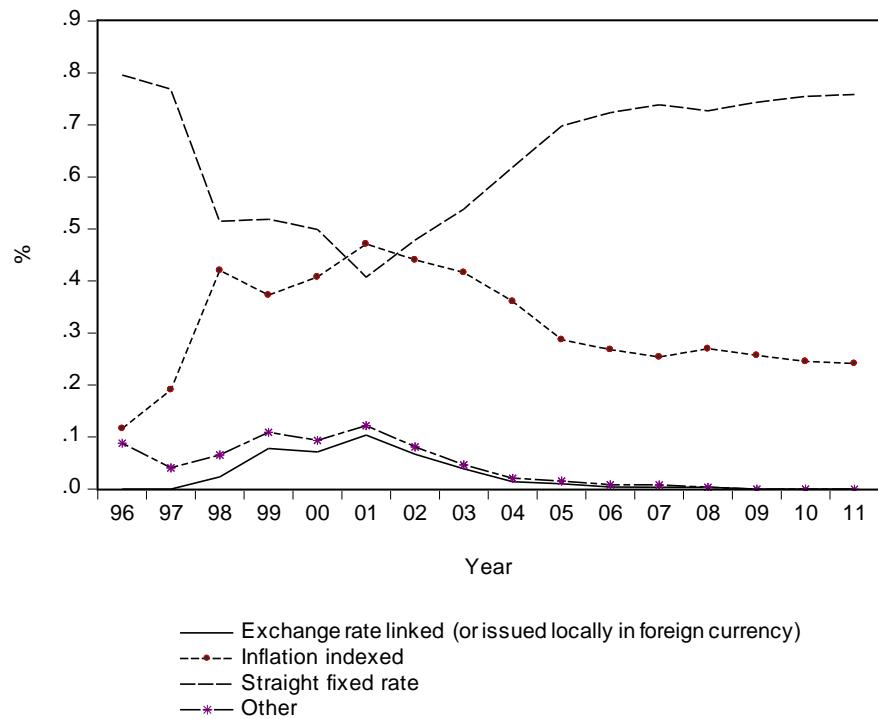
Graph 1
Central government debt to GDP ratio



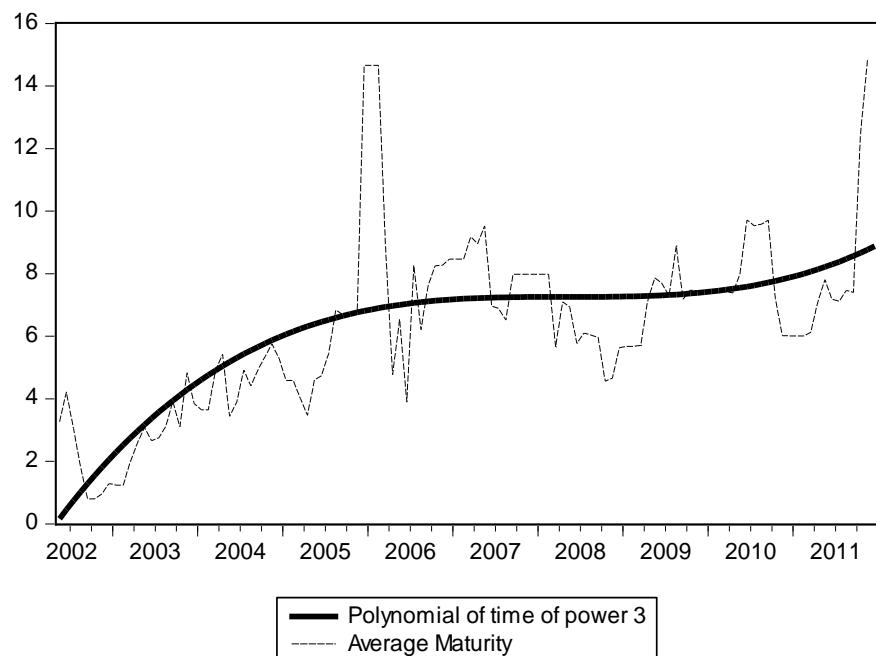
Graph 2
Currency mismatch indicator for central government



Graph 3
Composition of the domestic public debt



Graph 4
Average maturity of new issues of TES



Graph 5
Maturity composition of the fixed-rate TES stock

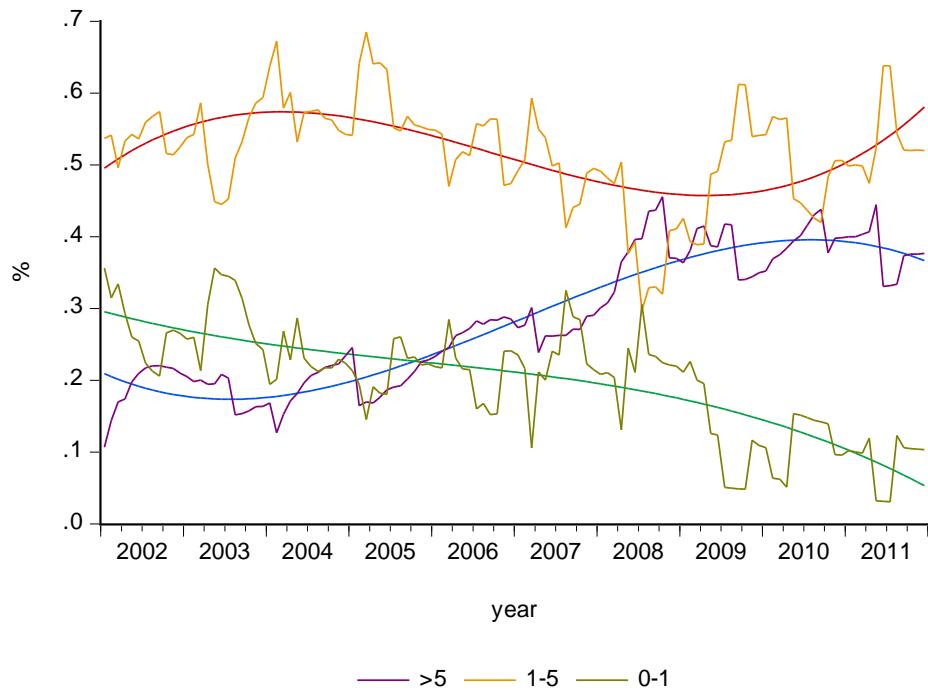


Table 1
Determination of the EMBI Colombia: long run relationships

Dependent variable: EMBI Colombia				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
gra: LVIX	0.6266	0.1700	3.6847	0.0006
log(d/y)	0.8529	0.3850	2.2153	0.0321
log(cm)	1.2614	0.1669	7.5569	0.0000
C	0.4002	1.6093	0.2487	0.8048

Cointegration Test Hansen (1992)

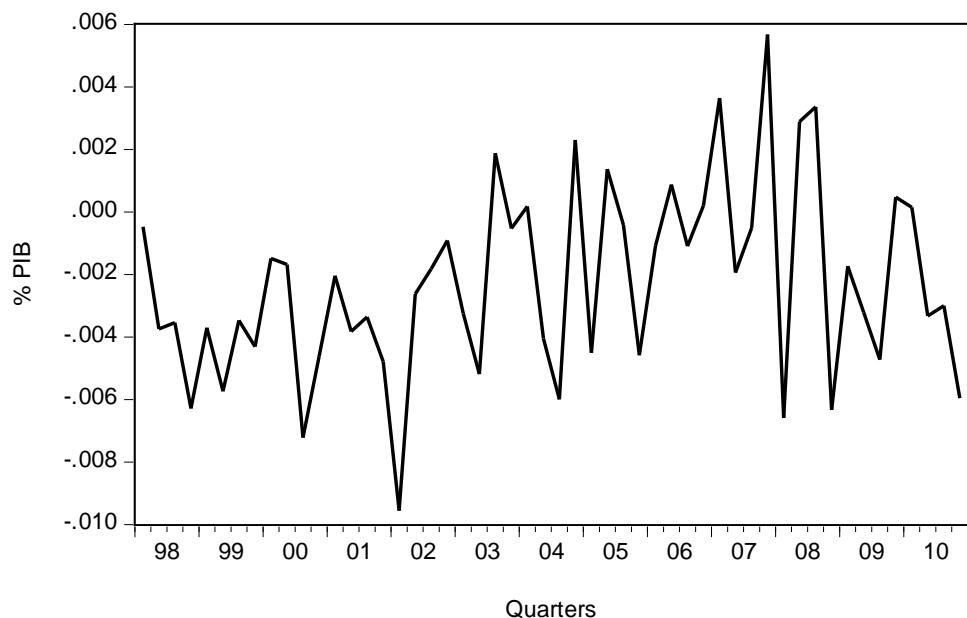
LM= 0.392339 p-value >0.20

Dependent variable: EMBI Colombia				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
gra: LSPREAD	0.5565	0.1229	4.5281	0.0000
log(d/y)	0.5061	0.3247	1.5586	0.1264
log(cm)	1.3208	0.1446	9.1328	0.0000
C	2.5258	1.2213	2.0681	0.0447

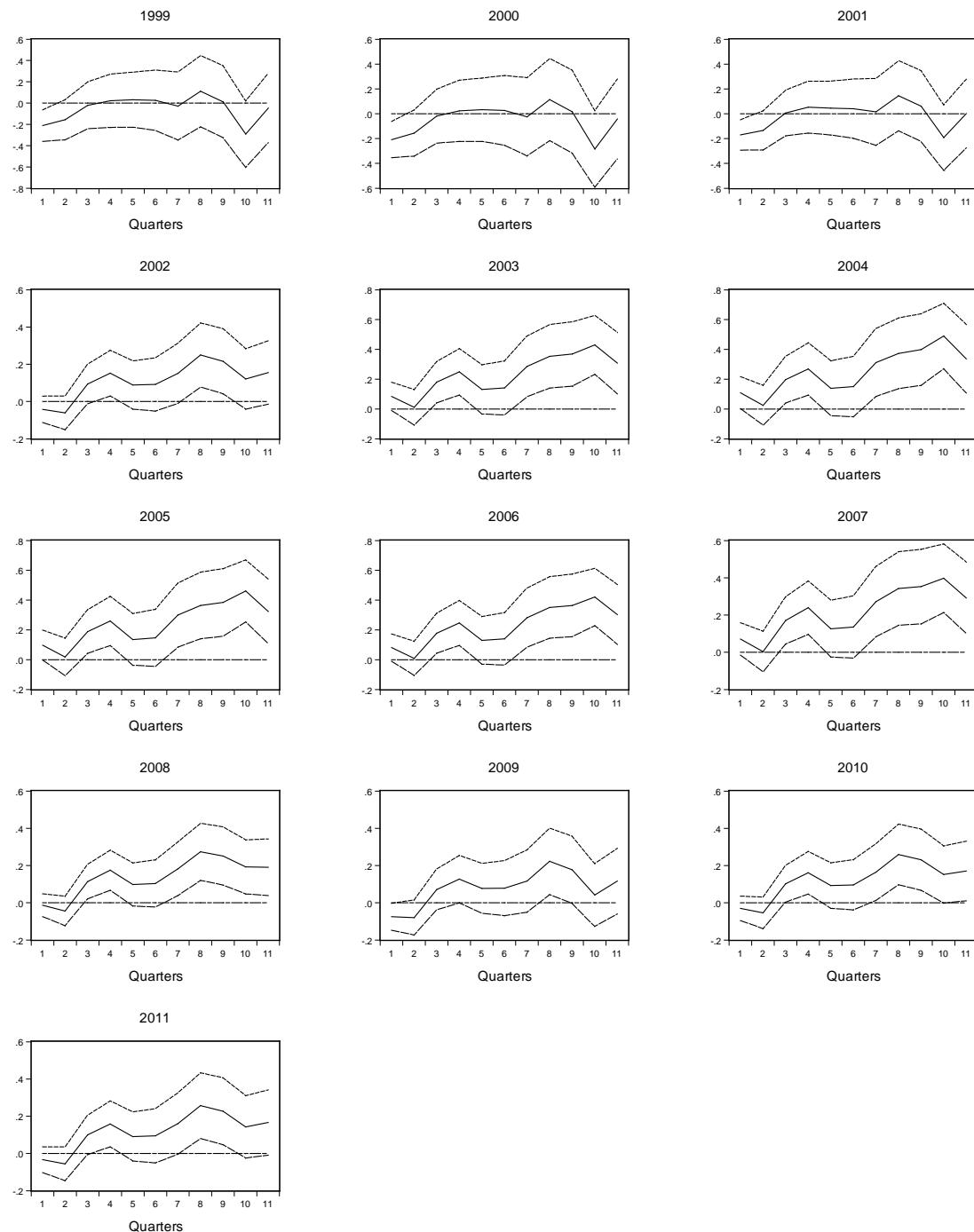
Cointegration Test Hansen (1992)

LM=0.474112 p-value >0.20

Graph 6
Difference between actual and debt-stabilizing primary balances
(% of GDP)

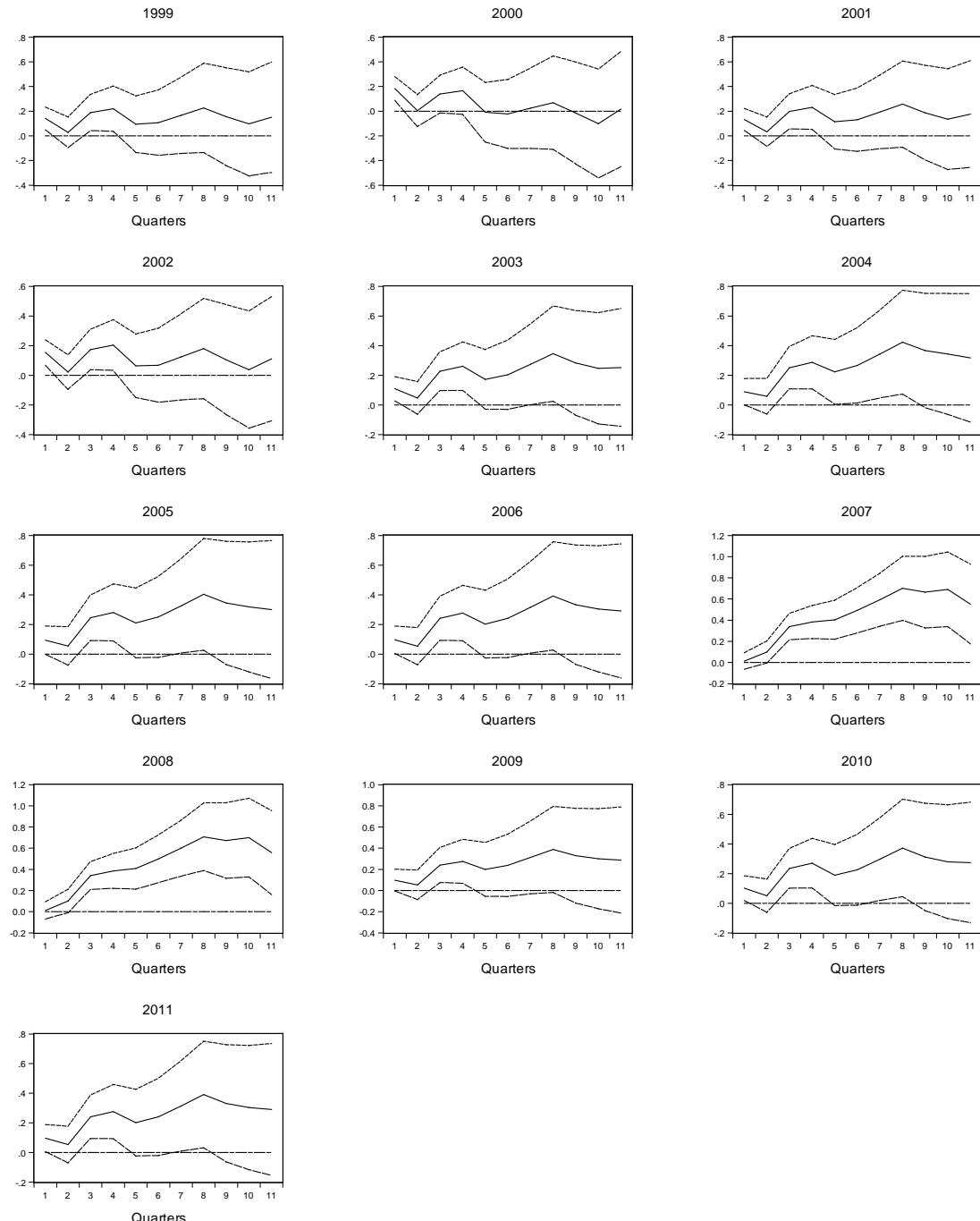


Graph 7
**Fiscal policy shock: Output responses conditional
on the debt to GDP ratio**

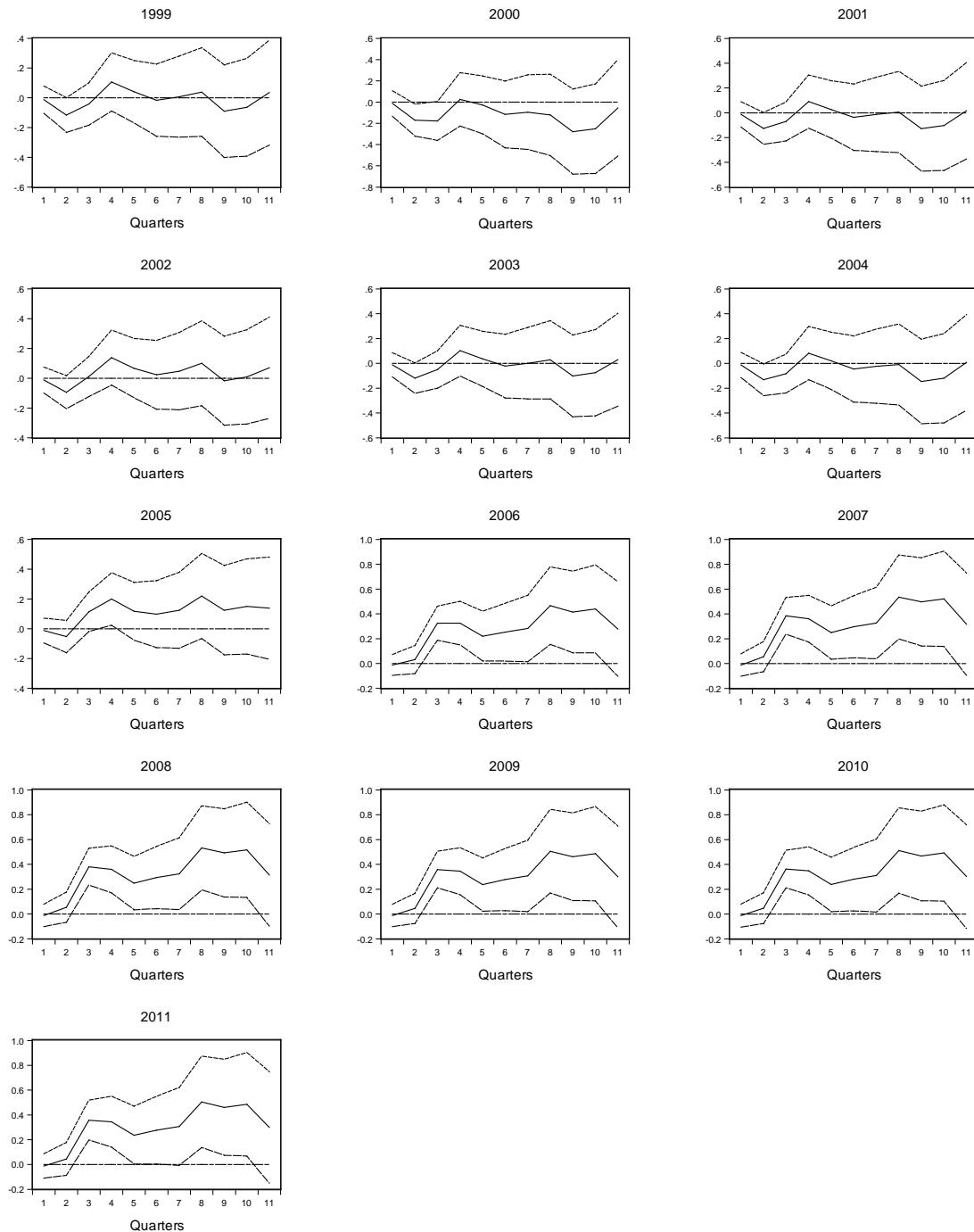


Graph 8

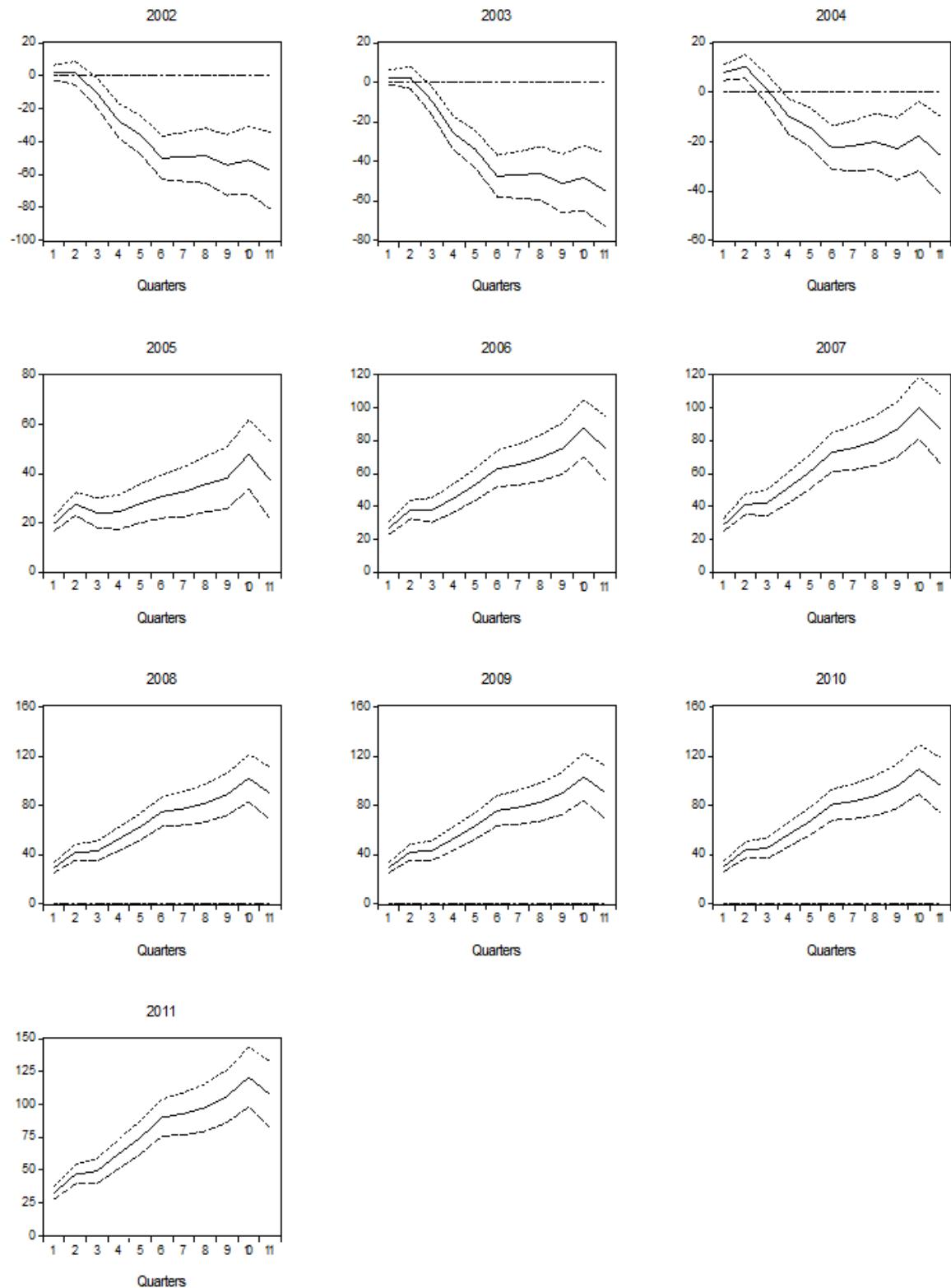
Fiscal policy shock: Output responses conditional on the difference between actual primary balance and its debt-stabilizing level



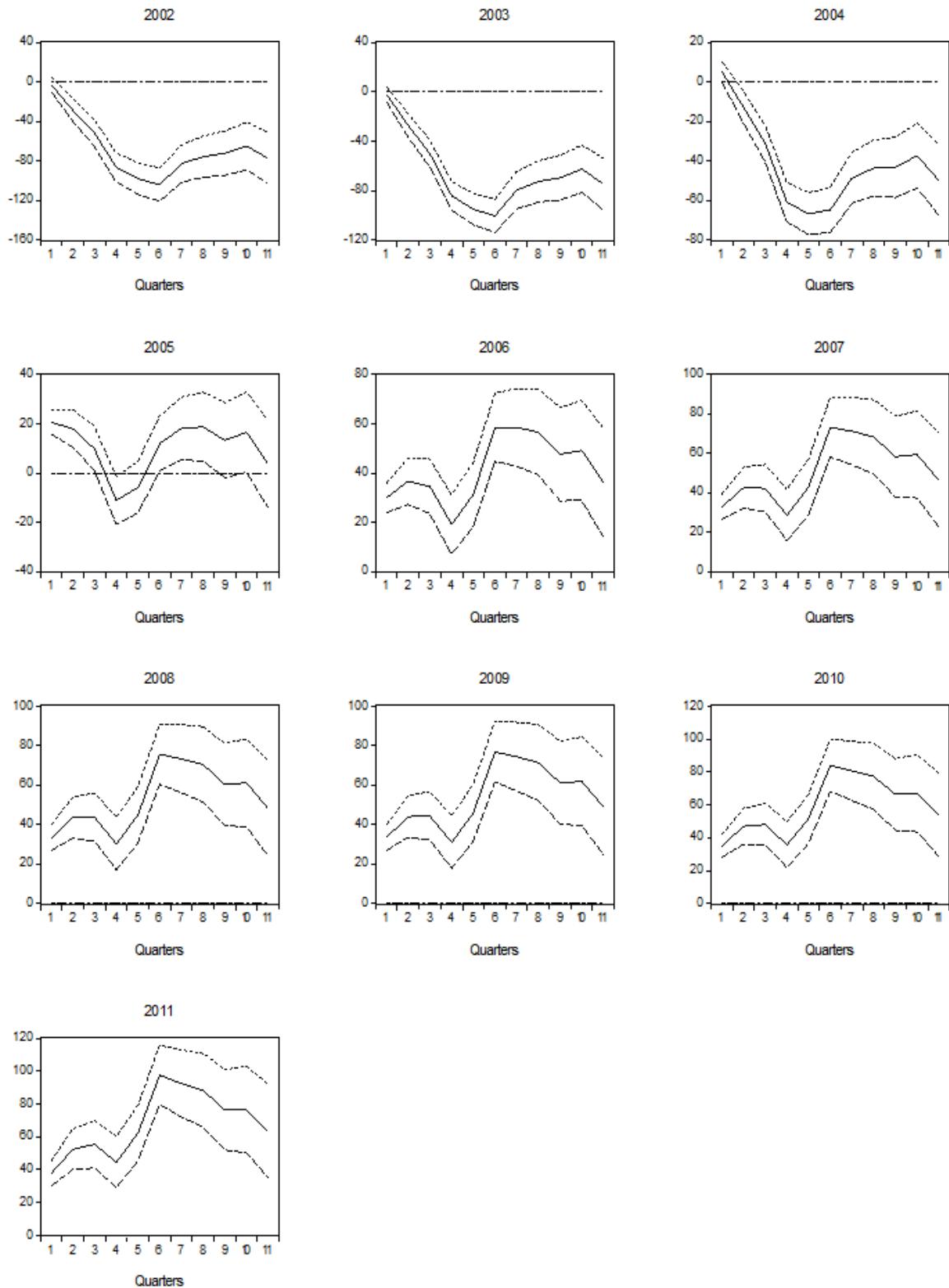
Graph 9
**Fiscal policy shock: Output responses conditional
on the currency mismatch indicator**



Graph 10
Monetary policy shock: Response of TES with maturity less than one year conditional on the average maturity of new issues of fixed-rate TES

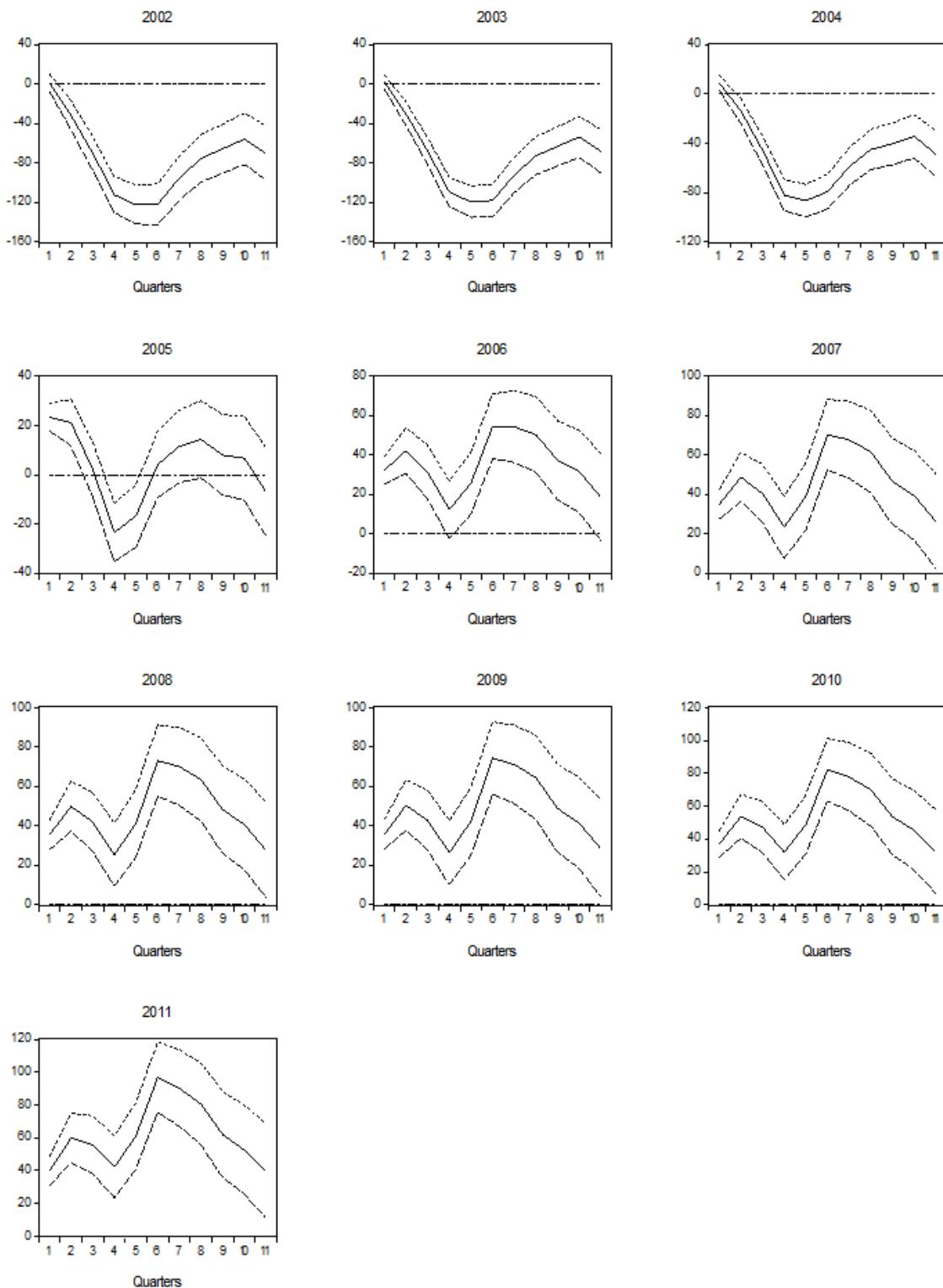


Graph 11
**Monetary policy shock: Response of TES with maturity
 between one and three years conditional on the average maturity
 of new issues of fixed-rate TES**



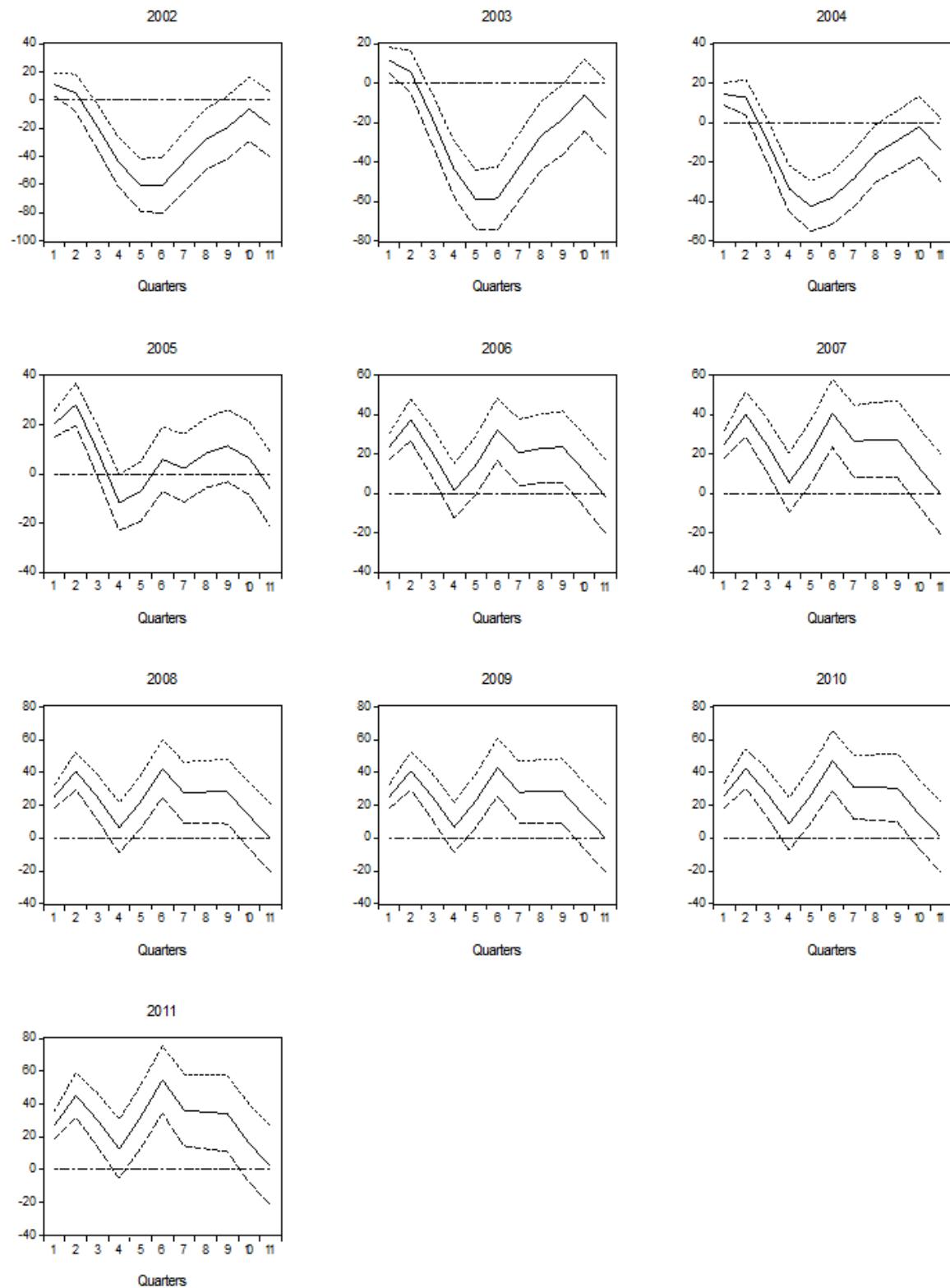
Graph 12

Monetary policy shock: Response of TES with maturity between three and five years conditional on the average maturity of new issues of fixed-rate TES

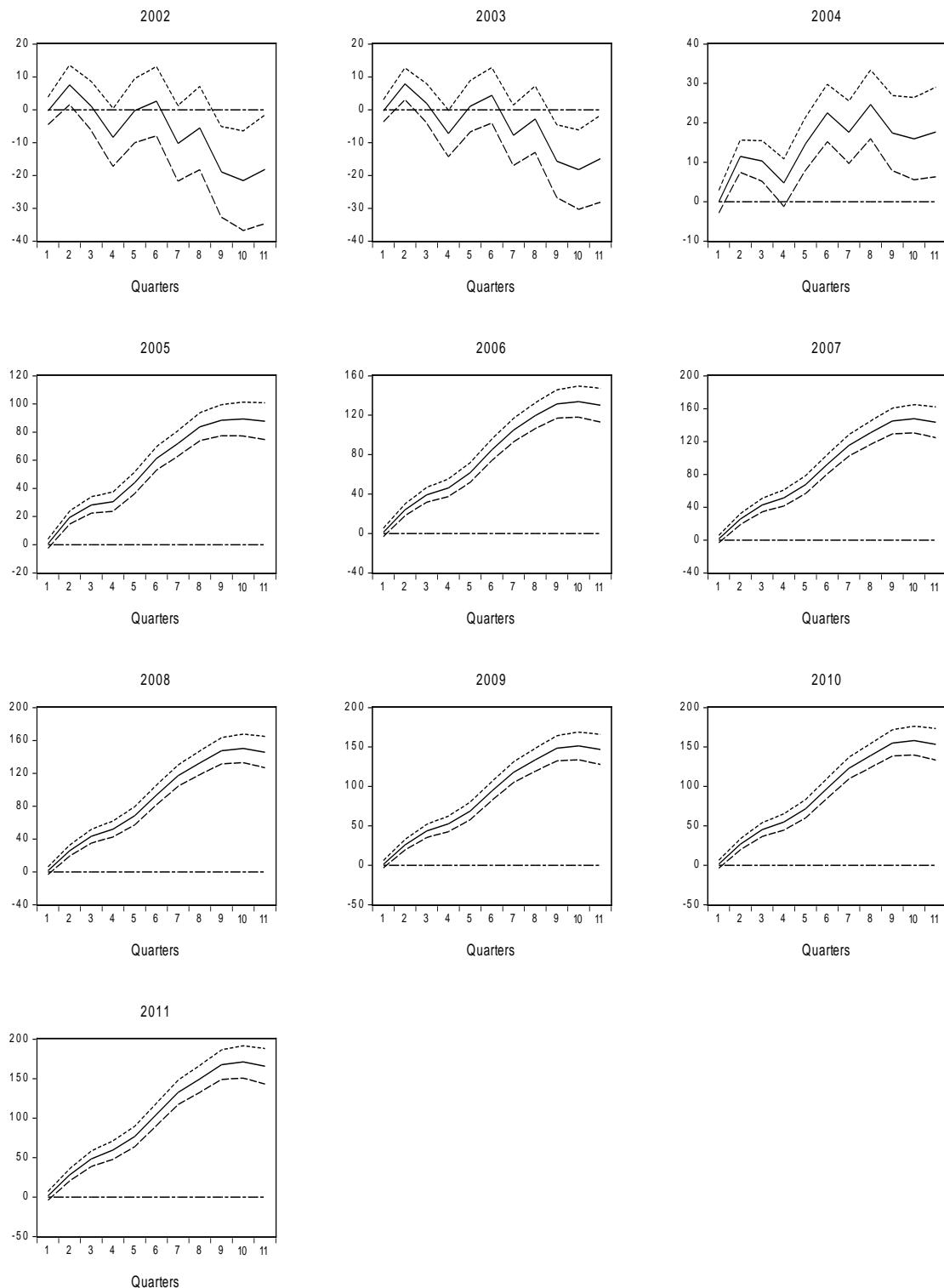


Graph 13

Monetary policy shock: Response of TES with maturity greater than five years conditional on the average maturity of new issues of fixed-rate TES

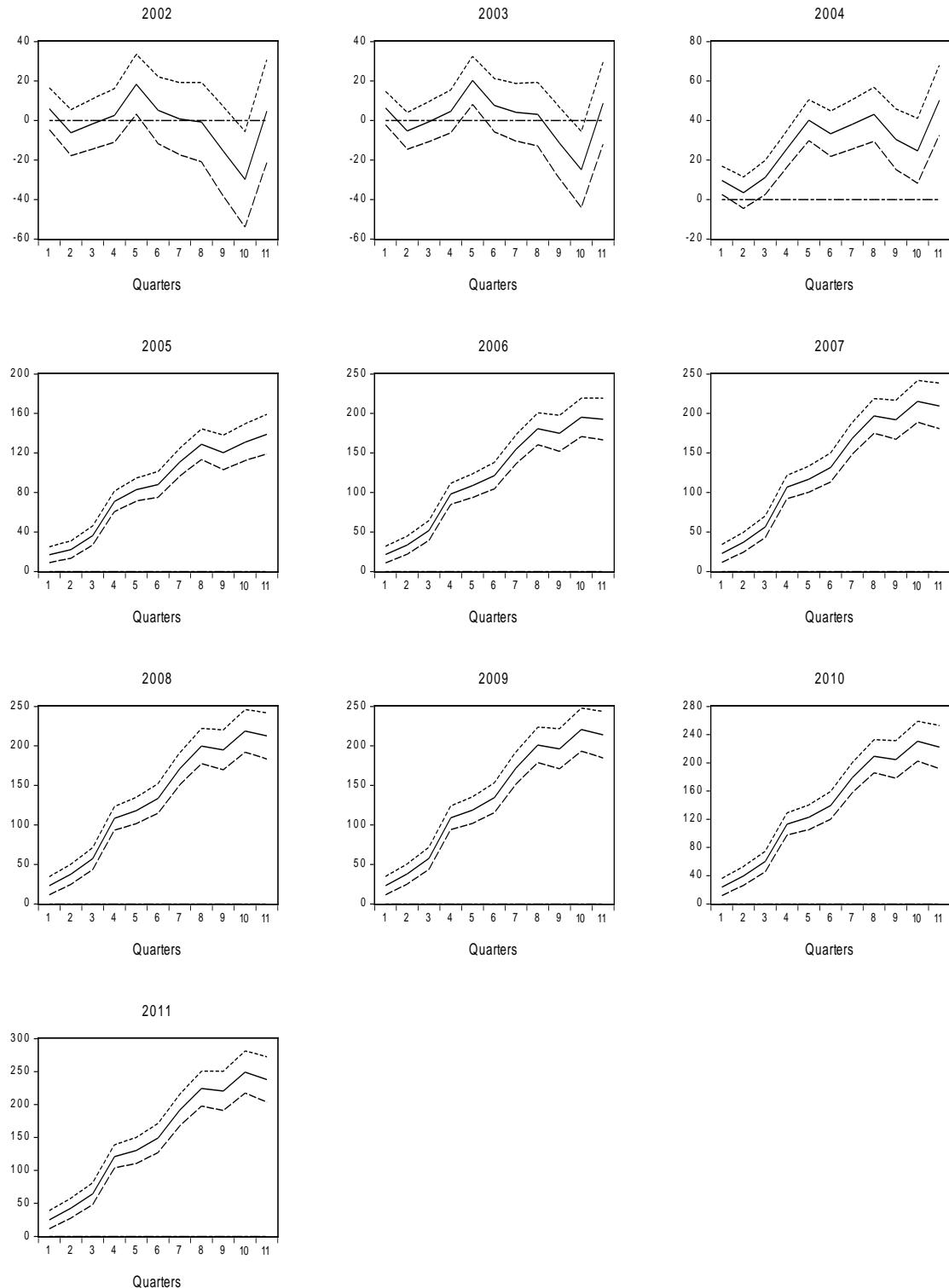


Graph 14
**Monetary policy shock: Response of commercial loan rate
with maturity less than one year conditional on the
average maturity of new issues of fixed-rate TES**



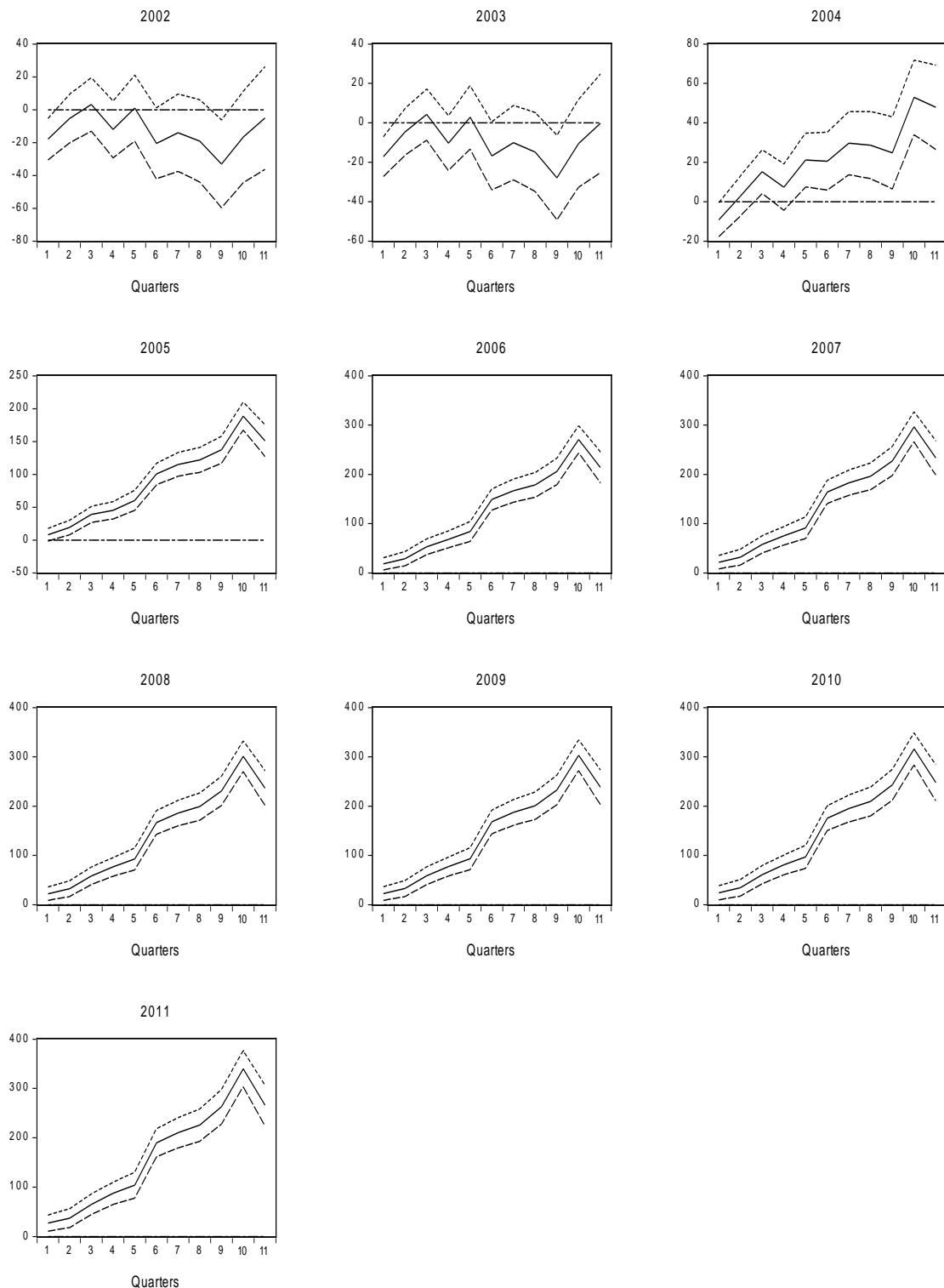
Graph 15

Monetary policy shock: Response of commercial loan rate with maturity between one and three years conditional on the average maturity of new issues of fixed-rate TES

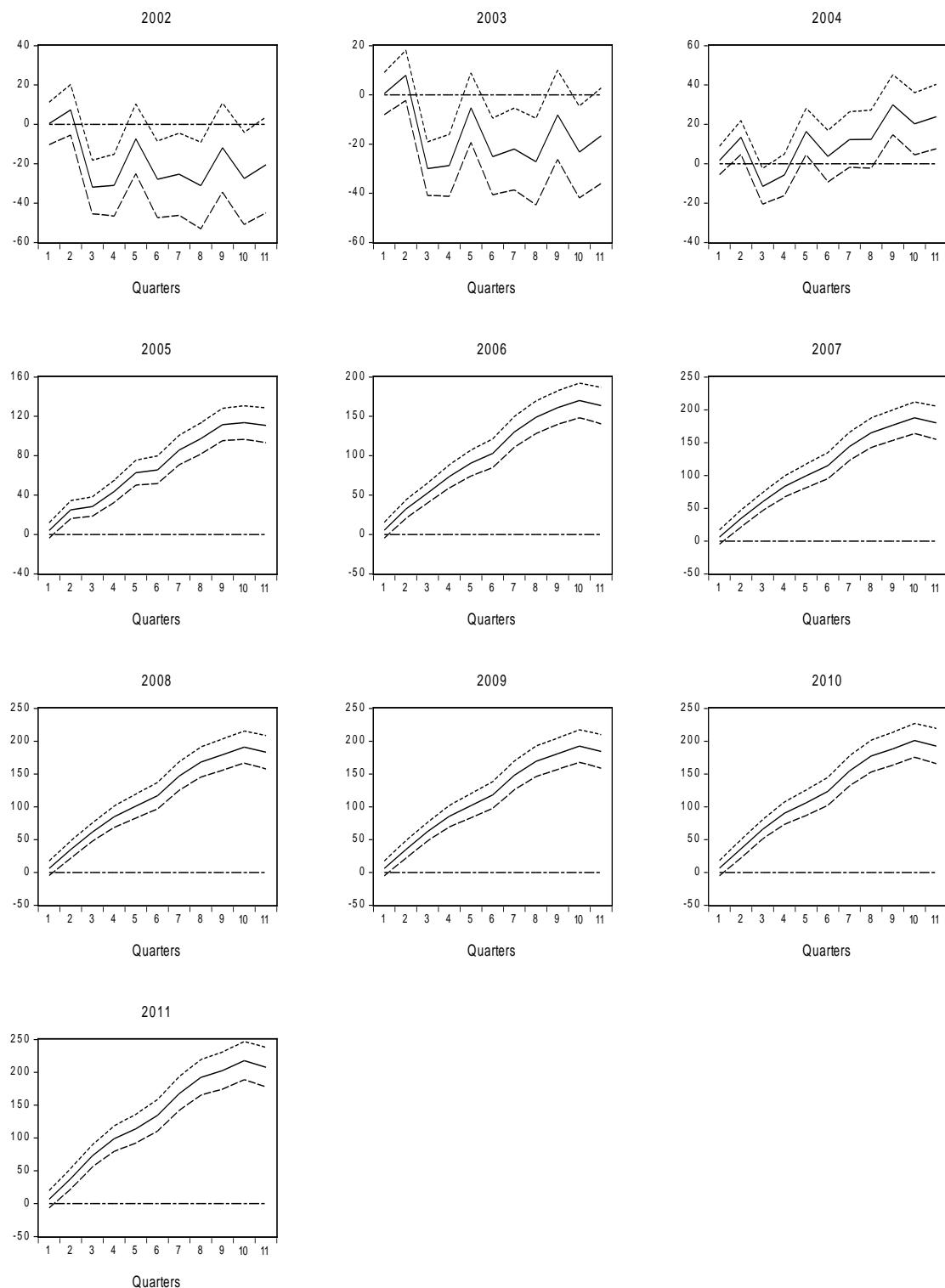


Graph 16

Monetary policy shock: Response of commercial loan rate with maturity between three and five years conditional on the average maturity of new issues of fixed-rate TES

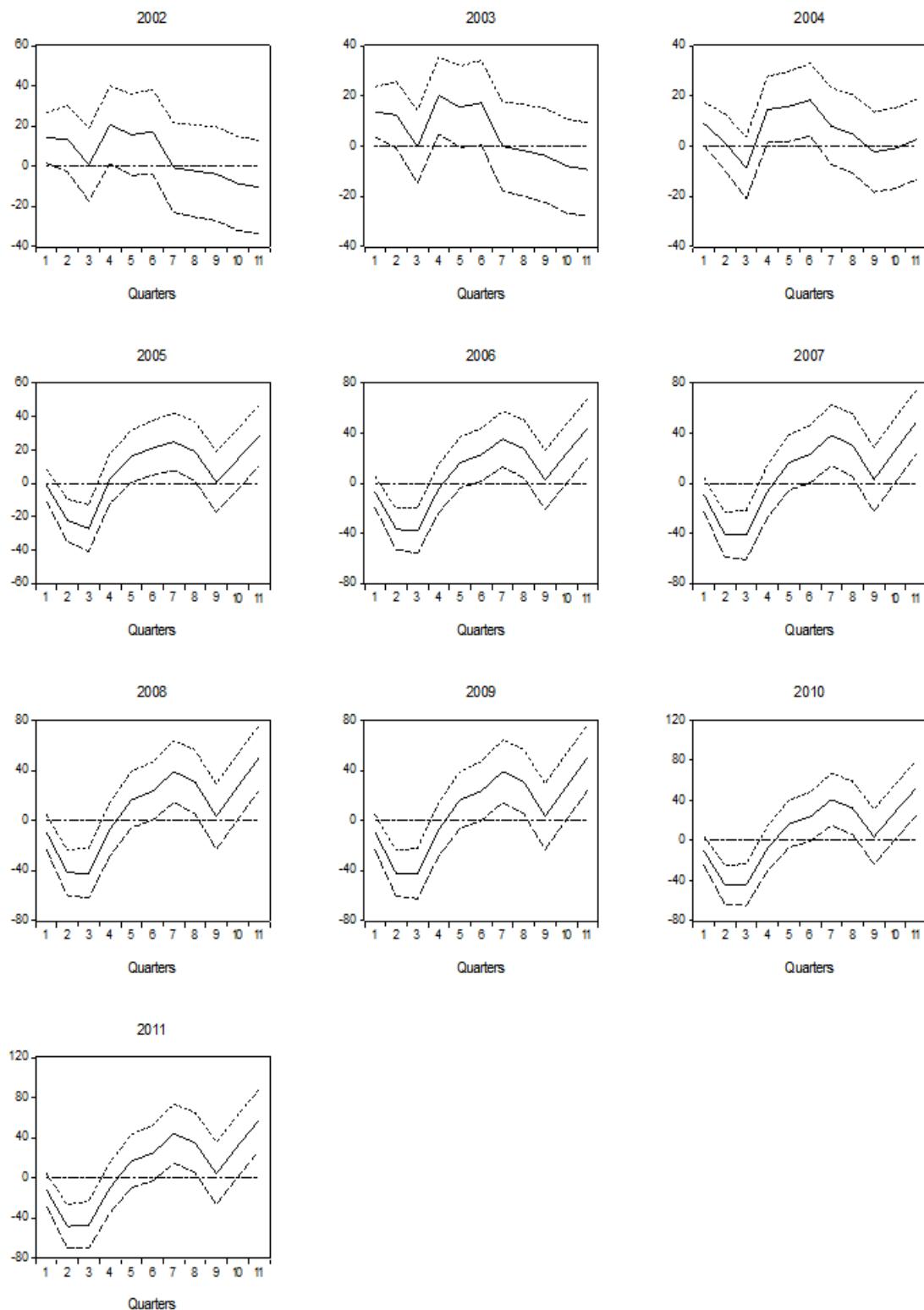


Graph 17
**Monetary policy shock: Response of commercial loan rate
 with maturity greater than five years conditional on the
 average maturity of new issues of fixed-rate TES**



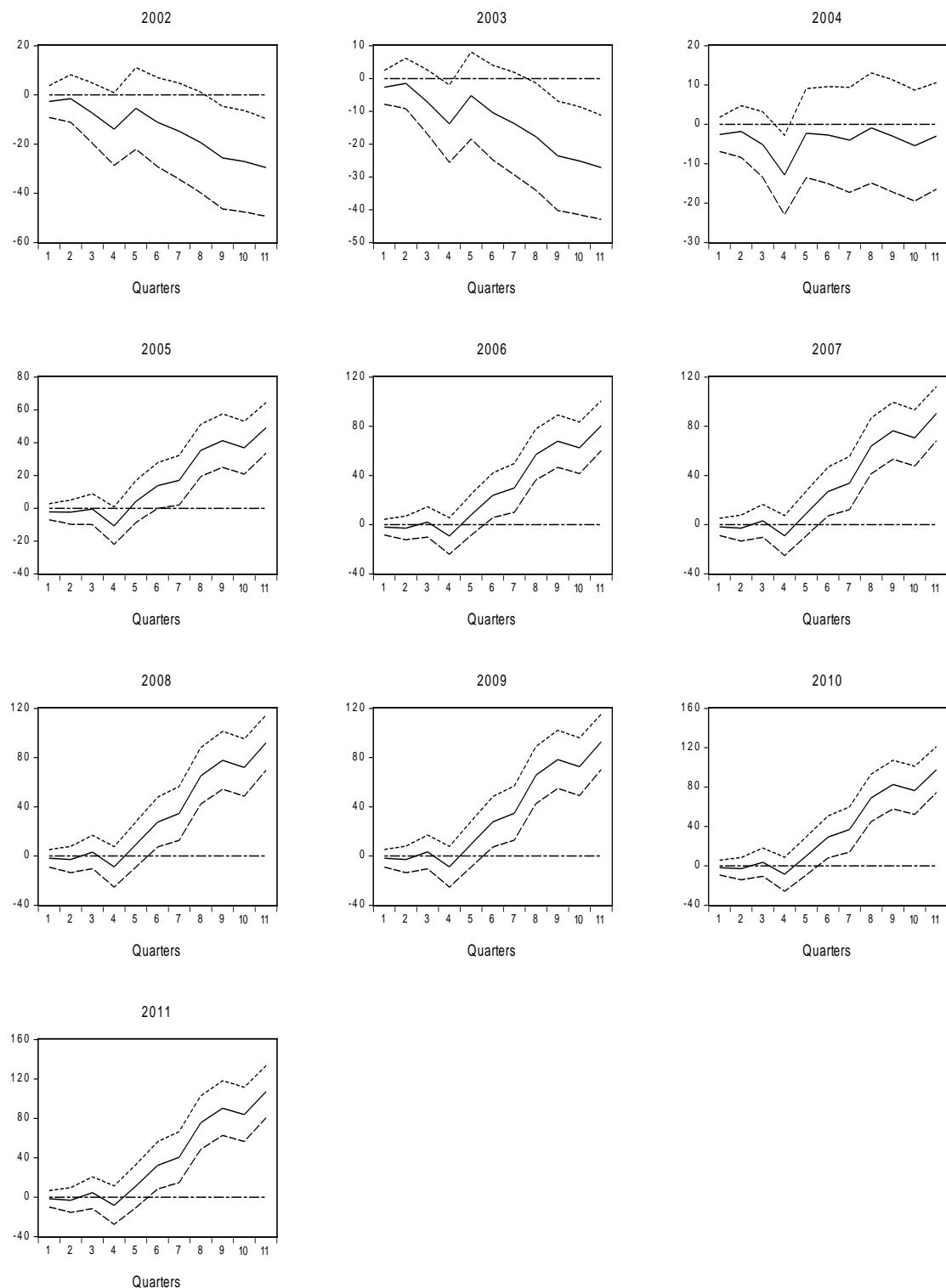
Graph 18

**Monetary policy shock: Response of the consumer loan rate
with maturity less than one year conditional on the
average maturity of new issues of fixed-rate TES**



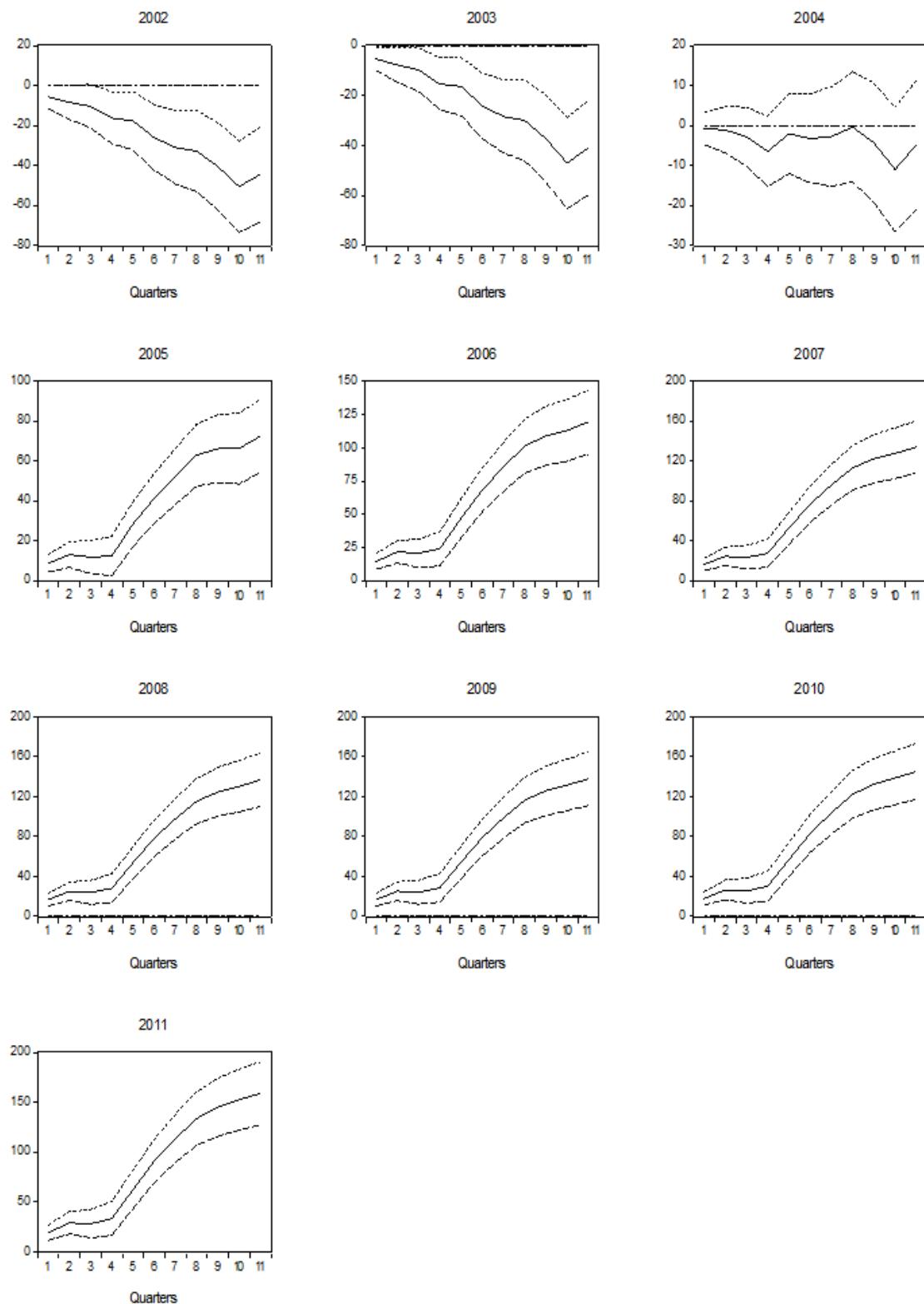
Graph 19

Monetary policy shock: Response of the consumer loan rate with maturity between one and three years conditional on the average maturity of new issues of fixed-rate TES

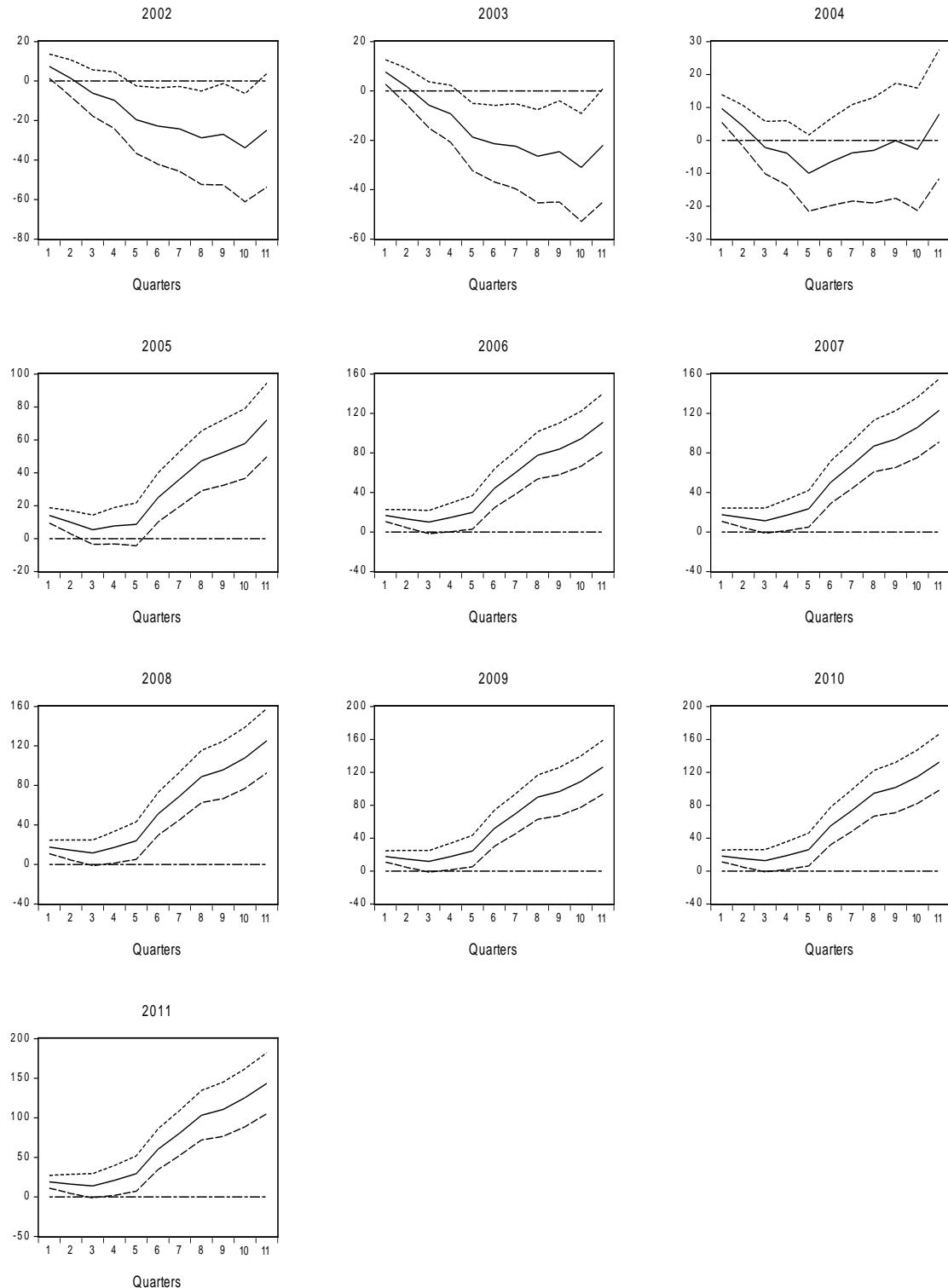


Graph 20

Monetary policy shock: Response of the consumer loan rate with maturity between three and five years conditional on the average maturity of new issues of fixed-rate TES

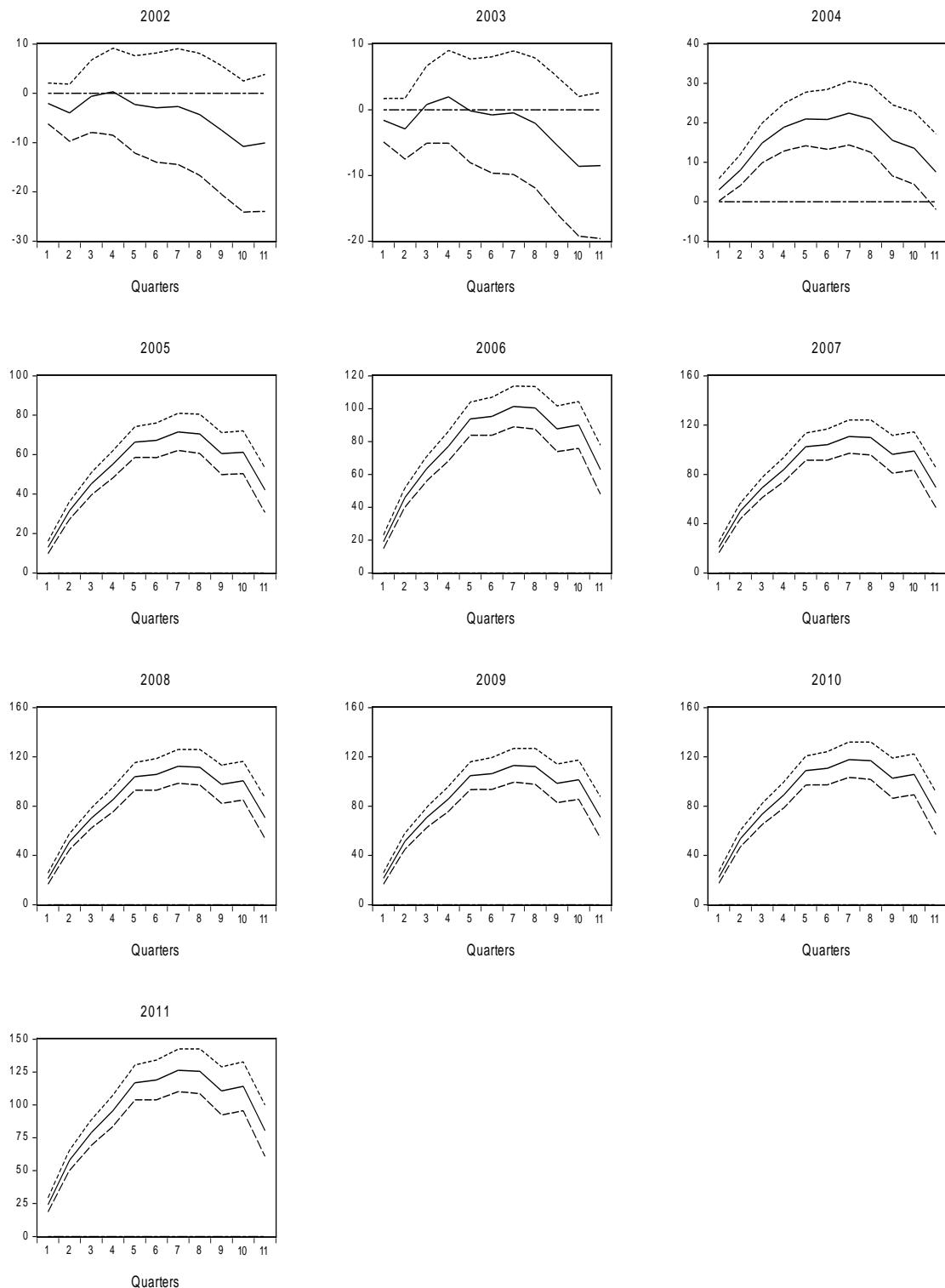


Graph 21
**Monetary policy shock: Response of the consumer loan rate
 with maturity greater than five years conditional on the
 average maturity of new issues of fixed-rate TES**

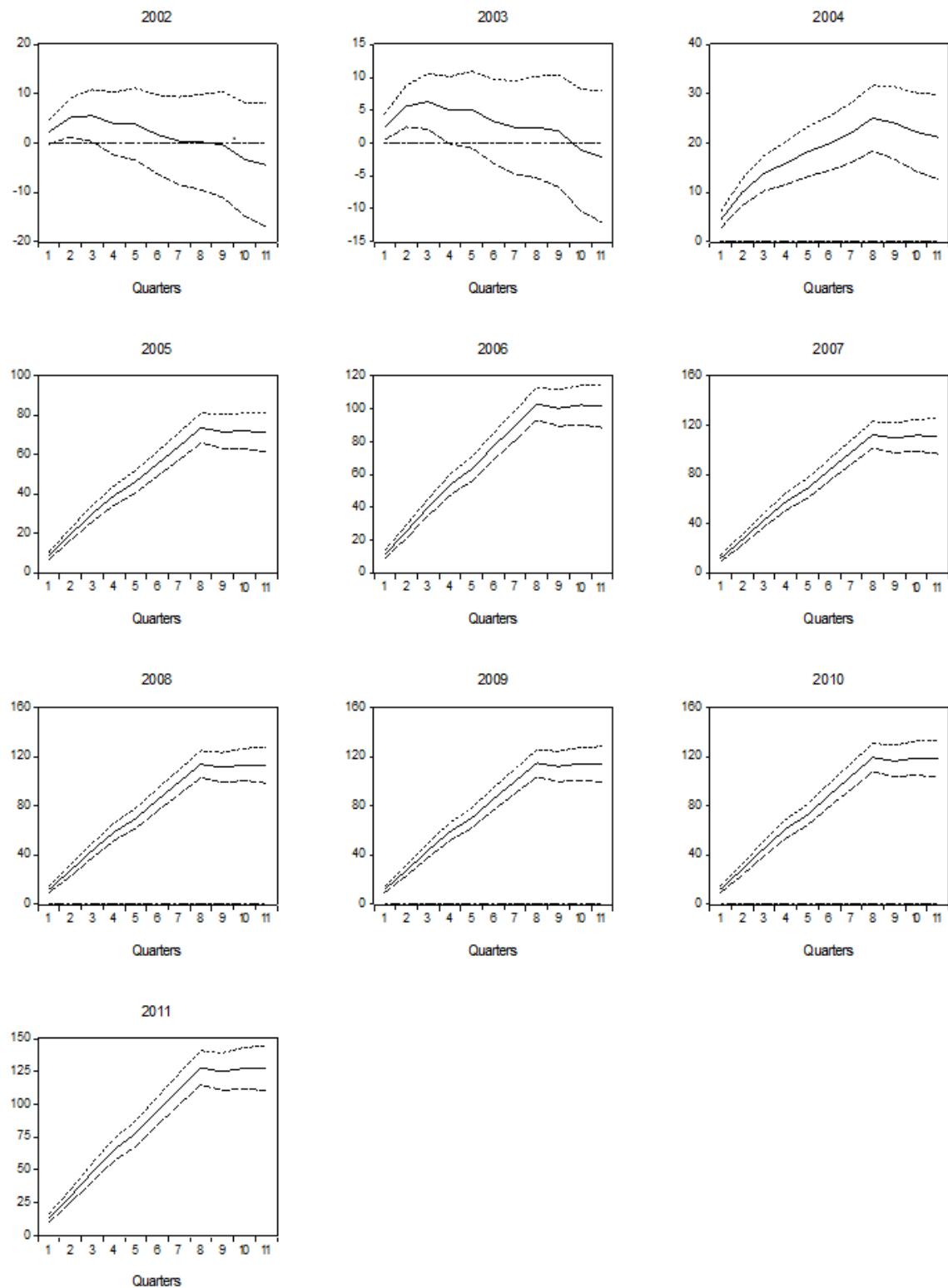


Graph 22

Monetary policy shock: Response of the CDT rate with maturity less than 90 days conditional on the average maturity of new issues of fixed-rate TES

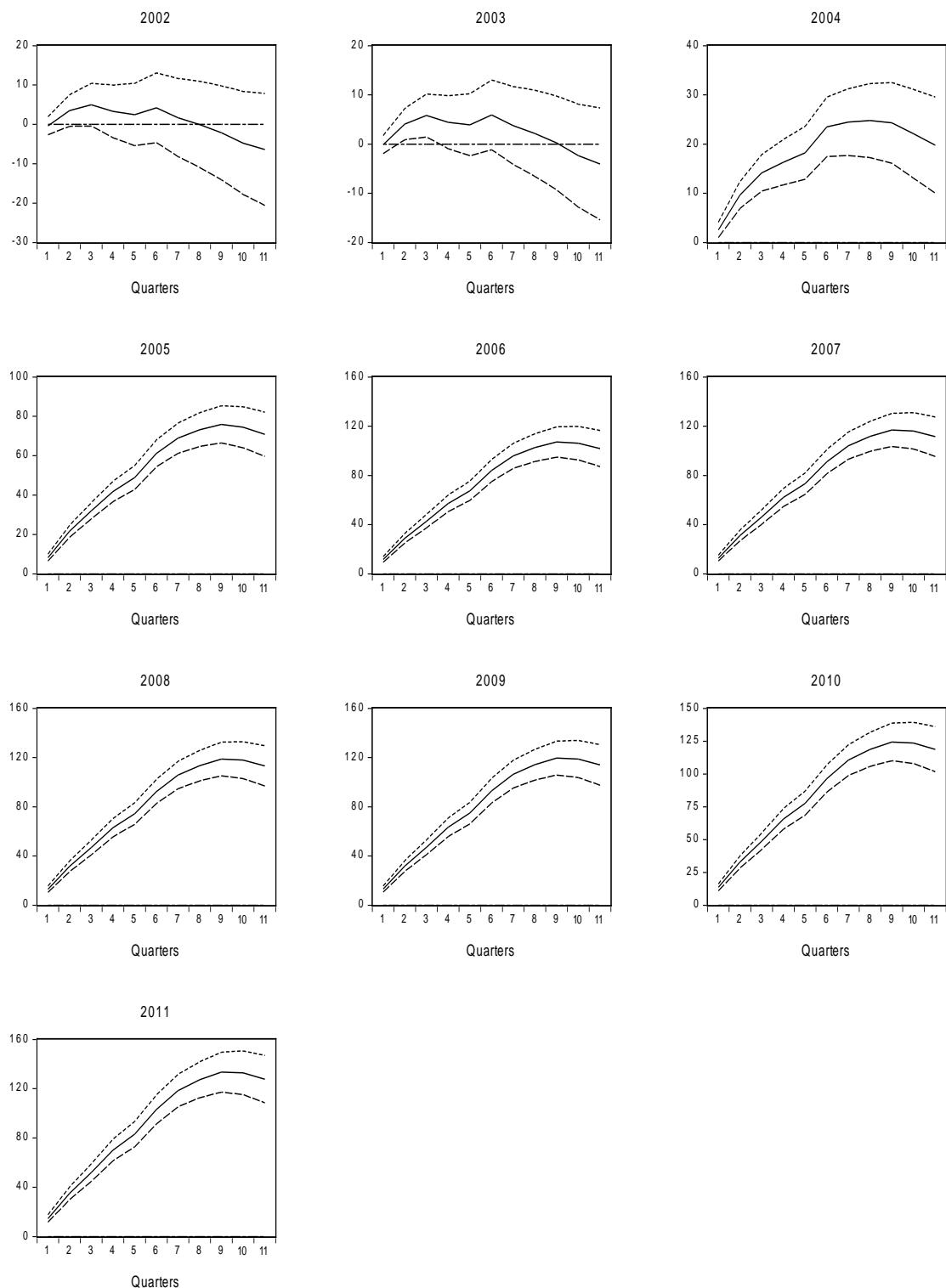


Graph 23
Monetary policy shock: Response of the CDT rate with maturity of 90 days conditional on the average maturity of new issues of fixed-rate TES

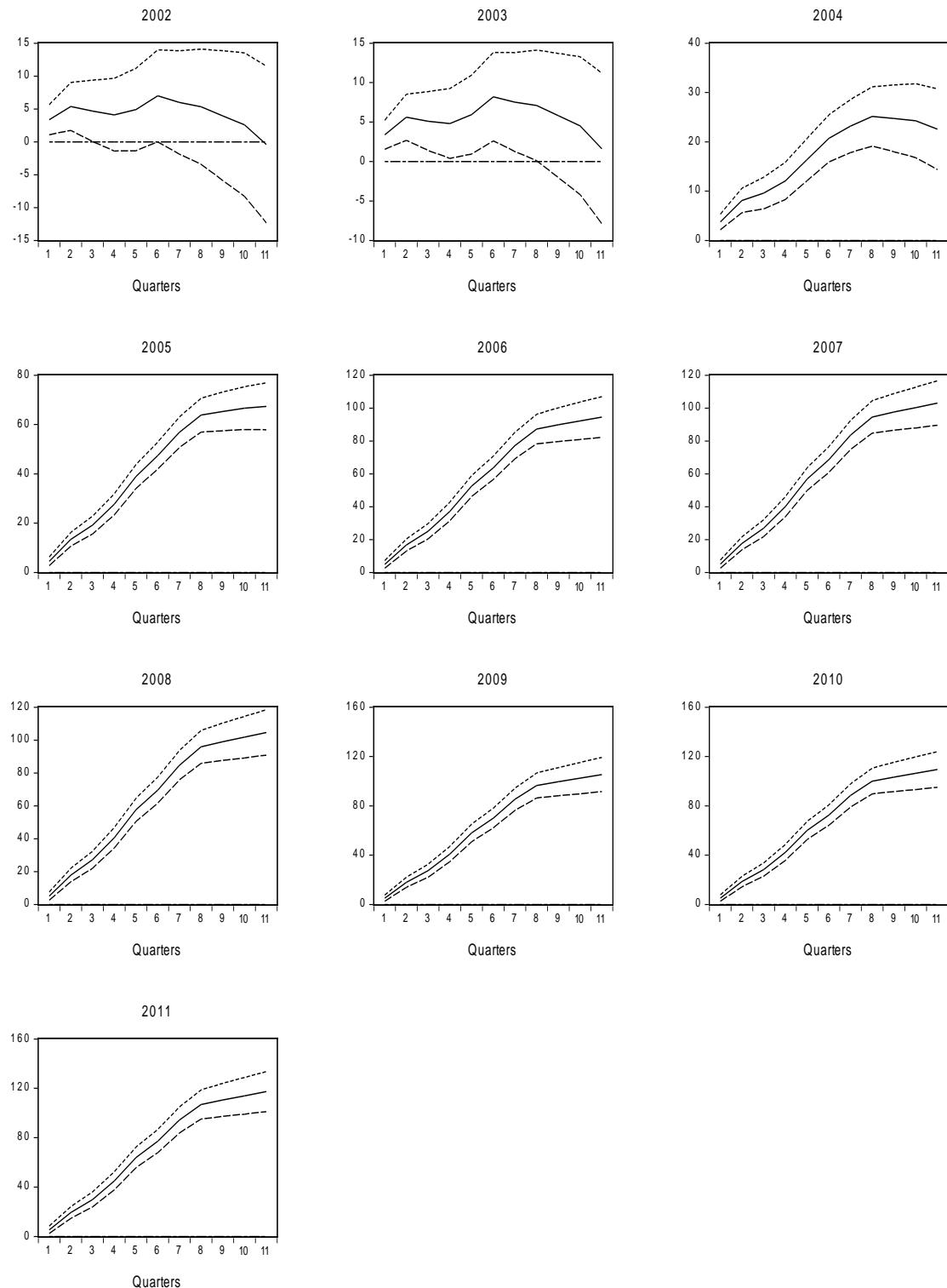


Graph 24

Monetary policy shock: Response of the CDT rate with maturity between 91 and 170 days conditional on the average maturity of new issues of fixed-rate TES

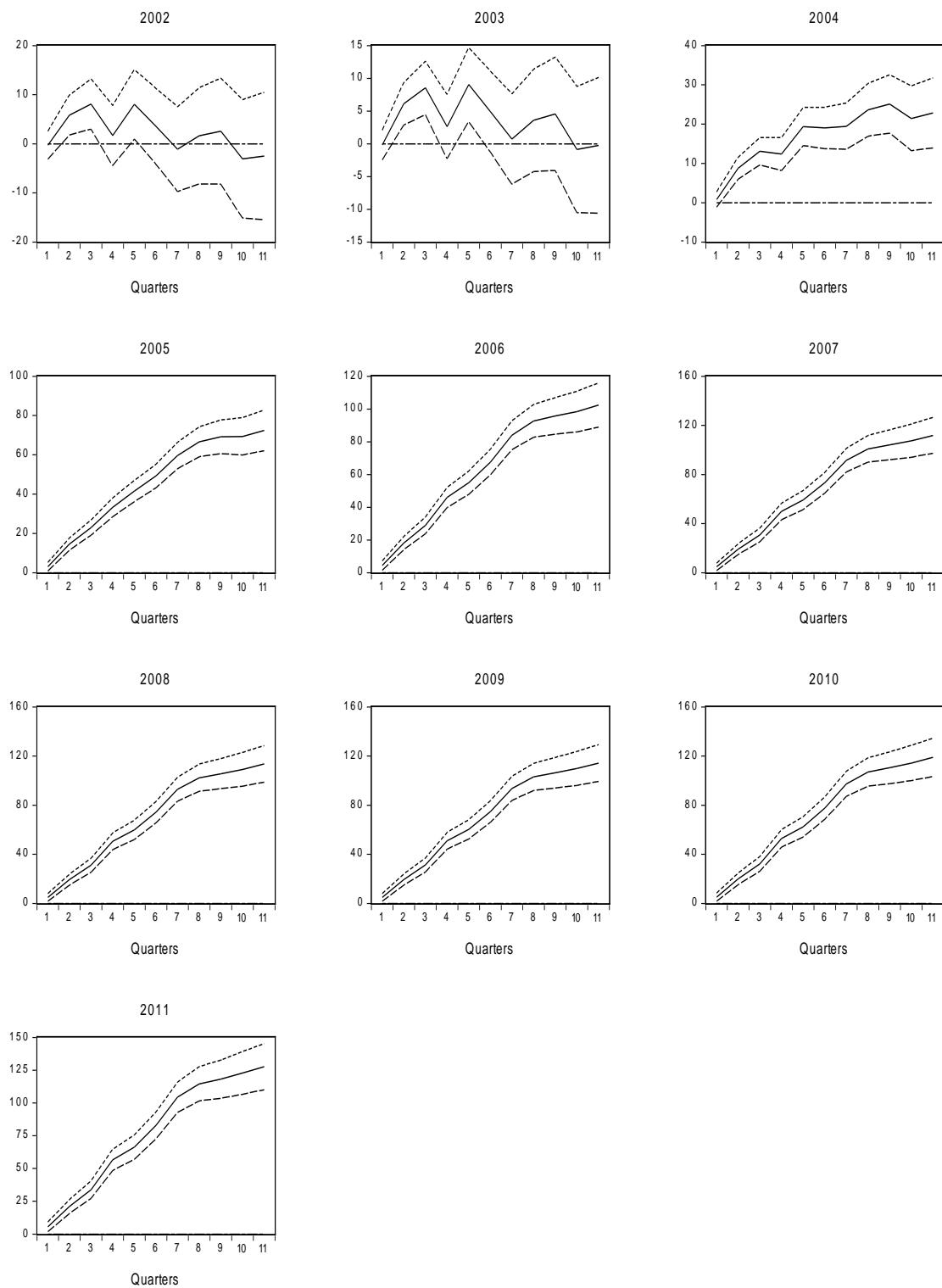


Graph 25
Monetary policy shock: Response of the CDT rate with maturity of 180 days conditional on the average maturity of new issues of fixed-rate TES

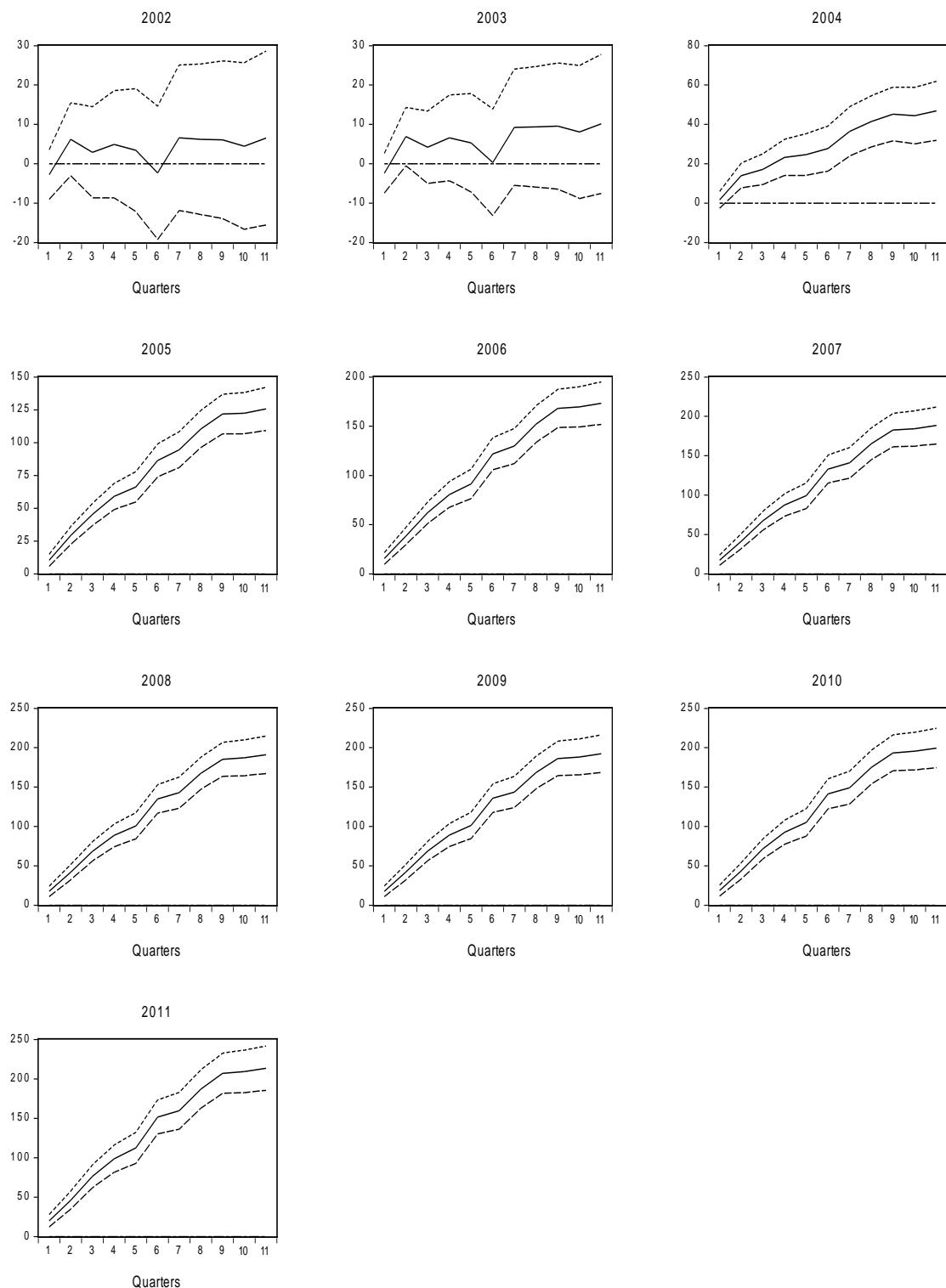


Graph 26

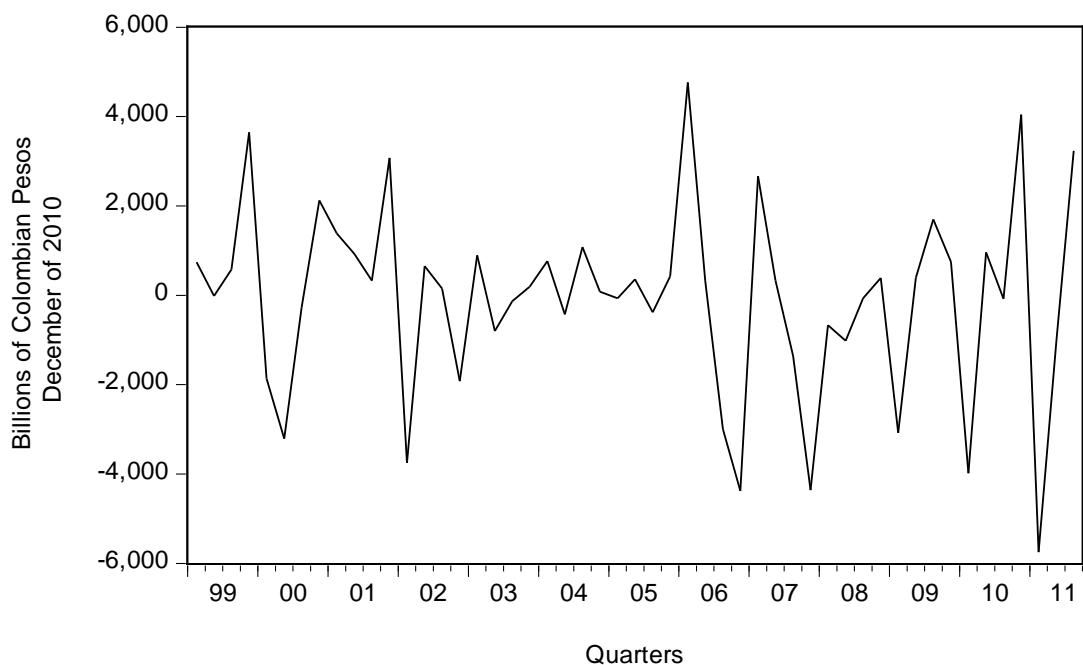
**Monetary policy shock: Response of the CDT rate
with maturity between 181 and 360 days conditional on the
average maturity of new issues of fixed-rate TES**



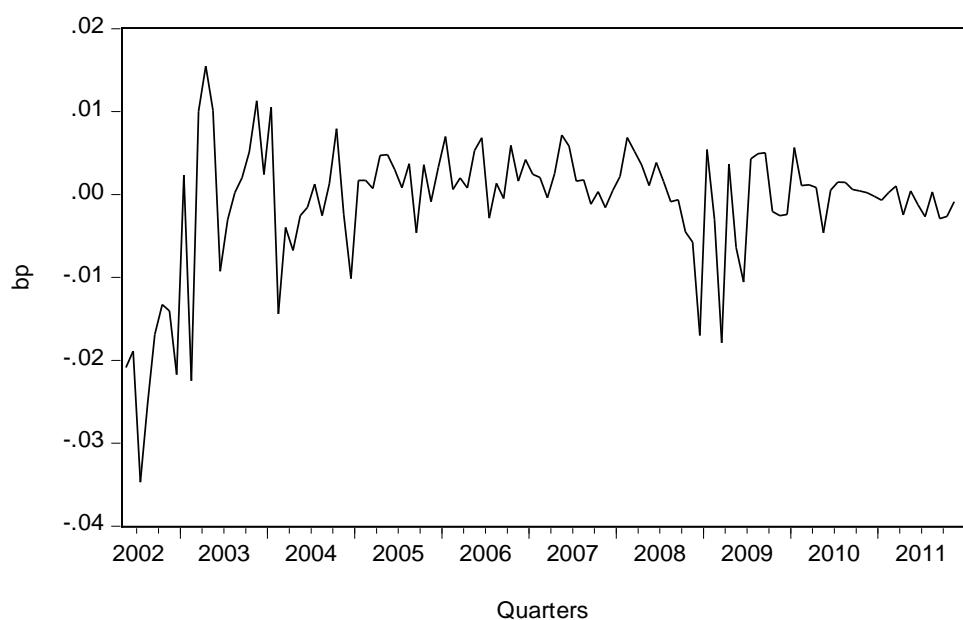
Graph 27
Monetary policy shock: Response of the CDT rate with maturity greater than 360 days conditional on the average maturity of new issues of fixed-rate TES



Graph 28
Fiscal shock



Graph 29
Monetary policy shock



Appendix 1: Calculation of the government expenditure shocks

To construct the spending forecast of the central government we followed these steps:

- a. The budget execution rate for each quarter in a year was obtained from the annual and quarterly historical data on actual expenditures.
- b. The annual spending announcements made by the government at the beginning of each year in its Financial Plans are considered as the annual spending forecast.
- c. Based on (a) and (b), we predict the government spending for the four quarters of each year by multiplying the corresponding budget execution rate (using a moving average of fourth order) by the annual spending announcements.
- d. By the end of the second quarter, information on the actual first quarter expenditure is available. Thus, we add an adjustment to the forecast of the third and fourth quarters that results from the assumptions that the annual expenditure plan will be fulfilled and that the first quarter forecast error is uniformly distributed between the second, third and fourth quarters.
- e. By the end of the third quarter, information on the actual second quarter expenditure is available. Thus, we add an adjustment to the forecast of the fourth quarter that results from the assumptions that the annual expenditure plan will be fulfilled and that the second quarter forecast error is uniformly distributed between the third and fourth quarters.
- f. The series of forecast errors (calculated with respect to the adjusted forecasts in the case of the third and fourth quarters) is the expenditure shock for each quarter. Graph 28 shows the fiscal shock (measured in 2010 COP billions).

Appendix 2: Estimation of the monetary policy shock

Similar to what is usually done in the VAR literature, we define monetary policy shock as an unexpected movement of the policy rate. That is, we suppose that there is a policy rule that relates the state of the economy with the actions of the monetary authorities and consequently a monetary policy shock will be a movement in the policy rate not explained by the rule. For example, under the assumption that the central bank follows a standard Taylor rule, a movement in the policy rate not explained by the observed behavior of inflation and output will be a monetary shock. However, if the central bank follows an expectations-based rule, that is, a rule in which the expected value of inflation and output are important, then it is natural to include within an estimated Taylor rule not just current inflation and output but also any other variables that can be useful indicators about the future behavior of these variables.

Notice also that under the VAR recursive identification, a monetary policy shock is not only an unexpected movement of the policy rate but is also orthogonal to the information set of the central bank. In other words, it is assumed that a variable that is observed by the central bank cannot react contemporaneously to the policy shock. With this in mind, it is possible to see that a forecast error can serve as proxy of a policy shock. In fact, we defined the policy shock through the forecast error: $i_{t+1} - E[i_{t+1} | \mathcal{W}_t]$, where i_{t+1} is the actual policy rate at time $t+1$ and $E[i_{t+1} | \mathcal{W}_t]$ is its expected value given the information set at time t denoted by \mathcal{W}_t .

Our definition of the policy shocks is consistent with the definition of the policy shock in a VAR model for two reasons. First, it captures unexpected movements in the policy rate and, second, by definition it is orthogonal the information set. However, given our definition of a policy shock, we can capture policy shocks that are policy errors or changes in the policy stance not necessarily expected at time t . In the first case, the policy rate is, unintentionally, too low or too high with respect to what is dictated by a policy rule, whereas in the second case, the policy shock signals a change in the monetary policy stance. The source of the policy shocks can have very different effects on the economy.

To make this definition of the policy shock operational one needs to be particularly carefully about the definition of the information set \mathcal{W}_t and the way $E[i_{t+1} | \mathcal{W}_t]$ is estimated. Empirically, the main concern with \mathcal{W}_t is not to include variables that are not observed at time t . In our exercise, the information set contains information on inflation, output, credit, the exchange rate, etc. However, some of these variables are observed with delay and consequently their current values cannot be in \mathcal{W}_t .

We approximate $E[i_{t+1} | \mathcal{W}_t]$ with linear projections. That is, $E[i_{t+1} | \mathcal{W}_t] = a_0 + a_1 x_t$, where x_t is an element of \mathcal{W}_t . a_0 and a_1 are estimated by OLS. We select the elements in x_t by minimizing the AIC criterion.

Finally, to construct a sequence of monetary policy shocks we carry out a rolling exercise where we forecast i_{t+1} at time t and compare it with the actual value of i_{t+1} . At each t the information set is updated and the elements of x_t are selected by minimizing the AIC criterion. The initial sample of the rolling experiment is 1999m9-2000m12 and is expanded until 2011m12.

The policy shocks are constructed using monthly data on the interbank rate, the Colombian inflation target, the growth rate of the index industrial production, the growth rate of credit, the index of capacity utilization, the nominal average unit labor cost, the nominal depreciation of the Colombian peso, the Index of Consumer Confidence (ICC) and the US inflation rate²¹. The shocks are shown in Graph 29.

²¹ All growth rates are annual, the index of capacity utilization, and the nominal average unitary labor cost are included in annual changes. Data are seasonally adjusted using TRAMO-SEATS in Eviews). All these variables are in general available with a delay of one month; however, the Index of Industrial Production, the Unitary Labor cost and the ICC are observed with a delay of two months.

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Some insights into monetary and fiscal policy interactions in the Czech Republic

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Abstract

The global financial and debt crisis highlights the need for a better understanding of how fiscal and monetary policies interact. This article examines three aspects of these interactions, as seen from the perspective of the Czech National Bank. It first looks at the effects of fiscal policy on the interest rate channel in the Czech Republic, where long-term government bond yields are an important determinant of market interest rates. Second, it reviews alternative methods for the cyclical adjustment of the fiscal balance, which might provide different assessments of the fiscal policy stance. Finally, it describes how fiscal policy is included in the Czech National Bank forecast.

Keywords: Monetary policy, fiscal policy, interactions, transmission, Czech Republic

JEL classification: E52, E58, E62, E63

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1. Introduction

In recent years, policymakers have responded aggressively with monetary and fiscal measures to counteract the macroeconomic consequences of the economic and financial crisis. Central banks have massively reduced interest rates. In many cases, they have resorted to unconventional monetary policies. Fiscal authorities have run up high budget deficits as revenues have declined and expenditures have been kept high in efforts to safeguard the financial sector and to stimulate the demand side of the economy.

The Czech National Bank (CNB) started to cut interest rates in summer 2008, reaching a record low level (a two-week repo rate of 0.75%) in May 2010. However, unlike many other central banks that were pushed by unfavourable circumstances into using unconventional monetary policy tools, the CNB was able to rely largely on standard policy instruments. It is worth noting in this context that a marked depreciation of the koruna exchange rate in late 2008 also helped the bank substantially in terms of monetary loosening. Thus, the floating exchange rate regime proved to be an efficient adjustment mechanism. In parallel, the Czech government in 2009 approved an anti-crisis package of fiscal measures, which were aimed at cushioning the impact of the crisis on Czech households and businesses.

The energetic response of central banks and governments around the globe has focused the interest of researchers on the topic of the mutual interactions between monetary and fiscal policy and the impact on the economy. The issue of monetary and fiscal policy interaction has been examined in a vast number of research papers, the seminal ones being Barro (1979), Lucas and Stokey (1983), Chari et al (1991). The more recent literature includes Schmitt-Grohe and Uribe (2004) and Davig and Leeper (2011), and is based on micro-based analysis of jointly optimal monetary and fiscal policies in economies featuring nominal inertia, taxation and imperfect competition.

A consensus seems to have emerged among researchers (Kirsanova et al 2009) that monetary policy should normally focus on business cycle stabilisation and inflation control, and that fiscal policy should focus on the control of government debt or deficits. However, if monetary policy is constrained in some way – either by design (eg for a monetary union member subject to asymmetric shocks) or by circumstance (interest rates hit the zero lower bound), fiscal policy should be used for business cycle stabilisation and inflation control. This is in line with empirically observed patterns in recent years, when fiscal policy has gained in importance for smoothing the business cycle and avoiding deflation, notably in the countries hitting the zero lower bound for interest rates. From this perspective, purchases of government securities conducted by some central banks might be considered as a monetary policy tool that supports the fiscal stimulus with a view to stabilising output and inflation. The other view could be, however, that such operations are a kind of monetary financing and that these central banks have subjected themselves to fiscal dominance.

Monetary and fiscal policies interact in many ways, both nationally and internationally. The vast number of interactions in the economy make it difficult to determine the specific influence of each policy with any certainty. Research on monetary and fiscal policy interactions can be divided into three strands. The first strand of research (for example, Blinder (1982) and Tabellini (1986)) focuses on the effect of interaction of fiscal and monetary policies using a formal game-theoretical approach. The second strand (notably Lucas and Stokey (1983), Chari et al (1991) and Woodford (2003)) has analysed the interactions using sophisticated macroeconomic models and has attempted to derive optimal monetary and fiscal policy strategies. Finally, the third strand of literature is more data-driven; using various econometric techniques (usually VaR), it investigates the impact of policy interactions on the transmission mechanism.

This article falls into the third strand of research and outlines several issues in fiscal and monetary policy interaction using the experience of the Czech Republic. In the second chapter, we discuss the effects of fiscal policy on the transmission of monetary policy. The

third chapter presents two alternative methods for the cyclical adjustment of the fiscal balance used for obtaining economically meaningful estimates of the fiscal stance. Based on these estimates, we analyse the cyclical of the Czech fiscal policy. The methods by which fiscal policy is forecast and included in the CNB macroeconomic predictions is described in the fourth chapter. The fifth chapter concludes.

2. The effects of fiscal policy on monetary policy transmission

Fiscal policy is an important determinant of economic developments and, as such, it affects monetary policy through several channels. Some fiscal measures (such as introducing or changing a consumption tax or value added tax) have a direct effect on inflation. Other fiscal measures have indirect effects on inflation through their impact on aggregate demand. Furthermore, fiscal policy influences other economic variables that are important in monetary policy transmission, notably interest rates, interest rate spreads and exchange rates. In the extreme case known as fiscal dominance, monetary policy might even become subordinate to fiscal policy. As Sargent and Wallace (1981) first pointed out, this situation might emerge if the fiscal authority sets its budget independently of public sector liabilities so that the fiscal expansion eventually needs to be monetised, giving rise to high inflation and inflation expectations.

In this chapter, we focus on the impact of fiscal policy on financial market interest rates and consequently on commercial interest rates. A description of other channels through which fiscal policy influences the monetary policy transmission is provided, for example, in Zoli (2005).

A consensus exists that under most circumstances an expansionary fiscal policy is associated with higher medium-term and long-term interest rates, ie that it crowds out private investment. This is supported by many empirical studies. Most recently, López et al (2011), using panel data of the long-term interest rate for the period 1990–2009 in 54 emerging and developed countries, find that when the fiscal deficit expands by 1% long-term interest rates rise between 10 and 12 basis points.

Similarly, a broad agreement exists on the role of public debt in determining long-term interest rates. Higher public indebtedness increases the risk of default on sovereign debt, which ultimately translates into higher spreads on government bonds (see, eg, Ferrucci (2003)). The current situation in the European market is a clear reminder about the importance of this mechanism.

Focusing on the Czech Republic, several studies estimate the effects of fiscal policy on long-term interest rates. Alexopoulos et al (2009) assess the role of fundamentals in driving long-term sovereign bond spreads in the new EU countries, including the Czech Republic, over the period 2001–08. They find, *inter alia*, that an adverse 10% shock to external indebtedness ratio shifts the long-run equilibrium spreads by 5 basis points in the Czech Republic. Baldacci et al (2008) on a panel of 30 emerging market economies conclude that an improvement in the primary budget balance by 1% of GDP helps to reduce spreads by about 30–40 basis points. Dumičić and Ridzak (2011) use panel data for eight central and eastern European countries and find that, if general government debt-to-GDP ratio increases by 5 percentage points, spreads increase by 19 basis points.

Wider spreads consequently lead to higher yields on government bonds and to higher commercial interest rates. The analysis of client interest rates on loans and deposits in the Czech Republic in the period between January 2004 and December 2009 shows that 10-year government bond yields might be used as a benchmark rate for client long-term interest rates (with maturity of more than one year in the case of loans and more than two years in the case of deposits). The sensitivity of selected client interest rates to 10-year government bonds as estimated by an error correction model is shown in Table 1.

Table 1
Transmission of changes in 10-year government bond yields into client rates

	Immediate pass-through α_0	Final pass-through β_1	Speed of adjustment β_0	Adjustment speed in months $(\beta_1 - \alpha_0)/\beta_0$
Loans to small corporations, fixed for more than 1Y	0.33(0.27) ↓	1.19 *** (0.15)	-0.4 *** (0.11)	3m
Loans to large corporations, fixed for more than 1Y	0.67 (0.99)	0.83 *** (0.11)	-0.64 *** (0.13) ↓	2m
Loans to households - mortgage loans	-0.09(0.07)	0.91 *** (0.04) ↑	-0.28 *** (0.03)	3m
Deposits with maturity longer than 2Y	-0.04(0.26)	0.73 *** (0.07) ↓	-0.47 *** (0.09) ↓	2m

Note: estimated equation $Dbr_{i,t} = \sum_{l=0}^q \hat{\alpha}_{li} Dmr_{t-l} + \sum_{k=1}^p \hat{\alpha}_{ki} Dbr_{i,t-k} + b_{0,i} (br_{i,t-1} - b_1 mr_{t-1} - m) + e_{it}$, where br_{it}

denotes the i -th bank interest rate at time t , mr_t represents the (bond) market rate and m is a constant that quantifies the spread of bank interest rates vis-à-vis the market rates. Symbols ***, ** and * denote statistical significance of parameters at 1%, 5% a 10% significance level. Standard errors are in parentheses. The symbol $\hat{\alpha}$ denotes parameters that are statistically significantly lower (in absolute value at the 10% significance level) than estimated parameters in the 2004–08 data sample. The symbol $\hat{\alpha}$ denotes the parameter that is statistically significantly higher (at the 10% significance level) than the parameter estimated in the 2004–08 sample. Other parameters are not statistically significantly different. The speed of adjustment was rounded to entire months.

Although the immediate (ie within one month) pass-through of government bond yields into client rates is not statistically significant, the long-run pass-through is significant for all interest rates shown in the table. A complete long-run pass-through is observed for loans to small corporations with terms of more than one year and for mortgages.

During the financial crisis, the transmission of government bond yields into client interest rates has slowed in the case of loans to large corporations and deposits. On the contrary, the relationship between mortgage interest rates and the yield on long-term government bonds has strengthened in the crisis period.

3. Two alternative methods for cyclical adjustment of fiscal balance

When assessing the fiscal policy stance, it is necessary to adjust the fiscal balance for its cyclical component. The fiscal balance is affected by fluctuations in the economy, as an expanding economy raises tax revenues and lowers social transfers (and vice versa). Rather than looking at the overall balance, it is thus more appropriate to disregard this cyclical and focus on the structural balance. A structural, cyclically adjusted balance is defined as the excess of public spending over revenues (or vice versa) that would persist if the economy were near its potential.

The estimates of cyclically adjusted budget balances are routinely used by the European Commission, the ECB, IMF, OECD and other institutions. The cyclically adjusted budget balance (CAB) is one of the key indicators for the analysis and conduct of fiscal policy in the EU fiscal surveillance framework. In this framework, the structural balance abstracts away

from cyclicality as well as from one-off and other temporary measures.² The long-term EU fiscal targets to be met by Member States under the provisions of the Stability and Growth Pact are expressed and assessed net of cyclical conditions and one-off and other temporary measures.

Several methods can be used to derive the cyclically adjusted balance. In this chapter, we discuss two alternative methods as applied by the European Commission (EC) and the European System of Central Banks (ESCB). Both these methods are calculated routinely at the CNB. In the above-mentioned EU fiscal surveillance framework, cyclically adjusted balances are estimated using the EC method and published in Stability and Convergence Reports. The ESCB method is used by the ECB and other national banks within the ESCB as an additional analysis and presented in two internal documents – the Public Finance Report and the Autumn Fiscal Policy Note. The main difference between the two methods is that, while the EC method is based on output gap calculations, the ESCB approach to cyclical adjustment takes into account the composition effects originating from the different cyclical behaviour of macroeconomic bases for the main revenue and expenditure categories. Both methods abstract away from one-off and other temporary measures:

$$CAB_t = BB_t - CC_t = BB_t - e \times OG_t$$

where BB_t is the nominal budget balance in year t , CC_t the cyclical component in the year t , e the budgetary sensitivity parameter and OG_t the output gap in the year t . The output gap represents an economy's cyclical position (difference between actual and potential output³).

The overall sensitivity parameter e is obtained by aggregating the elasticities of individual cyclically sensitive budgetary items⁴. The individual revenue elasticities ($h_{R,i}$) are aggregated to an overall revenue elasticity using as weights the share of each revenue category in the total current taxes (R_i / R):

$$h_R = \sum_{i=1}^4 h_{R,i} \frac{R_i}{R}$$

As for the expenditure elasticity (h_G), it can be expressed as:

$$h_G = h_{G,U} \frac{G_U}{G}$$

where $h_{G,U}$ is the elasticity of unemployment benefits and G_U / G is their share in the current primary expenditure.

The two elasticities h_R, h_G are then transformed into the overall sensitivity parameter of the budget balance (e) used in the equation defining CAB as follows:

$$e = e_R - e_G = h_R \frac{R}{Y} - h_G \frac{G}{Y},$$

² One-off and temporary measures are measures having a transitory budgetary effect that does not lead to a sustained change in the intertemporal budgetary position (eg short-term costs emerging from natural disasters, sales of non-financial assets).

³ Potential output is calculated on the basis of the Cobb-Douglas production function.

⁴ There are four tax categories (personal and corporate income tax, indirect taxes, and social contributions) and one expenditure category (unemployment benefits).

where R/Y is the share of current taxes in GDP, and G/Y is the share of primary expenditure in GDP. For a more detailed discussion of the EC method of cyclical adjustment see Larch and Turrini (2009).

The ESCB has elaborated a different method used for estimating the cyclical component (CC_t). In the ESCB method, the revenue and expenditure categories are adjusted individually based on the deviation from trend⁵ of their relevant macroeconomic bases in real terms. The following main budgetary items are adjusted (with corresponding macroeconomic bases in brackets): direct taxes paid by households (average compensation of employees and employment in the private sector), direct taxes paid by corporations (operating surplus), social contributions paid in the private sector (average compensation of employees and employment in the private sector), indirect taxes (private consumption) and unemployment-related expenditure (number of unemployed persons).

The individual cyclical component of each budgetary category is calculated by applying a constant elasticity to the trend deviation and then the CAB is calculated as follows:

$$CAB_t = BB_t - CC_t = BB_t - (RHP_C_t + RSP_C_t + RF_C_t + RI_C_t - XU_C_t)$$

where RHP_C_t is the cyclical component of direct taxes paid by households, RSP_C_t the cyclical component of direct taxes paid by corporations, RF_C_t the cyclical component of social contribution paid in the private sector, RI_C_t the cyclical component of indirect taxes and XU_C_t the cyclical component of unemployment-related expenditure. More details of the ESCB method can be found in Bouthevillain et al (2001).

In Chart 1, the outcomes of these two methods are compared for the Czech Republic. One can see from this chart that both these methods provide very similar estimations of the cyclical component. Nevertheless, two noticeable exceptions are the years 2003 and 2009. In 2003, the ESCB method estimates a slightly positive cyclical component due to positive wage developments in that year, while the EC method takes into account a negative output gap. In 2009, the more marked decline of the cyclical component in the EC method reflects the immediate impact of the global crisis on the GDP growth, whereas the impact on wages and private consumption was somewhat delayed and hence the ESCB method shows an almost neutral cyclical position.

It is also evident from the chart that, before the recent crisis, structural deficits were notoriously high as a result of a loose fiscal policy conducted in the years of prosperity between 2003 and 2007. This unfavourable starting fiscal situation was subsequently aggravated after the economic crisis hit the Czech Republic, when the cyclical position of the economy sharply turned negative and automatic stabilisers came into effect.⁶ In addition, the government approved an anti-crisis package of fiscal measures aimed at cushioning the impact of the crisis on Czech households and businesses. These measures led to a further deterioration in the public deficit.

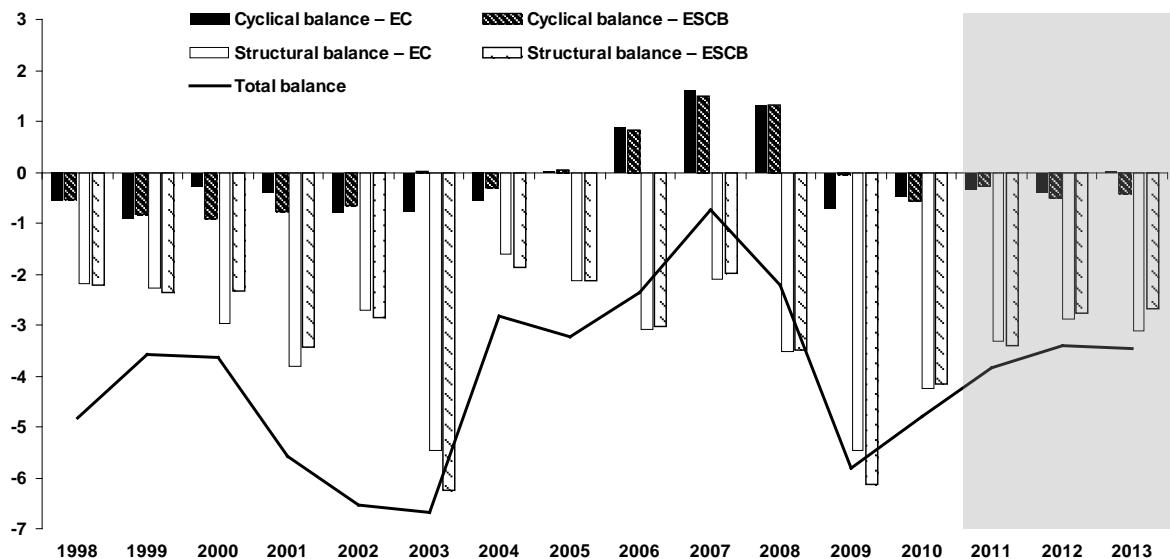
⁵ Trends are estimated using the Hodrick-Prescott filter.

⁶ It is worth mentioning that the economic and financial crisis hit the Czech economy solely via the foreign demand channel, very negatively affecting export and production performance of the Czech manufacturing sector. That said, the financial impact of the crisis on the Czech economy was modest, thanks to the resilience of the Czech banking sector, which had virtually no exposure to foreign toxic assets.

Chart 1

Cyclical decomposition of general government balance

In % of GDP



Source: CNB; the CNB forecast is shown in the grey zone.

As a result, the deficit-to-GDP ratio increased by approximately 5 percentage points between 2007 and 2009. The Excessive Deficit Procedure (EDP) was opened for the Czech Republic in late 2009 (for the second time during its EU membership) with the deadline for correction of the deficit below 3% of GDP being set at 2013.⁷ This situation called for an instant and decisive response by the Czech authorities if the deficits were to be brought back under control. Such an action came relatively soon; in late 2009 the government approved an “austerity fiscal package”.

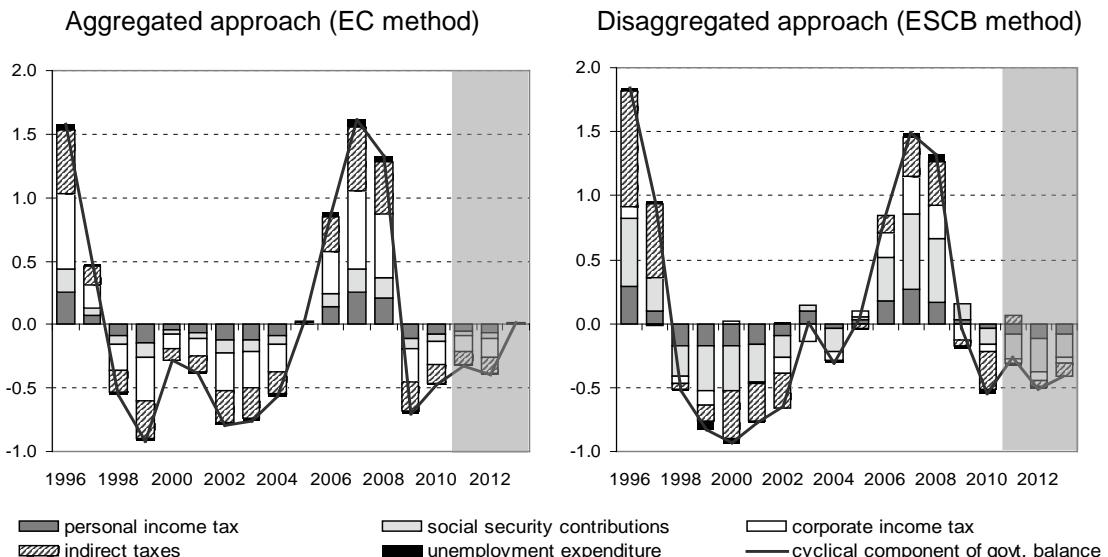
An advantage of the ESCB method of measuring the cyclical balance is that it estimates the cyclical position separately for each revenue/expenditure item. As a result, the individual cyclical components of revenues may in this method go in both positive and negative directions within a single time period (of one year). By contrast, in the EC method, all revenue/expenditure items always move in the same direction (positive or negative). This is because, in this method, the output gap derived from a production function is a single measure of the position of the economy within the business cycle and hence the only driver of the cyclical part of the revenues/expenditures.

Chart 2 shows a decomposition of the Czech Republic's cyclical balance into five major parts. Despite the different methodology, both approaches present roughly the same picture, indicating that the economic cycle influences the government budget balance mainly via revenues from corporate income tax and social security contributions. During the crisis, a sudden shortfall of budgeted revenues occurred especially in 2009 (with a more pronounced decline estimated by the EC method), but also in 2010.

⁷ The EDP for the Czech Republic was opened just after the country became an EU member in 2004, and then abrogated in 2008. It is also worth noting that the Czech Republic has as yet never reached its Medium-Term Objective (MTO), which is set at 1 % of GDP for the structural deficit of public budgets.

Chart 2
Components of cyclical balance

% of GDP



Two important observations can be made from the cyclically adjusted developments of fiscal deficits. First, that the Czech public finances are characterised by persistent government deficits, which have a predominantly structural character. The second distinctive feature is that Czech fiscal policy has usually been procyclical, especially in the years of economic boom when extra revenues were typically spent, and unfortunately also in the current period when there is a need for fiscal consolidation during the time of economic slowdown.

4. Fiscal policy in the CNB forecast

The CNB's fiscal forecast, which is independent from that of the Ministry of Finance, is an integral part of the CNB's quarterly macroeconomic forecast. The medium-term macroeconomic forecast serves as a main input into the CNB's board monetary policy decision-making.⁸ It includes a forecast of interest rate and exchange rate trajectories. A core model plays a key role in the preparation of the forecast. Since summer 2008, the "g3" model (a structural DSGE type of model) has taken over as the CNB's core model, replacing the previously used QPM model (which was a relatively small-size gap model).⁹

There are several interfaces between the fiscal outlook and the core model within the projection exercise.¹⁰ The process starts with the quantification of the demand-side fiscal impulse, which measures the impact of fiscal policy on GDP dynamics. The fiscal impulse is derived by fiscal experts based on government plans for both the revenue and expenditure

⁸ See Czech National Bank (2003) or Král (2005) for more information about the organisation and properties of the CNB's forecasting and policy analysis system.

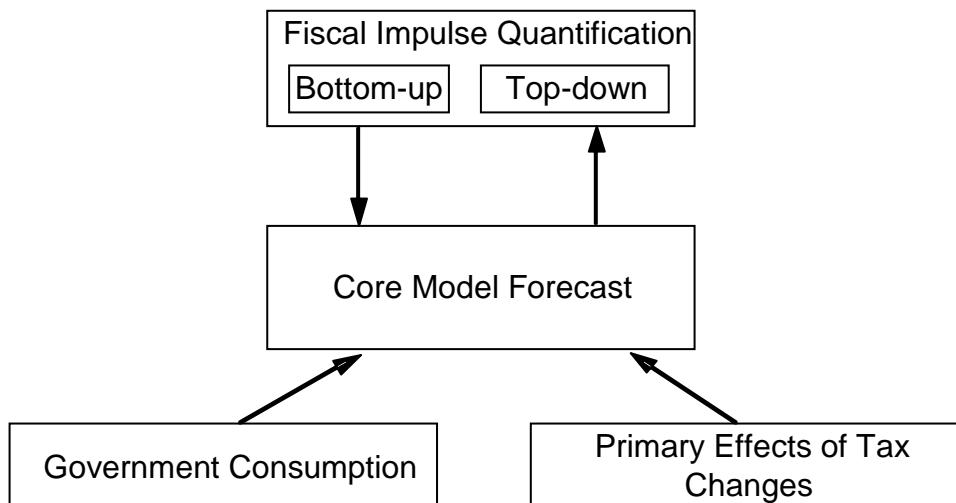
⁹ Andrlík et al (2009) describe the implementation of the "g3" model into the CNB's forecasting process.

¹⁰ The actual core model has no fully fledged fiscal block within its structure as yet and it is therefore dependent on expert inputs concerning fiscal policy.

sides of the public budget using two alternative methods. The bottom-up approach derives the impulse by summarising individual revenue and expenditure budgetary measures expressed as a share of nominal GDP, which is then multiplied by the estimated value of the fiscal multiplier (at 0.6) to derive the impact on GDP growth dynamics. The top-down approach (serving as an ex post consistency check) infers the fiscal impulse from the fiscal position which is defined as a year-on-year change in the structural deficit-to-GDP ratio expressed in percentage points. The structural deficit is estimated as the average of the two methods described in the previous chapter. The fiscal impulse in this approach is then computed by multiplying the fiscal position by the fiscal multiplier.

A final estimate of the fiscal impulse is incorporated into the forecast by influencing core model mechanisms that describe the behaviour of private consumption (via the savings rate), investments (via the cost of funds), the exchange rate (reflecting the country risk premium related *inter alia* to public indebtedness) and trends in productivity and technology (related to preferences, institutions and rigidities with respect to the size, features and efficiency of the public sector). Government and household consumption are the most significant expenditure items that are most influenced by governmental decision-making. The core model directly incorporates the expert outlook for government consumption as well as the anticipated primary effects of indirect taxation changes on inflation (see Chart 3). The CNB distinguishes between the primary and secondary effects of taxation changes because it does not react to the primary effects when setting interest rates. Besides the government consumption forecast, the fiscal unit provides the forecasting team with its outlook for some specific items of public expenditures such as social benefits, the public sector wage bill and government investment expenditures. These figures are used in the next stages of the forecasting process when preparing the final disaggregated macroeconomic story, which contains details beyond what the core model structure makes available (eg the disposable income of households, average wage and wage bill in the non-profit sphere etc).

Chart 3
Fiscal outlook in the CNB's macroeconomic forecast



The completion of the macroeconomic forecast and the fiscal outlook is an iterative process. After the (draft) macroeconomic forecast is completed (having incorporated all fiscal inputs mentioned above), the forecast of direct and indirect tax revenues and social security/public healthcare insurance contributions are computed. To do so, the fiscal experts make use of the labour market outlook, the prospect for GDP and its structure, estimated profits of firms etc. After that, the public budget deficit (and government debt) and its structural component

are derived with the latter providing an important *ex post* consistency check of the underlying fiscal stance arising from the mutual interaction between the fiscal side and the real economy. If necessary, a few rounds of iterations take place between fiscal and macro experts during the projection exercise to deliver a consistent economic story.

5. Summary and conclusions

The recent financial crisis highlighted the need for a better understanding of interactions between fiscal and monetary policy. These interactions are complex and their in-depth description and analysis is out of this paper's scope. Instead, we provide some partial insights into these interactions from the perspective of the Czech National Bank.

The first insight is on the impact of fiscal policy on the interest rate channel of monetary policy transmission. We show that government bond yields are an important determinant of client long-term interest rates in the Czech Republic. However, during the financial crisis, the relationship between the client interest rates and bond yields has weakened with the exception of interest rates on mortgage loans.

The second insight concerns alternative methods for the cyclical adjustment of the fiscal balance, which might lead to different assessments of the fiscal policy stance. We present two distinct methods, one used by the European Commission and another one used by the European System of Central Banks. The key difference between these two methods is that, while the first method is based on output gap calculations, the second takes into account the different cyclical behaviour of the main revenue and expenditure categories. Both methods provide almost identical estimations of the cyclical component when applied to the Czech data, with the exceptions being 2003 and 2009. Both methods also point to the existence of persistent government deficits that have a predominantly structural nature, and to the procyclicality of Czech fiscal policy in most years.

The final insight relates to how fiscal policy is incorporated in the CNB's forecast. The CNB fiscal forecast is an integral part of the CNB's medium-term macroeconomic forecasts. The key fiscal variable, ie the fiscal impulse, is derived using two approaches – bottom-up and top-down. The fiscal impulse influences private consumption, investments, the exchange rate and trends in productivity and technology. In addition to the fiscal impulse, the inputs to the CNB's macroeconomic forecasts include government consumption and the primary effects of indirect taxation changes on inflation.

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The importance of fiscal prudence under the Linked Exchange Rate System in Hong Kong SAR

Hong Kong Monetary Authority

Abstract

The Hong Kong SAR has consistently pursued a prudent fiscal policy. Substantial fiscal reserves have insulated government funding from the volatility of financial market conditions, and have buffered the economy against shocks, particularly in the absence of a discretionary monetary policy. Sound fiscal management has also reinforced the credibility of the Linked Exchange Rate system.

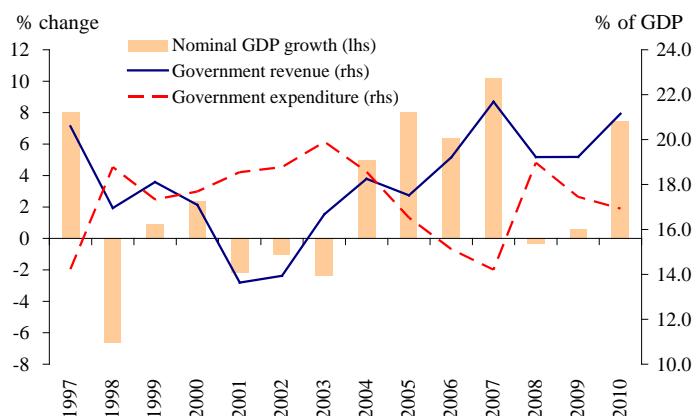
Keywords: Foreign exchange reserves, peg, deficit, fiscal policy

JEL classification: E52, F31, H62

Fiscal position of the Hong Kong government

Hong Kong has an impressive track record of fiscal prudence. The government has made significant efforts over the years to observe the provisions in the Basic Law¹ that call for a balanced budget over the medium term and require the pace of spending increases to be commensurate with the GDP growth rate. A case in point is the experience during the early 2000s, when the government undertook a series of major fiscal reforms (mainly in the form of spending cuts) in response to a decline in revenues associated with a protracted economic downturn. With the bursting of US dotcom bubble and the subsequent SARS epidemic exacerbating the painful adjustment in the aftermath of the 1997–98 Asian financial crisis, Hong Kong suffered a long period of deflation and anaemic real growth, with nominal GDP not returning to the 1997 peak level until 2005. However, the government's reform efforts helped to keep the fiscal deficits at a relatively low level, and eventually to restore the budget balance to surplus in 2005 (Chart 1). Even during the 2008–09 global financial crisis, the government continued to register a small surplus, thanks to a tight control on expenditure. For the current 2011/12 fiscal year, the budget projects a small deficit, driven mainly by one-off relief measures.²

Chart 1
Hong Kong's fiscal performance and nominal GDP growth



The sustained fiscal discipline has yielded a sizeable accumulation of fiscal reserves. Unlike most fiscal authorities internationally, the Hong Kong government is a net creditor, with more financial resources at its disposal than the liabilities it owes to the public. Outstanding general government gross debt to finance fiscal operations totalled only about HK\$11 billion (or 0.6% of GDP),³ while the pool of fiscal reserves stood at HK\$595 billion (or one third of GDP) as of March 2011. The reserves are large enough to cover about 24 months of government expenditure. Given the considerable fiscal headroom, along with

¹ The Basic Law serves as the constitutional document of post-colonial Hong Kong SAR.

² It now seems likely, however, that the government will record a surplus in 2011/12, partly due to higher-than-expected revenue collections.

³ This debt was issued in 2004 and 2005, complementing the drawdown from the fiscal reserves. The government also issues bonds under the Government Bond Programme to promote development of the local bond market. Proceeds from this programme are credited to a separately managed bond fund and are not used for fiscal operations. As at the end of October 2011, outstanding bonds under the programme amounted to HK\$43 billion (or 2.4% of GDP).

Hong Kong's other favourable economic and institutional fundamentals, the government's creditworthiness has been strongly endorsed by the rating agencies, with long-term credit ratings of AAA from Standard and Poor's and Aa1 from Moody's.

The need for strong fiscal reserves to cope with shocks

Having adequate fiscal scope for cushioning economic downturns is particularly important for economies with a fixed exchange rate regime and perfect cross-border capital mobility, such as Hong Kong. Under a fixed exchange rate regime and with an open financial account, the monetary authorities cannot pursue an independent monetary policy, thus leaving fiscal policy, possibly supplemented by other policy tools including macroprudential measures, as the key levers for managing economic cycles and mitigating the impact of shocks on the economy. The availability of a sizeable pool of fiscal reserves provides the government with sufficient financial resources to implement a countercyclical expansionary fiscal policy during economic downturns, without having to worry about potentially volatile funding conditions in the government debt market. The unfolding European sovereign debt crisis has clearly demonstrated how heavy reliance on debt can expose governments to swings in market sentiment.⁴

The experience in the years following the Asian financial crisis underscores the role of strong fiscal reserves in supporting Hong Kong's economic stability. Due to falling income in the private sector and sluggish asset markets amid a series of adverse shocks including the Asian financial crisis, the bursting of the US dotcom bubble and the SARS epidemic, government revenue dropped by more than 35% in nominal terms between FY1997/98 and FY2002/03. The marked revenue loss contributed to consecutive years of budget deficits, from FY1998/99 to FY2003/04 (with the brief exception of FY1999/2000). While reforms were undertaken to shore up the fiscal position, the needed fiscal adjustment would have been much larger – and hence the fiscal support for the economy much weaker – if not for the option to deploy the existing fiscal reserves to finance public spending. A total of HK\$182 billion, or 40% of the fiscal reserves, was drawn down during the period, which represented about 15% of Hong Kong's annual GDP at the time.

In addition, the fiscal reserves can contribute to maintaining financial stability in Hong Kong at times of heightened market stress, as the 2008–09 global financial crisis illustrates. As in the economic downturn during the early 2000s, the available fiscal headroom enabled the government to effect significant relief measures – which totalled about 6.3% of annual GDP from 2008/9 to 2010/11 – to bolster the economy against the fallout from the global financial crisis. As importantly, at the depth of the crisis when concerns about bank soundness arose, to maintain confidence the government adopted full deposit guarantees and standby measures to backstop banks' recapitalisation needs. The credibility of these policy actions was underpinned by the strong financial backing of the Exchange Fund, of which the fiscal reserves constitute a major part.⁵ In other words, the fiscal reserves substantially augment the government's resources in supporting the financial sector as needed during times of extraordinary distress.

⁴ In addition, for a small economy whose currency is not a major reserve currency, for example Hong Kong, the local debt market tends to be less liquid and could experience particularly acute sell-off pressures in times of global stress when investors' demand for liquid assets surges. In Hong Kong, yields on Exchange Fund bills rose sharply vis-à-vis their US counterparts during the 2008–09 crisis.

⁵ The fiscal reserves account for about one quarter of the Exchange Fund assets.

The importance of building up strong fiscal reserves in Hong Kong also reflects volatile government revenue and future ageing-related fiscal pressures.

- The fluctuations in Hong Kong's government revenue are among the most extreme in the world (Porter (2007)).⁶ This is partly due to the openness of the economy and its susceptibility to external shocks, but it also reflects a revenue regime that has a narrow tax base and relies heavily on non-tax income. Taxes are based either on earnings (not on more stable consumption spending) or dependent on asset market activities (where stamp duties apply). Also, the volatile non-tax asset income (comprising the proceeds from land sales and investment income in Hong Kong) accounts for around 20% of government revenue, one of the highest levels in Asia. The large fluctuation in fiscal receipts amplifies the importance of maintaining strong fiscal reserves to support steady government spending.
- The government has large potential contingent liabilities associated with the future ageing of the population. In the case of Hong Kong, the expected rise in health care spending due to ageing will put pressure on public finances as health care services are largely government-funded.⁷ The availability of fiscal reserves could ensure a smooth transition for any necessary structural reforms in the revenue regime.

The role of fiscal reserves in fortifying the Linked Exchange Rate system

The government's fiscal discipline has been a cornerstone of long-term monetary stability in Hong Kong. As the government holds a substantial amount of net financial assets, there are few concerns that the Hong Kong Monetary Authority would ever be forced into monetising government debt, thus undermining the currency board arrangement. Separately, under the fixed exchange rate, any overheating pressures in the economy would have to be absorbed solely by domestic price adjustment, thus likely resulting in high inflation. However, the government's prudent approach to spending reduces the risk that the economy will face overly strong demand pressures, thereby helping to support a low level of inflation in Hong Kong. The Argentina debt crisis in the late 1990s that led to the collapse of the country's exchange rate peg is a notable example of the importance of fiscal discipline in ensuring the feasibility of a currency board system (see, eg, IMF (2003)).⁸

The absence of government borrowing would also help alleviate the likely interest rate adjustment in crisis scenarios. In the event of a crisis, money markets typically come under pressure, causing interbank interest rates to surge. Heavy government borrowing compounds the liquidity pressures and pushes interest rates even higher, thus exacerbating the economic downturn and associated asset market correction. The ensuing downturn in confidence intensifies adverse sentiments towards the local currency. If, on the other hand, the government has no borrowing requirement, the Hong Kong dollar will experience that much less downward pressure during a crisis.

More importantly, the fiscal reserves boost the financial resources available to defend the Linked Exchange Rate system. The fiscal reserves placed with the HKMA, which constitute about one quarter of the total Exchange Fund, expand the resources that can be called upon to defend the Hong Kong dollar against speculative attack or a sudden reversal

⁶ N Porter, "Guarding against fiscal risks in Hong Kong SAR", IMF Working Paper, no 07/150, 2007.

⁷ There are estimates that fiscal reserves totalling up to 30% of GDP may be needed by 2030 to anticipate the ageing-related budget pressures in Hong Kong (Porter (2007)).

⁸ "Lessons from the crisis in Argentina", International Monetary Fund (IMF), October 2003, pp 8–11.

in capital flows. In August 1998, to counteract market manipulations and defend the Linked Exchange Rate system, in addition to dispensing the foreign reserves to meet the Hong Kong dollar sell-off pressures, the government and the HKMA drew on the Exchange Fund in an unprecedented operation in the stock and futures markets that involved stock purchases totalling HK\$118 billion. The support of the fiscal reserves alleviated the constraints on the possible scale of the operation, thus improving the odds that the Hong Kong dollar could be effectively defended. While the technical refinements undertaken over the years have greatly improved the robustness of the currency board arrangement,⁹ the additional financial resources conferred by the fiscal reserves would certainly still be useful in extreme circumstances to support our exchange rate regime.

⁹ These refinements include the formal establishment of two-sided convertibility undertakings and convertibility zone, and the introduction of a discount window.

The impact of public debt on foreign exchange reserves and central bank profitability: the case of Hungary

Gergely Baksay, Ferenc Karvalits and Zsolt Kuti¹

Abstract

This paper focuses on the interactions between public debt policy and foreign exchange reserve management. We found that, although foreign currency debt issuance can contribute significantly to the growth of foreign exchange reserves, it can cause serious difficulties in the assessment of reserve adequacy, especially during crisis periods. Furthermore, it affects the profit-loss of the central bank. On the other hand, the accumulation of foreign exchange reserves may affect the public deficit and debt as well.

Based on these observations, we draw several lessons. We conclude that debt management policy may result in a suboptimal solution on a consolidated basis if the needs of reserve adequacy are not taken into account within the decision-making process for foreign currency debt issuance. In addition, we argue that, if the central bank wants to enhance its capacity to intervene during a crisis, it should seek to identify and utilise other sources of foreign exchange liquidity. But the options here are limited: we believe that the most appropriate tool that would enable a central bank such as the MNB to rapidly obtain an ample amount of foreign exchange reserves is a foreign exchange swap line provided by a developed country central bank.

Keywords: Monetary policy, fiscal policy, public debt management, national budget, sovereign debt, foreign exchange reserve

JEL classification: E52, E58, E62, E63, H63

¹ Gergely Baksay is Senior Analyst, Ferenc Karvalits is Deputy Governor and Zsolt Kuti is Senior Economist.

Introduction

Through various channels, the amount and structure of public debt can have a significant influence on a central bank's foreign exchange reserve management. On the one hand, the issuance of foreign currency-denominated debt can boost international reserves. On the other hand, repayment of public foreign currency debt not only reduces the level of foreign exchange reserves but can cause transient problems in liquidity management. Furthermore, the dynamics of public debt influences not only reserve accumulation but may affect the central bank's reserve adequacy targets, as an increased level of foreign debt can push up the reserves requirement, depending mainly on the maturity structure of public assets held by non-residents.

The actual level of reserves may also set in motion forces that interact with public debt. Inadequate foreign exchange reserves would call for an increase in foreign currency debt or would lead to changes in market perception about the sustainability of the debt. Such changes would affect the fiscal deficit not only directly through interest costs, but indirectly through the central bank's profit and loss. The cost to the central bank of sterilising excess liquidity in the domestic money market is likely to increase, given that there is a significant spread between the cost of sterilisation and the yield on foreign exchange reserves.

This paper focuses on how public debt policy and foreign exchange reserve management have interacted in Hungary. The massive increase in the country's foreign currency debt and the changes in reserves in the past decade offer several important lessons. We describe how the central bank's room for manoeuvre in reserve accumulation can be constrained by debt and exchange rate considerations. We evaluate the most important components of such constraints. We also demonstrate how various state agencies may have diverging goals related to public debt, and how the potential conflict of interest between these goals can influence preferences that are reflected in the assessment of reserve adequacy.

The paper proceeds as follows: Section 2 outlines the development of foreign exchange-denominated public debt in Hungary. Section 3 investigates the effect of this increase on the international reserves. Section 4 examines the impact on reserves requirements while Section 5 describes the effects on the central bank's profit and loss. Section 6 summarises the most important policy lessons and Section 7 concludes.

The role of foreign currency-denominated debt in Hungary's public finances

There is an extensive literature on the benefits or desirability of foreign currency-denominated public debt. The most important potential benefits of foreign currency debt include access to a larger investor base, less crowding-out in domestic markets, lower yields on foreign exchange issuance, access to longer maturities, and the possibility of building up official foreign exchange reserves and improving short-term stability in hard times.

But foreign currency financing has risks. These include more stringent constraints on redeeming foreign currency debt relative to debt denominated in the domestic currency, which can increase the rollover risk. Also, large-scale foreign exchange issuance can increase the country's external vulnerability as perceived by investors and credit rating agencies. Finally, a significant depreciation of the domestic currency may significantly increase the interest burden as calculated in that currency.²

² Wolswijk and de Haan (2005) summarise the related literature, where empirical studies suggest that smaller economies tend to take on more foreign currency debt (Claessens et al (2003)), and the decision seems to be

In Hungary, the Debt Management Agency (ÁKK) incorporated these considerations into a quantitative model for cost/benefit and risk analysis. They used the model to construct a reference band for the foreign exchange share of public debt, at 25–32% of total government debt in 2004. This seemed to be a reasonable choice at Hungary's pre-crisis public debt level of 60–67% of GDP. Like many other emerging market economies, Hungary was short of domestic private savings to cover the government's large financing requirement. Thus, it was vital to attract foreign investors. Large-scale issues of foreign currency-denominated bonds were inevitable because investors were reluctant to purchase domestic currency government paper in the necessary amounts. According to ÁKK, the benefits of foreign debt would offset the additional costs and risks in the target range and the annual issuance of foreign currency debt was broadly in line with the central bank's foreign exchange reserve target.

Prior to the crisis, the actual share of foreign currency debt remained at the planned levels. However, the impact of the global turmoil in late 2008 enforced a radical change in debt management, and the actual share of foreign currency debt jumped to more than 40% of total debt. After the collapse of Lehman Brothers, the demand for HUF government bonds plummeted and ÁKK was forced to suspend primary issuances. Medium- and long-term HUF bond issuance was suspended between 22 October 2008 and 12 February 2009, when it was restarted on a smaller scale, returning to normal levels only around July 2009.

To cover its financing needs, the government, together with the central bank, requested an EU/IMF standby agreement in November 2008. The financing provided by this programme practically replaced the government's local currency financing with foreign exchange-denominated debt in 2009. The EUR 20 billion arrangement served three goals beyond supporting the financing of the balance of payments. It (i) helped to increase the foreign exchange reserves of the central bank; (ii) covered the government's financing needs; and (iii) it also played a substantial part in stabilising Hungary's financial system. The government drew down EUR 12.9 billion over the course of the programme, while the central bank withdrew an additional EUR 1.4 billion to replenish foreign exchange reserves without increasing the public debt.

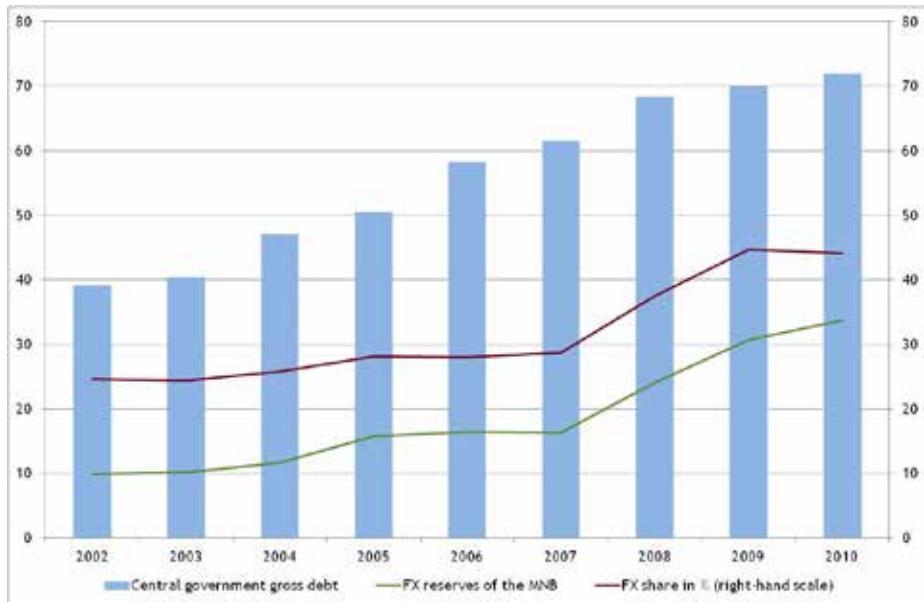
The most direct consequence of the EU/IMF agreement was that gross government debt surged in 2008, in spite of the historically favourable deficit of 3.7% of GDP. As the drawdowns were front-loaded, and part of the tranches were deposited at the central bank, or were onlent to support domestic financial institutions, gross debt increased by more than the government's financing needs.³

At the same time the foreign exchange share of public debt exceeded its ceiling, reaching 44.7% by the end of 2009. This radical change was clearly due to practical considerations, and was not preceded by the overhaul of the debt management strategy. However, the sudden increase in foreign exchange debt had a substantial impact on interest expenditure, short-term external debt, foreign exchange reserves, the central bank's profit and loss, and the structural liquidity surplus on the interbank money market, as presented in the following sections.

motivated mainly by practical considerations especially the expected cost of foreign currency debt (Pecchi and Di Meana (1998)).

³ The front-loaded pattern of the loans only slightly affected the medium-term level of debt, because the excess withdrawals were gradually used for government financing at a later stage. Thus the debt converged to a level derivable from a smoother theoretical debt issuance schedule.

Graph 1
Central government debt and foreign exchange reserves
 In billions of euros



The effect of foreign currency-denominated public debt on foreign reserve dynamics

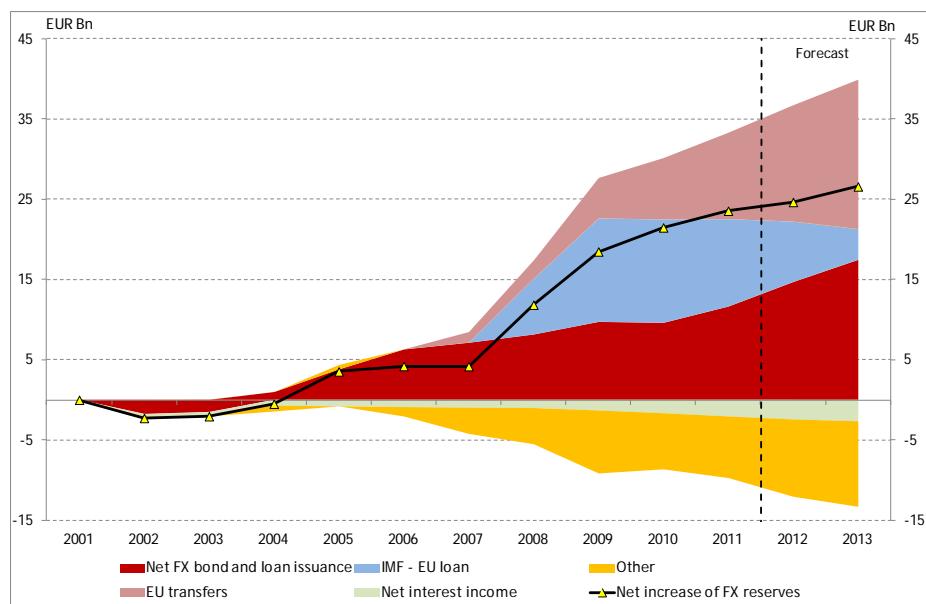
The financial crisis caused significant changes in the structure of the Hungarian foreign exchange reserves. Before the crisis, reserve levels increased only slowly in line with the country's short-term debt dynamics. The authorities preferred not to hold any buffer above this precautionary level. However, after the crisis deepened, the level of international reserves doubled in three years. This section describes how the increase of foreign currency debt contributed to this process and what kind of side effects and constraints arose in the management of foreign exchange reserves.

Foreign currency debt issuance can contribute significantly to the growth of foreign exchange reserves

If the central bank manages the government's transaction account, new foreign exchange issuances boost the foreign exchange reserve level immediately. If the conversion of the government's foreign exchange balances to local currency are also effected by the central bank, then the additional reserves stay with the central bank even after the government starts spending the local currency equivalent of the foreign exchange issuance.

In Hungary, the increase in foreign currency debt issuance and the EU/IMF loan were the most important factors behind the growth of foreign exchange reserves (see Figure 2). In the last 10 years net debt issues contributed almost EUR 22 billion to the level of reserves. Such a large external influence has a serious impact on the central bank's ability to autonomously determine the desired level of foreign currency reserves.

Graph 2
Growth of foreign exchange reserves and foreign currency debt issuance
Cumulated changes



Foreign currency issuances can fall short in times of market stress, resulting in a lower-than-expected level of foreign exchange reserves

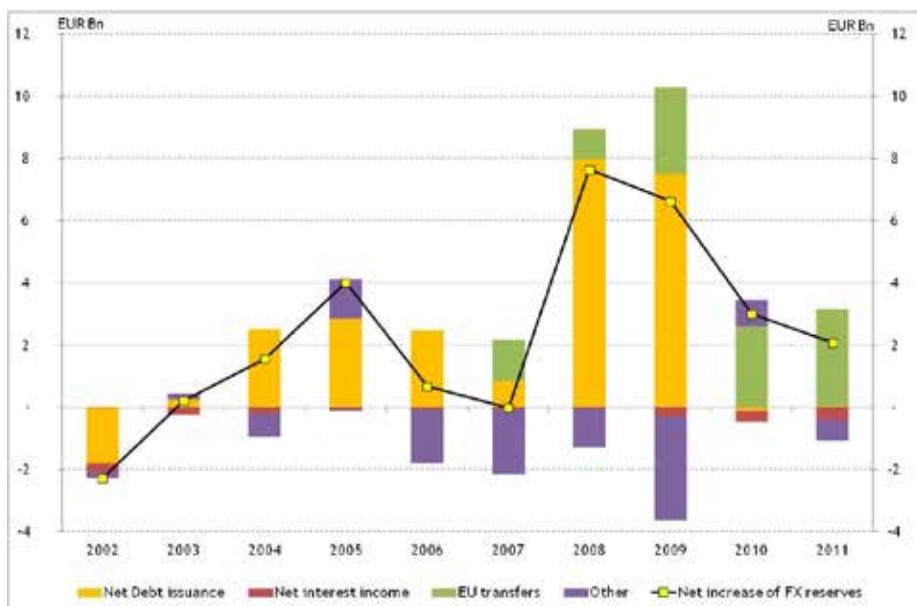
Evidently, foreign currency debt issuance can be a continuous net contributor to reserve growth only if new issues exceed the amounts maturing in a given year. At times of crisis this might be difficult to achieve, especially for countries with weak economic fundamentals. Even to renew maturing debt can be hard and, even if market access is possible, the increased funding cost can be punitive. In the worst case of a sudden stop, the country is unable to obtain market funding at any rate.

As a consequence, market debt issuance usually cannot work as an automatic stabiliser for foreign exchange reserves. Since the expected level of foreign reserves generally increases in times of stress, any shortfall in foreign currency funding can exacerbate the problem of inadequate foreign currency reserves.

This problem can be detected in the reserve dynamics of Hungary (see Graph 3). Until 2007 the impact of the debt on reserves was quite limited: the relatively small amount of foreign currency debt issuance went hand in hand with the slow growth of international reserves. In 2008, however, when an increasing level of short-term debt and the harsher investment climate called for higher level of foreign reserves, net foreign exchange bond issuances could not be increased due to the worsening of market conditions.

Finally, the IMF/EU loan resulted in a rapid increase of foreign currency reserves, contributing some EUR 6–7 billion to reserve growth in both 2008 and 2009. Repayment of the IMF/EU loan started in the last quarter of 2011 and will peak in 2012–14. This schedule will compel Hungary to issue foreign currency debt in larger amounts than it did in the pre-crisis period. This elevated level of foreign currency funding is required if the IMF/EU funds used to increase central bank reserves are to be replaced.

Graph 3
**Growth of foreign exchange reserves and
foreign currency debt issuance**
Yearly changes



Hedging foreign exchange risk can cause relatively large swings in foreign currency reserves

In addition to the net foreign currency debt issues there is another important factor that can have a large direct impact on the level of foreign exchange reserves, namely the flows related to the margin accounts of derivative positions held by the public sector.

As a policy matter, the Hungarian debt management agency only accepts EUR/HUF risk on its foreign currency debt. As a significant part of the foreign currency issuance occurs in currencies other than the euro, such as the US dollar or Japanese yen, the state runs a large FX swap book that is used to hedge the cash flows of non-euro denominated foreign currency bonds into euros.

As the market rate of the euro changes, the swap counterparties evaluate their positions and adjust collateral as necessary. The Hungarian debt management agency must pay out cash collateral to its counterparties when the euro appreciates against the other foreign currency while, if the euro weakens, its counterparties will pay out. Since these flows are directly debited or credited to the debt agency's foreign currency account kept at the central bank, the level of foreign currency reserves changes accordingly.

Before 2008 these flows did not significantly influence the level of Hungarian reserves. From that year, however, these flows have contributed significantly to the volatility of the foreign exchange reserves. The crisis has resulted in a much more volatile exchange rate environment, increasing the need for collateralisation. Furthermore, the currency structure of Hungary's issues has changed following the issue of a USD 3.75 billion dollar-denominated bond in early 2011. These three factors have contributed to the increasing volatility of margin call flows: before 2010 even the largest quarterly changes in the level of net cash collateral did not exceed EUR 200 million whereas in the last two years there have been quarters when the net flows reached EUR 1 billion.

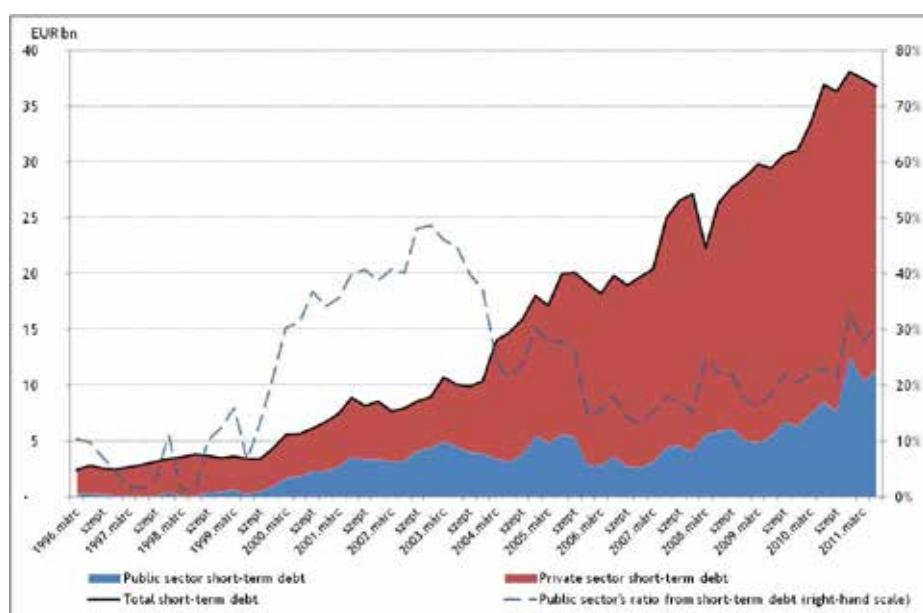
The effect of foreign currency-denominated public debt on the required level of foreign reserves

The size and structure of foreign currency-denominated public debt also influences the necessary or optimal level of foreign exchange reserves. We demonstrate this using the well known Guidotti-Greenspan rule, which states that reserves should cover a country's short-term external debt. Several channels exist through which public debt can have an impact on reserve requirements.

At the end of the 1990s, Hungary's external short-term debt was limited, and the public sector had no reliance on short-term external funding (see Graph 4). From 2000 onwards, the Guidotti-Greenspan rule started to indicate an increasing need for reserves. Up until 2003, the increasing public sector debt was the sole contributor to this process, pushing up the public sector's share within short-term external debt to 50%.

After 2003, private sector external indebtedness began to grow apace whereas the public sector's short-term debt fluctuated at around EUR 4–5 billion. These patterns have changed again after the outbreak of the financial crisis: both public and private sector short-term debt have started to increase significantly. However, the former has outpaced the latter, again resulting in an increase in public sector's contribution to short-term debt dynamics.

Graph 4
Public and private sector short-term debt



Based on these tendencies we can conclude as follows:

The total and relative amounts of public debt matter for the reserve requirement

Short-term debt tends to increase in line with the total amount of public debt. Additional public debt tends to crowd out private companies from local financial markets, pushing them to seek financing from external sources. Both of these factors lift the Guidotti-Greenspan indicator, raising the optimal level of reserves.

Furthermore, although international comparisons can provide a wide range of examples, in general, investors respond to a heavy public debt burden by shifting their activity towards shorter-term debt with the aim of reducing their interest rate and default exposures. This shortening process results in a larger reserve requirement, which usually leads to trouble

during a crisis. Such a situation is exacerbated by the liquidity shortages that typically occur during a crisis episode.

Heavy public indebtedness can cause significant interest rate differentials which can push up carry trader's demand for short-term assets

Again, tendencies can vary from country to country, but emerging economies with heavier public debt burdens and weaker fundamentals usually need to offer higher interest rates on their public debt. However, high interest rates can attract carry traders especially when the interest rates offered by the "safe haven" currencies are low and there is abundant liquidity in the global financial system. Such flows directly push up reserve requirements but, since they do not contribute to the foreign exchange reserves themselves, reserve adequacy is eroded.

Flows from margin calls can also contribute to the volatility of the reserve requirement

We have already mentioned that margin calls on the state debt management agency's FX swap contracts can cause relatively large swings in foreign exchange reserves. But it is worth emphasising that this can also affect the required level of reserves. All inflows from margin calls are regarded as short-term funding. If the debt agency becomes a net debtor at the individual counterparty level, any additional funding obtained from margin calls boosts both the foreign exchange reserves and the reserve requirement.

Long-term debt, usually considered to be stable, can also be a source of instability when liquidity needs suddenly increase during sudden sell-offs

Hitherto, we have used the Guidotti-Greenspan rule as a leading indicator to assess the reserve requirement. However, the experience of the recent crisis suggests that using short-term debt as an indicator for the foreign exchange reserve requirement can be misleading. During the crisis many countries, including Hungary, found that the volume of capital outflows depended much more on the type of capital rather than on its maturity. For example, short-term parent bank lending to subsidiaries proved to be highly stable whereas foreign portfolio investors sold large amounts of Hungarian long-term financial assets. Non-resident holdings of HUF-denominated government bonds declined by approximately 30% in the second half of 2008, which put heavy pressure on the local spot and FX swap currency markets.

The effect of foreign currency-denominated public debt on the central bank's profit and loss

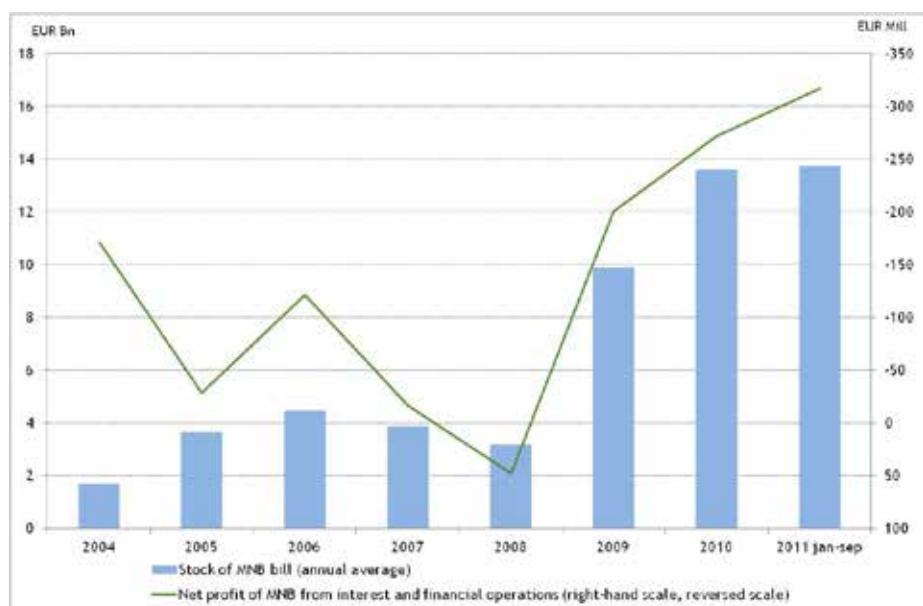
A heavy public sector foreign currency debt burden affects the consolidated expenditures and revenues of the public sector via the net interest expenditures of (i) the government and (ii) the central bank. We analyse the net effect of these relatively separate channels on a consolidated level, merging the costs and benefits for both the central bank and the government.

One of the key arguments for foreign currency-denominated government issuance is the lower interest rate relative to local currency funding. In the case of Hungary, this was particularly true for the EU/IMF loan package. While the average actual interest rate on the EU/IMF loans was 2.9% between 2008 and 2011, the average five-year HUF bond yield was 8.1%. If we consider only that part of the international financial package that was used for actual government financing, the comparison between the actual interest payments to the estimated interest expenditure on the HUF bonds that might have been issued instead

suggests that around EUR 0.8 billion was saved thanks to the IMF-EU loans between 2008 and 2011.⁴

However, the resulting growth in the foreign reserves of the Magyar Nemzeti Bank (MNB) increased the central bank's net interest expenditures through the higher cost of sterilisation. As the government converted the majority of the loans at the central bank to cover its debt repayment and regular expenditures, it not only raised the MNB's foreign exchange reserves, but also increased its HUF liquidity. The MNB sterilises the structural liquidity surplus via the two-week MNB bill, its main policy instrument. The resulting surge in liquidity considerably increased the MNB's interest expenditure, while the higher foreign exchange reserves were not able to offset this effect on the interest revenue side due to lower foreign exchange yields. Although the foreign exchange reserves increased somewhat more than the stock of MNB bills, the higher HUF interest rates imposed a higher overall net interest expenditure on the central bank. This effect has been augmented by the increasing spread between the MNB's policy rate and the yield on its foreign exchange reserves.⁵

Graph 5
Change of outstanding MNB bills and its effect on profit/loss of the central bank



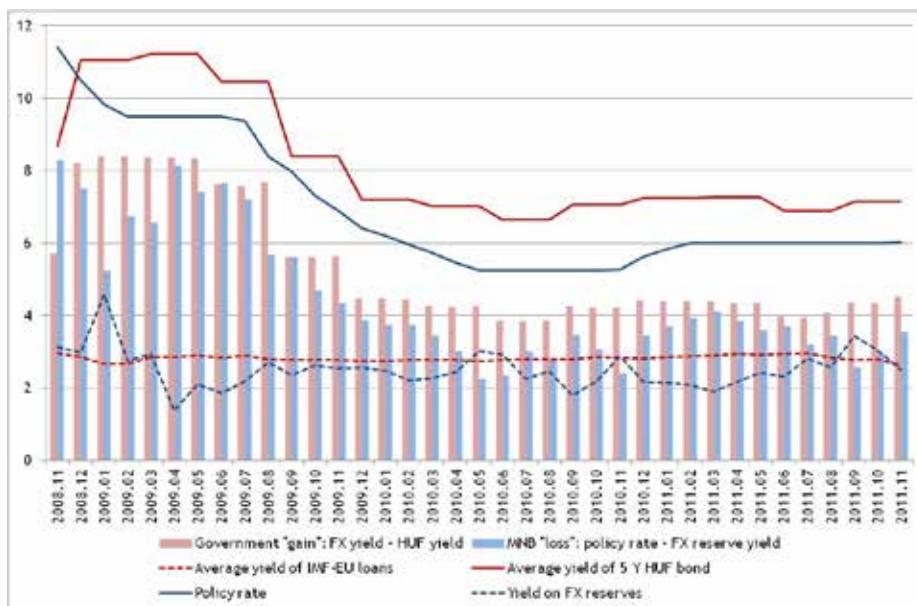
On a consolidated level, the balance of government savings and the central bank's net extra interest expenditure is likely to be positive because of the high opportunity cost of HUF bond issuance. When the government covers its financing requirement by foreign currency debt issuance, and converts the funds raised at the central bank for HUF liquidity, then the government gains the difference between the interest rate on foreign exchange loans and the rate on HUF bonds. At the same time, the central bank's loss amounts to the difference between the policy rate and the yield on foreign exchange reserves. The average difference of the aforementioned spreads for the period between November 2008 and November 2011 is around 90 basis points, which means that the government's gain has so far exceeded the

⁴ Of course the counterfactual assumption on HUF bond issuance is somewhat unrealistic, as the primary market dried up totally at beginning of the period.

⁵ The excess withdrawals were held at the central bank, increasing the interest revenue on FX reserves, but without any effect on the structural liquidity.

actual losses of the central bank. This gain may decrease, or turn into a loss, once the EU/IMF loan is repaid and replaced by market issuance.

Graph 6
Actual cost of IMF-EU loans on a consolidated level



Lessons from the viewpoint of foreign reserve management

As we have seen, the level and dynamics of foreign currency public debt can heavily affect the central bank's ability to formulate its own strategy on foreign reserves. This section summarises the most relevant constraints and policy conclusions.

Growing public debt tends to increase the level of uncertainty in the dynamics of foreign exchange reserves

Foreign currency debt issuance can contribute significantly to the growth of foreign exchange reserves. Yet, reserve accumulation via this channel is strongly countercyclical: during periods of abundant market liquidity and low risk awareness, there are practically no constraints. In bad times, however, when the need to use these reserves arises, an emerging economy has very limited scope to issue new debt in the necessary amounts. Furthermore, hot money investors tend to become more active as public debt grows, causing an ever-increasing volume of short-term funding to flow in and out of the country.

The central bank needs to have a buffer above necessary level of reserves

All the above factors tend to increase the uncertainties in the dynamics of foreign exchange reserves: that is, reserves are likely to fall below the expected level when sudden and large shifts occur in reserve requirements. In such a situation, simply targeting the reserve level at the precautionary level (ie at the level indicated by the Guidotti-Greenspan rule or similar) can create difficulties, given that the replenishment of reserves will take time and that, especially during a period of market disorder, the required funds will be difficult to obtain from the market. This suggests that the central bank will be better off if it maintains an additional buffer, over and above the precautionary level of reserves.

However, maintaining excess reserves implies extra costs too. The size of these costs is determined by the differential between the financing cost and the yield on reserve assets. This gap is usually positive and during an episode of market disorder it tends to widen.

The central bank's autonomous instruments may not be sufficient to counteract volatility in reserve levels and reserve requirement

Although foreign currency debt issuance plays crucial role in foreign exchange reserve growth in Hungary, the central bank has only a limited degree of influence over foreign currency debt management. The debt management agency may take reserve adequacy considerations into account, but the major drivers behind its decisions are its own preferences on the optimal level of foreign currency debt. In theory, the central bank can also issue foreign currency debt, booking it on its own balance sheet. Statistically speaking, this would not increase the government's debt, but there are several disadvantages to this approach. Thus, this is not common practice internationally.

In Hungary, the central bank has only limited scope for building foreign exchange reserves through the use of its own instruments. The direct spot purchase of foreign exchange is not practicable, because of the negative revaluation effect on the private foreign currency debt stock. Nor is it possible to impose reserve requirements on local banks based on their foreign exchange liabilities: as the banking system also suffers from a foreign exchange liquidity shortage, such a measure would increase their participation on the central bank foreign exchange tenders, thus wiping out any increase in the foreign exchange reserves. The central bank could, in principle, conduct repo or FX swap deals with large foreign banks, but these agents would be willing to provide short-term funding only. Thus reserve adequacy would not be bolstered in this way. FX swap lines extended by developed country central banks might provide an appropriate tool, but the options for Hungary are rather limited in this respect.

These considerations suggest that the central bank would face difficulties if it were forced to quickly replenish foreign exchange reserves. An important lesson of the recent crisis was that investors expected countries to hold the optimal (ie Guidotti-Greenspan rule-based) level of foreign exchange reserves even at the height of the crisis. All this implies that central banks that have not previously built up large reserve buffers may find their capacity for intervention severely circumscribed in a crisis.

Efficient coordination between government agencies is vital

Serious conflicts of interest can arise between different government institutions (such as the debt management agency, finance ministry or central bank) which can strongly influence the evolution of the foreign exchange reserves. For example, changes in the preferences of policymakers regarding the structure of the public debt can greatly affect the reserves accumulation process. A particularly crucial decision is the level at which the target ratio of the foreign component in total debt is determined. Any move to reduce this ratio can easily conflict with policy targets related to foreign exchange reserves. Furthermore, any early repayment of foreign currency public debt can have a negative side effect on foreign exchange reserves.

Clearly, swings in debt management policy can cause major difficulties for the management of foreign exchange reserves. In addition, if the issue of foreign exchange reserve adequacy has only a limited weight in the decision-making process, foreign currency debt management may lead to suboptimal results at the consolidated level. In order to avoid such an outcome and to optimally coordinate the different interests, we believe that a long-term debt issuance strategy should be defined in which both the central government and the central bank have a say in determining the size and the timing of foreign exchange issuance – a strategy which would also be binding on the debt management agency.

Additional sources of foreign currency liquidity could play an important role

Acknowledging the central bank's dependence on the government's foreign currency debt issuance, the Hungarian central bank seeks to identify and utilise other sources of foreign currency liquidity from both market and official sources. However, as we have briefly outlined in Section 6.4, the options are limited.

The only tool that would allow central bank to quickly obtain an ample amount of foreign exchange reserves is a FX swap line extended by developed country central banks. Based on the MNB's previous experience, the existence of a such a line can significantly improve market sentiment⁶ even if actual utilisation is limited. Market participants "reward" such agreements not only because they represent a potential source of foreign exchange liquidity but also because they are a token of support from a developed country central bank.

The costs and benefits of foreign currency debt should be considered on a consolidated basis

When the effect of foreign currency debt on the central bank's net interest expenditure is taken into account, the overall cost of public debt financing in foreign currency may be significantly altered. Usually governments pay lower interest rates on their foreign currency debt than on domestic issuance. This is, of course, one of the most appealing features of foreign currency financing. On the other hand, the conversion of foreign exchange loans increases the domestic liquidity which the central bank will likely be obliged to sterilise. When it does so, the sterilisation cost may partially or totally offset the government's saving on its interest payments. If the increased interest expenditure for the central bank causes losses, the government is ultimately obliged to reimburse that loss, and thus sterilisation costs should be taken into account when the cost of foreign exchange financing is assessed. The consolidated outcome depends on the difference between the interest rate on international loans and the rate on HUF bonds compared to the difference between the policy rate and the yield on foreign exchange reserves.

If the net interest expenditures of the government and the central bank are consolidated, we estimate that the cost of the foreign exchange loans is likely to be slightly lower than the equivalent domestic issuance would be. However, this gain may turn negative in future if foreign exchange loans are rolled over into new foreign exchange bond issues with higher yields.

Conclusion

This paper focuses on the interactions between public debt policy and foreign exchange reserve management. We found that, although foreign currency debt issuance can contribute significantly to the growth of foreign exchange reserves, it can cause serious difficulties in assessing reserve adequacy. This is especially the case during a crisis when it becomes almost impossible to refinance maturing debt at a time when, for various reasons, the reserve requirement may be rising still further. On the other hand, the accumulation of foreign exchange reserves may affect the public deficit and debt, both directly and indirectly, especially if it is implemented through foreign currency debt issuance by the government.

Based on these observations, several lessons could be drawn. Rising public debt tends to increase the uncertainty in foreign exchange reserve dynamics. The reserve requirement can

⁶ Markets responded favourably in the case of other countries obtaining an FX swap line from a developed country central bank: see Aizenman and Pasricha (2009).

fluctuate within a wider range but the central bank has only limited influence on the reserve accumulation process. As a consequence, the debt management policy may result in a suboptimal solution on a consolidated basis if the needs of reserve adequacy are not taken into account within the decision-making process on foreign currency debt issuance. To avoid such negative side effects, we believe that a long-term debt issuance strategy should be defined where both the central government and the central bank have a say in determining the size and the timing of foreign exchange issuance. Further, if the central bank wants to enhance its capacity to intervene during a crisis, it should seek to identify and utilise other sources of foreign exchange liquidity. But the options here are limited: we believe that the most appropriate tool that would enable a central bank such as the MNB to rapidly obtain an ample amount of foreign exchange reserves is an FX swap line provided by a developed country central bank.

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Sovereign debt management in India: interaction with monetary policy

R Gandhi¹

Abstract

India's expansionary fiscal policy during the recent crisis resulted in higher government borrowing through 2008–09 and 2009–10. This borrowing requirement came in about 83% above the budget estimate in 2008–09, and 65% above the previous year in 2009–10. The debt-to-GDP ratio rose from 69% before the recent global financial crisis to 73% in 2010, creating a severe challenge for the Reserve Bank of India (RBI) in meeting the public borrowing requirement without causing market disruption. To hold borrowing costs down while scheduling issue maturities so that rollover risk was kept to a minimum, the RBI followed a multi-pronged strategy.

The potential for interaction between public debt management and monetary policy has undoubtedly increased during the recent global crisis. This is due to the increase in short-term debt, which can jeopardise both the signalling of monetary policy and its transmission. India's particular dilemma, however, was related to systemic liquidity, ie the system would preferably be in deficit for monetary policy transmission whereas a system in surplus would be more favourable for debt management. The RBI has resolved this dilemma by putting in place a monetary policy operating framework whereby the system is ideally allowed to be in deficit (or surplus) to the extent of the frictional component ie 1% (+/-) of the banking system's net demand and time liabilities (NDTL). In this setup, the structural liquidity deficit (or surplus) is met through OMOs and adjustments in the cash reserves.

Against the background of the increased interaction between sovereign debt management (SDM) and monetary policy, two important issues urgently need to be addressed. These are: (i) to ensure seamless coordination between SDM and monetary policy, especially during turbulent periods; and (ii) to revisit the role of central banks in public debt management.

Keywords: National debt, debt management

JEL classification: E610, E630, H630, H740

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Sovereign debt management (SDM) is important for other macroeconomic policies, especially monetary policy setting and transmission. The recent global crisis has brought sovereign debt to the forefront as debt surged to unsustainable levels in many advanced countries, triggering sovereign debt crises. Reinhart and Rogoff (2011) find that, for countries with systemic financial crises and/or sovereign debt problems (Greece, Iceland, Ireland, Portugal, Spain, the United Kingdom and the United States), average debt levels are up by about 134% since 2007, surpassing by a significant margin the three-year 86% benchmark that the same authors (2009) find for earlier deep post-war financial crises.² These debt levels have posed severe challenges for other macroeconomic policies and objectives. Some central banks, especially in advanced countries, have applied unconventional monetary policy measures, ie outright purchase of long-term government bonds to influence long-term interest rates. However, the success of such measures has yet to be proven. Nevertheless, a broad consensus has emerged in academia and among policy practitioners on the importance of coordination between debt management and other macroeconomic policies, especially monetary policy.

The sovereign debt composition in terms of maturity, instruments and currency could also have grave implications for other macroeconomic policies. For instance, heavy government borrowing combined with the outright purchase of government securities by central banks has heightened the interaction between monetary policy and SDM. Rising sovereign default risks and increased volatility in markets for government securities have serious implications for financial markets and financial stability, given that government securities constitute a large part of banks' and financial institutions' portfolios.

India's debt-to-GDP ratio rose from 69% before the recent global financial crisis to 73% in 2010. This increase was mainly due to India's fiscal stimulus measures, which were similar to those implemented by sovereigns worldwide after the financial crisis. This note covers the various issues arising from the Indian experience with public debt management and the challenges it poses to monetary policy.

Public debt management framework

The Reserve Bank of India (RBI) is responsible for managing India's public debt, especially debt denominated in the domestic currency. The management of the central government's debt is conducted by RBI under statutory provisions that oblige the central government to delegate its debt management to the RBI. The debt of the sub-national governments, on the other hand, is managed by the RBI under bilateral agreements. The RBI seeks to hold the government's borrowing costs to a minimum over the medium to long term, while keeping the associated risks to a prudent level. The cost objective is largely met by deepening and widening the government securities market, while rollover risk is contained by fixing upper limits for yearly maturity buckets as well as individual securities. These limits are set according to the government's repayment capacity and the probable demand for government securities. Further, the maturity of each new issue of government debt is influenced by the interest rate cycle; shorter maturities are considered when the yield curve is steep and vice versa.

Two landmark developments have shaped India's public debt management framework, namely (i) the March 1997 supplemental agreement between the RBI and the government

² The combination of high and climbing public debts (a rising share of which is held by major central banks) and the protracted process of private deleveraging makes it likely that the 2008–17 period will be aptly described as a decade of debt

and (ii) the 2003 Fiscal Responsibility and Budget Management (FRBM) Act. The supplemental agreement discontinued the issuance of ad-hoc treasury bills by the government to the RBI to finance the fiscal deficit, while the FRBM Act prohibits the RBI from participating in the primary auctions for government loans. Together, these measures prevent the fiscal deficit from being monetised.

Apart from its role as debt manager, the RBI also acts as a banker to both central and sub-national governments. Thus, the RBI provides Ways and Means Advances (WMA) and limited overdrafts to both the central and sub-national governments allowing them to meet any temporary mismatch between receipts and payments. Further, the RBI acts as a fiscal adviser to both the central and the sub-national governments. For example, most of the sub-national governments have adopted fiscal responsibility legislation that was originally proposed by an RBI working group.

Debt management experience during the crisis

The expansionary fiscal policy adopted during the recent crisis resulted in higher government borrowing during 2008–09 and 2009–10. The government's gross market borrowing was estimated at INR 1,497.80 billion in the 2008–09 budget. However, actual government borrowing during 2008–09 amounted to INR 2,730 billion, about 83% higher than the budget estimate. Gross borrowing increased further to INR 4,510 billion during 2009–10 reflecting continued fiscal expansion. The challenge for the RBI was to manage a government borrowing programme on the required scale without disrupting markets, especially in an environment of uncertainty and heightened risk aversion among investors. The borrowings of sub-national governments also increased by about two thirds in 2008–09 over the previous year, as they also undertook countercyclical measures. The sub-national governments raised from the market a gross amount of INR 1,181 billion and INR 1,311 billion during 2008–09 and 2009–10, respectively.

The associated challenges need to be viewed in the context of the fiscal stimulus packages implemented worldwide after the crisis to offset falling consumption and investment. In India, the most significant challenge for the RBI was to manage the sudden large increase in the borrowing requirement during the crisis period. Second, liquidity in the system had dried up due to large capital flow reversals as foreign investors withdrew funds from EMEs. Third, uncertainty and general risk aversion in financial markets further complicated the task of the debt manager in completing the borrowing programme without disrupting markets. To meet these challenges, while also seeking to keep borrowing costs low over time and to mitigate rollover risk, the RBI followed a multi-pronged strategy that included the following elements:

- front-loading of borrowing to make use of more favourable market conditions in the first half;
- the Market Stabilisation Scheme (MSS), which was primarily used by RBI for managing liquidity infused by capital flows, was de-sequestered to partly fund the GFD alleviating pressure on fresh government borrowings;
- use of Treasury bills to partially fund the increased gross fiscal deficit;
- shortening of average maturity to lower effective borrowing costs. The average maturity of India's public debt was sufficiently long (ie 10.59 years as at end-March 2008) to allow scope for some shortening without a significant increase in rollover risk;
- continued use of the RBI's uniform price auction format to allow aggressive bidding by investors in an uncertain market environment; and

- increased communication between the RBI and market participants through press releases, meetings, and information on evolving issues and policy decisions.

The weighted average cost of borrowing through dated securities fell from 8.50% in 2007–08 to 8.23% during 2008–09 and further to 7.89% in 2009–10. The issuance of government dated securities with maturities of five years or less increased during the crisis period, with the weighted average maturity of dated securities issued during the year shortening from 14.9 years in 2007–08 to 13.81 years in 2008–09 and further to 11.16 years during 2009–10.

Interaction with monetary policy

The interaction between SDM and monetary policy operations is a topic that has attracted an increasing amount of attention from both scholars and policymakers in recent years. When the financial crisis forced a sharp rise in sovereign borrowing, debt managers in many countries (eg the euro area) shifted the maturity structure of fresh borrowing towards the short term. Issuance of short-term debt increased significantly in almost all OECD markets during the crisis period (Blommestein (2010))³. Hoogduin et al (2010) note that the potential for interaction between public debt management and monetary policy has risen due to the increase in short-term debt during the recent global crisis period. Sovereign debt managers generally operate over the medium to long term; but their increased short-term fund-raising could potentially come into conflict with the monetary policy transmission mechanism. Further, the greater reliance on short-term borrowing (for example, Treasury bills and cash management bills in India) could distort the yield curve in a thin market, jeopardising monetary policy signalling and its transmission mechanisms, besides having serious implications for public welfare as the yield curve is a public good.⁴

Another possible interaction between SDM and monetary policy could be through the central bank's open market operations and the new issuance of securities by the debt manager. Since the onset of the international crisis, central banks in many advanced economies and emerging markets (EMs) have purchased government bonds in the secondary market as part of unconventional monetary policies. However, the intended effect of purchasing long-term securities (open market operations) by the central bank could be offset by a concurrent decision by the sovereign debt manager to issue long-term securities. In this regard, Mohanty and Turner (2011) note that the recent central bank operations in government debt markets to influence the long-term interest rate are usually defended on the grounds that monetary easing is constrained once the policy rate approaches zero. Furthermore, the liquidity and monetary management operations of the monetary policy also interact with SDM operations as government bonds are used as collateral in open market operations and other liquidity facilities.

These potential interactions between monetary policy and SDM could be smoothed without any adverse impact through seamless coordination between the monetary policymaker and the debt manager. Such coordination, however, is more difficult when these activities are conducted by different agencies. It has been argued that independent sovereign debt managers, seeking solely to keep costs low, are tempted to prioritise their short-term

³ The explosion in the supply of public debt happened at a time when even sovereign issuers were experiencing liquidity problem in their secondary markets.

⁴ When conventional monetary policy uses policy interest rate adjustments and signalling as the instrument, central banks typically operate such that their transactions in government debt markets have only a minimal impact on yields, so as not to undermine the usefulness of the yield curve as an indicator of macroeconomic expectations (BIS (2011)).

goals. For example, the share of short-term issuances has recently increased significantly in the sovereign debt of countries such as Greece, Portugal, Ireland and Spain, where SDM has been segregated from monetary policy into a separate debt management agency. Hoogduin, et al (2010) have analysed debt managers' behaviour in the euro area, where sovereign debt is managed by independent debt management agencies, finding that debt managers are apt, in the interests of cost mitigation, to shift excessively towards short-term borrowing in response to a steepening of the yield curve or other interest rate movement. If, however, the central bank is also empowered to manage the country's sovereign debt, it is in a position to ensure seamless coordination between both activities. This kind of coordination was evident in India during the recent global financial crisis, when it became vital to efficiently manage the steep increase in government borrowing.

In India, debt management is currently carried out by the RBI's Internal Debt Management Department (IDMD), which is functionally separate from monetary policymaking. The debt management strategy is formulated by the Monitoring Group on Cash and Debt Management, which is the apex coordinating body between the RBI and the Ministry of Finance. Contrary to the popular perception of a conflict between monetary policy and debt management, there exists a strong confluence of interest in these two activities that are undertaken by the RBI. In fact, any perceived conflict of interest was resolved by two measures, namely (i) the March 1997 agreement between Government of India and RBI that discontinued the issuance of ad-hoc treasury bills by the government to RBI, which effectively put an end to the automatic monetisation of the fiscal deficit; and (ii) the 2003 Fiscal Responsibility and Budget Management (FRBM) Act, which debars the RBI from participating in the primary market auction for government borrowing. Further, the open market operations (OMO), in which the RBI purchases and sells government securities, are coordinated with the government's borrowing programme, ruling out any potential for conflict between these activities. If there is a dilemma for RBI with regard to monetary policy and debt management, it is related to systemic liquidity. That is, the system may need to be in deficit for monetary policy transmission, whereas a system in surplus would be more favourable for debt management. But RBI has resolved this dilemma by putting in place a monetary policy operating framework whereby the system is allowed to be in deficit (or surplus) to the extent of its frictional component, ie 1% (+/-) of the banking system's net demand and time liabilities. At the same time, any structural liquidity deficit (or surplus) is met through OMOs.

The perception that a conflict exists between monetary policymaking and debt management misses the point that monetary policy lies at the core of debt management. Without inflation at a low and stable level, it would be very difficult to sell fixed coupon government securities, particularly of longer maturities. Low and stable inflation since the mid-1990s has made it possible to extend India's sovereign yield curve. The RBI has also been actively engaged in developing the government securities market, *inter alia*, in terms of instruments and investor base, and the Bank has put in place an efficient infrastructure for trading, payment and settlement. These efforts have helped to contain the cost of government borrowing over the medium term. Therefore, a central bank that is also responsible for debt management can be equally committed to price stability, particularly when debt management is its statutory responsibility.

In this regard, Goodhart (2010) argues that debt management is again becoming a critical element in the overall conduct of macroeconomic policy. Hence, he suggests, central banks should be encouraged to revert to their role of managing the national debt. Subbarao (2011) also concludes that, on balance, and as long as there are institutionalised mechanisms to negotiate the various trade-offs within the overarching objective of achieving monetary and financial stability, the separation of debt management from central bank would seem to be a sub-optimal choice.

Further issues

The increased interaction between SDM and monetary policy raises two important issues that urgently need to be addressed: (i) to ensure seamless coordination between SDM and monetary policy, especially during turbulent times; and (ii) to revisit the role of central banks in public debt management. In countries where debt management has been separated from the central bank and entrusted to an independent debt management office (DMO), an institutional mechanism may exist for coordination between debt management and monetary policy. But the larger question is whether the desired coordination is taking place in practice, as the central bank and the DMO may at times find their objectives in conflict. Thus, the coordination mechanism needs to be reviewed, especially against the backdrop of auction failures in the United Kingdom and Germany in the recent past, and the sub-optimal debt structures implemented by some DMOs. In India, the 2007–08 budget announced that an independent DMO would be set up and a middle office has already been set up in the Ministry of Finance. If an independent DMO is established in countries where the responsibility for SDM currently lies with the central bank, then challenges might arise when seeking to ensure seamless coordination between monetary policy and debt management. This is particularly the case where the level of sovereign debt is high, as in India where government borrowing has increased in parallel with the fiscal deficit. A further challenge would be to ensure that the borrowing programmes of the central government and the sub-national governments are fully coordinated.

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Fiscal policy, public debt management and government bond markets in Indonesia

Mr Hendar¹

Abstract

Over the past several years, the Indonesian government has pursued a prudent fiscal policy while still promoting economic growth. Since 2005, the government has shifted the source of deficit financing from external to domestic debt via the issuance of government securities. In doing so, it has sought to lengthen the maturity of local currency government bonds and to construct a yield curve. Meanwhile, the global excess of liquidity has driven foreign investors to seek for higher yields. With its strong fundamentals and attractive yields, Indonesia has therefore been the recipient of massive capital inflows, most of which have been invested in stock and government bonds. As the central bank, Bank Indonesia has adopted a mixture of monetary and macroprudential policy measures to manage these capital inflows and excess liquidity. From early 2008, the Bank has conducted daily operations with government securities to manage liquidity in the market.

Keywords: Central Banks, Monetary Policy, Fiscal Policy, Indonesia

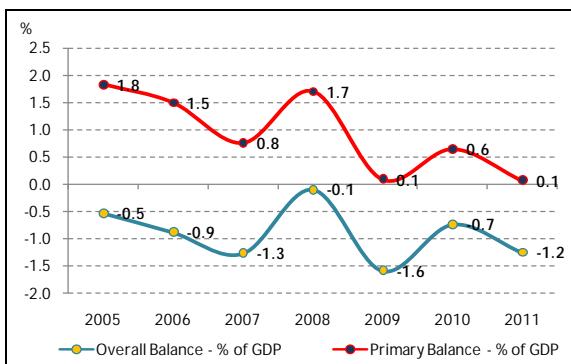
JEL classification: E58, E63

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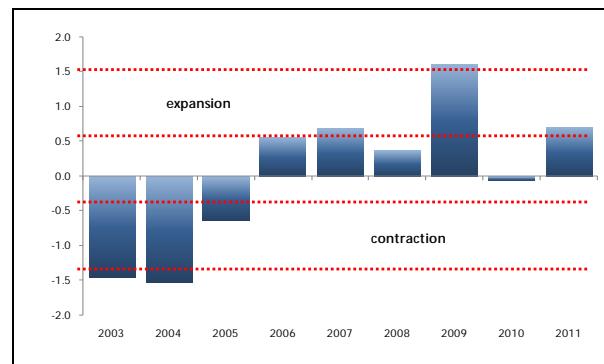
Fiscal policy overview

Fiscal policy indicators show that the Indonesian government has managed to pursue a prudent fiscal policy while still promoting economic growth. The fiscal policy stance is measured by estimating the overall balance, the primary balance, and fiscal impulse. Over the past several years, a relatively low deficit has been reflected in the ratio of the overall balance, which indicates the difference between revenues and grants, and expenditures. The exception was in 2009, when the overall fiscal deficit reached 1.6% of GDP as the government sought to cushion the impact of the global crisis on the Indonesian economy. At the same time, the fiscal impulse – which indicates the role of government in increasing (or dampening) aggregate demand – also showed an expansion, in line with the government's prioritisation of economic growth.

Indonesia overall and primary balance

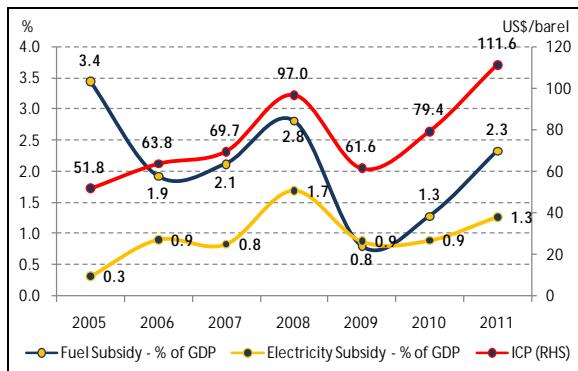


Fiscal impulse

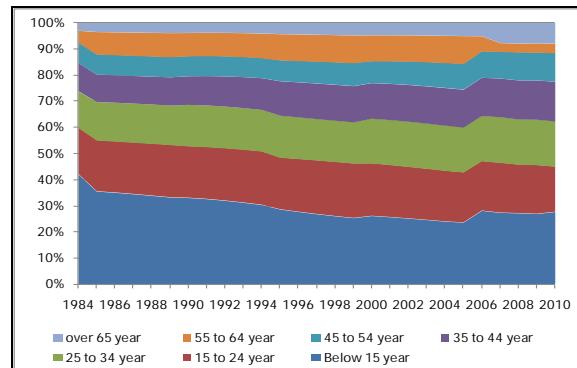


Medium-term pressures could potentially arise from official subsidies, especially those for fuel and electricity. Rising as it does in line with the oil price, the cost of fuel subsidies has the potential to undermine the state budget. In 2012, the government has sought to place limits on the fuel subsidy, with a view to reallocating the subsidy budget to more productive expenditure such as infrastructure and capital development. However, the medium-term demographic threat to the government budget from pensions or health care spending is limited, we believe, given that around 65% of Indonesia's population lies within the economically active 15–64 age bracket.

Energy subsidies as a share of GDP



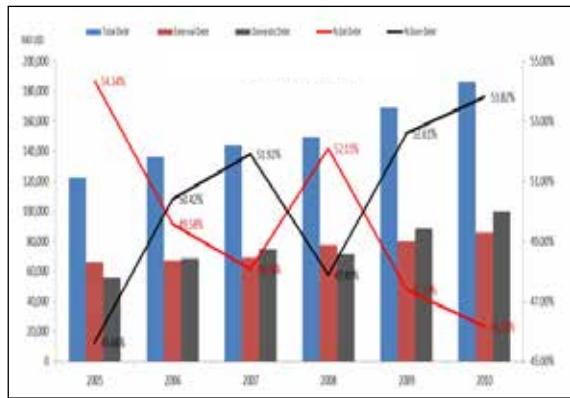
Population demography



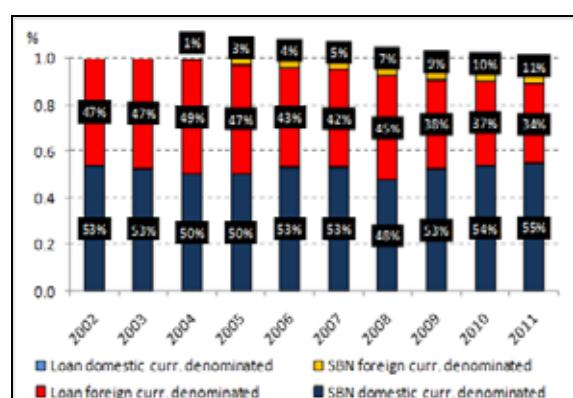
The government has shifted the financing of the government deficit from external to domestic financing. Since 2005, government securities have become the primary financing instruments for the government deficit. The ratio of domestic debt relative to total debt

increased from 45% in 2005 to 54% in 2010. However, this trend was interrupted in 2005 and 2008, when new public debt was issued in US dollars. The government's aim is to refinance maturing foreign debt by issuing securities in the domestic market, to achieve a sound balance of foreign and domestic debt, and to strengthen the domestic financial market. Thus, financing from external borrowing has trended downwards since 2004. From that point, planned loan repayments have been set to exceed disbursements.

Central government debt



Composition of central government debt

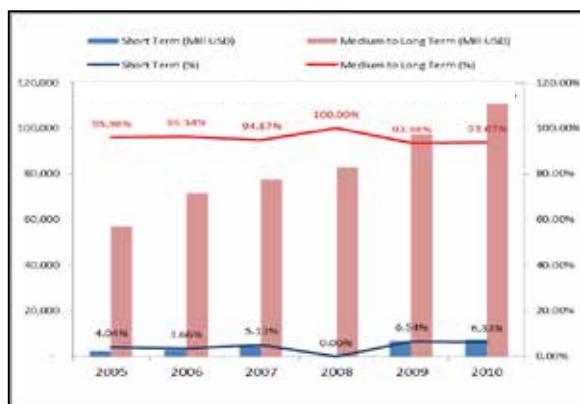


Source: Debt Management Office, Ministry of Finance.

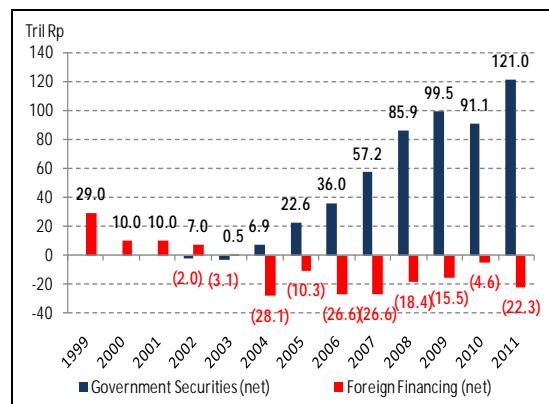
Bonds market, money market and monetary policy implementation

The government is seeking to lengthen the maturity of its domestic bonds and to construct a yield curve. More than 90% of the outstanding central government debt is in medium- to long-term maturities. Since 2002, the government has conducted a reprofiling strategy to improve the maturity profile of government debt securities, hence reducing refinancing risk. Capital flows from abroad, combined with a relatively flat yield curve, have pushed down government bond yields. With its strong fundamentals and attractive yields, Indonesia has received massive capital inflows from yield-seeking foreign investors. Most of these inflows are invested in stocks and government bonds. Coupled with the limited supply of paper, this strong demand has further reduced the yield on government bonds.

Maturity profile of government debt

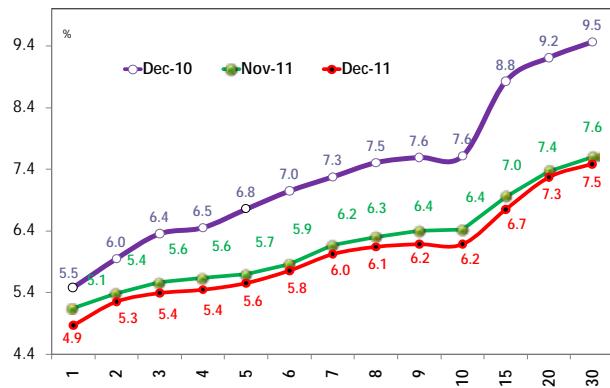


Reprofiling strategy for government debt



Source: Debt Management Office, Ministry of Finance.

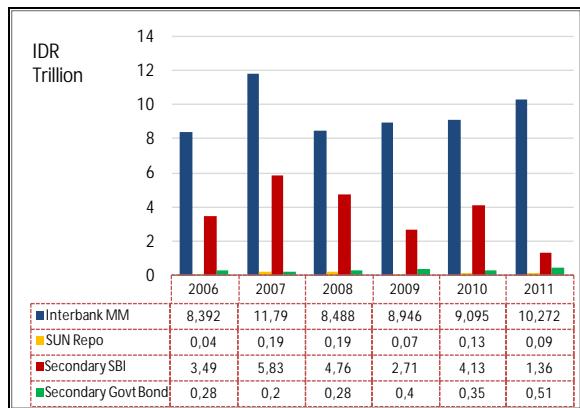
Yield curve for government debt



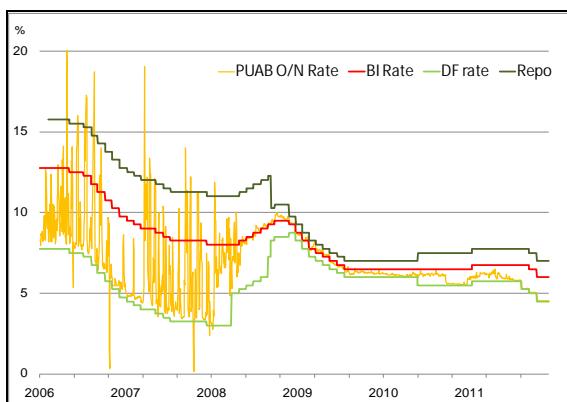
The Indonesian money market is dominated by interbank call money. In terms of the underlying transaction assets, the Indonesian money market can be categorised into collateralised and uncollateralised segments. Based on transaction volume, more than 70% of money market transactions, in daily volume terms, are conducted in interbank call money. Owing to the excess liquidity in the economy, the money market rate tends to hover around the lower border of the central bank's corridor, ie the deposit facility rate. As the repo market is undeveloped on account of this excess liquidity, demand for short-term liquidity is largely met by interbank call money. Repo rates are also higher than those for interbank call money, despite the lower credit risk.

Bank Indonesia has taken various monetary and macroprudential policy measures to manage capital inflows and curb excess liquidity. To maintain financial stability amid massive portfolio capital inflows, Bank Indonesia has imposed a six-month holding period for Bank Indonesia bills (formally known as Certificates of Bank Indonesia or SBI). At the same time, this policy measure supports the central bank's aim of managing excess liquidity by lengthening the maturity profile of monetary instruments. In this regard, the Bank is currently issuing only nine-month SBIs (in monthly auctions) with a view to absorbing liquidity over a more sustained period.

Daily average volume



Interbank money market rate



Since early 2008, Bank Indonesia has conducted daily operations to manage liquidity in the market. Among others, one aim of this policy enhancement is to reduce fluctuations in the overnight interbank call money rate, which is the operational monetary policy target rate. Daily liquidity management operations have relied mainly on term deposits, reverse repo transactions (with government bonds as underlying securities) and deposit facilities (standing

facilities). As the market believes that Bank Indonesia will act to maintain the stability of the overnight interbank call money rate, it is expected that the effect of these measures will be transmitted to the longer-term interest rates too.

The coordination of monetary policy and fiscal policy

The monetary authority coordinates with the fiscal authority in conducting macro policy. According to the Central Bank Act, Bank Indonesia has operational independence in determining monetary policy. However, to improve the effectiveness of monetary policy and fiscal policy, there is close cooperation between the central bank and the fiscal authority. Moreover, Bank Indonesia is prohibited from buying government securities in the primary market for its own account, except when purchasing short-term government securities solely for the purpose of monetary operations. In the primary market for short-term government securities, Bank Indonesia acts as a non-competitive bidder. At the same time, according to the Government Securities Act, Bank Indonesia is the auction and administration agent for government securities. In this connection, the government is required to consult with Bank Indonesia before issuing government securities.

Since 2002, Indonesia's public debt management has been conducted by the Debt Management Office within the Ministry of Finance. For its part, Bank Indonesia is responsible for managing the country's foreign exchange reserves, conducting various foreign exchange transactions, and receiving the proceeds of foreign borrowing. The central bank and the Ministry of Finance coordinate closely with the aim of improving the quality of macroeconomic policy. In addition, the Central Bank Act requires the Ministry of Finance to consult with Bank Indonesia before any issuance of debt. The Act further states that Bank Indonesia must evaluate the monetary implications of such issuance and advise the Ministry of Finance on its terms. As the auction agent for domestic government securities, Bank Indonesia announces the auction plan for government securities, conducts the auctions, and announces the auction results. The Bank also has a role in administering government securities, including their registration, clearing and settlement, and repayment in both primary and secondary markets. For global issuance, the Ministry of Finance appoints external agents to conduct the auctions as well as clearing and settlement.

Since 2011, Bank Indonesia has increased its use of government bonds in its reverse repo operations with the aim of absorbing excess liquidity. As part of its enhanced monetary policy implementation, Bank Indonesia has gradually shifted from the issuance of central bank bills (SBI) to reverse repo transactions as a means of absorbing excess liquidity. This strategy has a twofold benefit, in that it stimulates the development of the government bond market and reduces price discrepancies between different government securities.

The interaction between monetary and fiscal policy: insights from two business cycles in Israel

Kobi Braude and Karnit Flug¹

Abstract

Comparing the two significant recessions Israel experienced over the last decade, we highlight the importance of sustained fiscal discipline and credible monetary policy during normal times for expanding the set of policy options available at a time of need. In the first recession Israel was forced to conduct a contractionary fiscal and monetary policy, whereas in the second one it was able to pursue an expansionary policy. The difference in the effect of the policy response between the two recessions is sizable: it exacerbated the first recession while it helped to moderate the second one.

Keywords: Fiscal policy, fiscal discipline, public debt, monetary policy, counter-cyclical policy, business cycles

JEL classification: E52, E62, H6

¹ Bank of Israel. We thank Stanley Fischer and Alon Binyamini for helpful comments and Noa Heymann for her research assistance.

Introduction

Over the last decade Israel experienced two significant business cycles. The monetary and fiscal policy response to the recession at the end of the decade was very different from the response to recession of the early 2000s. In the earlier episode, following a steep rise in the budget deficit and a single 2 percentage point interest rate reduction, policy makers were forced to make a sharp reversal and conduct a contractionary policy in the midst of the recession. In the second episode, monetary and fiscal expansion was pursued until recovery was well under way. This note examines the factors behind the difference in the policy response to the two recession episodes.

Comparing the two episodes, we highlight the importance of fiscal discipline and the reduction of public debt over time for allowing counter-cyclical fiscal and monetary policy during recessions. In particular, we show that the improved fiscal situation on the eve of the last recession, along with other factors, played an important role in allowing the Bank of Israel to pursue a highly expansionary monetary policy during the recent recession, which helped to moderate and shorten it. By contrast, the poor fiscal situation that preceded the previous crisis and too-sharp an instant interest rate cut that proved unsustainable not only prevented any monetary expansion during that crisis; it actually forced the central bank to raise its interest rate in the midst of the crisis. This actually exacerbated the recession. A rough estimate shows that the difference in the effect on GDP of the policy response between the two episodes was sizable.

Two recessions – different circumstances

During the years 2001-2003 Israel experienced its worst recession in decades, which included four consecutive quarters of negative GDP growth (Figure 1). The dramatic change in the state of the economy, which came after an exceptional 9 percent GDP growth rate in 2000, was due to the unpleasant combination of the burst of the global hi-tech bubble and a sharp deterioration in Israel's security situation (the *Intifada*). Unemployment rose sharply, peaking at about 11 percent (Figure 2), and began to decline only after about 3 years. The budget deficit peaked at almost 6 percent of GDP in 2003 (Figure 3), and the public debt, which was high to begin with, reached almost 100 percent of GDP that year (Figure 4).

Figure 1: Growth Rate of GDP
2000-2011

(Quarterly, seasonally adjusted, annual rates of change)

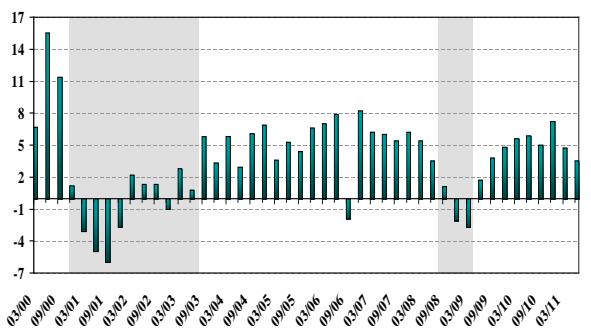
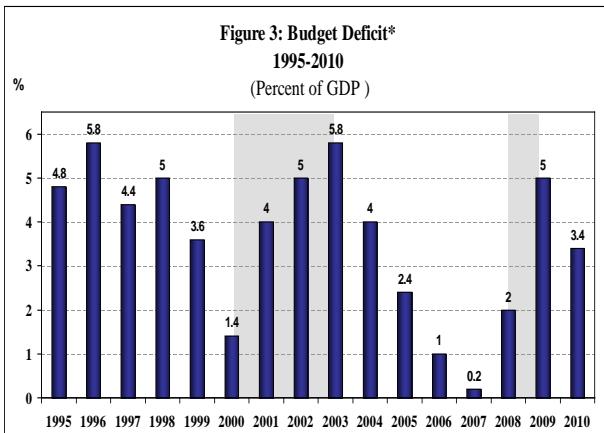


Figure 2: Unemployment
2000-2011

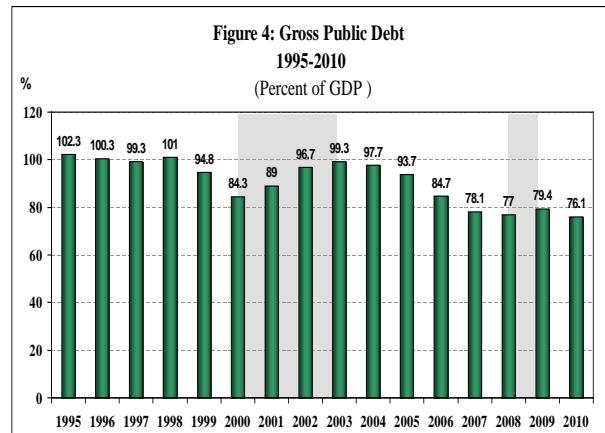


SOURCE: Based on Central Bureau of Statistics data.

SOURCE: Based on Central Bureau of Statistics data.



* The data refer to the deficit excluding the Bank of Israel's profits, and excluding credit extended.
SOURCE: Bank of Israel.



SOURCE: Bank of Israel.

The 2008-2009 recession in Israel was somewhat different: it was due entirely to external factors – the global crisis – and was milder and shorter than the 2001-2003 recession. In particular, growth was negative for only 2 quarters, and the rise in unemployment, while quite sharp, was short-lived: it peaked within just 3 quarters and started declining thereafter. It should be emphasized, however, that it is only in retrospect that we can characterize the outcomes of the recent crisis as milder. The shock to real activity in Israel may have been not much smaller than in the previous recession, and the shock to its financial markets was certainly larger. The fact that, *ex post*, the recent crisis in Israel turned out to be milder than the previous one, and milder than feared in real time, is in part due to the more aggressive policy pursued in Israel, and in part to the success of policy measures abroad in containing the crisis.

Several important differences in the circumstances under which the two recessions evolved should be noted:

The relative nature of the shock: As noted, in 2001 Israel faced a unique combination of shocks such that it was hit more severely than the rest of the world and its relative risk increased. In contrast, the core of the recent crisis did not include Israel, and in many respects it fared better than most advanced countries during the recession. For example, the fall in exports and in GDP in Israel in 2001 was much larger than in the advanced economies, whereas in the 2008-2009 crisis Israeli exports decreased by roughly the same as in the advanced economies and GDP fell considerably less (Figures 5 and 6). Notably, while sharp declines in housing prices and housing investment played a major role in the development of the recent crisis in the US and other advanced economies, demand and prices in the Israeli housing market rose during 2009. This rise was partly driven by the Bank of Israel's interest rate cuts and reflected the desired transmission of its expansionary monetary policy to the construction sector and, through it, to the economy at large.² The considerable pressures for an appreciation of the shekel during much of the recent crisis, which the Bank was trying to moderate by purchasing foreign currency, also reflected Israel's relatively favorable position at that time.

² Activity in the Israeli housing market slowed down at the peak of the crisis (late 2008 and the beginning of 2009), but accelerated thereafter. The acceleration during 2009 stood in sharp contrast to the falling real prices and low level of activity in this market in the preceding decade.

Figure 5: Change in Exports of Goods and Services

2000-2010

(Volume change, annual)

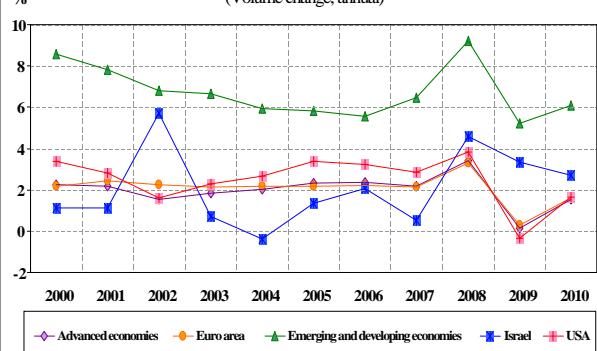
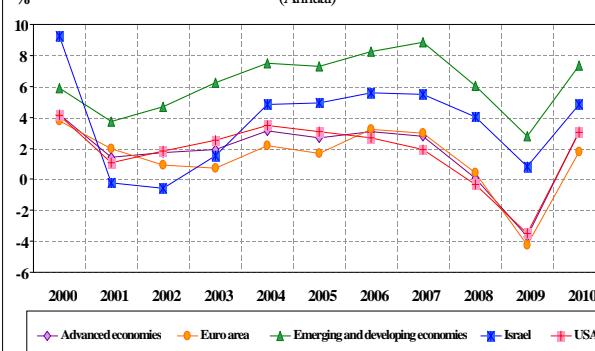


Figure 6: Rate of GDP Growth

2000-2010

(Annual)



SOURCE: IMF World Economic Outlook, September 2011.

SOURCE: IMF World Economic Outlook, September 2011.

World policies: Low interest rates and substantial monetary and fiscal expansions around the world during the recent crisis made such policies in Israel more feasible and acceptable to financial markets. This is particularly true regarding the very low *level* which the interest rate in Israel reached. However, the low levels of interest rates abroad do not tell the entire story, since it is not just the level that was much lower in Israel during the recent recession compared with the 2001-2003 one. Figure 11 shows that the interest rate differentials were also much lower. This reflects a decline in Israel's risk premium and underlines the importance of the improvement in its particular situation compared with the 2001-2003 episode, over and above the global circumstances.

The state of the economy in the years preceding the crisis: The recent crisis hit Israel after about 5 years of exceptionally high growth (about 5 percent a year). This was robust and sustainable growth³ in the sense that it was driven by strong fundamentals: strong export growth driven by world demand and sound macroeconomic policy, which included both fiscal discipline and monetary credibility, as well as structural reforms. Growth rates in the years preceding the previous recession were slower⁴ and were not sufficiently based on strong fundamentals and fiscal discipline.

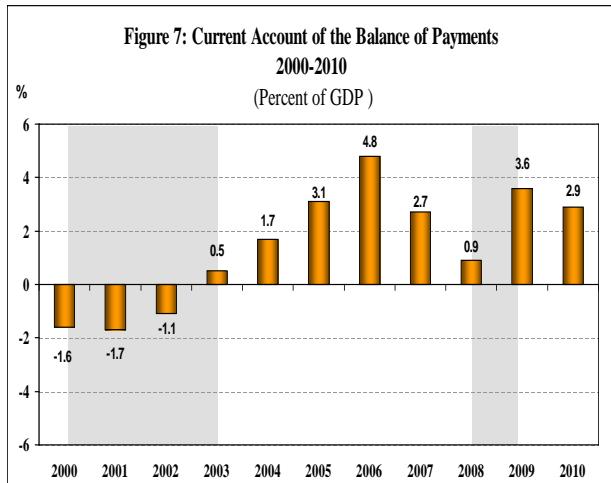
The current account and IIP: As in other respects, Israel's current account on the eve of the last recession was in much better shape than in the run-up to the 2001-2003 recession (Figure 7). Israel had been running a deficit on that account prior and during most of that recession, while it has had a substantial surplus since 2003. These accumulated surpluses also resulted in an improved IIP at the onset of the recent crisis, which increased Israel's resilience to the crisis. In fact, Israel's net foreign liabilities have neared zero since 2008. In particular, it has held a positive and growing net asset position in debt instruments since 2003 (Figure 8).⁵ However, it is noteworthy that neither of the two crises were essentially balance-of-payments crises. Moreover, the current account deficit at the onset of the previous recession was not large (1.6 percent of GDP) and followed a trend of decline in those years. Hence, the importance of the balance of payments notwithstanding, this is

³ Absent the global crisis the robust growth could have continued, though likely at somewhat lower rates as the economy was gradually shifting from a cyclical expansion to long-term growth.

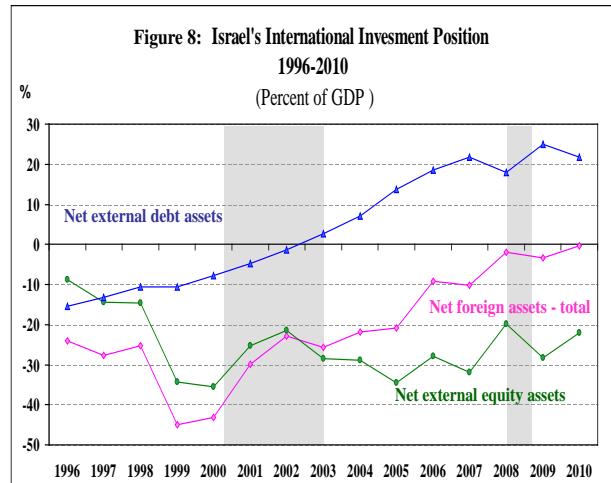
⁴ As noted the spectacular growth in 2000 was exceptional and unsustainable. It collapsed at once at the end of that year.

⁵ The position in debt instruments has been shown to be particularly associated with debt crises around the world. See the IMF World Economic Outlook Sep. 2011. Box 1.5.

apparently not the major difference between the two crises in regard to the economy's situation.



SOURCE: Balance of Payments, Central Bureau of Statistics.



SOURCE: Bank of Israel.

Real time perception of the severity of the crisis: Beyond the objective circumstances described above, differences in the real time assessment of the severity of the situation also contributed to the different policy responses. The dramatic events in global markets as the recent crisis evolved, combined with the tremendous uncertainty and concerns over the potential deterioration, pointed to a possibility that this crisis would be substantially worse for Israel than the 2001-2003 one. As policy makers had to act under such uncertainty and react in a timely and preemptive manner, this real time perception played an important role in motivating the aggressive policy response in Israel. The fact that, ex post, the recent crisis in Israel turned out to be milder than feared is in part due to the more aggressive policy pursued in Israel, and in part to the success of policy measures abroad in containing the crisis.

A different policy response

The different circumstances noted above notwithstanding, both recessions were deep enough to require a significant counter-cyclical fiscal and monetary policy response. However, such policy was pursued only in the 2008-2009 recession.

In the first recession, the increase in the budget deficit (Figure 3) brought about by the fall in economic activity caused yields on government bonds to soar in 2002-2003 (Figure 9) as financial markets were reluctant to finance the growing debt. Thus Israel was forced to pursue a procyclical fiscal policy, cutting public spending drastically. This is well illustrated by the decrease in the cyclically adjusted budget deficit⁶ during 2001-2002 (Figure 10). The excessively sharp cut in the Bank of Israel interest rate – 2 percentage points at once – turned out to be unsustainable (Figure 11). Thus, the response of financial markets, for example the rise in yields and the depreciation of the shekel, forced the Bank to raise its interest rate sharply in the midst of the recession by about 5 percentage points within a few months and maintain it at a high level for a considerable period of time.

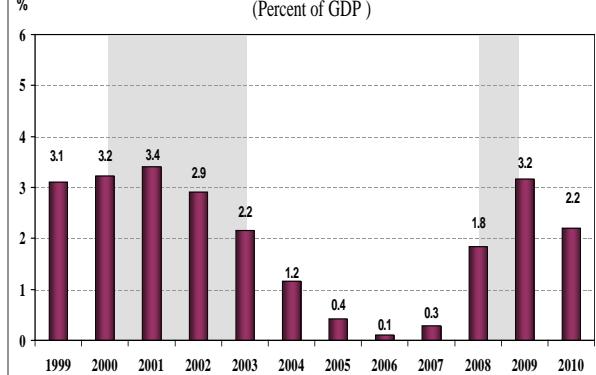
⁶ The adjustment is based on the tax revenues that could be expected if GDP were currently at its potential level.

Figure 9: 10-Year Government Bond Rate
2001-2011



SOURCE: Bloomberg.

Figure 10: Cyclically-Adjusted Budget Deficit
1999-2010
(Percent of GDP)



SOURCE: Bank of Israel.

The recent recession looks very different in terms of fiscal and monetary policy. This time the government did not have to cut total spending at all, and in fact let the tax-revenue automatic stabilizers act in full, allowing the budget deficit to rise to 5 percent of GDP in 2009, in line with the decline in tax receipts.⁷ This was reflected in a rise in the cyclically adjusted budget deficit during 2008-2009 (Figure 10), which was exceptional in view of previous recessions in Israel in which policy was typically procyclical.⁸ The policy was well received by the financial markets, as reflected in the relative stability of government bond yields in 2008 (which even declined somewhat at the beginning of 2009), in sharp contrast to their surge in 2002.

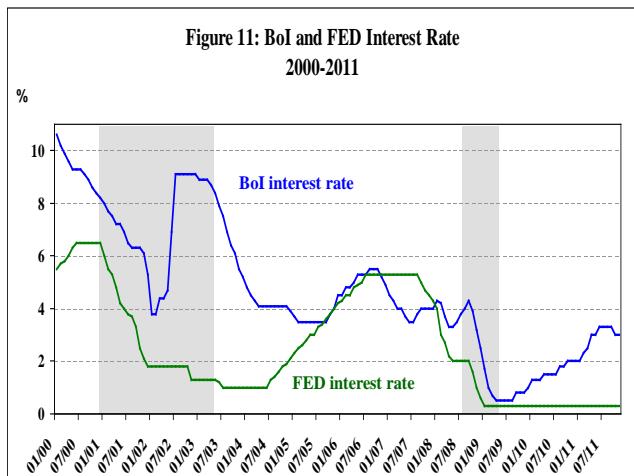
The difference in monetary policy between the two episodes is perhaps even more striking. The Bank of Israel responded to the recent crisis with an unprecedented monetary expansion. Starting in October 2008 the Bank cut its interest rate by 3.75 percentage points bringing it to 0.5 percent in April 2009, its lowest level ever (Figure 11). In contrast to the sharp rate cut at the end of 2001 which proved unsustainable, this time the Bank was able to maintain the rate at its near-zero level, and started raising it in September 2009 in view of the rapid improvement of the economic situation and the resumption of growth, not because of pressures from the financial markets. As the monetary rate approached its near-zero level, the Bank also started implementing quantitative easing by purchasing government bonds in the secondary market. At the same time, the Bank continued its purchase of foreign currency. The Bank had begun these purchases about a year earlier as a preemptive measure to moderate the appreciation of the shekel, which could prove particularly harmful to Israeli exports when combined with the contraction in world demand associated with the global recession. These measures, which were quite unthinkable during the previous recession and would have probably had a major destabilizing effect on financial markets at that time, did not invoke any irregular reactions in the markets during the last recession. As noted, yields remained relatively steady in 2008-2009.

The evolution of the exchange rate provides a further illustration of the difference between the two episodes (Figure 12). Following the interest rate cut at the end of 2001, the shekel depreciated sharply, and remained at its highly depreciated level for more than a year, despite the sharp increase in the interest rate which followed immediately after its attempted

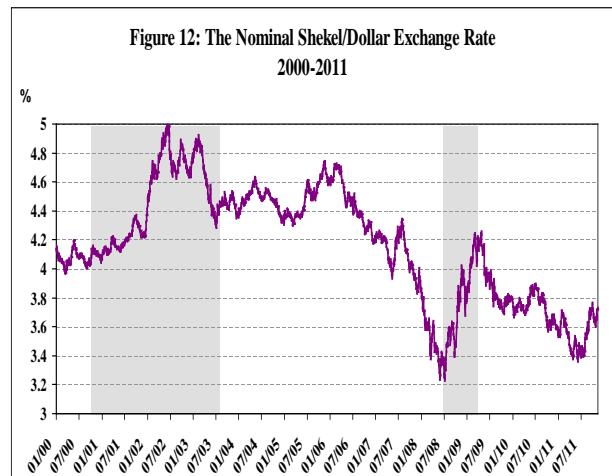
⁷ Governments in Israel tend to raise the rates of indirect taxes (mainly the VAT) during recessions. In that respect even the 2008-2009 recession was no exception, as described in Strawczynski and Weinberger (2011). However, unlike in previous recessions, this increase was explicitly designed to allow a corresponding increase in expenditure, and not to offset the effect of the automatic stabilizers.

⁸ The cyclical nature of fiscal policy in Israel is discussed in Strawczynski and Zeira (2007).

cut. This underlined the inability to pursue a monetary expansion at the time, due in part to the fiscal situation and the undermined credibility of monetary policy. In contrast, during the recent recession not only did the Bank cut the interest rate and narrow the rate differential with world rates, it also purchased substantial amounts of foreign currency in order to induce a depreciation of the shekel and support exports. The sharp depreciation of the shekel during the second half of 2008 and the beginning of 2009 reflected these purchases, as well as a change in the perception of markets regarding the resilience of the domestic economy to the global recession.⁹



SOURCE: Bank of Israel.



SOURCE: Bank of Israel.

Why was the policy response so different?

The difference in the policy responses between the two crises, which were both severe enough to call for counter-cyclical fiscal and monetary measures, raises the question as to why a policy like the one undertaken in the 2008-2009 recession was not feasible in 2001-2003. In other words, why were financial markets willing in 2008-2009 to accept fiscal and monetary policy which they would by no means tolerate in the 2001-2003 recession?

We argue that initial conditions at the onset of the crisis are crucial for understanding this difference. As noted above, Israel entered the recent crisis in a much better position in terms of the state of the economy. The different nature of the crises and the global environment are also important in this respect. However, the most important factor is probably the difference in the state of fiscal and monetary policy on the eve of the two crises. In the recent crisis Israel reaped the benefits of several years of sound macroeconomic policy, particularly in terms of persistent fiscal discipline, which was crucially lacking at the onset of the previous crisis, and in terms of the credibility of its price stability target, which had been established over time.

⁹ It should be noted that the pass-through of exchange rate movements to the consumer price index had declined over time in Israel (due in large part to reduced indexation of housing prices to the shekel/dollar exchange rate). Thus the depreciation during the recent crisis exerted much less inflationary pressure than it did in the 2001-2003 recession. This mitigated the need to strike a balance between the benefits of depreciation for exports and its inflationary costs.

Fiscal policy: In the years preceding the recent crisis, Israel pursued a very disciplined fiscal policy.¹⁰ It avoided substantial increases in public spending despite its rapid growth, and used the large cyclical tax revenues and receipts from privatization to reduce public debt. The budget deficit declined steadily between 2003 and 2007 (the budget was almost balanced in 2007), as did even the cyclically adjusted one until 2006 (Figures 3 and 10). Thus the public debt decreased from almost 100 percent of GDP in 2003 to 77 percent in 2008 (Figure 4).

Such fiscal discipline was lacking in the years preceding the 2001-2003 recession, and the government was not making much progress in terms of fiscal consolidation at the time. During 1995-1999 the budget deficit was around 4-5 percent of GDP, and public debt was around 100 percent of GDP, showing no real signs of embarking on a downward path.¹¹ Thus Israel entered the crisis in 2001 with alarmingly high public debt, a poor fiscal reputation and a troubling outlook for its fiscal standing. This state of things made it particularly vulnerable to shocks. As soon as the economy was hit by (a combination of) shocks and the deficit increased due to the fall in tax revenues, yields surged, as did the exchange rate. In fact, policy makers lost all degrees of freedom: they were forced to tighten fiscal policy and more than offset the effect of the automatic stabilizers. The problematic fiscal circumstances reflected on monetary policy as well: in view of these circumstances, financial markets were also reluctant to tolerate a monetary expansion.

Monetary policy: Despite considerable fluctuations in actual inflation during 2003-2007, inflation expectations remained relatively stable and almost entirely within the inflation target range during that time (Figure 13). This reflects the degree of credibility that monetary policy had established in those years. This credibility played an important role in allowing the highly expansionary monetary policy during the recent crisis without jeopardizing the stability of prices and financial markets: in spite of the sharp interest rate cut, the quantitative easing, and actual inflation exceeding the upper bound of the target range during the crisis, inflation expectations remained within the target most of time and their fluctuations were smaller than those of actual inflation.¹²

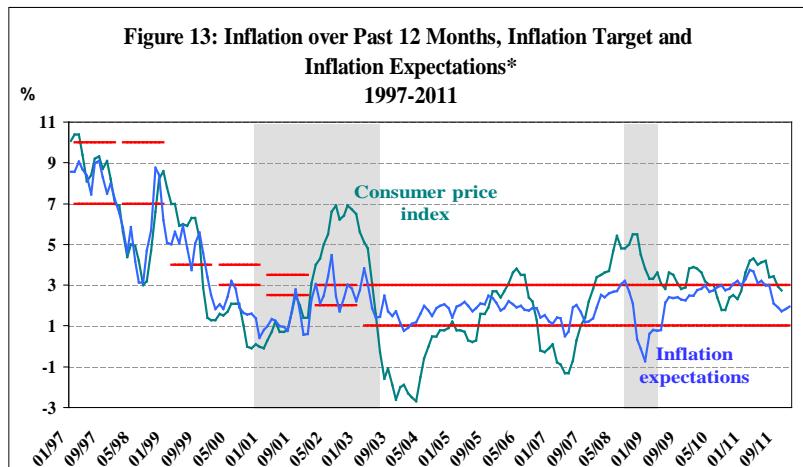
Such credibility of monetary policy had not been sufficiently established by the time the 2001-2003 recession hit Israel. During the second half of the 1990s Israel was still proceeding with its disinflation process. While inflation had been lowered substantially in those years, in fact falling below the inflation target, inflation expectations remained as volatile as actual inflation and credibility had yet to be consolidated (Figure 13). Under these circumstances, the unduly sharp single rate cut at the end of 2001 undermined credibility. Building on the credibility established in recent years and spreading the rate cut over several months, the Bank was able to sustain a much larger cumulative rate cut (3.75 percentage points) during the 2008-2009 recession.¹³

¹⁰ Brender (2009) studies Israel's fiscal policy during 1985-2007 and concludes that during those years only two periods, 1985-1992 and 2002-2006, can be characterized as episodes of sustainable consolidation.

¹¹ The sharp decrease in public deficit and debt in 2000 is not a reflection of fiscal consolidation but rather the (short-lived) result of the exceptional (and equally short-lived) GDP growth rate in that year. Moreover, as Brender (2009) notes, the government actually raised the deficit target for that year and introduced several expansionary policy initiatives.

¹² In fact, inflation expectations at the end of 2008 and the beginning of 2009 fell below the lower bound of the range, reflecting in large part fears of the crisis and its potential deterioration. A major concern of monetary policy at that time was indeed to prevent a deflationary spiral.

¹³ The intolerance of financial markets to the 2001 rate cut was due to additional factors. This cut was supposed to be a part of a package deal in which the government was to take immediate measures to reduce its deficit. However, it did not. It also appears that the interest rate had been kept too high for too long and that a more gradual reduction over time might have turned out to be more sustainable. The surprising and dramatic 2 percentage point cut took markets by surprise and seemed like a breach in policy.



* Expectations derived from the capital market.
 SOURCE: Bank of Israel.

An illustrative estimate of the effect of the different policy responses

In this section we provide a rough estimate of the effect of the policy response in each crisis. We estimate the (counterfactual) cumulative loss of GDP that would have been caused by the exogenous factors absent any policy response, and compare it to the actual cumulative loss of GDP.¹⁴ We attribute the difference between the two losses in each episode to the effect of the policy response (fiscal and monetary) in that episode.

The main exogenous factors affecting GDP growth in the 2001-2003 recession were the *Intifada* and, to a lesser extent, the slowdown in world trade. In the 2008-2009 recession, the decline in world trade was the major exogenous factor, and an additional important factor was a wealth effect driven by the decline in the value of financial assets, which affected the purchase of durable goods.¹⁵ We calculate the effect of world trade on GDP in each episode drawing on the unit elasticity of Israeli exports to world trade, which has been found in many studies, and applying the share of exports in GDP as well as the value added of exports that were relevant in each period. The loss of GDP due to the *Intifada* is calculated using estimates published by the Bank of Israel (2001-2003) in its annual reports. The effect on GDP of the decline in the purchase of durables arises mainly through import taxes. This is because a substantial part of these goods in Israel are imported and the significant taxes on these imports are part of GDP in accordance with national accounting conventions. We thus estimate the loss of GDP due to the loss of these tax revenues. The actual loss of GDP in each recession is calculated as the cumulative difference between potential and actual growth during the respective period.

The results of our calculations are reported in Table 1. The first two columns show that the 2001-2003 recession was more severe than the 2008-2009 one in terms of both the magnitude of the exogenous shocks (the first column) and the actual loss of GDP (the second column). However, for our purposes, the main point is given by the last column: in the 2001-2003 recession the actual loss of GDP was 1.5 percentage points larger than the loss attributable to the exogenous shocks. That is, the contractionary monetary and fiscal

¹⁴ We consider the years 2001 through the first half of 2003 for the first recession, and the third quarter of 2008 through the second quarter of 2009 for the second recession.

¹⁵ Credit constraints affecting consumers and the housing market were relatively mild in Israel during the 2008-2009 recession.

policy response at that time exacerbated the crisis. The opposite was the case in the 2008-2009 recession: the expansionary policy response to this crisis helped moderate its effect on the economy, so that the actual loss of GDP is estimated to have been 0.9 percentage points smaller than the loss that would have been caused by the shocks absent a policy response.

Our calculation probably underestimates the loss of GDP caused by the exogenous shocks in the recent recession since we do not account for all of their financial effects, such as the increase in the cost of credit for firms. This implies that the contribution of the policy response to mitigating the crisis in Israel in 2008-2009 was probably larger than reported in Table 1.

Table 1
**The effect of shocks and policy on GDP
in the 2001-2003 and 2008-2009 recessions**

Cumulative effect, percent of GDP

	Loss of GDP due to exogenous shocks	Actual loss of GDP	Policy effect on GDP
2001-2003	7.6	9.1	-1.5
2008-2009	5.1	4.2	0.9

A separate calculation using the Bank of Israel DSGE model for the Israeli economy yields similar results.¹⁶ It shows that implementing the contractionary policy of the previous recession during the 2008-2009 recession would have resulted in a loss of 2.6 percent of GDP. The DSGE calculation further implies that about three quarters of the loss are due to monetary policy, and the remaining loss to fiscal policy. Our calculation, which derives the effect of policy as a residual, does not allow for such decomposition between monetary and fiscal policy.

Looking ahead – confronting the looming crisis

The possibility of a second global crisis triggered by the current events in Europe raises the question whether Israel can repeat its monetary and fiscal policies that seem to have worked well in the recent crisis. The answer is not straightforward.

As noted, Israel was affected relatively mildly by the 2008-2009 crisis and has recovered rapidly, enjoying growth rates that were higher than in most advanced countries. It avoided the large increases in public debt which many advanced countries experienced during the crisis, and has also maintained fiscal discipline since emerging from the crisis. Hence, in terms of debt- and deficit-to-GDP its situation compared with other advanced economies has improved in recent years. It has also accumulated substantial amounts of foreign currency reserves in recent years. Additionally, it has raised its interest rate several times in the last two years, while most advanced countries have left it at a very low level. All this would seem to suggest that Israel has ample room to pursue fiscal and monetary expansion – allowing

¹⁶ We thank Alon Binyamini for providing this calculation. The MOISE DSGE model is described in detail in Argov et al. (2012).

automatic stabilizers to increase the deficit and bring its interest rate back to a near-zero level.

However, several circumstances have changed since the last crisis. It seems that in view of lessons learned from fiscal policies in the recent crisis, the debt crisis in Europe and the state of public finance in the US, global financial markets are less tolerant to budget deficits than they were in 2008-2009. Combined with the risk of contagion among markets, Israel's fiscal performance in recent years may not suffice to allow it to increase the deficit by as much as it did in the recent crisis.

Concluding remarks

The experience Israel has had with two recessions over the last decade provides an interesting example regarding the interaction between monetary and fiscal policy, and the conditions under which policy makers can pursue counter-cyclical policies. The main lessons are that favorable initial conditions and sound macroeconomic policy during normal times expand the set of policy options available to policy makers at a time of need.

In this note we have focused on fiscal and monetary policy but the lesson applies more generally: good policy in good times pays off handsomely in bad times. Good policy in that respect means sustained fiscal discipline during the upside of the business cycle, which credibly aims at an acceptable level of the public debt-to-GDP ratio and pursues a steadily declining path of this ratio over time, along with monetary policy that promotes price stability. Such policy is awarded by the tolerance of financial markets to fiscal and monetary expansion during a recession: yields, risk premia and the exchange rate remain reasonably stable as the central bank cuts the interest rate and the automatic stabilizers are allowed to act, temporarily raising the budget deficit and the public debt. Our calculation shows that the effect on GDP of such a policy response can be sizable.

Looking ahead in view of current developments abroad, Israel is relatively well positioned to confront another crisis. It has some room to increase the deficit and cut the interest rate.

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Public debt and monetary policy in Korea

Dr Geum Wha Oh¹

Abstract

This note reviews Korea's fiscal policy and public debt management, and discusses some of the constraints that bind the Bank of Korea in its conduct of monetary policy. Fiscal prudence and low public debt in Korea have allowed monetary policymakers to focus on inflation control without worrying about public debt dynamics. Such fiscal prudence is mainly attributable to the strong and long-standing commitment to a balanced budget. However, recently, fiscal policy has been managed in a more countercyclical manner within the framework of medium-term fiscal planning. During the recent global financial crisis, Korea implemented large-scale countercyclical fiscal policies to counteract the contractionary effect of the crisis.

Meanwhile, the Korean government bond (TB) market has grown rapidly. Such a development can potentially be helpful for implementing countercyclical fiscal policy against crises, by acting as a low-cost funding source during crises. The Korean government has made various efforts to develop an efficient bond market, such as introducing a system of fungible issuance and opening the market to foreign investors. A recent phenomenon is the increase of official investment in TB by Asian countries, including China and Thailand. The opening-up of the financial market, however, has also complicated the implementation of monetary policy because capital flow also affects market liquidity and the exchange rate. A recent study on the transmission channel shows that the bank lending channel is the most effective one, while the scope for other channels to operate (eg through the yield curve) is limited. This result indicates that monetary policy may have been constrained in reacting to inflationary pressure after the global crisis.

While it is true that public debt sustainability is currently not an issue in Korea, it is also true that sovereign debt management could face significant challenges arising from population ageing and ballooning social welfare expenditures. Other risk factors for public debt dynamics are unfunded government liabilities, public agency or state-owned enterprise debt that is not counted as sovereign debt, and the cost of unification.

Keywords: Fiscal policy, public debt management, capital inflow, monetary policy

JEL classification: E61, E62, H60

¹ Bank of Korea

I. Introduction

Fiscal policy, public debt management, and monetary policy are closely interlinked. Both fiscal and monetary policy enter the government's inter-temporal budget constraint, and directly affect the dynamics of public debt. As proven by the recent euro zone debt crisis, public debt is a highly significant factor in financial stability particularly if it is unsustainably high and constitutes a significant part of bank assets. But the converse is also true, in that the euro zone debt crisis is in large part a legacy of the global crisis.

Public debt management and monetary policy have been fairly independent in Korea, and are expected to remain so in the foreseeable future. Fiscal prudence and low public debt has allowed monetary policy to focus on inflation control without concerns for public debt dynamics. Korea's fiscal policy and public debt management will pose no immediate threat to monetary policy and financial stability. But, in the long run, they do face significant challenges from population ageing and growing social demands for social welfare spending, among other factors.

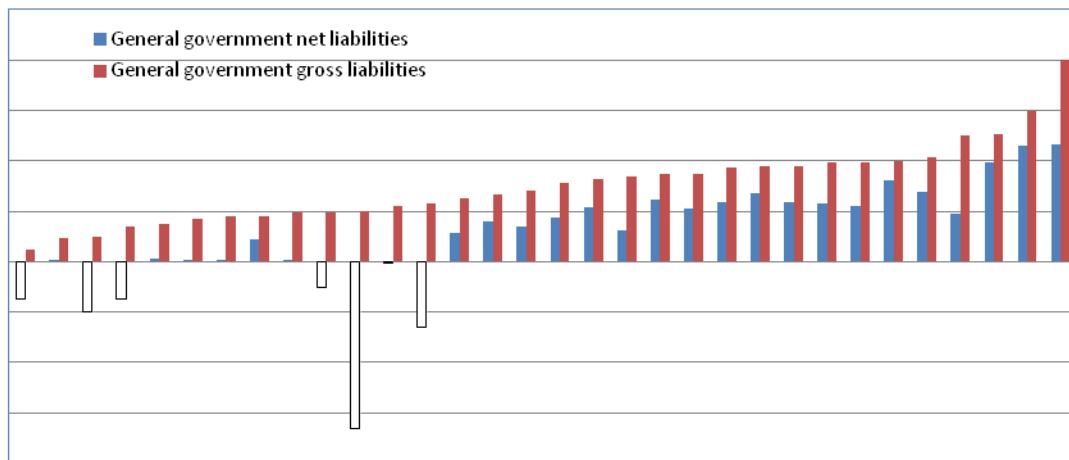
This note reviews Korea's fiscal policy and public debt management, and discusses the constraints faced by the Bank of Korea in conducting monetary policy.

II. Fiscal policy and public debt management: an overview

Institutional setup for fiscal policy

Korea's fiscal policy and public debt management have been prudent since the 1980s by any international standards. Indeed, Korea is one of the least indebted among the OECD countries with public debt standing at about 33.4% of GDP at end-2010 and with no signs of investor concerns over fiscal sustainability (Figure 1). Fiscal prudence has been aided by the sustained solid growth of the economy and by stable financial conditions.

Figure 1. General Government Liabilities of OECD Countries
(Percent of GDP, 2010)



Source: OECD

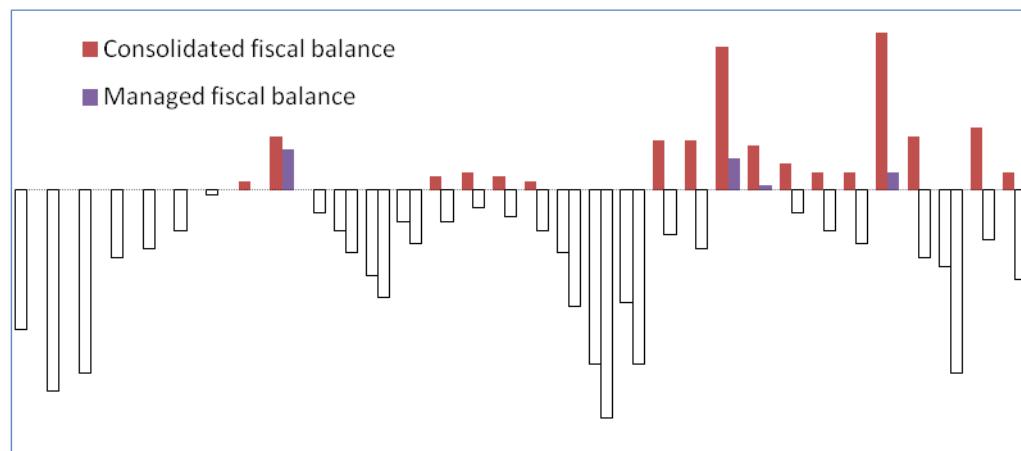
The backbone of fiscal prudence and transparency is the five-year medium-term fiscal plan first introduced in 2004. The plan serves not only as the basic framework for each year's budget formulation and fund management but also as a basis for establishing targets for fiscal balance and public debt over the medium term. Experts from the private sector

participate in the planning process, and the final plan is reported to the National Assembly not later than 90 days prior to the start of a new fiscal year (which coincides with the calendar year). Strictly speaking, the plan is not a fiscal rule as it is not legally binding. Rather, it is an apparatus for encouraging fiscal discipline.

For transparency and administrative efficiency, fiscal activities are categorised into three accounts: (1) the general account, (2) special accounts and (3) public funds accounts. The general account covers general fiscal activities while special and public funds accounts are for public projects funded by taxes and by levies earmarked for specific purposes. As of 2011, there were 18 special accounts and 64 public funds accounts. Public funds accounts had been allowed a relatively high level of flexibility and autonomy for efficiency reasons but only at the expense of reduced transparency and prudence in their management. For this reason, they have required the review and approval of the National Assembly since 2002. They are also subject to a need test every three years conducted by an evaluation committee comprising a group of civil experts.

The consolidated fiscal balance, which includes all three fiscal accounts, recorded a surplus in the mid-1980s after a series of deficits. Since then, it has fluctuated over the business cycle, but remains broadly balanced once adjusted for cyclical factors. The consolidated balance net of social security funds, which is known as the “managed fiscal balance”, has remained close to a balance except for the periods of severe recession or financial crisis. According to the budget, the consolidated and managed fiscal balances are expected to record a surplus of 0.4% of GDP and a deficit of 2.0% of GDP, respectively, in 2011 (Figure 2).

Figure 2. Consolidated and Managed Fiscal Balance
(Percent of GDP)



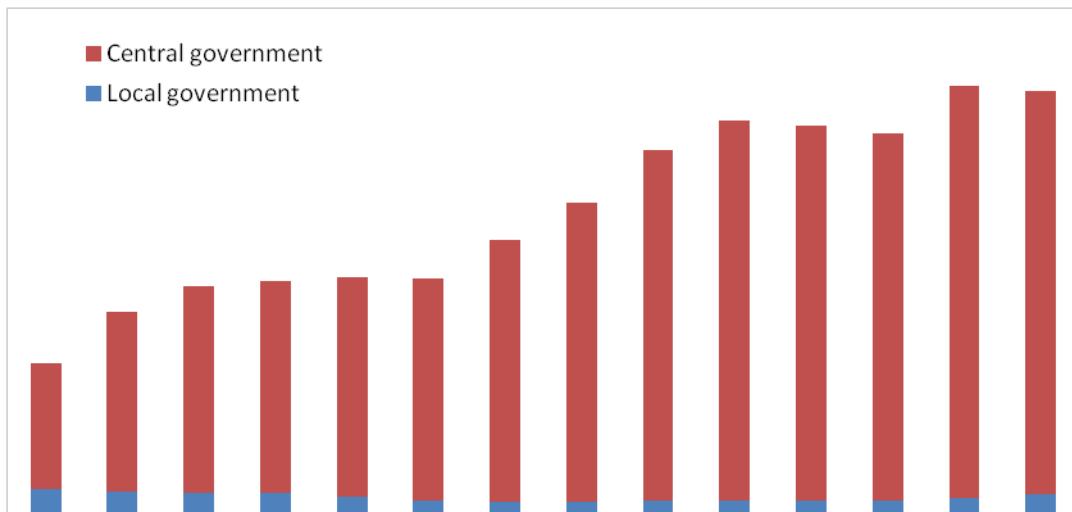
Source: Ministry of Strategy and Finance

Local governments enjoy only a limited degree of fiscal autonomy in their fiscal management, given their role in executing various policies on the central government's behalf in the area of education, social welfare and industrial policy. Nevertheless, their autonomy has recently been on the rise in line with growing fiscal decentralisation. Local governments' debt net of borrowing from the central government is only modest, standing at 1.6% of GDP or 18.4 trillion won at end-2010.

Prudent fiscal management, aided by solid economic growth and stable inflation, has resulted in low government indebtedness. Public debt stood at 33.4% of GDP (392.2 trillion won) in 2010, the majority of which is owed by the central government

(Figure 3). The debt ratio is low by international standards and also relative to the 60% threshold of danger zone for EMEs as estimated by Reinhart and Rogoff (2010). Foreign currency-denominated debt accounted for less than 3% of total public debt at end-2010, some 84% of which is denominated in US dollars.

Figure 3. Central and Local Government Debt
(Percent of GDP)



Source: Ministry of Strategy and Finance

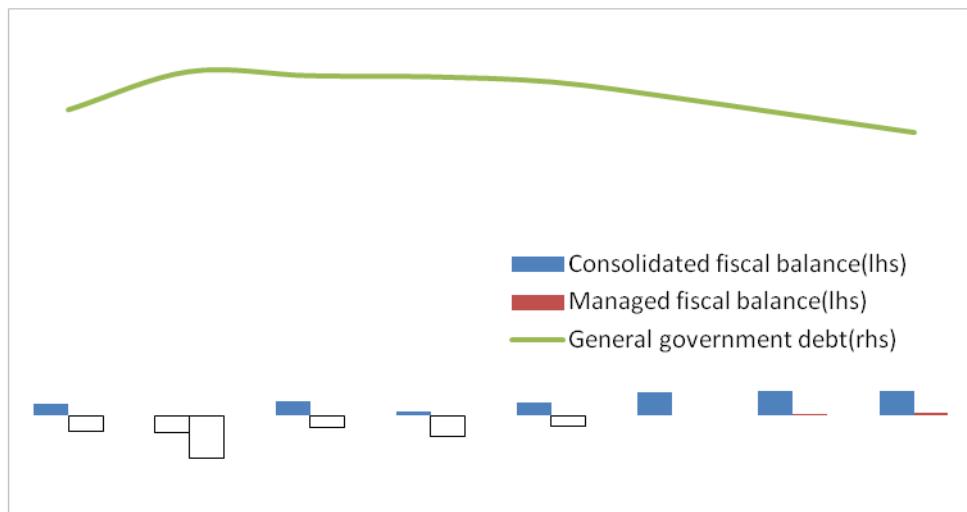
The general government's financial assets have increased rapidly since the mid-1990s, thanks to the surpluses of the national pension fund, and reached 73% of GDP by 2009, which is more than twice its debt. The general government remains a net creditor even if the assets of the national pension fund (which stood at 39.7% of GDP) are excluded. However, it should be noted that government assets in the form of loans, stocks and proprietary equities are illiquid.

Fiscal policy during crisis periods

Fiscal policy was procyclical until the 1997 crisis due mainly to a strong and long-standing commitment to a balanced budget. In view of the critical role it played in the recovery from the 1997 crisis, fiscal policy has since been managed in a more countercyclical manner and also within the framework of medium-term fiscal planning. During the more recent global crisis, Korea deployed a large-scale countercyclical fiscal policy to counteract the contractionary effects of the crisis. To be specific, discretionary government spending increased by 6% of GDP during 2008–10. This policy response proved successful in mitigating the fallout from the crisis – indeed, Korea recovered quickly from the global crisis with growth of more than 6% in 2010.

Success in crisis management was not free of cost, however. Public debt increased to 33.8% of GDP by 2009, up from 30.7% of GDP in 2007, largely driven by swollen deficits, before falling slightly to 33.4% in 2010 as the economy recovered. In order to strengthen fiscal discipline and prevent rapid increases in the public debt ratio, the medium-term fiscal plan for 2011–15 targeted a balanced budget by 2013 and restricted expenditure growth to 4 percentage points below revenue growth until 2013 (Figure 4).

Figure 4. Key Features of the Medium-Term Fiscal Plan for 2011-15
(Percent of GDP)



Source: Ministry of Strategy and Finance

III. Sovereign debt market

Sovereign debt market structure

The government issues several types of bonds for its financing, including treasury bonds (TBs), foreign exchange equalisation bonds (FEEBs), and national housing bonds (NHBs).

Table 1
Treasury bonds: maturities and issue/tender dates

Maturities	Three years	Five years	10 years ¹	20 years
Tender date	Monday of the first week	Monday of the second week	Monday of the third week	Monday of the fourth week
Issue dates for bonds	June 10 and December 10	March 10 and September 10	September 10	March 10

Note: (1) Inflation-linked bonds of 10-year maturity are issued on Wednesday in the third week of every month.

TBs are issued on a regular basis in four fixed maturities – for three, five, 10 and 20 years – at the market interest rate through public tender (Table 1). The terms of TB issuance are also standardised under the system of fungible issuance which was introduced in 2004 as part of a package of development measures for the domestic bond market. Fungible issuance has allowed the government to improve TB liquidity and cut its debt financing costs. FEEBs are issued at irregular intervals when the need arises to curb excessive volatility in the exchange rate. While they are typically issued overseas in foreign currency, the government issued them in the domestic market in 1998 after the crisis. The outstanding volume of FEEBs stood

at about \$7 billion at end-2011 with debt service being well dispersed between \$0.5 and \$2.5 billion each year over the 2013–25 period (Table 2).

Table 2
Foreign exchange equalisation bonds: issuance and maturity

	2003	2004	2005		2006		2009	
Amount of issuance	\$1 billion	\$1 billion	\$0.4 billion	€0.5 billion	\$0.5 billion	€375 million	\$1.5 billion	\$1.5 billion
Maturity (year)	2013	2014	2025	2015	2016	2021	2014	2019

Source: Ministry of Strategy and Finance.

Since March 2007, the 10-year inflation-linked bond has been issued using the three-month-ahead consumer price index as the underlying index for inflation. This bond is also regularly issued through public tender. As the volume issued has not been large, however, inflation-linked bonds have only limited market liquidity and thus give little indication of inflation expectations. Inflation-linked issues accounted for less than 2% of total issuance of TBs in 2010, and none were issued in 2009 (Table 3).

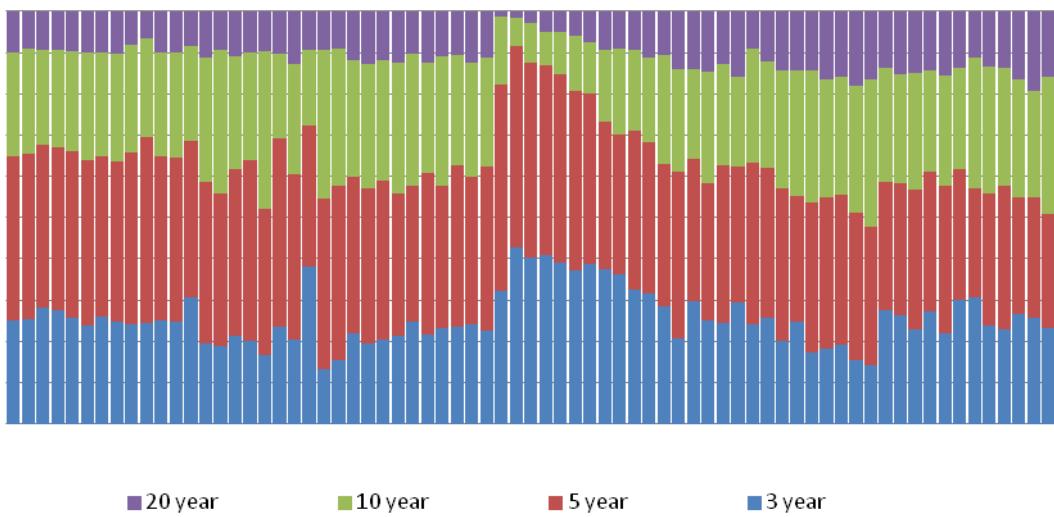
Table 3
Inflation-linked bonds

	2007	2008	2009	2010	2011.1–11
Amount of issuance (trillion won)	1.9	0.8	0.0	1.3	1.1
Ratio to total issuance of TBs (%)	3.8	1.6	0.0	1.6	1.5

Source: Ministry of Strategy and Finance.

The volume of TBs issued increased somewhat after 2008 to finance the large-scale fiscal stimulus aimed at mitigating the recessionary impact of the global financial crisis. The amount of net issuance remained at 10–16 trillion won during 2007–08, but almost tripled to 30–45 trillion won in 2009–10. These large increases in TB issuance were accompanied by changes in the maturity composition. Following the collapse of Lehman Brothers, the share of TBs with maturity of five years or less jumped to from the previous 60% to 92% in November 2008 before falling back to the pre-Lehman level by 2010 when financial instability was largely resolved (Figure 5).

Figure 5. Issuance and Maturity Composition of Treasury Bonds
(Ratio to total issuance)



Source: Korea Securities Depository

Despite the large increase in shorter-term bond issuance immediately after the global crisis, the average remaining maturity of TBs increased rather than decreased. This was because the financial market had been stabilised in a relatively short period and because the 20-year bonds – first issued in 2006 – had increased as a share of total issuance. Nevertheless, the effective (average) interest rate on TBs has declined significantly, aided by the accommodative monetary policy stance after the global crisis (Table 4).

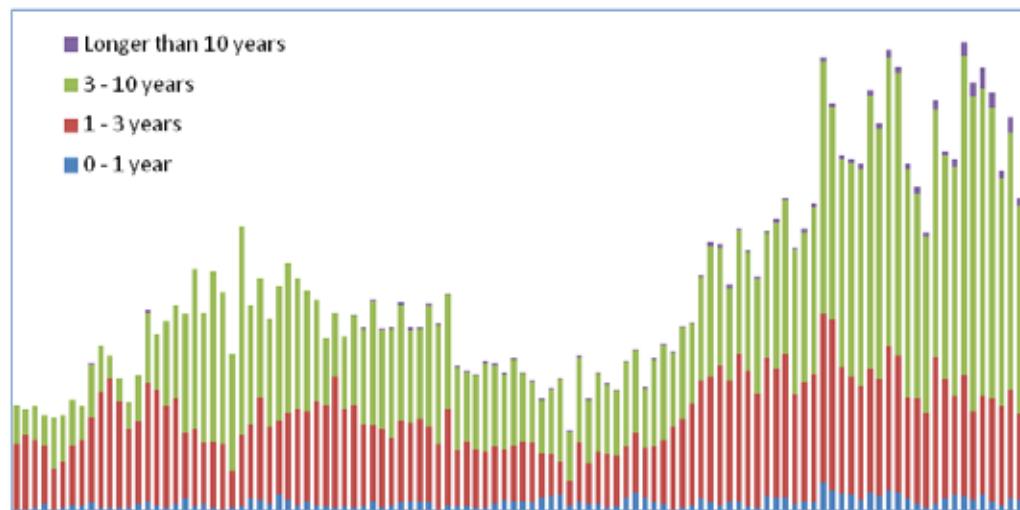
Table 4
Effective interest rate and average maturity of TBs

	2003	2004	2005	2006	2007	2008	2009	2010
Average interest payment (%)	4.76	4.38	4.57	5.05	5.18	5.37	4.64	4.48
Average remaining maturity (years)	3.73	4.04	4.17	4.55	4.68	4.85	4.96	5.33

Source: Ministry of Strategy and Finance.

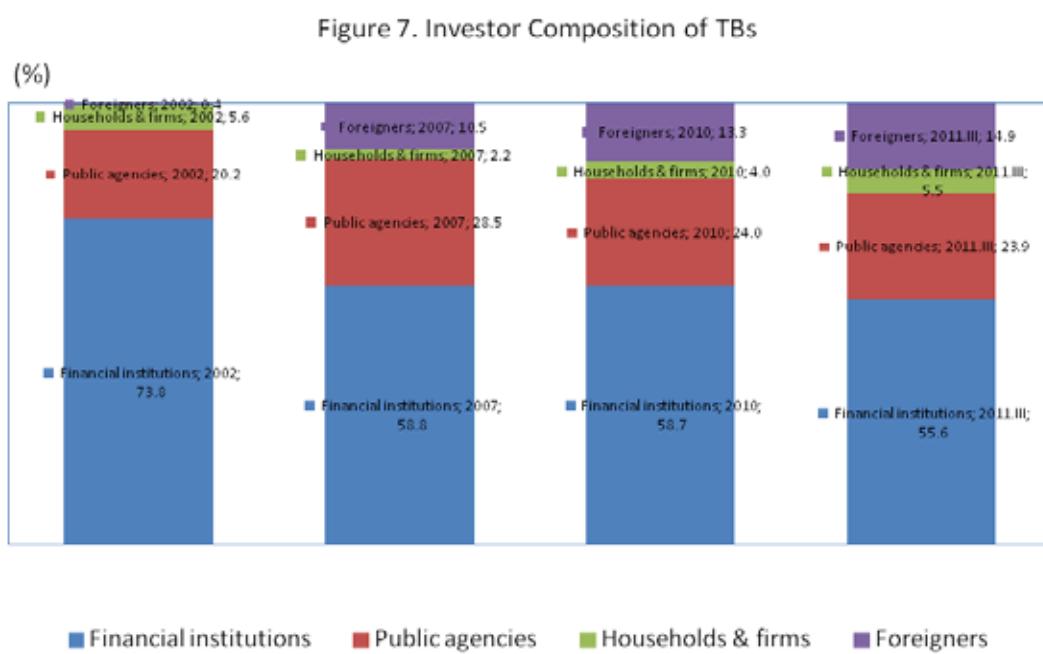
The global crisis affected the secondary TB market only moderately. In fact, the monthly transaction volume of TBs in the OTC market increased sharply from about 100 trillion won during 2007–08 to more than 180 trillion won in 2009, against the backdrop of a tripled volume of new TB issuance in 2009 relative to previous years. It increased further to 266 trillion won in 2010–11, comprising mainly longer-term bonds with maturity of three years or longer (Figure 6). Underlying these sharp increases were continued foreign capital inflows into domestic bond markets after 2009.

Figure 6. Transaction Volume of TBs by Remaining Maturity
(Trillion won)



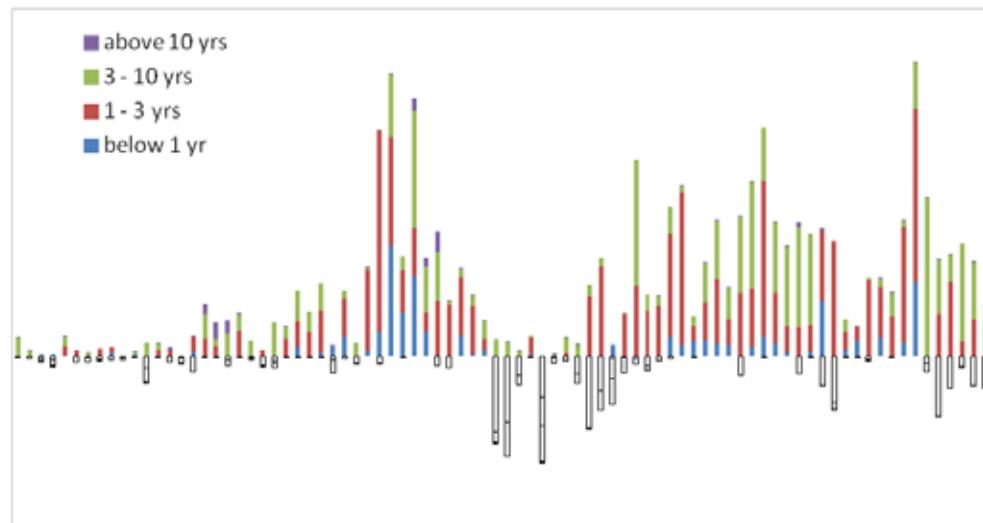
Source: Korea Securities Depository

The foreigners' share in the total outstanding volume of government debt has rapidly increased recently (Figure 7). Foreigners held 14.9% of the total or 58.8 trillion won at the end of the third quarter of 2011 (as compared to the similar share of 31.2% in the stock market in 2010). The remainder was split between financial institutions (55.6%) and public agencies including the national pension fund (23.9%). Foreigners purchased mainly TBs with maturities of three years or shorter in 2007 when foreign bond investment started to expand, after which they seem to have gradually increased the share of longer maturity bonds in their holdings (Figure 8).



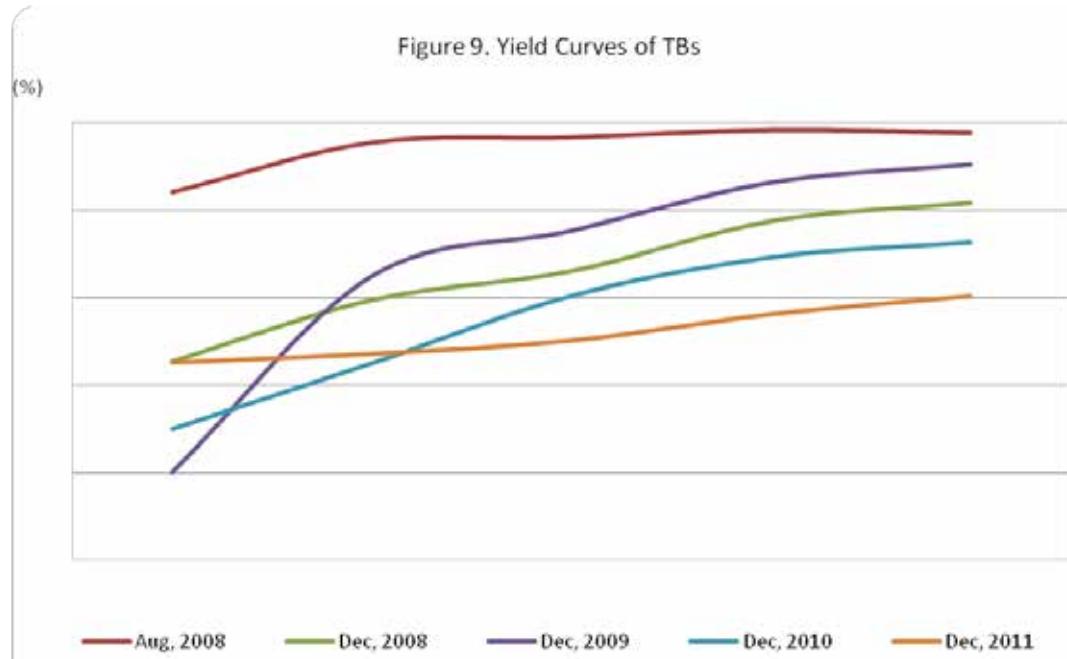
Source: Korea Securities Depository

Figure 8. Foreigners' Net TB Purchase by Maturity
(10 billion won)



Source: Korea Financial Investment Association

Increased investor demand for TBs and the accommodative stance of the monetary policy after the global crisis has resulted in a downward shift of the yield curve (Figure 9). The yield curve became quite flat by the end of 2011, reflecting global economic woes and the influx of global liquidity into domestic markets.



Source: Bank of Korea

Debt instruments of the central bank

The Bank of Korea (BOK) issues and purchases its own debt instrument – monetary stabilisation bonds (MSBs) – as part of its open market operations and liquidity control. The issuance is subject to the ceiling on total outstanding volume set every three months by the

Monetary Policy Committee, the supreme organ of monetary policy. MSBs are issued in 13 standardised maturities ranging from 14 days to two years. As of the end of 2010, the average remaining maturity is 0.8 years (Table 5). Short-term MSBs, which have maturity of less than 28 days, are issued at irregular intervals depending on market conditions, while the bidding date for MSBs with maturity of 28 days or longer is pre-fixed every month. Given that TBs and MSBs are close substitutes from the perspective of investors, the Ministry of Strategy and Finance (MOSF) and the BOK coordinate their issues to minimize any overlap in the maturity structure between the two debt instruments. At present, TBs are issued with maturities of three years or longer while MSBs are issued at shorter maturities.

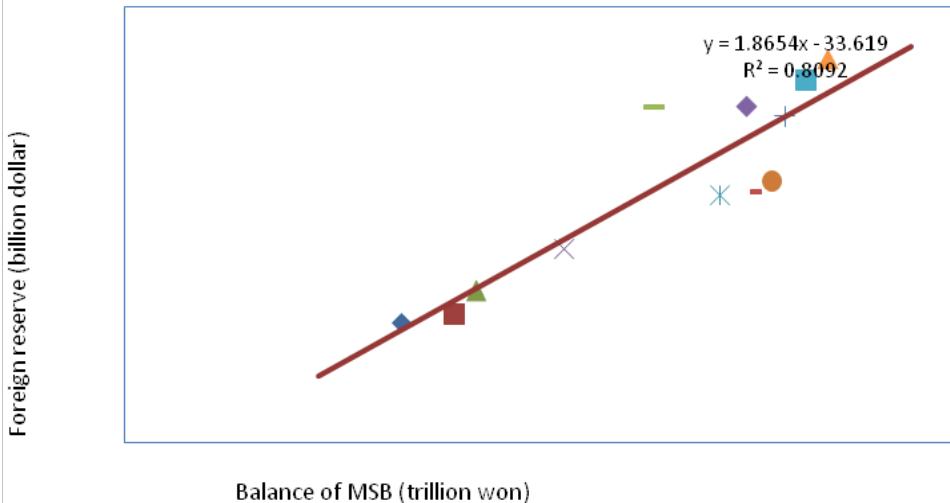
Table 5
Remaining maturity distribution of MSBs
(End-2010)

Below one year (%)	Between one and three years (%)	Above three years (%)	Average remaining maturity (yr)
63.5	36.5	0.0	0.8

Source: Bank of Korea.

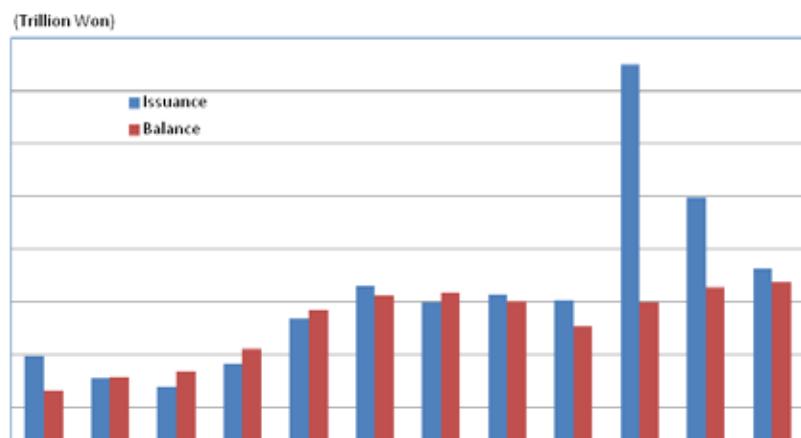
The outstanding volume of MSBs fell in 2008 but has been on the rise since 2009, reflecting the sterilisation operation against capital inflows to the stock market (Figure 10). The outstanding balance of MSBs amounted to 13.9 % of GDP, or 163.5 trillion won, at end-2010 (Figure 11).

Figure 10. MSBs and Foreign Reserves
(2000-2011)



Source: Bank of Korea

Figure 11. MSBs: Issuance and Outstanding Balance

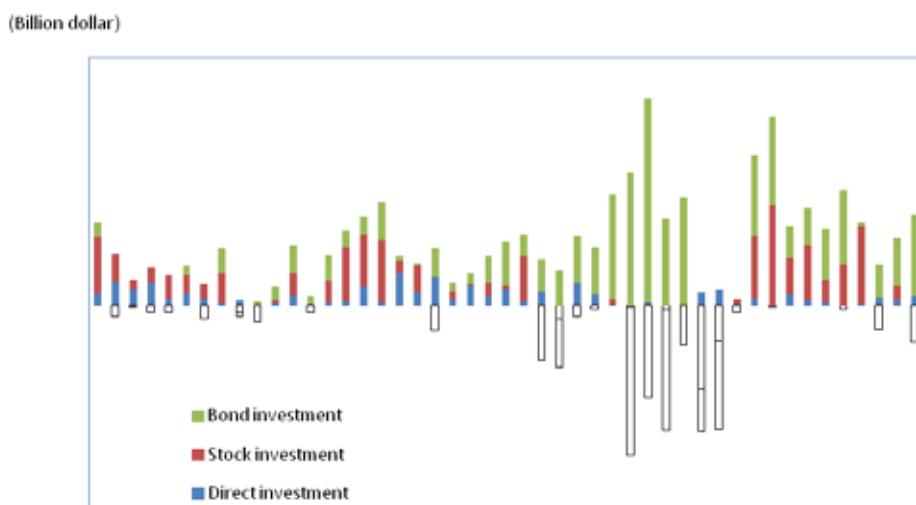


Source: Bank of Korea

IV. Capital flows and monetary policy

Following the 1997 financial crisis, the capital account was widely liberalised to a degree comparable to that of advanced economies. Since then, monetary policy has been increasingly subject to the influence of capital flows on market liquidity and the exchange rate. For example, monetary policy was tight during 2006–07 but asset price inflation remained high partly due to a surge in capital inflows driven by abundant global liquidity. The outbreak of the global crisis triggered an abrupt and sharp reversal in capital flows, which soon gave way in its turn to a renewed surge of inflows. Specifically, foreign investors withdrew \$62.4 billion from the stock market during 2007–08 before reinvesting \$48.5 billion over the next two years. Bond investment recorded net outflows during the second half of 2008 but these gave way to a \$43.5 billion inflow during 2009–10. Such swings in capital flows were repeated in 2011, albeit to a lesser degree, in line with the heightened market uncertainty emanating from the euro area fiscal crisis (Figure 12).

Figure 12. Foreign Investment Flows

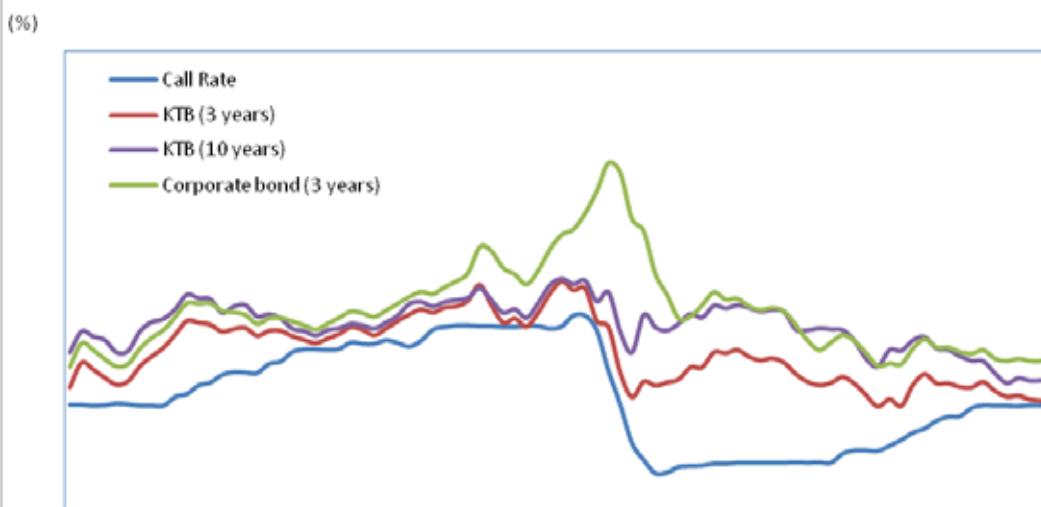


Source: Bank of Korea

More recently, official investment in TBs by Asian countries including China, Thailand, Malaysia and Singapore has increased, which has offset in part the bond outflows driven by European investors. This new development seems to reflect the interest rate differentials between home and abroad, the diversification needs of official investors related to foreign reserve management, and the positive market perception of the safety of Korean TBs. At the end of 2011, the outstanding balances of stock and bond investment funds stood at \$41.3 billion and \$25.0 billion (or 14% and 34% of total foreign investment), respectively.

Monetary policy was often complicated by these volatile and large capital flows, which distorted the transmission channel and created unpleasant policy trade-offs. While the policy rate (and the overnight call rate) have been raised several times since 2010, longer-term market interest rates have been on the decline since 2009. As a result, the spread between long and short rates narrowed to less than 1 percentage point by end-2011 – for example, the spread between the overnight call rate and the three-year TB yield fell from 0.64 percentage points in 2006 to 0.55 percent points in 2011, a level even lower than observed in the pre-crisis period. In contrast, the risk premium between three-year corporate and treasury bonds has remained significantly higher during the post-crisis period than in the pre-crisis period but nevertheless declined from 4.8 percentage points in December 2008 to less than 1 percentage point by 2011 (Figure 13).

Figure 13. Market Interest Rates



Source: Bank of Korea

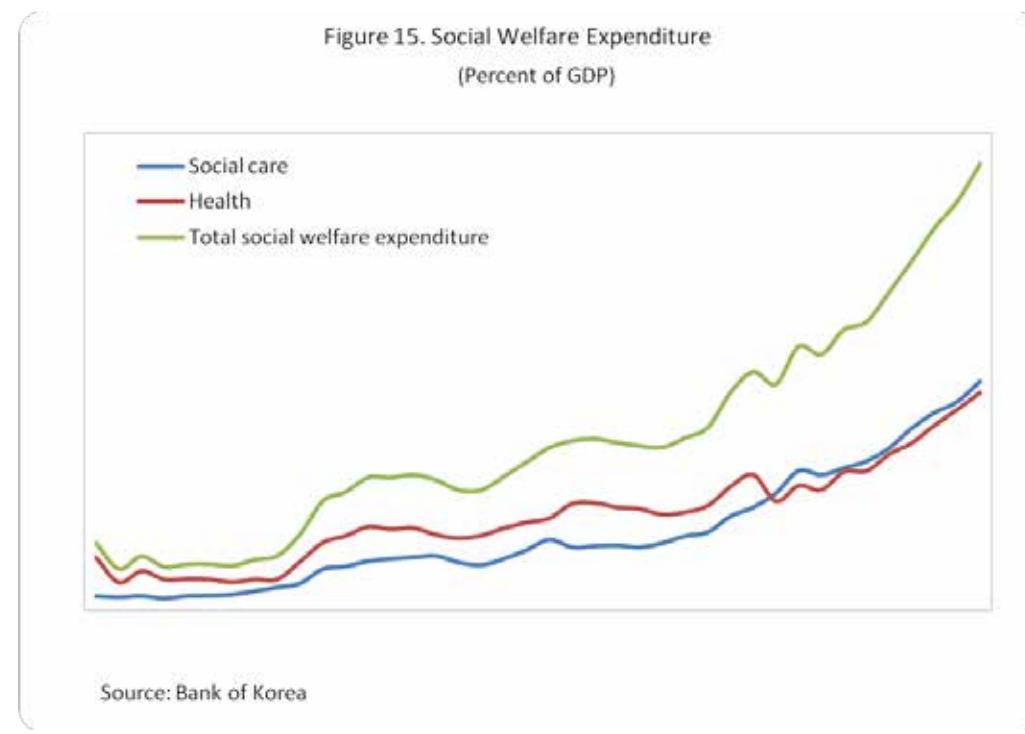
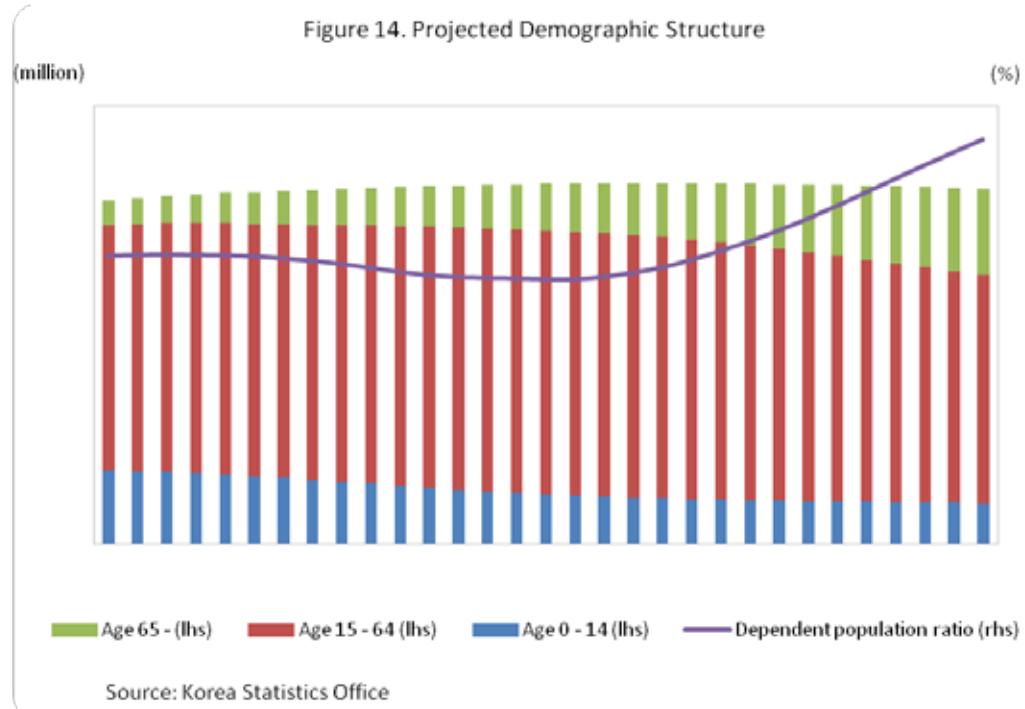
While many factors including negative outlooks for the global economy may have contributed to the opposite movements in short and long rates, the prime suspect has been large capital inflows, suggesting that the so-called Greenspan conundrum is no longer a phenomenon confined to advanced countries. A recent study on the transmission channel shows that the bank lending channel (through changes in bank lending rates) is the most effective one while the scope for other channels (eg through the yield curve) to operate is limited. These results indicate that monetary policy has been constrained in reacting to inflationary pressure after the global crisis.

Though there have been huge inflows of foreign capital since the global financial crisis, there is no clear evidence that they have eroded Korea's international competitiveness. The level of the effective exchange rate is somewhat lower compared with that of the pre-crisis period. The growth rates of the monetary aggregate, which have shown a downward trend, seem to indicate that the capital inflows have not expanded domestic liquidity to any great extent.

V. Further considerations

Long-run fiscal challenges

Public debt sustainability is currently not an issue which requires immediate policy attention or corrective action. And the risk of fiscal dominance is only a remote possibility. But sovereign debt management will face significant challenges arising from population ageing and ballooning social welfare expenditures (Figure 14). Social welfare expenditure has risen rapidly to almost 9% of GDP by 2010, up from less than 5% of GDP in the early 2000s while the dependency ratio is projected to rise above 50% by the late 2020s (Figure 15).



Other risk factors to public debt dynamics are unfunded government liabilities (such as future pension payments), public agency or state-owned enterprise debt which is not counted as sovereign debt, and the cost of unification. It is very difficult, if not impossible, to estimate the cost of unification with any precision but the impact of unification on the government budget would in all likelihood be enormous.

The state-owned enterprises (SOEs) are making profits (eg 2.9 trillion won in 2010) and maintain a positive net asset position (assets 444.6 trillion won, debt 271.8 trillion won) and there is no sign of imminent financial problems. However, the SOEs have increased debt rapidly in recent years in order to finance large-scale multi-year investment in infrastructure and the energy sector. This may potentially give rise to a public debt problem and needs to be monitored carefully.

Financial risks to the Bank of Korea

The Bank of Korea is subject to financial risks as it issues its own debt in domestic currency and purchases foreign assets. Financial risks involve interest rate, credit and currency risks. Interest payments on MSBs have typically accounted for more than half of the total operation cost of the Bank (Table 6). Moreover, the Bank incurred a large loss in 2005–07 because of the Korean won's steep appreciation. Acknowledging such financial risks, the recent revision of the Bank of Korea Act allows the Bank to maintain a higher reserve balance (to be used to compensate for losses) by withholding up to 30% of its operational profit (previously 10%).

Table 6
Operation balance of BOK
(Billion won, %)

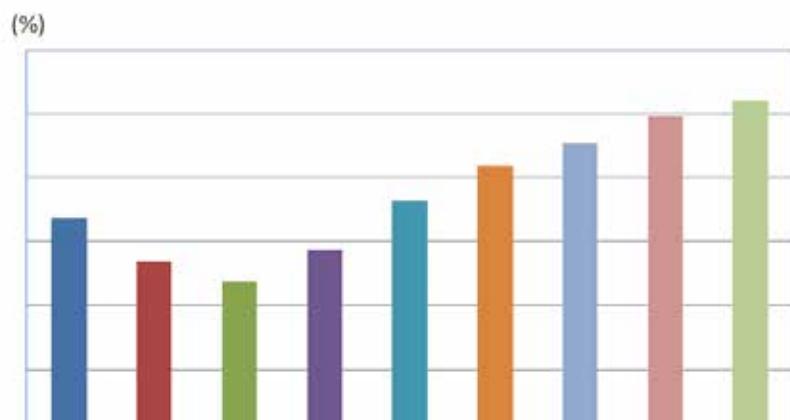
	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Operation cost (A)	6,243	6,223	6,405	7,899	9,344	11,945	14,081	16,916	12,915	11,876
Interest payment for MSB (B)	4,873	4,802	4,963	5,584	6,144	6,806	7,478	7,200	6,228	6,010
(B/A, %)	(78)	(77)	(77)	(71)	(66)	(57)	(53)	(43)	(48)	(51)
Operation profit	6,124	4,149	3,198	35	−1,919	−1,762	−491	3,363	3,823	4,560
Appreciation rate of won to dollar	−14.2	3.1	4.7	4.0	10.5	6.7	2.8	−18.7	−15.8	9.4

Source: Bank of Korea.

Household debt and monetary policy

While sovereign debt is low by international standards, household debt has recently increased to an alarming level. The ratio of household debt to disposable income stood at 132% at the end of 2010, a level broadly comparable to the corresponding figures of many advanced economies, including the United States (Figure 16). In addition, the characteristics of this debt are less than benign. The majority of household debt comprises bullet loans from banks and non-banks at variable interest rates and a relatively short maturity (typically of three years). This suggests that households are exposed to liquidity risk and remain vulnerable to income shocks.

Figure 16. Ratio of Household Debt to Disposable Income

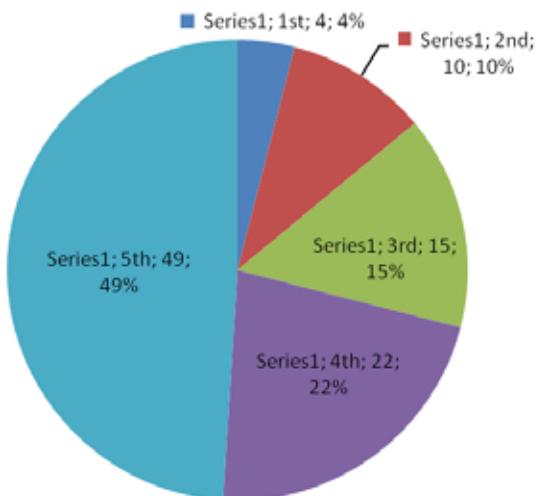


Source: Bank of Korea

The recent increases in the household debt ratio seem to reflect not only consumption smoothing at a time of sluggish income growth and low interest rates but also financing of home purchases in anticipation of rising housing prices (particularly in non-metropolitan areas). The accommodative monetary policy stance, maintained since the global crisis, may also have influenced the increase in household debt.

At present, the underlying macrofinancial risk related to high household indebtedness seems to be less than one would infer from the debt-to-disposable-income ratio itself. To be specific, according to a household financial survey data, most household debt is owed by middle- to high-income groups (ie the top three quintiles), whose repayment capacity is assessed as relatively strong (Figure 17). Moreover, these groups have financial assets that can be drawn down if necessary for debt repayment. Indeed, the household debt ratio is estimated to fall to below 80% if measured against the broader financial resource base comprising disposable income and long-term time deposits. Last but not least, housing loans have been subject to tight prudential regulations, including LTV and DTI restrictions since 2002.

Figure 17. Distribution of Household Debt by Income Quintile (2010)



Source: Korea Statistics Office

While there seems to be no immediate threat to financial stability at present, high and rising household debt, if persisting over a long period, would in all likelihood lead to increased systemic risk and undermine the scope for monetary policy to preserve price and financial stability. In view of the high uncertainty in global financial markets and real activities, Korea's monetary policy has so far remained accommodative despite a five-step increase in the policy interest rate since mid-2010. And the likelihood of monetary tightening in the near future seems low in view of the deteriorating global outlook. In this light, the supervisory authority has taken macroprudential action to slow the speed of household debt increases, if not prevent it from rising further.

Banco de México and recent developments in domestic public debt markets

José Sidaoui, Julio Santaella and Javier Pérez¹

Abstract

This paper describes major policy actions that have recently contributed to the development of the Mexican domestic-currency debt market, and concomitant benefits. Among the most important are a significant reduction in exchange-rate exposure and a decline in refinancing risk for the government and private sectors alike. Another positive outcome of the development of government securities markets has been investor base diversification. This paper explains how capital inflows have translated into larger and more stable foreign investor participation in local debt markets. Empirical evidence presented suggests that these capital inflows have had positive funding implications, lowering both interest-rate levels and volatility.

Keywords: Public debt management, financial markets, Latin America

JEL classification: H63, E63, N26

¹ The authors thank Dorothy Walton and Armando Gonzalez Torres for their assistance. The opinions in this paper are solely those of the authors and do not necessarily reflect those of Banco de México.

1. Introduction

The development of financial markets has yielded several benefits for the Mexican economy. Among them are a significant increase in the share of domestic-currency liabilities in the total, which has reduced the exchange-rate exposure of government and private-sector debt servicing. Other developments are a lengthening of the yield curve, which has limited refinancing risk for the government and provided reference rates for private issuers, and an ample peso interest rate swap (IRS) market, allowing investors a better risk distribution. More liquid and deeper markets, in turn, have contributed to a more efficient allocation of resources by reducing transaction costs. They have also been essential in the economy's ability to take advantage of capital inflows by channeling them towards more productive uses.

The law governing the central bank, Banco de México, requires that in addition to the mandate to safeguard price stability, the bank must promote the healthy development of financial markets and serve as the fiscal agent of the federal government. Hence, in coordination with the government and other financial supervisors, it has played a key role in putting into place the building blocks of the institutional framework that has enabled the development of the domestic debt markets. Undoubtedly, the current liquidity and stability that the domestic public securities market enjoys, even amid severe external financial turmoil, result from this progress, as well as from sound macroeconomic and financial stewardship.

This paper describes major policy developments in recent years and identifies some of their benefits. We build on previous research and document the latest advances in government securities markets, notably, the lengthening of the sovereign yield curve and the increase in the share of local-currency government securities in the total. We discuss Banco de México's role in this process. One outcome of the development of government securities markets has been the diversification of the investor base. This has been accompanied by capital inflows that have translated into higher foreign participation in local debt markets, apparently investors with more stable profiles. Empirical evidence suggests that these capital inflows have had positive funding implications, decreasing interest-rate levels and volatility. Adequate fiscal and monetary policies and a respect for freely functioning markets, together with international recognition (e.g., the inclusion of Mexican government securities in Citigroup's WGBI), have all been pivotal to these results.

This note is structured as follows. Section 2. discusses various policy actions taken by the authorities to develop the government securities market. Section 3. briefly describes the recent evolution of interest-rate derivatives, which have served as a complement to the government securities market. Section 4. summarizes how these actions brought about further development of local debt markets. Section 5. advances the hypothesis of a change in investor profile towards more stability. Finally, section 6. offers conclusions.

2. Policy aimed at developing local debt markets

For several years now, Mexican policymakers have been committed to developing domestic debt markets and have taken steps in this direction as conditions have made it possible. Previous research (see, for instance, Sidaoui, 2002; Pérez-Verdía and Jeanneau, 2005) refers to many important institutional achievements over the last decade. This section describes how sound macroeconomic policies, together with financial reforms, have contributed to the development of local debt markets.

2.1 Sound macroeconomic policy

Sound fiscal, monetary and debt management policies pursued since the Mexican crisis of 1995 have been conducive to higher macroeconomic stability and to the development of financial markets. Pérez-Verdía and Jeanneau (2005) show how most public finance indicators improved since 1995: both fiscal-deficit-to-output and public-debt-to-output ratios followed decreasing paths between 1995 and 2005. As a consequence of the 2008 financial crisis, the Mexican government provided fiscal stimulus to moderate the dampening effect of external conditions on the domestic economy. Although this stimulus temporarily weakened public finance numbers, the financial position of the government remained sound. By the end of 2010, total public debt as a proportion of GDP was 32.2% (versus 21.8% in 2005), while the narrowly defined fiscal deficit was 2.8% of GDP (which compares to 0.1% in 2005).² Pérez-Verdía and Jeanneau (2005) show as well inflation converging towards Banco de México's target of 3%.

2.2 Minimal market intervention

The Mexican authorities are convinced that free markets are best suited to allocating resources and determining prices. Therefore, they have facilitated the development of the debt markets by liberalizing almost every segment of the financial sector. Furthermore, consistent efforts have been made to provide markets with sound legal, operational, and institutional infrastructure. Government interference with the market price-discovery mechanism has been avoided. On the very few occasions there has been a market intervention, it has been under extreme market stress and limited to providing liquidity.³ No capital controls have been imposed, even in view of massive capital inflows in the recent past. Instead, the strategy to cope with capital inflows has been a combination of various policies believed to increase the chances of attracting potentially longer-term investors, thus decreasing the likelihood of sudden stops without provoking severe market distortions. The hallmarks of the strategy are a stable macroeconomic outlook together with predictable and reliable policymaking, and sterilization by the central bank of the impact of capital surges on domestic liquidity (see section 2.6 for additional details). As a result of these and other events where the propensity to intervene has been tested, the Mexican government has earned a reputation for promoting the independent and orderly functioning of markets.

2.3 Pension system reforms

Debt market development cannot proceed unless there is a dependable supply of long-term loanable funds from institutional investors. Reforms to the Mexican pension system have strengthened the demand for government securities. The transformation in 1997 of a pay-as-you-go system into an individual contributory pension system for private workers resulted in a surge of large pension funds. Later on in 2007, the pension system of public employees went through a similar reform which further increased assets managed by pension funds, hence stimulating additional demand for securities. By the end of 2010, the net assets of these funds amounted to 1.4 trillion pesos, equivalent roughly to 10% of GDP. The resources under

² Source: Finance Ministry (SHCP) public finance and debt statistics.

³ During periods when liquidity tends to dry up, causing high market volatility, authorities have introduced auctions to sell foreign currency. The auction mechanism is pre-announced to the public, it is for a limited amount of foreign currency, and it starts at a floor of 2% above the previous day's reference exchange rate, or the Fix. This scheme was used in the late 90s, during the Lehman crisis in 2008, and, more recently, since November 30, 2011. Additionally, a few extraordinary auctions of foreign currency were carried out on days of particularly scarce liquidity in 2008 and 2009.

their custody have grown very fast; just a few years back, in 2004, they were 6.5% of GDP. Almost half of their assets are invested in government securities, which account for 12% of the total outstanding. Aside from being major investors in local government debt, pension funds have contributed to the demand for long-term securities. This is a natural result of their investment horizon. As of October 2011, the average duration of government securities they held was 7.3 years (the average maturity of outstanding government debt is 4.5 years).

2.4 Improved securities clearing and settlement systems

Reliable clearing and settlement systems are key components for the sustainable operation of financial markets. Banco de México, the National Banking and Securities Commission (CNBV), and the National Securities Depository Institute (Indeval) have worked closely together to develop centralized and automatized clearing and settlement systems. The legal framework has been enhanced to provide certainty to market participants carrying out market transactions. Indeval, the centralized securities custodian, offers services such as the settlement and transfer of securities, collateral management, securities lending, and the infrastructure for repo operations. Currently, operations are settled on a near real-time Delivery versus Payment (DvP) protocol. Furthermore, Indeval is linked to foreign clearing and settlement systems such as Euroclear and Clearstream in order to facilitate trading with securities issued abroad by Mexican firms and institutions (Jiménez Vázquez, 2011).

2.5 Completing the market's information set

Efficient resource allocation depends on reliable prices. In this regard, Banco de México has been providing reference interest rates and securities prices to the market for a long time. On a daily basis, the central bank publishes the peso/dollar Fix rate (an auction-determined exchange rate for U.S. dollar liabilities payable in Mexico), as well as the 28- and 91-day reference interest rate, or TIIE (the 182-day TIIE is published once a week). As documented by Sidaoui (2002), the TIIE has become a widely used benchmark for loans, yields, and as an underlying rate for futures and swaps. Moreover, daily, Banco de México publishes the price vector it uses to mark to market its holdings of government securities.⁴ In addition, private price vendors have been authorized in order to preclude conflicts of interest among market participants.

Furthermore, in a permanent effort to improve upon transparency and information quality, Banco de México publishes an array of financial and economic indicators which have been progressively standardized to meet international criteria (e.g., IMF, CUSIP). Also, the central bank publishes its policy stance and various reports on inflation, monetary policy, and the financial system on a timely basis and in accordance with a pre-determined calendar. These announcements provide news agencies with updated information.

To improve the predictability of the issuing patterns for government securities, the government, Banco de México, and the Institute for the Protection of Bank Savings (IPAB, the nation's deposit insurance agency),⁵ preannounce their issuance program on a quarterly basis. The program includes details on the securities as well as on the amounts to be auctioned each week. In addition, the government has published debt guidelines on a yearly basis since 2004. This has the advantage of allowing investors to estimate the supply of securities ahead of time and to adjust their investment strategies accordingly.

⁴ Banco de México averages information from private price vendors to create its own price vector.

⁵ The deposit insurance agency regularly issues debt, which is viewed by the markets as quasi-government debt.

2.6 The use of government securities as monetary policy instruments

Although the central bank can issue its own paper to carry out open market operations (see below), it has chosen to use government paper instead. This decision was made in order to foster the development of the government debt markets. Banco de México is prohibited by law from financing the government. Thus, a mechanism was designed that allows it to use government paper without acting as financier (see Box 1). In the last couple of years, there has been a significant increase in reserve accumulation, and the use of government securities to sterilize the resulting liquidity has proved effective. In what follows, we describe how the central bank has alternated the use of its own and government securities for liquidity management.

Banco de México only used government securities to manage liquidity until 2000. Nevertheless, in order to test the market acceptance of central bank paper that year, the bank issued its own securities and used them to implement monetary policy. At that time, a market niche was perceived due to the fact that investors were looking for an instrument to reduce price sensitivity to interest rates because they feared episodes of higher interest-rate volatility. Thus, Banco de México began issuing Monetary Regulation Bonds (BREMs), which were bonds indexed to the daily overnight interbank lending rate.⁶

Six years later, the central bank and the government reached the conclusion that it was to their mutual benefit to use one security. They substituted the BREMs with government paper with identical characteristics, Bondes-D. An objective of the switch was to facilitate the government's interest-rate and currency-exposure reduction strategy (to be described in section 4.1). Another aim was to enhance the liquidity of these securities given the fact that both entities were to use the same paper for their financing needs.

Currently, the federal government auctions Bondes-D every second Tuesday, while Banco de México does so every Thursday. These floating-rate bonds are completely fungible from the market's perspective.⁷ Since both risk-free issuers use the same instrument, predation is avoided. At the same time, the use of Bondes-D has two appealing advantages: it preserves the government's floating-rate niche, and the markets of other government securities are not distorted as a consequence of Banco de México's liquidity management operations.

2.7 The issuance of warrants

A part of the active debt management strategy has been to identify opportunities to cater to particular investor needs. In November 2005, the government realized there was demand from investors exposed to Mexican sovereign debt in dollars for an instrument that had an embedded option for the same credit risk in pesos. Since then warrants have been sold on different occasions to fulfill this demand. These instruments entitle their holders to exchange securities denominated in foreign currency for securities denominated in local currency. At the time of issue, the warrants establish the ratio at which, during their validity, specific securities may be exchanged. The warrants give investors the option to hold sovereign risk constant, but at the same time to manage their currency exposure. The option granted by the warrants becomes profitable as the spread between foreign-currency and local-currency yields narrows. As section 4.1 will explain, to date, the warrants have contributed to reducing the government's foreign-currency liabilities.

⁶ It should be noted that these changes have been coordinated with the government in order to protect its debt segments and to avoid distortions in the securities market.

⁷ The reason for making this distinction is to provide the market with information on how much the government and the central bank are issuing each time.

Box 1

The use of government securities for liquidity management

Direct sales of government securities are one of the instruments Banco de México (henceforth “the Bank”) uses to manage liquidity (mainly to sterilize international reserve accumulation). Legal support for these operations stems from articles 7 and 9 of the law that governs Banco de México. Article 7 entitles the Bank to deal with this class of securities. Article 9 contains accounting guidelines for the operations:

“Banco de México shall not lend securities to the Federal Government nor purchase securities from it, except when purchases of securities that are payable by the Government comply with one of the two following conditions:

- I. When said purchases are covered by cash deposits, made by the Government in the Bank with the proceeds of the placement of said securities, and which may not be withdrawn before their maturity date; the amounts, terms and yield on these deposits must be equal to the amounts, terms and yield of the securities being traded; [...]”

Therefore, when the Bank purchases securities from the government for liquidity management purposes, its balance sheet is affected as follows. On the liability side, the Bank constitutes a cash deposit in favor of the government; the deposit cannot be withdrawn before the securities mature. These deposits are labeled in the Bank accounts as a “government-securities monetary-regulation deposit” (henceforth “deposit”). On the asset side, the Bank records the holdings of purchased government securities.

Once the securities are on the books of the Bank, they are marked to market daily. This procedure ensures that before the securities are sold to the market, all the holdings on the asset side are perfectly matched by the deposit on the liability side. Further, if the securities are coupon bonds, the accrued interest of current coupons is computed and provisioned both on the asset side (government securities holdings) and liabilities (deposit) side of the balance sheet. Whenever coupons are due, the Bank simultaneously debits the provisioned interest and credits the government account.

When the Bank sells securities to the market, it creates an imbalance between its assets and liabilities. This happens because the deposit is held as a liability until the securities mature. In the case of coupon bonds, an additional imbalance arises from the fact that the Bank continues to credit the deposit with the accrued interest on current coupons from securities sold, but ceases to provision this interest on its asset side. When a coupon matures, the Bank transfers resources to the government account to pay the bond holders.

Similarly, when securities mature, the Bank debits unsold securities at face value from the government’s account, and credits the government with the face value of securities sold. Finally, the Bank pays bond holders by debiting the account of the government. The re-pricing of securities as well as interest is then reflected in Banco de México’s P & L.

2.8 Additional measures to enhance the liquidity of government securities

In order to foster liquidity, several other measures have been adopted. They include market makers,⁸ a strips market,⁹ and the reopening of previously issued securities. Additionally,

⁸ As Pérez-Verdía and Jeanneau (2005) explain, market makers are financial institutions that commit themselves to bid for a minimum amount of securities at primary auctions of government securities, to always make two-way quotes for a minimum amount of fixed-income securities, and to maintain a cap on the bid-offer spread. In exchange, market makers are entitled to take part in green-shoe auctions, to hold regular meetings with government debt-management authorities, and to have access to Banco de México’s securities lending facility.

⁹ The strips program was launched in 2005 to foster liquidity in the secondary market. Nevertheless, very few bonds have so far been stripped, and turnover of these securities is minimal (García Padilla, 2011).

several exchanges and repurchases of securities have been carried out to smooth the maturity profile or to increase the liquidity of particular issuances. More recently, to support the potential inclusion of Mexican government securities in the WGBI¹⁰ (which took place in October 2010), a syndication program was introduced in February 2010. One goal of this program was to furnish new issues with an acceptable initial total outstanding amount, thus enhancing their liquidity from the outset and enabling them to be included in global fixed-income indices.

The creation of a securities-lending scheme provides another way to add liquidity to the market for government paper. To illustrate this point, consider a long-term bond owned by a pension fund. Typically, given its investment horizon, the pension fund would very likely hold this bond until maturity. However, by lending this security to another investor, the pension fund would earn a fee and get the bond back upon expiration of the lending agreement. As a consequence of similar lending operations, the liquidity of the market for the securities increases.

The central bank proactively carried out regulatory modifications to facilitate repo transactions and securities lending. In particular, a master contract for both operations was designed in 2007 in accordance with international guidelines from the Public Securities Association, the Bond Market Association, and the Securities Industry Association. Further, to foster the development of the private securities lending market, Banco de México increased the cost of its securities lending facility. Currently, there are two privately owned firms that provide securities lending intermediation: Accipresval, owned by Citibank, and Valpre, owned by Indeval.

3. The development of derivatives markets

In principle, derivatives add liquidity and depth to government securities, since they offer hedging possibilities for different portfolios, therefore expanding the range of investors demanding the underlying assets. Hence, Banco de México, in coordination with other regulators, made institutional arrangements to provide the legal and operational framework for a derivatives exchange. MexDer, the Mexican derivatives exchange, was created in 1998 in order to provide a standardized environment for trading commonly used derivatives. Asigna, MexDer's clearinghouse, guarantees that obligations arising from transactions in MexDer will be honored. More recently, in 2006, Banco de México revisited the regulation that establishes which underlying assets are eligible to become derivatives and the type of market participants that may trade these securities. Furthermore, any intermediary that wishes to participate in this market has to comply with minimum requirements the central bank imposes for management, operations, and internal governance.¹¹

¹⁰ The WGBI (World Government Bond Index) is an index of fixed-income sovereign securities from 24 countries that is constructed by Citigroup. Eligibility criteria include a minimum total outstanding amount of each bond (at least USD 20 billion a year), a minimum credit rating (BBB- by Standard and Poor's or Baa3 by Moody's), and low barriers to entry. Mexican government bonds already met the last two requirements: long-term local sovereign Mexican debt is rated A by Standard and Poor's and Baa1 by Moody's, and it can be settled on Euroclear. As of March 2011, the market value of assets linked to the WGBI was approximately USD 18.1 trillion (Tapia Rangel, 2011). Mexico was the first Latin American country to be included in the WGBI.

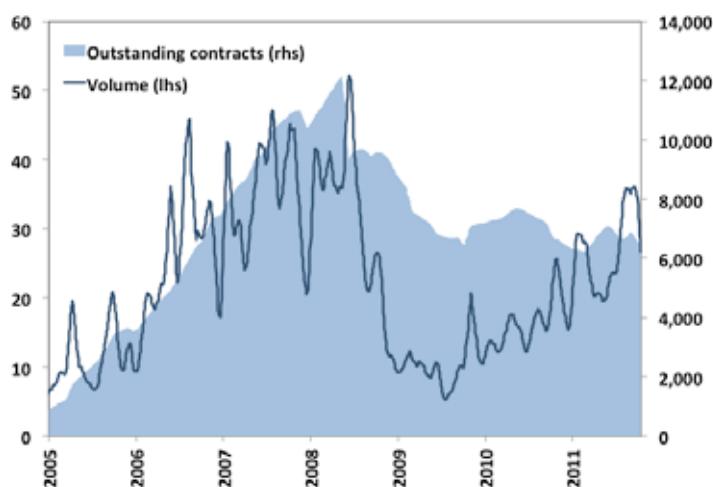
¹¹ There is a guideline, known as "Banxico's 31 points," which states minimum requirements by which institutions trading derivatives must abide, regulated by Banco de México (Circular 4/2006).

Derivatives markets have complemented the government securities market. There are no comprehensive measures of the peso OTC interest-rate derivatives market.¹² However, interest-rate swaps (IRS) within Mexican financial institutions and between these institutions and other investors, which are systematically reported to Banco de México, could serve as a lower bound for the volume operated in the peso OTC interest-rate derivatives market, since a significant fraction is traded off-shore. Using this information, Figure 1 illustrates the size of the peso IRS market, as measured by outstanding IRS contracts reported to the central bank, and the traded volume of these derivatives. Although the market shrank during the recent financial crisis in 2009, it should be noted that traded volume has gradually recovered over the past three years.

Figure 1

Peso-denominated IRS reported by financial institutions to Banco de México: outstanding contracts and traded volume

In billions of pesos: 2005-2011



Source: Banco de México

Filter: 20-day moving average

NB: Total outstanding IRS are calculated by adding the absolute value of both legs, since the goal is to gauge the value of the total number of outstanding contracts, regardless of which party is on the other side of the contract.

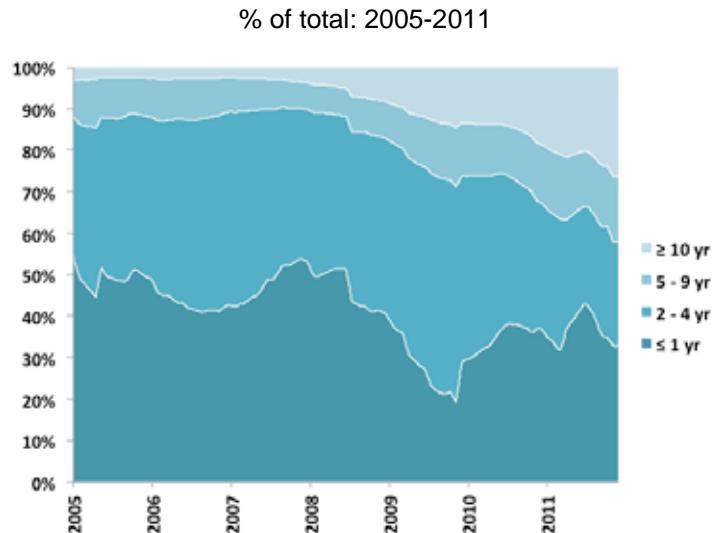
Perhaps the most interesting development in the derivatives market has been the lengthening of the horizon of interest-rate derivatives investors have access to. This has allowed investors to pair derivatives with investment strategies on the full span of the yield curve. In MexDer, futures on the 28-day TIIE are by far the most widely traded¹³ interest-rate derivative and are available up to a five-year horizon. However, MexDer offers other instruments that may well meet investors' needs to hedge virtually every portfolio of government securities: 2- and 10-year interest rate swaps, as well as futures on 91-day Treasury certificates (Cetes), and on 3-, 5-, 10-, 20-, and 30-year bonds. Additionally, futures

¹² Today there is an ample IRS market both in nominal and real (inflation-linked) interest-rate instruments.

¹³ According to MexDer's website, open interest in TIIE 28 futures accounted for more than 96% of open interest in interest-rate derivatives by the end of October 2011.

on UDIs, the inflation-indexed units on which real-rate government securities are based, are also available. Data on the OTC IRS market collected by Banco de México reflect as well the usage of longer-term derivatives. In fact, as depicted by Figure 2, the proportion of longer-term swaps, mainly in the “ ≥ 10 year” bucket, has steadily increased, while the proportion of short-term swaps (less than 1 year) has become smaller.

Figure 2
Outstanding peso-denominated IRS reported by financial institutions to Banco de México by maturity



Source: Banco de México

Filter: 20-day moving average

NB: Total outstanding IRS are calculated by adding the absolute value of both legs, since the goal is to gauge the value of the total number of outstanding contracts, regardless of which party is on the other side of the contract.

4. The advantages of a well developed government securities market

Sound policymaking and the growth of complementary markets have enabled the Mexican government to pursue a strategy to mitigate vulnerabilities by reducing interest rates and currency risks. They have also helped to finance the government's deficit and to develop domestic securities markets. We next describe how the policy actions explained in the previous sections have contributed to this strategy.

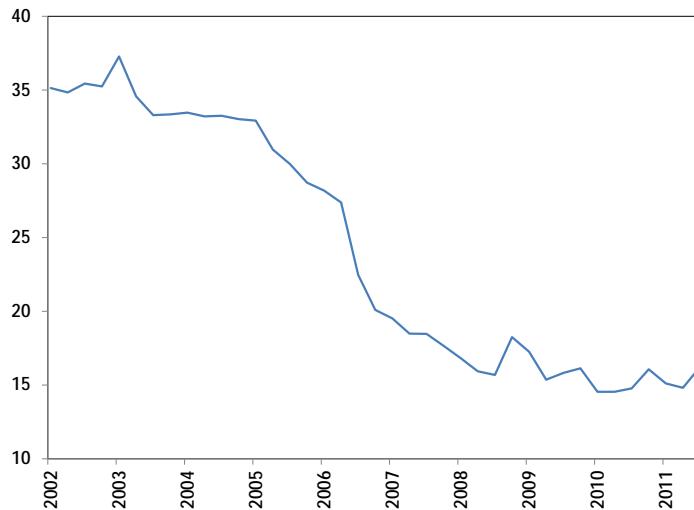
4.1 Lower currency risk exposure

The growth of domestic financial markets has allowed the Mexican public sector to stop relying on foreign markets for its financing requirements. The debt denominated in foreign currency has declined from 35% of local-currency debt at the beginning of 2002 to 16% in

late 2011 (Figure 3).¹⁴ This has reduced public-sector exposure to exchange-rate risk, a key financing vulnerability. In fact, since 2001, the government has had the capability to completely finance its deficit in the domestic markets at its choosing.

Figure 3
Ratio of foreign-currency to domestic-currency government securities

#: 2002-2011



Source: Banco de México and the Finance Ministry (SHCP)

The reduction in external debt was achieved through several actions. First, the government was able to prepay an important portion of its external debt between 2005 and early 2008 thanks to two factors: its ability to get funding in the local markets at reasonable terms, and its ability to buy a large amount of dollars (USD 25.5 billion) without distorting the foreign exchange market. The foreign currency was purchased from the central bank's international reserves at market prices (at the Fix). By using international reserves, the government and the central bank avoided sending unintended signals that could have been read mistakenly by the market as changes in the stance of monetary or exchange policy.

Second is the issuance of warrants described in Section 2.7. These warrants granted investors wishing to incur some sovereign risk but limit their currency exposure the option of exchanging foreign-currency-denominated government bonds for nominal and inflation-indexed local securities. As a result of this program, the government has reduced its external liabilities by nearly USD 5 billion since 2005.

Third, all of the maturing foreign-currency bonds were replaced with debt issued in the domestic markets.

4.2 Lower interest-rate risk exposure

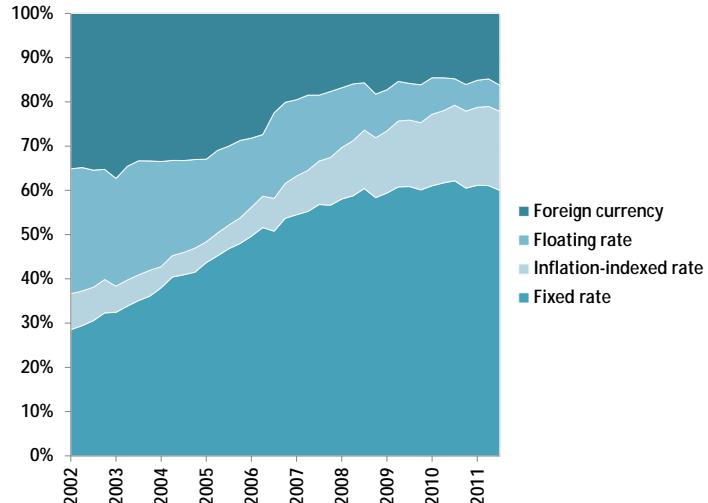
The government has continuously sought to alter the mix between foreign-currency-denominated and floating-rate securities on the one hand, and peso-denominated fixed-rate or inflation-indexed securities on the other, in favor of the latter. Figure 4 clearly illustrates this point: the share of fixed-rate peso-denominated securities has more than doubled from 28% of the total in 2002 to 60% of the total in late 2011. Lower and more stable inflation has

¹⁴ The pace at which this share has decreased slowed in 2009, when the federal government turned to external markets to take advantage of better funding conditions.

arguably contributed to the increase (Pérez-Verdía and Jeanneau, 2005). However, more stability has not only contributed to a larger share of fixed-rate securities, but also to extended government-debt maturities.

Figure 4
Outstanding federal government securities by currency and rate type

% of total: 2002-2011



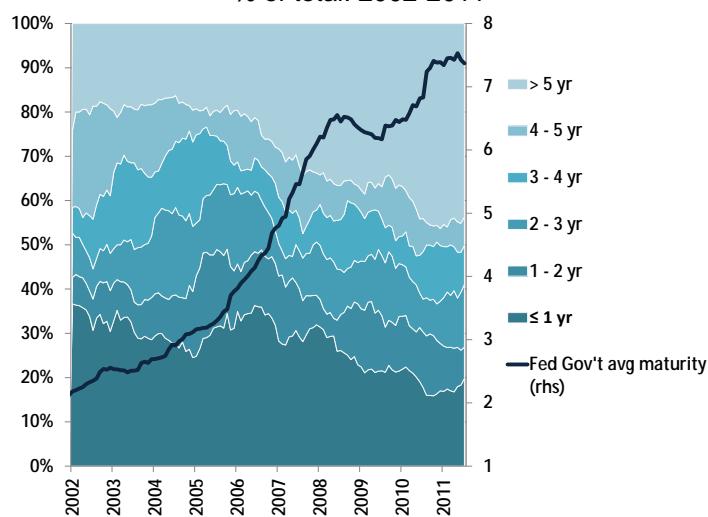
Source: Banco de México

4.3 Lower refinancing risk for public and private issuers

The government has gradually increased the length of its nominal yield curve from 6 months in 1995 to 30 years since 2006. This action has reduced its refinancing risk and provided the market with long-term reference rates. A major benefit is that private issuers have been able to rely more on the domestic markets for their financing needs. Debtors have extended their debt maturities, which in all probability has also decreased their refinancing and foreign-exchange risks (see Figure 5).

Figure 5
Federal government debt average maturity (in years) and the distribution of private securities by maturity

% of total: 2002-2011

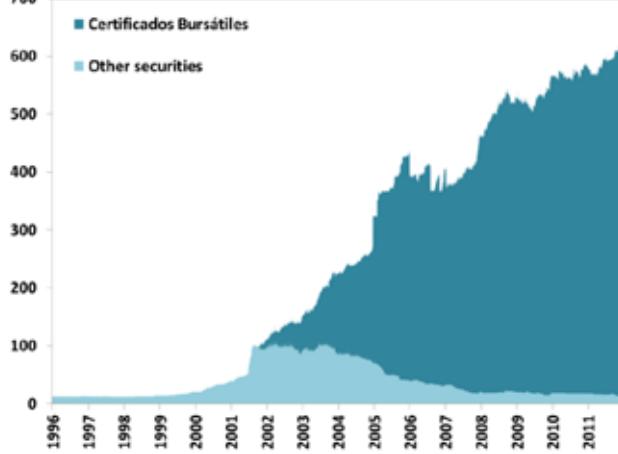


Source: Banco de México

Indeed, private and public corporations' domestic debt issuance has seen a significant increase since 2000 (see Figure 6). This has been supported, in part, by a legal reform that created a new instrument (the "Certificado Bursátil"), making the process to access markets much easier. The new law eliminates red tape and simplifies the issuance process: authorities grant an "umbrella permit" to place debt and the choice of instrument and maturity is left to the issuer's discretion. In contrast, the previous procedure required case-by-case authorization.

Figure 6
Outstanding securities issued by the domestic private sector

In billions of pesos: 1996-2011

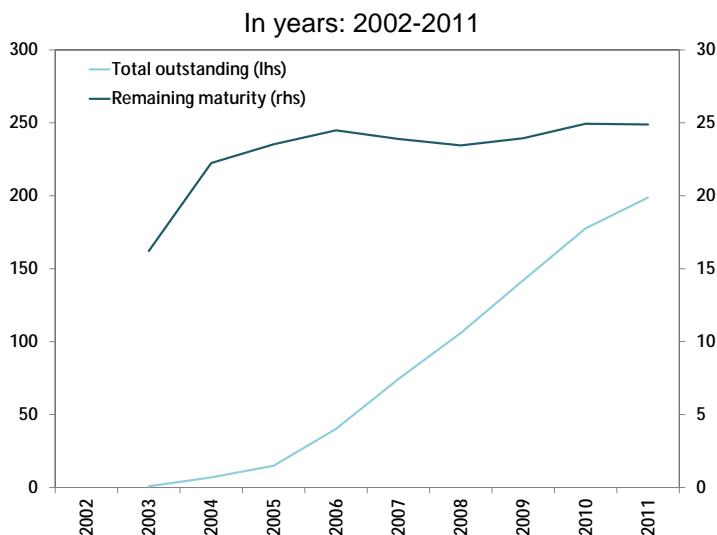


Source: Banco de México

Excludes securities issued by financial institutions.

Among the debt instruments that have benefited from longer risk-free reference rates are mortgage-backed securities. The development of this market allowed mortgage intermediaries to broaden their funding sources (see Figure 7).

Figure 7
Mortgage-backed securities: total outstanding (in billions of pesos) and remaining maturity



Source: Banco de México

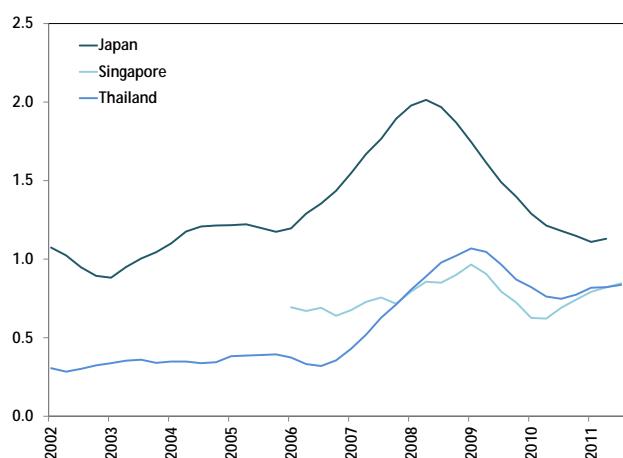
4.4 Higher liquidity

During the recent financial crisis, global liquidity almost seized up, and this had a sizeable effect on the turnover of several sovereign debt markets (Figure 8). The Mexican market was not an exception. Figure 9 shows turnover and volume of government bonds from 2003 to 2011. Traded volume increased until 2007 and then sharply decreased in 2008. Turnover increased during 2007, reversing a downward trend documented by Pérez-Verdía and Jeanneau (2005). However, turnover also fell during 2008. As global liquidity has begun to return, both turnover and traded volume have rebounded, although they have not yet reached their pre-crisis levels.

Figure 8

Turnover ratio (% of total outstanding) of selected government debt markets:

2002-2011



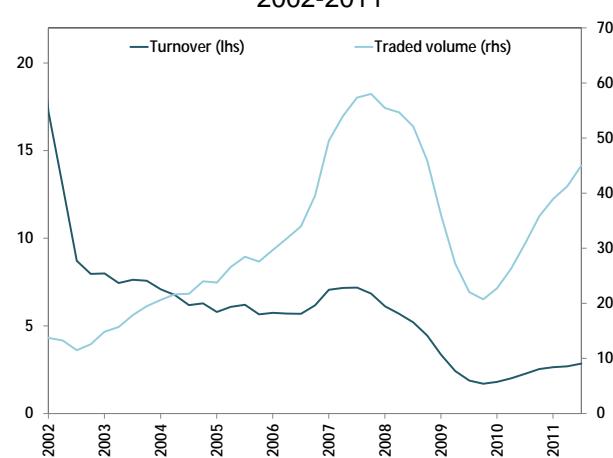
Source: AsianBondsOnline

Filter: yearly moving average of quarterly data

Figure 9

Turnover ratio (% of total outstanding) and traded volume (in billions of pesos) of Mexican government bonds:

2002-2011



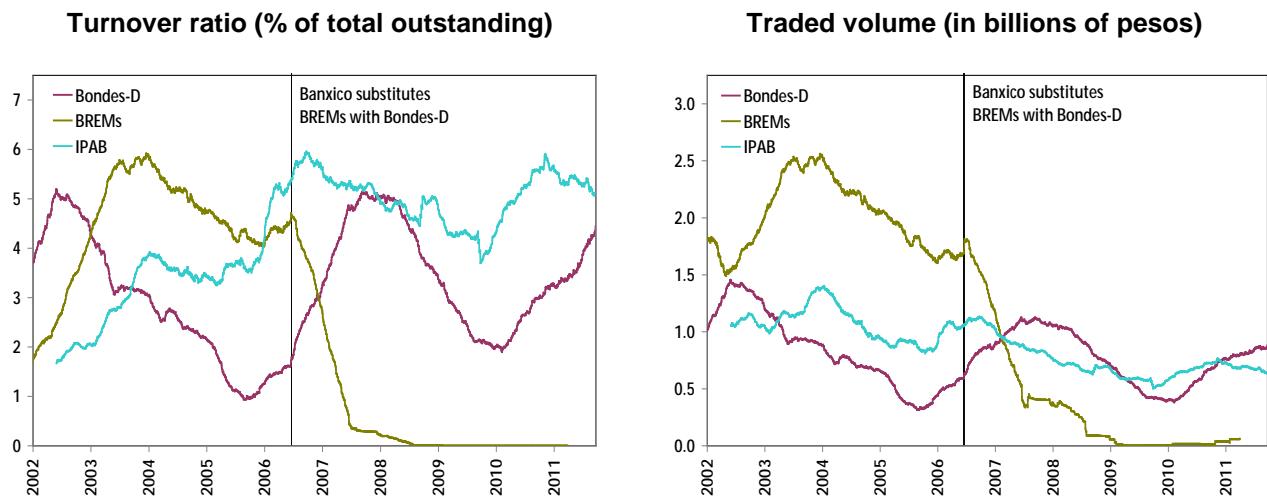
Source: Banco de México

Filter: yearly moving average of quarterly data

Section 2.6 argued that a rationale for using government-issued (as opposed to central-bank issued) securities to sterilize international reserve accumulation was to avoid predation between similar securities (in this case, floating-rate bonds) from two institutions with comparable risk profiles (in this case, the federal government and Banco de México). In fact, there is evidence that predation could have been taking place. Figure 10 displays two liquidity measures (turnover on the left panel and traded volume on the right) for floating-rate securities issued by the federal government (Bondes, including Bondes-D) and by Banco de México (BREMs). IPAB securities are also included as a proxy for secular liquidity trends for public floating-rate securities. The fact that Bondes and BREMs exhibit a negative correlation for both liquidity measures could be indicative of how substitutable they were. In other words, to a certain extent, BREMs could have crowded out liquidity from Bondes. Unsurprisingly, turnover and the volume of BREMs traded sharply decreased once the central bank substituted them with Bondes-D. Although the liquidity of Bondes had already been increasing prior to the introduction of Bondes-D, the increase accelerated once the new securities were issued (particularly, traded volume, on the right panel). Therefore, it seems that substituting BREMs with Bondes-D has promoted the liquidity of the market for government floating-rate securities.

Figure 10
Liquidity measures for floating-rate securities:

Federal Government, Banco de México, and IPAB: 2002-2011



Source: Banco de México

Filter: yearly moving average

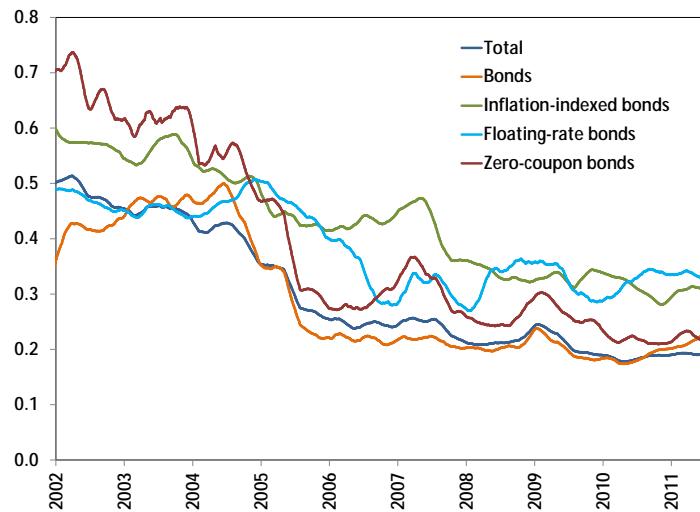
4.5 Higher diversification of the investor base for domestic public debt

As put forward by Pérez-Verdía and Jeanneau (2005) and by Tapia Rangel (2011), an enhanced institutional framework in tandem with macroeconomic stability has also promoted the diversification of the investor base. While the government has gained more confidence from foreign investors, the growth of domestic institutional investors, such as pension and mutual funds or insurers, has guaranteed a healthy demand for government securities. This development could be represented by a Herfindahl index of government securities holdings by investor category. Lower levels of this index would be related to a more diversified investor base. Figure 11 suggests that the investor base has indeed become more diversified; it suffices to compare the value of the Herfindahl index in 2002, around 0.5, with the 0.2 it attained in December 2011.

A major advantage of the increased investor diversification could be lower debt market sensitivity to shocks that are idiosyncratic to each investor profile. In addition, there is some evidence that suggests that the profiles of both institutional and foreign investors are of a more stable nature. Figure 12 shows rolling standard deviations of daily percentage changes in government securities holdings for some investor categories. The purpose is to capture how the volatility of holdings of each investor type has evolved over time. According to this measure of volatility, it appears that the holdings of mutual funds and foreign investors have become more stable over the last decade.

In what follows, we will discuss the role foreign investors have played lately in government securities markets.

Figure 11
Herfindahl index of government securities holdings by investor category:
 2002-2011



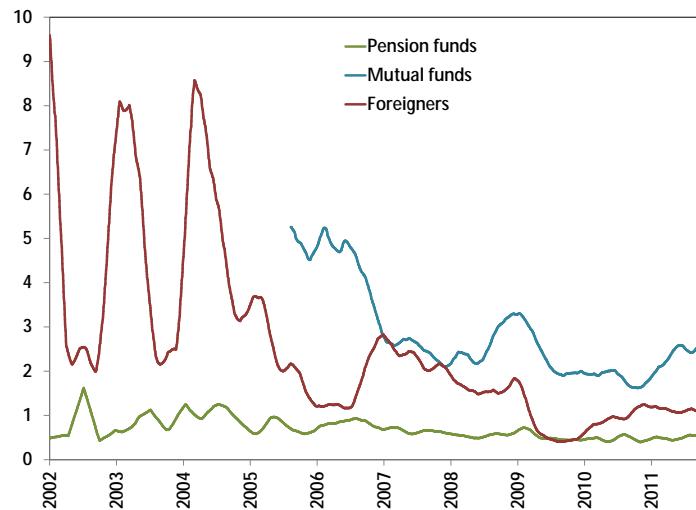
Source: Banco de México

Filter: 60-day moving average

The Herfindahl index ranges between 0 and 1. Higher levels of the index are associated with lower investor base diversification.

Investor categories used to compute the index are: banking sector, pension funds, mutual funds, insurers, other domestic investors, foreign investors, repo operations with Banxico, and collateral received by Banxico.

Figure 12
Rolling standard deviation of daily percentage changes in government securities holdings of selected investor categories:
 2002-2011



Source: Banco de México

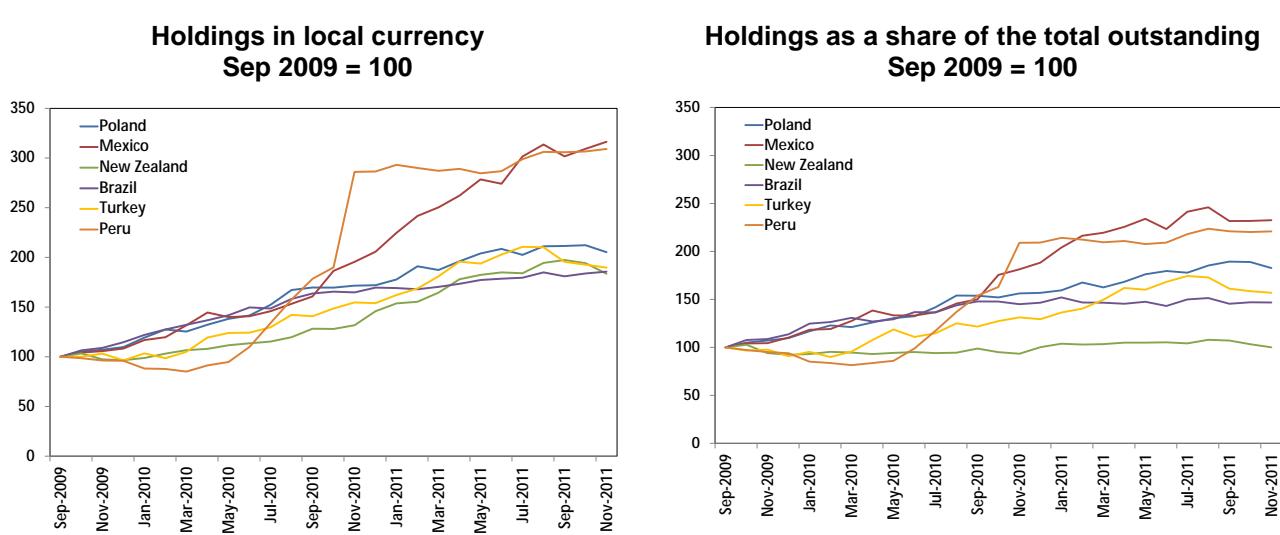
Filter: 60-day moving average

Rolling standard deviations are computed over 60-day windows.

5. The stability of recent capital inflows

Many emerging economies have recently received significant capital inflows. In Mexico, these inflows have resulted in unprecedented participation by foreign investors in the local government securities market. Indeed, as Figure 13 shows, foreign investor holdings of government securities have tripled since 2009, while their share of the market has more than doubled over the same time period. Figure 13 also shows that the Mexican government securities market stands out in emerging economies as one of those foreign investors favor.

Figure 13
Participation by foreign investors in selected emerging public securities markets:
2009-2011



Sources: Banco de México, the Reserve Bank of New Zealand, the Central Bank of the Republic of Turkey, the Turkish Treasury Secretariat, the Peruvian Ministry of Economics and Finance, the Polish Ministry of Finance, the Brazilian National Treasury.

In practice, it is not easy to measure the extent to which these flows are attracted by temporary arbitrage conditions, or by fundamentals. However, as previously suggested in Figure 12, a number of factors point to more stable foreign investment, presumably because investors have not only been attracted to Mexican financial markets by carry-trade opportunities but also by fundamentals. As Sidaoui, Ramos-Francia and Cuadra (2010) explain, Mexican public finances are in good shape, inflation has steadily converged to the central bank's target, financial system resilience indicators pass international standards with flying colors, and international reserves (together with liquidity arrangements with major foreign institutions) convey confidence in the ability to finance external accounts should external conditions significantly worsen. Finally, commitment to a floating exchange-rate regime is well established.

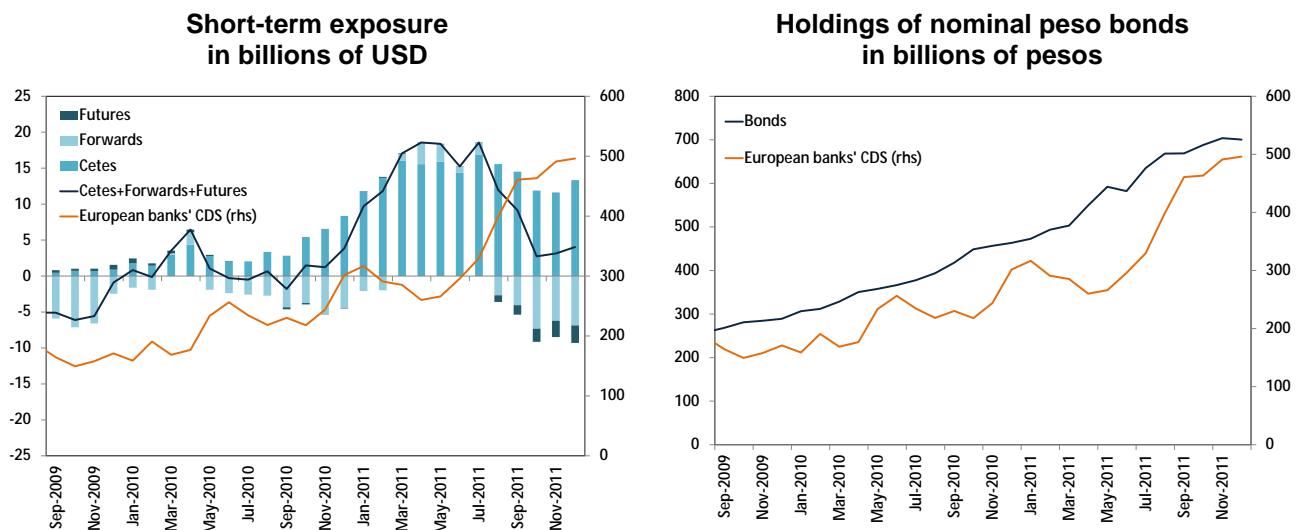
Another factor that lends support to more stable higher participation by foreign investors in the Mexican government securities market is the inclusion of Mexican bonds in Citigroup's WGBI since 2010. In addition to the fact that the market considered Mexico's inclusion in the WGBI to be yet another stamp of outside approval, the WGBI also raised awareness among foreign investors of the availability of opportunities to invest in Mexican local markets. Finally, the WGBI might have induced participation in government securities by those investors who replicate this index.

Foreign investor participation in Mexican government securities has been fairly resilient to global financial turmoil at least since 2009. Figure 14 depicts the exposure of foreign

investors to several Mexican public debt instruments and uses the CDS of European banks as a proxy for adverse external conditions. The left panel shows information on foreigners' short-term (Cetes) positions, with their positions in interest-rate derivatives netted out. Although foreign investors have sharply decreased their short-term exposure since August 2011, their short-term positions have remained quite steady in spite of a worsening external outlook. The right panel of Figure 14 offers a more supportive argument to the resilience of foreign investor participation: regardless of a riskier environment in Europe, their holdings of long-term government bonds have continued to increase, although at a much slower rate.

Figure 14
Participation by foreigners in Mexican government securities and CDS of European banks (in basis points):

2009-2011



Sources: Banco de México and Bloomberg (European banks' 5-year CDS).

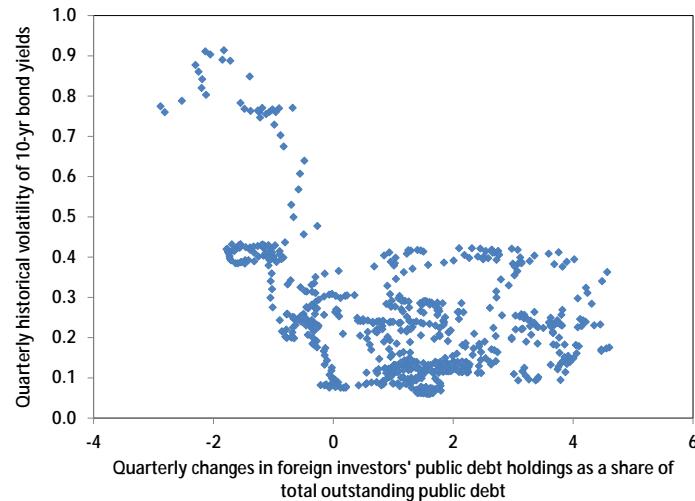
It is still a matter of debate whether or not capital inflows have added stability to local debt markets. Peiris (2010)¹⁵ offers empirical evidence for a number of emerging economies, including Mexico, suggesting that the effect on interest-rate volatility of higher foreign investor participation in domestic government securities markets tends to be either negative or negligible.¹⁶ This result is unsurprising for Mexico due to the aforementioned evidence for foreign investors being attracted by fundamentals. Figure 15 depicts the negative correlation that has recently been observed between changes in foreign investor participation in Mexican government securities and interest-rate volatility (as measured by the historical volatility of 10-year bond yields).¹⁷

¹⁵ The countries considered in Peiris (2010) are Brazil, the Czech Republic, Hungary, Indonesia, South Korea, Malaysia, Mexico, Poland, Thailand, and Turkey. The analysis spans from 2000 to 2009.

¹⁶ South Korea is the only country in Peiris (2010) that seems to have experienced higher interest-rate volatility along with higher foreign investor participation.

¹⁷ Causality cannot be inferred from Figure 15 alone: in principle, it is not possible to disentangle whether increased foreign investor participation lowers interest-rate volatility or whether causation occurs in the reverse direction. The picture is offered as an illustration of the negative correlation between the two variables, for which a more causal empirical analysis is in Peiris (2010), where the panel dimension is exploited to address endogeneity.

Figure 15
**The volatility of 10-year bond yields and changes
in foreign investor participation (%):**
2009-2011



Source: Valmer and Banco de México

Volatility was computed with 10-year constant-maturity bond yields.

Increased foreign investor appetite for government securities, *ceteris paribus*, would bring about lower interest rates. Pradhan *et al.* (2011)¹⁸ use a panel of emerging economies to analyze the effect of foreign participation on interest-rate levels. They conclude that emerging economies, including Mexico, have recently benefited from better funding conditions arising from stronger external demand for public debt.

Evidence largely suggests that recent capital flows could be of a more stable nature and have had a positive effect on the government securities market by diversifying the investor base and by generating cheaper borrowing opportunities. However, in the current uncertain environment, new episodes of turbulence in international markets could lead to higher risk aversion. Under such circumstances foreign investors usually do not discriminate among countries with better fundamentals. Mexico could be vulnerable in such a case. But, eventually, sound macroeconomic fundamentals will attract abundant and more stable capital inflows.

6. Concluding remarks

The development of domestic debt markets has contributed to better government financing terms and has helped the central bank to carry out its open market operations more effectively. It has also provided economic agents with a wide range of products for saving and obtaining financing as well as hedging risks. Several factors have contributed to the development of the Mexican local-currency securities market and span various fronts. Sound

¹⁸ The countries considered in Pradhan *et al.* (2011) are Brazil, Indonesia, South Korea, Malaysia, Mexico, Poland, Thailand, and Turkey. The analysis spans from 2000 to 2010.

macroeconomic policy, minimal market intervention, pension system reforms (which led to the expansion of large institutional investors), improved market transparency, and safer clearing and settlement of securities have all created a more robust institutional framework. These advances have fostered the development of secondary and derivatives markets, which in turn feeds back to the debt market.

The government has pursued an active debt management strategy in order to reduce its refinancing and interest-rate and currency-exposure risks. As a consequence of a more stable macroeconomic outlook, it has been able to lengthen its yield curve and to increase the share of fixed-rate, peso-denominated securities in the total. This has had positive spill-over effects on the private securities market by providing longer-term reference rates, thus allowing for an increase in the maturity of private debt instruments.

Banco de México has played an important role in the development of the government securities market. The federal government has prepaid its outstanding foreign liabilities in different ways. The currency needed for these operations was taken from Banco de México's international reserves, with virtually no effect on the exchange rate. The central bank has also contributed to the improvement of the liquidity of the government securities market by using these securities in its monetary operations.

Sound monetary and fiscal policies have led to international recognition of Mexican debt. Government securities have attracted considerable interest from foreign investors. Mexican bonds have been included in Citigroup's WGBI, fueling greater investor awareness of Mexican debt markets.

Overall, the Mexican government has succeeded in developing its local-currency securities market. So far, in the current context of high external volatility, this strategy has paid off fairly well. The investor base for government debt is more diversified, and increased foreign investor participation seems to have favored more advantageous borrowing opportunities for the government.

Still, some challenges remain for the attainment of higher levels of liquidity and greater government securities market depth. Although securities lending has increased, most of the activity is done by market makers through the central bank's lending facility, in spite of efforts to encourage lending among private parties (e.g., an increase in the cost of using the central bank facility). Another positive development would be an increase in the maturity of repo operations (currently, the bulk is overnight), which would ultimately lower market participants' refinancing risk.

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Fiscal policy considerations in the design of monetary policy in Peru

Renzo Rossini, Zenón Quispe and Jorge Loyola¹

Abstract

We evaluate the financial and real linkages between fiscal and monetary policy in Peru, and show that during the recent export commodity price boom, public finances supported the implementation of monetary policy. In particular, the reduction of the net public debt has translated into a greater capability by the Central Bank to sterilize its FOREX interventions. Also, an active policy to enhance the development of the local capital markets, using the issuance of public bonds denominated in local currency as a benchmark, has created the incentive to de-dollarize banking credit. On the other hand, difficulty in fine-tuning public investment around the business cycle in recent years has led to periods of a fiscal stance that does not counteract the real business cycle. This raises the question of the possibility of adopting a structural rule for the public sector balance, based on structural fundamentals.

Keywords: Central bank monetary policy, fiscal policy, macroeconomic stabilization

JEL classification: E52, E58, E63

¹ Central Reserve Bank of Peru.

Introduction

According to the Peruvian Constitution, the Central Reserve Bank of Peru (BCRP) is an independent public institution that has the objective of preserving monetary stability through the regulation of money and bank credit. On this basis, monetary policy in Peru follows a modified form of inflation targeting, in which the policy interest rate is used to counteract deviations of inflation with respect to the target of 2% (price stability), but also includes a set of additional, unconventional, instruments aimed at avoiding an overreaction of bank lending.

Fiscal policy aims to create equal opportunities among citizens, ensure sustained growth and defend the public credit (ensuring fiscal solvency to avoid a financial crowding out). The last two objectives are related to the stabilization policies and the public sector asset and liability management, and therefore overlap with monetary policy. For this reason, the design and implementation of monetary policy take into account the impact on aggregate demand of a positive or negative fiscal impulse, and in this way the BCRP seeks not to overreact to or accommodate a fiscal shock. Additionally, in the short run, the monetary operations take into account the Treasury cash flow and other financial operations.

The surge of commodity prices in the last 10 years has led to a significant increase in earnings in Peru, including tax revenue. This environment has been favorable to the surge in foreign direct investment and other forms of capital inflows, which have become a source of risk of macroeconomic overheating. To avoid a pro-cyclical stance, the public sector has achieved an annual financial surplus several times since 2006, and has reduced the size of the public debt, increased the size of the Fiscal Stabilization Fund, and augmented the amount of other public sector deposits at the BCRP. Given this favorable financial position, the fiscal authorities have adopted an expansionary stance to protect the economy from the adverse shock created by the international financial crisis in 2009.

In this article, we assess the policy coordination between the BCRP and the Ministry of Finance at two levels: financial and macroeconomic stability. In the first part we show that Peru's fiscal policy has been able to save part of the non-structural revenues, complementing the monetary policy. In the second part, we evaluate Peru's fiscal stance in terms of its supporting role for macroeconomic stability.

Financial Policy Coordination

During the last 10 years, average annual GDP growth in Peru has been 6.3%, reflecting, among other things, the increase of export commodity prices (see Figure 1 and 2), which on average grew 14% per year. The impact on revenues from the export boom has been significant, with tax revenues growing from 14% of GDP in 2001 to 18% in 2011. This has become more noticeable since 2005, given the increase in mineral prices in international markets. The average price of Peruvian exports was 126% higher in 2005-2011 than in 2001-2004. As a result, revenues from mining exports as a percentage of total fiscal revenues rose from 5.9% in 2005 to nearly 10% in 2011.

Figure 1

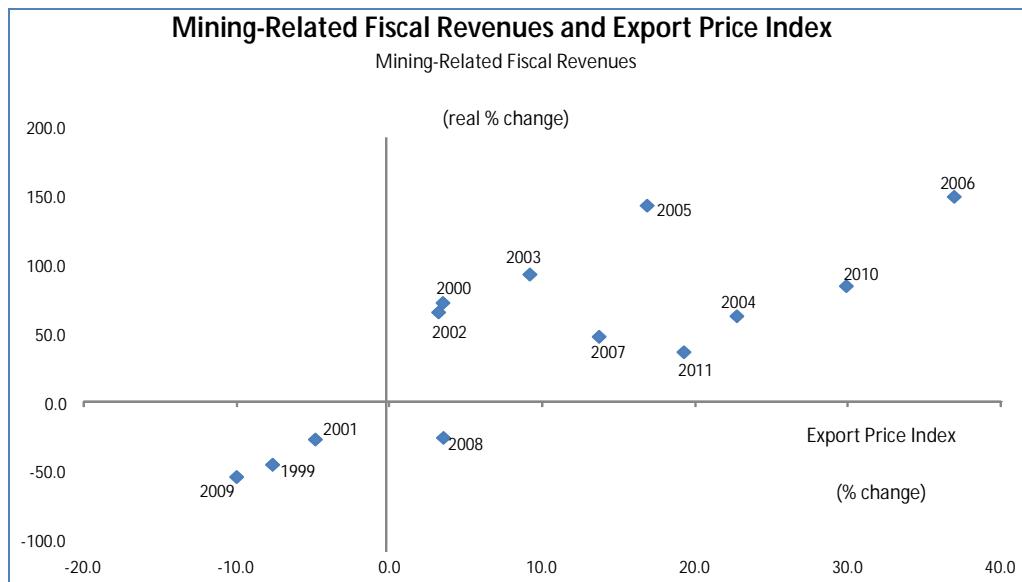
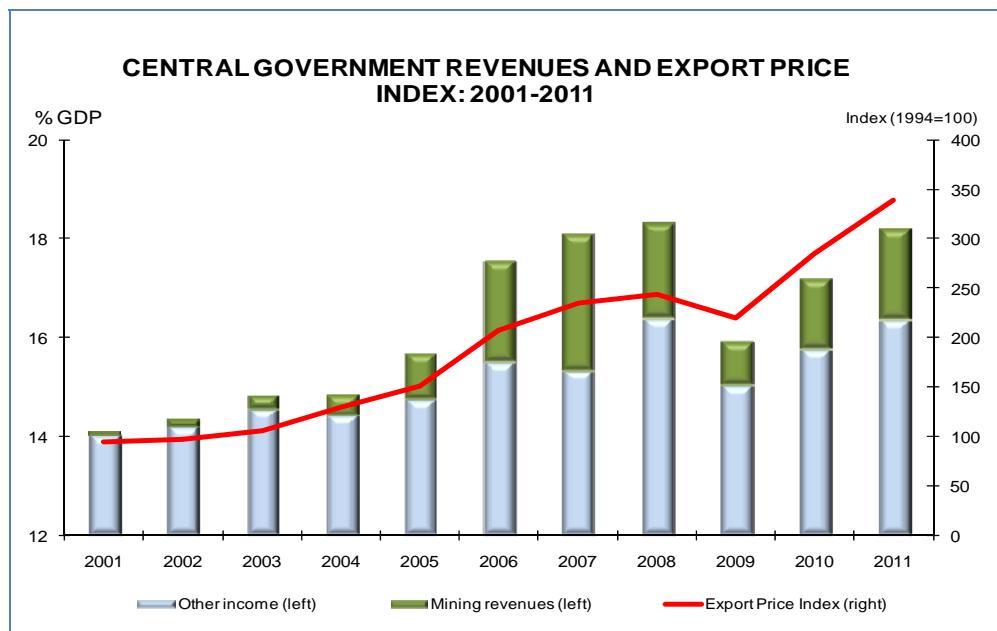


Figure 2

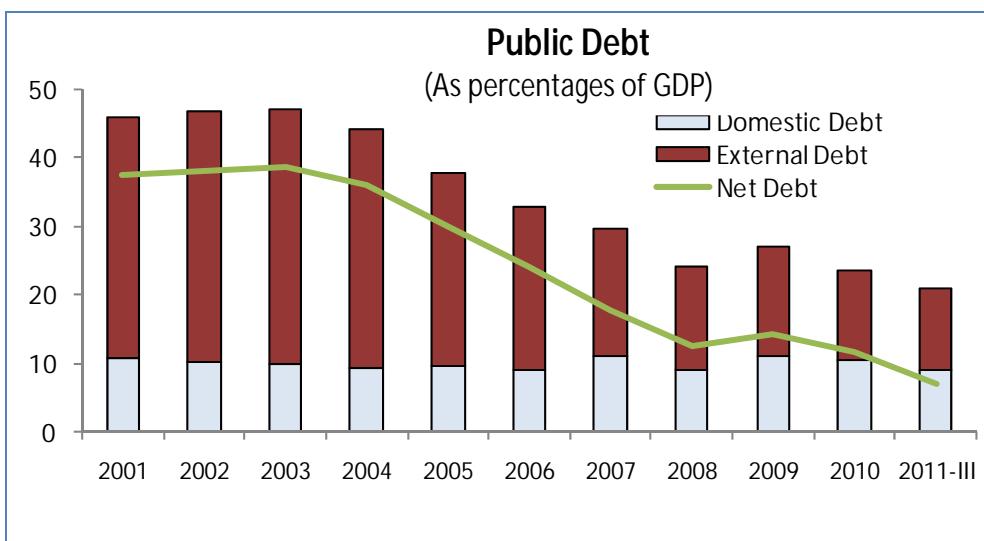


The size of the expenditures in the public sector budget has not increased at the same pace as the tax revenue, resulting in a considerable reduction in the net debt of the public sector, from 38% of GDP in 2001 to 8% in 2011. This figure includes public sector liquid assets of about 14% of GDP. Regarding the latter, two major issues in the management of public debt in the last decade have to do with the increase in the share of domestic debt relative to the total public debt from 23% in 2001 to 43% in 2011; and a significant extension of the average debt maturity from 7 years in 2002 to 13 years in 2011 (see Table 1 and Figure 3). These fiscal results show that part of the non-structural revenues was saved.

Table 1

Public Debt Ratios			
	2002	2006	2011
Debt (As percentage of GDP)			
Gross debt	46.7	33.0	21.8
Net debt	38.0	24.1	8.3
Domestic debt	10.2	9.2	10.3
External debt	36.5	23.8	11.5
Average maturity (In years)			
Domestic debt	4.6	10.3	15.1
External debt	7.8	8.0	11.7
Total	7.4	8.4	13.0
Debt/Fiscal revenues			
(Number of times)	2.71	1.62	0.98
Debt service/Fiscal revenues			
(In percentages)	30.5	21.0	18.7
Non-residents holdings of Treasury bonds BTP/Total BTP			
(In percentages)	-	26.8	45.4

Figure 3



The main components on the asset side of the public sector balance sheet are BCRP obligations (9.2% of GDP), including Fiscal Stabilization Fund deposits (3.3% of GDP), other Treasury deposits (3.5% of GDP), and sub-national government deposits (2.1% of GDP). The Fiscal Stabilization Fund was created by the Fiscal Responsibility Act as a buffer during recessions (Table 2).

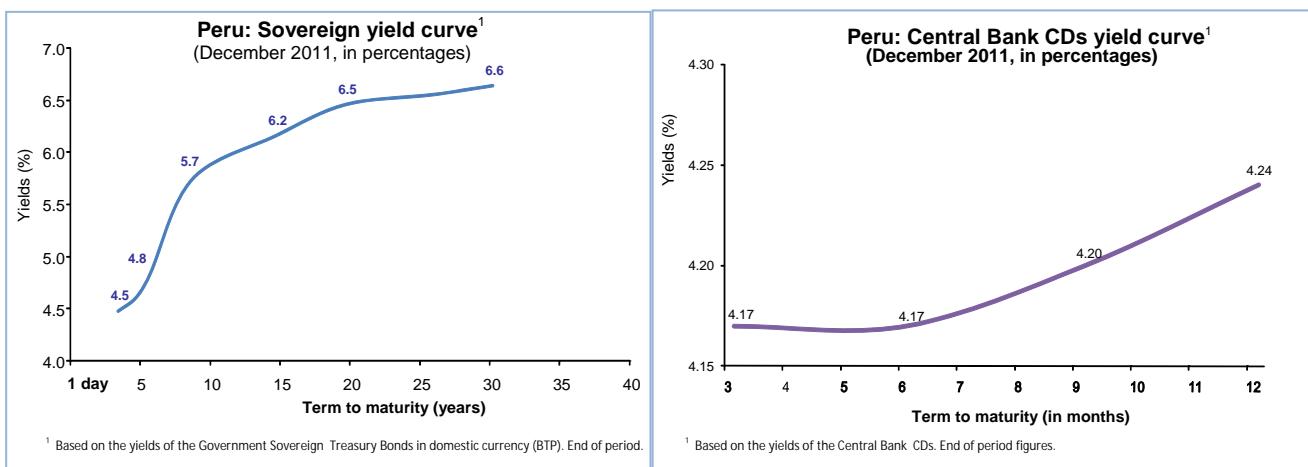
Table 2

Public Sector Balance Sheet (As percentages of GDP, September 2011 figures)		
Assets	Liabilities	
Central Reserve Bank 9.2	Bonds (foreign currency)* 5.5	
-Treasury 3.5	Other external debt 6.3	
-Sub-national governments and others 2.1	Bonds (domestic currency)** 6.5	
-Consolidated Pension Reserve Fund 0.3		
-Fiscal Stabilization Fund 3.3		
Banco de la Nación 2.1	Lima Municipal Bonds 0.0	
-Treasury 0.2	Pension Recognition Bonds 1.6	
-Sub-national governments and others 1.9		
Commercial Banks 2.3	Credits from Banco de la Nación 0.3	
Rest of Financial System 0.2	Short-term 0.7	
Total 13.8	Total 20.9	
Net Debt (Liabilities - Assets) 7.1		

*Include global bonds (US\$ 9 312 million) and bonds of financial system (US\$ 122 million of domestic debt)
** Include sovereign bonds (US\$ 14 048 million and debt exchange bonds (US\$ 682 million of domestic debt)

Since 2002, the fiscal authorities' liability management has contributed to creating a benchmark for issuances of long-term obligations in domestic currency. The actual size of public bonds in domestic currency placed in the local market is equivalent to 6.1% of GDP, with an average maturity of 15.7 years and a yield of 5.85%, representing 29% of the total public debt. The short end of the yield curve is made up of BCRP Certificate issuances with maturities of up to one year. As shown in Figure 4, the short- and long-run segments of the benchmark yield curve are well connected. BCRP Certificates were created in 1991 to sterilize FOREX intervention. The alternative of issuing public debt to sterilize the liquidity created by FOREX interventions has so far been discarded because of the lack of flexibility of debt operations compared with monetary operations.

Figure 4



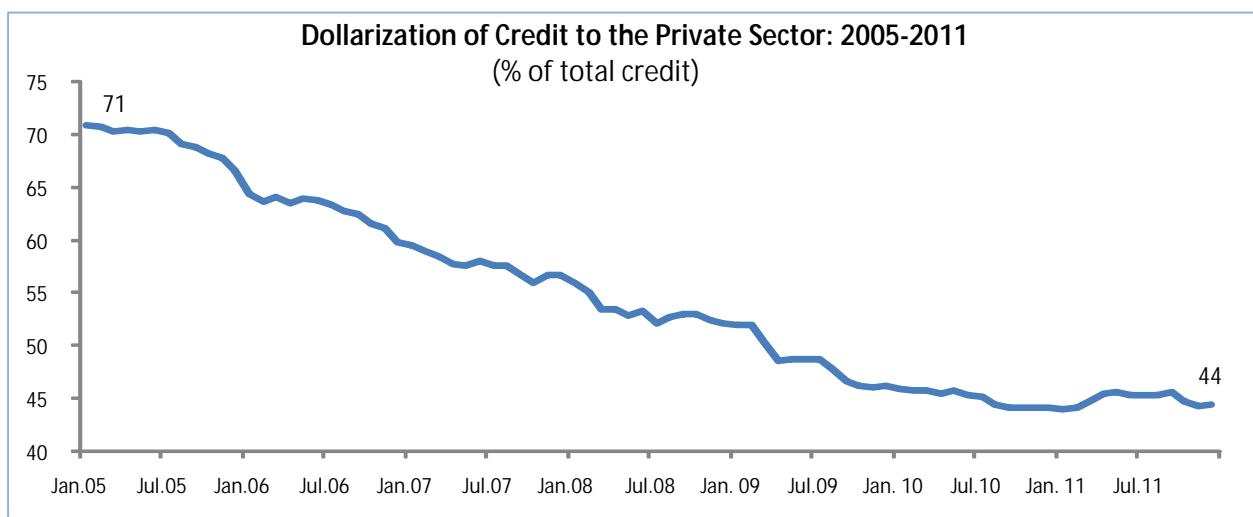
Public sector deposits at the BCRP are the main source of sterilization of FOREX operations (Table 3). The BCRP accumulates international reserves as a preventive measure, considering the risks associated with a partially dollarized financial system. FOREX intervention has reduced exchange rate volatility, thus avoiding deterioration in the quality of banks' loan portfolios. The size of net international reserves increased from 18.7% of GDP in 2006 to 27.8 % of GDP in 2011. Reserve requirements (with higher rates on banks' short-term foreign exchange liabilities) provide another source of international reserves.

Table 3

Peru: Central Reserve Bank Balance Sheet		
(As percentages of GDP, November 30, 2011 figures)		
Assets		Liabilities
International reserves	27.8	Public sector deposits 10.9 In domestic currency 7.1 In foreign currency 3.8 Reserve requirements 7.8 In domestic currency 2.2 In foreign currency 5.7 Central Bank instruments 3.3 Cash holdings 5.2 Other liabilities 0.5

Inflation targeting in Peru, as described in Rossini et al. (2011), gives special consideration to financial stability, given the weakness associated with financial dollarization (see Figure 5). Therefore, additional instruments, like reserve requirements, are used to avoid significant swings in bank credit like those than can emerge from sharp exchange rate fluctuations, bank runs on dollar deposits, and capital inflows. In this regard, close attention is paid to deviations of bank credit as a percentage of GDP with respect to the trend (Figure 6). In terms of policies, there are preventive measures to ensure an adequate level of bank liquidity, using reserve requirements kept at the Central Bank in the form of international reserves.

Figure 5



One consideration regarding sterilized interventions is the net cost of the additional monetary liabilities, compared with the returns on international reserves. Table 4 shows that in 2011 the returns from international asset management (1.52%) were above the average cost of the BCRP's liabilities (1.45%). This result is influenced by the zero cost of the currency and the interest paid on public sector deposits. It is worth mentioning that the valuation effect of exchange rate fluctuations on the BCRP's net foreign currency assets is not part of its profit and loss statement, since it is registered in a separate line in the capital account. Despite the lack of general accounting rules for central banks, the rationale for this method to register valuation changes is that a depreciation of the currency should not generate profits, nor should an appreciation create accounting losses.

Figure 6

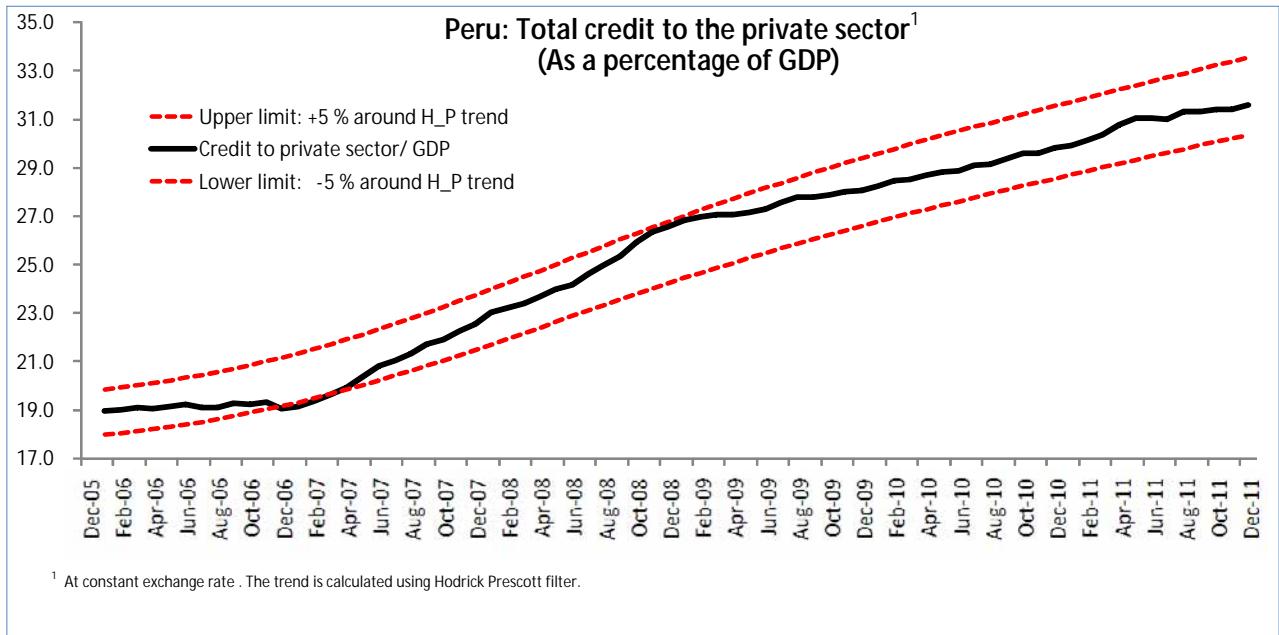


Figure 7

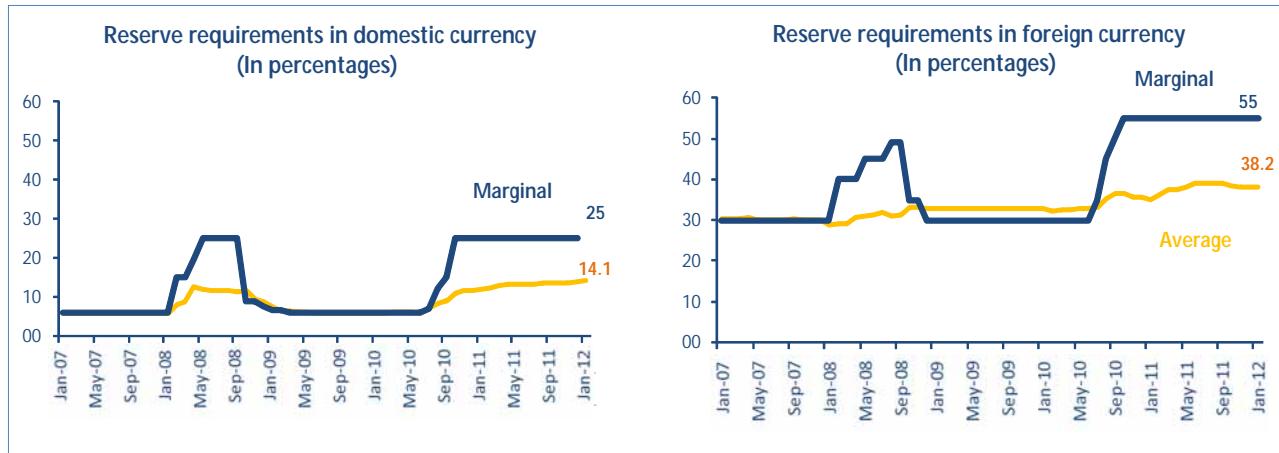


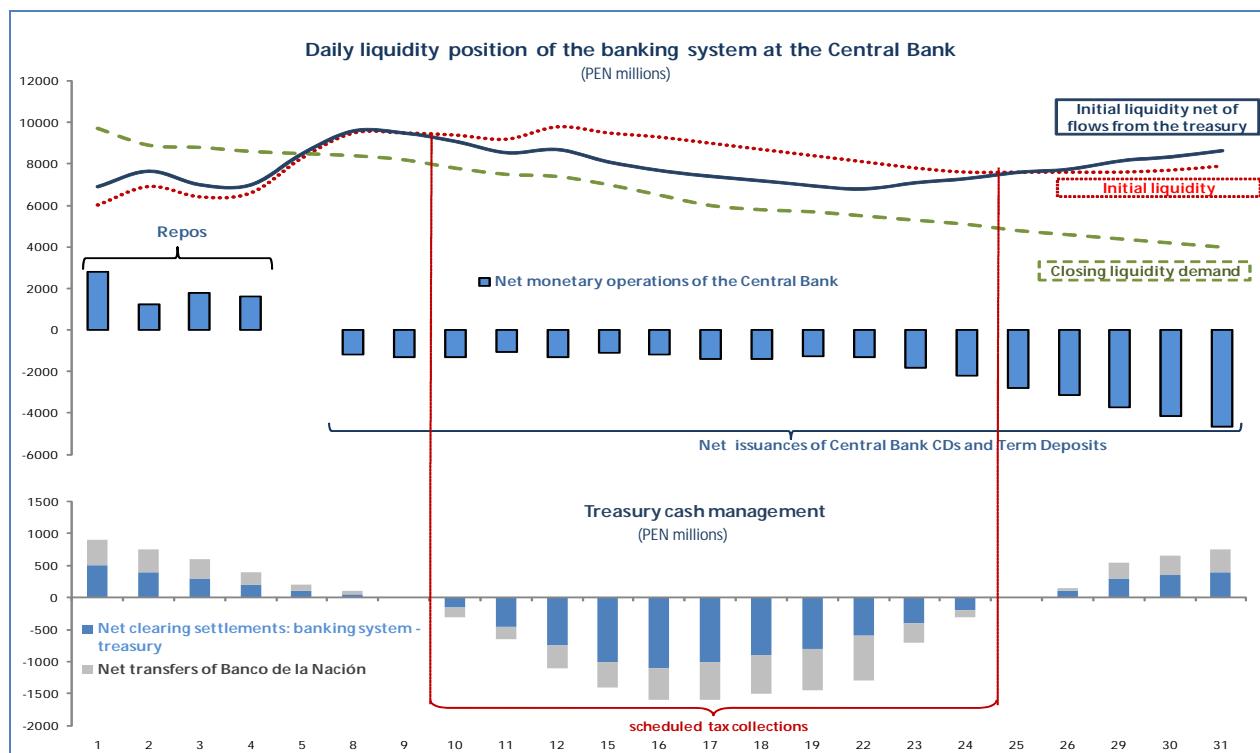
Table 4

Peru: Average yields and funding costs of the Central Bank balance sheet
(In percentages, November 30, 2011 figures)

Assets		Liabilities
International reserves	1.52	1.45
		Funding costs
		Deposits of the public sector
		In domestic currency
		in foreign currency
		Reserve requirements
		In domestic currency
		in foreign currency
		Central bank instruments
		CDs
		Term deposits
		Cash holdings
		Other liabilities

Policy coordination at the operational level is also a critical dimension of monetary and fiscal policy coordination. At the macro level, monetary programming frameworks can be instrumental in preventing inconsistencies in the policy mix, whereas the coordination of operations is of critical importance for the day-to-day implementation of monetary and fiscal policies at the microeconomic level. As shown in Figure 8, the considerations of the daily Treasury cash management shape the liquidity management of the BCRP to ensure adequate liquidity for the desired closing liquidity demand of private banks. This is more evident during the scheduled tax collection period, when private banks transfer liquidity to the Treasury and the BCRP responds with open market operations to preserve the liquidity of the system.

Figure 8



Macroeconomic Policy Coordination

As part of the institutional framework governing the relationship between fiscal and monetary policy in Peru, the BCRP is explicitly forbidden to finance the public sector with loans or purchases of government securities. Also, the government is obligated to request BCRP advice and publish it together with official fiscal forecasts. Finally, the BCRP is required to inform the Ministry of Finance if a given policy affects the BCRP's ability to fulfill its mandate. The Fiscal Responsibility and Transparency Law (1999) includes a combination of a target for the nominal fiscal deficit and a ceiling for the expansion for non-financial public sector expenditure (Table 5). These targets are not adjusted for non-structural effects, and do not necessarily ensure a countercyclical stance. Table 6 outlines the main goals and structure of the Treasury Cash Management Committee (CMC).

Table 5

Macro-fiscal Rules	
Deficit rule	The annual deficit of the non-financial public sector (NFPS) cannot exceed 1% of GDP.
Expenditure rule	The annual increase in consumer spending of the central government shall not exceed 4% in real terms. Consumer spending includes spending on salaries, pensions, goods, and services.
Debt rule	NFPS debt must not be increased by more than the amount of deficit corrected for the difference attributable to changes in currency parities, issues of recognition bonds, changes in deposits and debt taken by the NFPS.
Fiscal Stabilization Fund (FEF)	
Funding sources	The FEF's regular funding sources are the fiscal surpluses of the Treasury obtained at the end of each year. The accumulated savings cannot exceed 4% of GDP. Any additional earnings are used to reduce debt. The FEF balance at December 31, 2011 was U.S. \$ 5.6 billion.
Uses	The FEF can be used if the current revenue, in terms of GDP, falls more than 0.3 percentage points below its average level of the last 3 years. In this event, the amount that exceeds the declining limit of 0.3% of GDP, and up to 40% of the current balance of the FEF, will be used to cover poverty alleviation programs, as a priority.
Exceptions to the rules	
Exceptional events	In the event of national emergency or international crisis, the Congress may suspend up to a maximum of three years the implementation of any of the fiscal rules outlined above. For instance, during 2009-2010 this exception to the rule was activated in order to meet the costs of the international financial crisis.

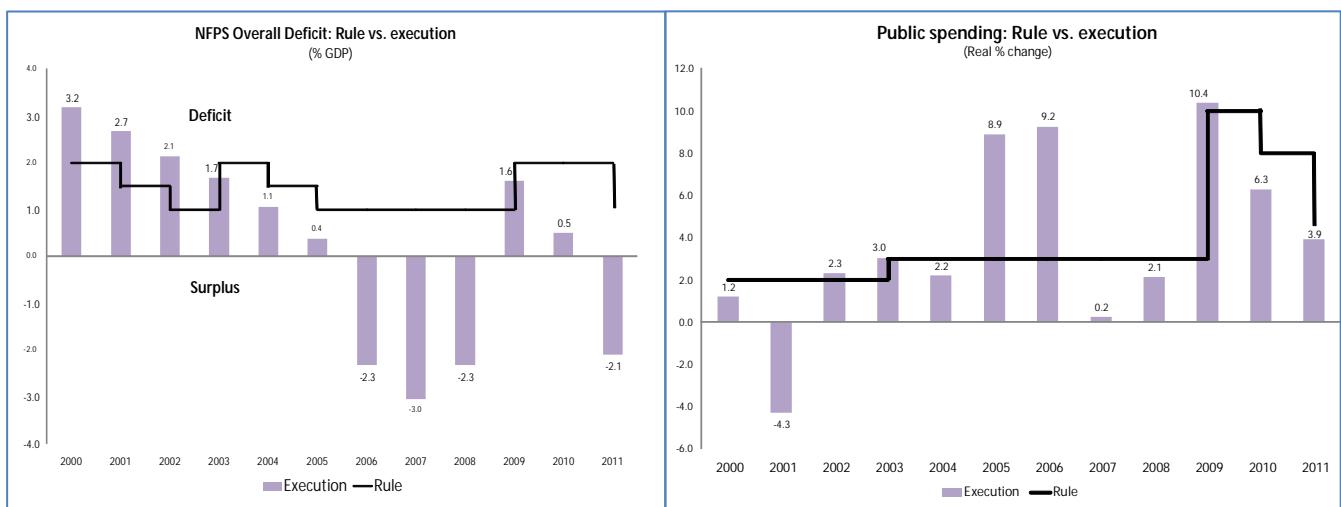
Table 6

Cash Management Committee (CMC)	
Functions	The CMC evaluates and approves, on a monthly basis, the expenditure control and financing operations of the Treasury.
Treasury cash flow (definition)	Flow of funds associated with the cash revenues and expenditure profiles in domestic and foreign currencies from the national, regional, and local government entities. The General Director of Treasury and Public Debt of the Ministry of Economy is in charge of the management of the fund. The cash flows are centralized and managed through the Treasury's main account at the Central Bank.
Members	The CMC is composed of 5 members, including the General Manager of the Central Bank, the Vice Minister of Economy, the General Manager of the Banco de la Nación, the General Director of Treasury and Public Debt, and the General Director of the Public Budget. The importance of the Treasury's cash management for the monetary policy design justifies the inclusion of a representative of the Central Bank on the CMC.

The charts in Figure 9 show the limits established by the Law of Fiscal Responsibility and Transparency with respect to the deficit and expenditures for each year and the execution of these variables. Since 2003, the deficit has been consistent with the rules, although in 2009 and 2010 it was necessary to establish waivers approved by the Congress as a result of the global financial crisis. In 2005 and 2006, public spending growth was above the targets set by the rule, as exceptions approved by the Congress. These deviations have given rise to discussions about the need to replace the growth targets with limits to the structural balance.

BCRP independence includes the ability to establish its policy goals and decide which instruments to use, and, as consequence, policy coordination with the Ministry of Finance is mainly based on the consideration of the actions of the other body. This process includes the publication of the Ministry of Finance and BCRP macroeconomic forecasts in the semi-annually Multiannual Macroeconomic Framework Memoranda (MMM) and the quarterly Inflation Report, respectively. Table 7 shows the sequence for the publication of these forecasts during the year. As a result of this coordination in the forecasting process, the Ministry of Finance and BCRP forecasts and final data tend to be quite similar.

Figure 9



The Ministry of Finance's statistics and figures on the budget policy goals are taken into account by the BCRP to generate its own projections, but there could be forecasting differences due to different assumptions in crucial variables like terms of trade and nominal and real GDP growth. However, government expenditure figures tend to be similar, as they reflect the annual budget's policy goals.

Table 7

Timeline of Macroeconomic Projections												
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Monetary Policy			Inflation Report: t, t+1			Inflation Report: t, t+1, t+2			Inflation Report: t, t+1, t+2			Inflation Report: t, t+1, t+2
Fiscal Policy					MMM: t, t+1, t+2, t+3			Revised MMM: t, t+1, t+2, t+3				

To assess the impact of the fiscal stance on aggregate demand, the BCRP calculates a modified form of the indicator for the structural balance to take into account the effect of export prices on tax revenues: the actual balance of the consolidated public sector is adjusted not only for the effect of the output gap on tax revenues, but also for the effect of the deviation of the average export price (relative to a long-run trend) on the income tax paid by the mining sector.

Equation 1 shows how the structural balance (SB_t) is calculated adjusting the public sector balance (PB_t) for the effect of the output gap (CE_t) and export prices (PE_t) on taxation. In order to assess if the real intention of the fiscal policy is to contract or expand the economy, the indicator used is the change of the structural balance, or the fiscal impulse (FI_t). When positive, FI_t shows a policy expansion, and when negative a contraction.

$$SB_t = PB_t - CE_t - PE_t \quad (1)$$

$$FI_t = -(SB_t - SB_{t-1}) \quad (2)$$

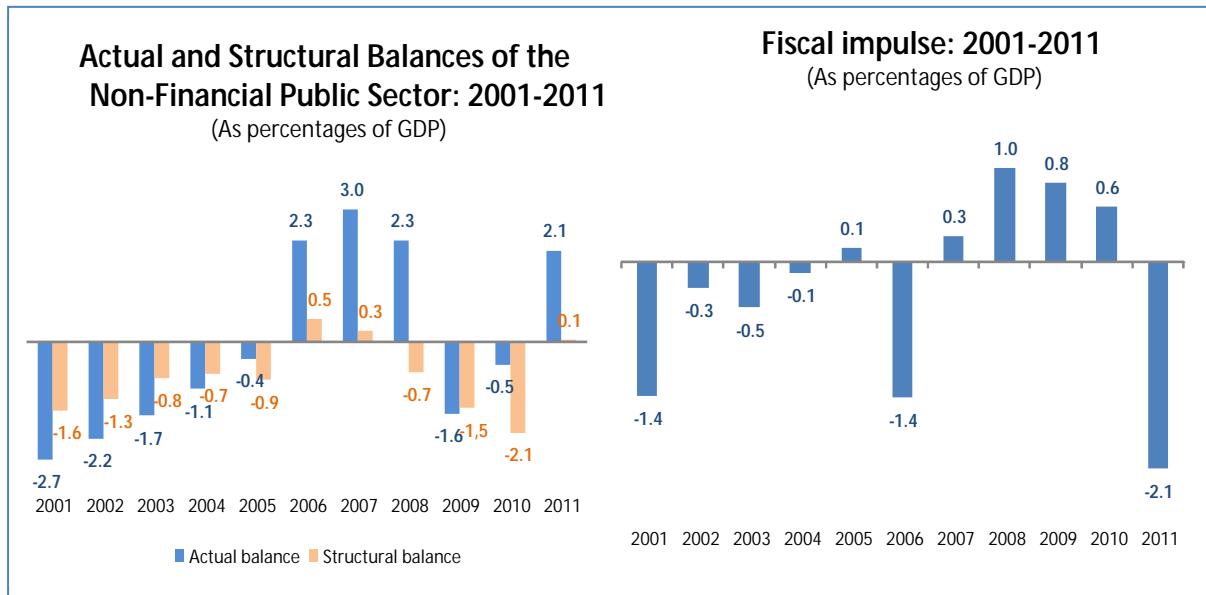
Table 8 shows the evolution of the public sector actual and structural balances. It can be verified that the unadjusted fiscal balance does not necessarily reflect the real fiscal stance. For example, in years of apparent fiscal contraction like 2005, 2007, and 2010, the structural balance showed a fiscal expansion.

Table 8

STRUCTURAL BALANCE OF NON-FINANCIAL PUBLIC SECTOR											
	(% of potential GDP)										
	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
Public Sector Balance (PB)	-2.5	-2.1	-1.6	-1.0	-0.4	2.3	3.1	2.4	-1.6	-0.5	2.1
Cyclical component	1.0	0.8	0.8	0.3	-0.5	-1.8	-2.7	-3.0	-0.2	-1.5	-2.0
Impact output gap (CE)	1.0	0.7	0.7	0.6	0.3	0.0	-0.4	-0.9	0.4	0.0	-0.2
Impact of terms of trade (PE)	0.0	0.1	0.1	-0.3	-0.8	-1.8	-2.3	-2.1	-0.6	-1.4	-1.9
Other adjustments	0.0	0.0	0.0	0.0	0.0	0.0	-0.2	-0.1	0.3	-0.1	0.0
Structural Balance (SB)	-1.6	-1.3	-0.8	-0.7	-0.9	0.5	0.3	-0.7	-1.5	-2.1	0.1
Fiscal Impulse (FI)	-1.4	-0.3	-0.5	-0.1	0.1	-1.4	0.3	1.0	0.8	0.6	-2.1
<i>Memo:</i>											
Output gap	-5.1	-3.8	-3.8	-3.3	-1.6	0.0	1.9	3.8	-1.9	0.1	0.7
Export price gap ¹	-30.4	-27.4	-16.7	18.4	42.2	95.3	93.6	62.5	32.1	60.7	70.1

¹ Using 10 year window.

Figure 10



The BCRP's Inflation Report presents estimates of the structural fiscal balance to show the differences with the public sector balance (Figure 10). The BCRP identifies the size of the temporary factors affecting public sector earnings and measures the fiscal impulse to establish if fiscal policy is accommodative or tight.

The ability of fiscal policy to contribute to stabilizing macroeconomic activity can be assessed estimating the multipliers of different components of the fiscal result. Using a structural vector auto-regression (SVAR) model, with variables such as current income and expenditure, capital expenditures, real GDP, terms of trade, and the balance of the monetary base, it can be established that only capital expenditures have a multiplier² generating an impact on GDP greater than 1, and statistically different from zero (Table 9). This implies an important

² We would like to acknowledge the assistance received from Mr. Guillermo Ferreyros, who carried out the calculation of fiscal spending multipliers, Mr. Enrique Serrano, for computing the output gap response to the fiscal impulse within the quarterly forecasting model of the Central Bank, and Mr. Luis Rizo Patron, for the satellite estimations of the relationship between the fiscal impulse and the output gap.

difficulty, since capital expenditures take time to design and implement; in consequence, using them to stabilize the economic cycle could have an untimely effect, producing an involuntary pro-cyclical fiscal stance.

Table 9
Fiscal Multipliers
(in PEN Soles)

Effect on GDP of an increase of PEN S/.1.00 in:			
	Current Revenues	Current Expenditures	Capital Expenditures
Initial effect	-0.44	0.78	1.36
Effect after 1 year	-0.32	0.59	2.46
Effect after 2 years	-0.38	0.52	2.63

The difficulty of synchronizing fiscal policy with the need to reduce the output gap has been given rise to periods of pro-cyclical fiscal policy. These events can be explained by the tendency to maintain an expansionary (or a contractionary) fiscal stance once the recession (or boom) is over. This has an important consequence: monetary policy has a greater responsibility for fine-tuning aggregate demand during the business cycle. For example, despite the recovery in 2010 from the external shock of 2009, the fiscal policy was maintained in an expansionary mode. The forecasting process of the BCRP includes the evaluation of a fiscal shock to aggregate demand, whose impact is estimated with a policy parameter of 0.24 and a maximum policy lag of 6 quarters (Figure 11).

Figure 11

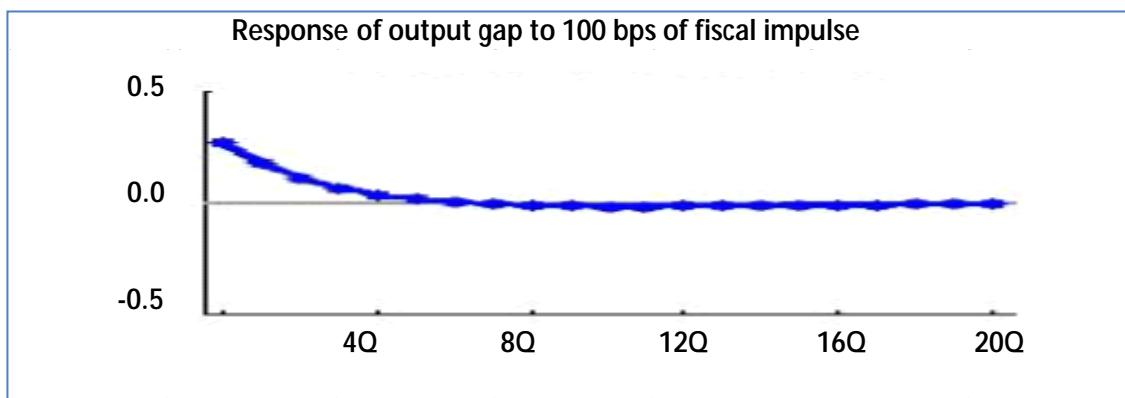
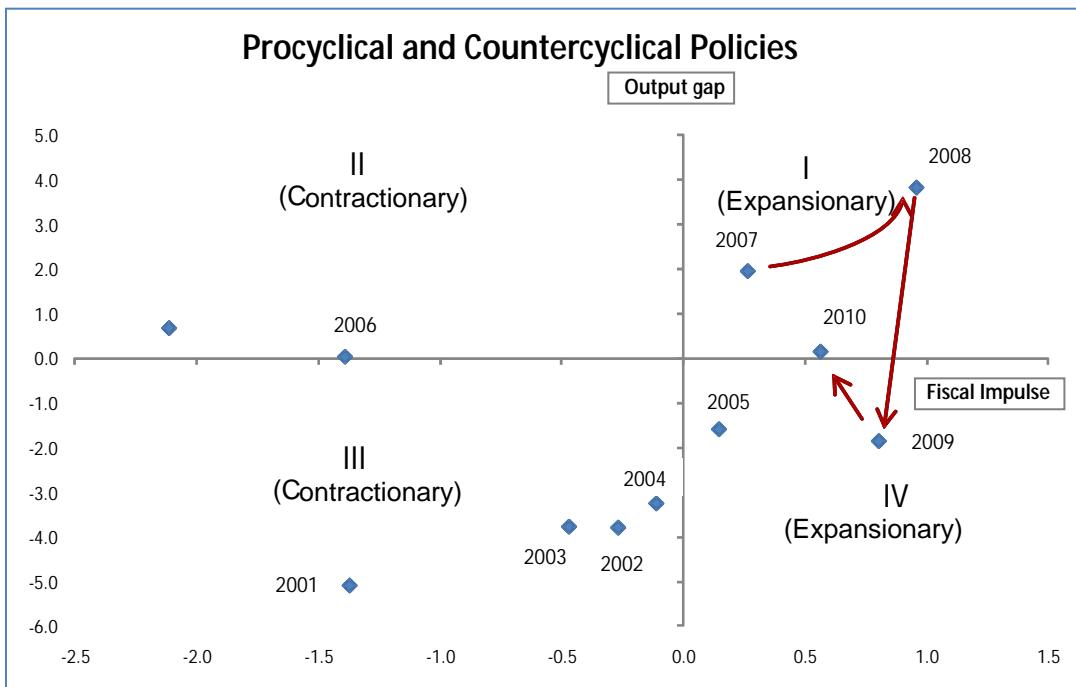


Figure 12 shows the sequence of fiscal policy decisions in Peru around the Lehman Brothers bankruptcy, which demonstrates the lagged impact of those policy changes.

For example, between 2007 and 2008, and from 2009 to 2010, despite the improvement of the output gap, the fiscal stance was maintained in an expansionary mode. Conversely, in 2008 and 2009 the fiscal impulse was of a similar magnitude in both years despite the significant contraction in economic activity.

Figure 12



In order to contrast the fiscal policy decisions with some theoretical structural fiscal rule, which could be identified with the fiscal impulse (FI_t) as the policy reaction to the previous level of the fiscal impulse (FI_{t-1}) and to yearly deviations of the output gap (OG_t), we can check if the fiscal policy actions were systematically countercyclical according to the following rule in equation 3:

$$FI_t = \delta FI_{t-1} + \gamma OG_t; \quad \gamma < 0 \quad (3)$$

The estimation of the relationship between the fiscal impulse and the output gap in equation 4 confirms that the difficulty in fine-tuning public investment around the business cycle in recent years has led to the adoption of a fiscal stance that does not counteract the real business cycle. In particular, the parameter of the output gap presents an opposite sign than the expected, and without significant explanatory power. This result holds when we estimate the equation looking for an optimal lag structure. This raises the question of the possibility of adopting a structural rule for the public sector balance, based on structural fundamentals such as the one presented in equation 3.

$$FI_t = 0.365 FI_{t-1} + 0.069 OG_t \quad (4)$$

$$(2.54758) \quad (0.81548)$$

Conclusions

We have evaluated the financial and real links between fiscal and monetary policy in Peru, and have shown that during the recent export commodity price boom, the public finances supported the implementation of monetary policy. In this regard, the reduction of the net public debt has been translated into greater Central Bank capability to sterilize its FOREX interventions. Also, an active policy to enhance the development of the local capital market, using the issuance of public bonds denominated in local currency as a benchmark, has created the incentive to de-dollarize bank lending.

On the other hand, difficulty in fine-tuning public investment around the business cycle in recent years has led to periods of a fiscal stance that does not counteract the real business cycle. This raises the question of the possibility of adopting a structural rule for the public sector balance, based on structural fundamentals.

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Fiscal policy, public debt management and government bond markets: the case for the Philippines

Diwa C Guinigundo¹

Abstract

The fiscal health of the Philippines has improved significantly over the past decade. Notwithstanding the dividends from reforms, challenges remain for the Philippines on the fiscal side. Policy coordination, primarily through the Development Budget Coordinating Committee, has helped to reduce the need for policy sterilisation. However, some concerns have been raised by the Bangko Sentral ng Pilipinas (BSP) about the reduced issuance of government securities as well as possible interest rate repression. Meanwhile, sufficient liquidity in the domestic economy has ensured that the crowding out of private offerings is not an immediate concern. Further reforms on public debt management are needed to promote efficiency, further develop the capital market and enhance overall financial stability.

Keywords: Fiscal policy, public debt management, Philippines

JEL classification: E630, H063

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1. Introduction

The fiscal health of the Philippines has improved significantly over the past decade. By 2005, there was widespread recognition that the fiscal position of the national government had become untenable. Subsequently, fiscal prudence was observed and new taxes were enacted. As a quick result, the fiscal position had almost returned to balance by 2007. This led to a reduction in the total outstanding government debt from a high of 74.4% of GDP in 2004 to a more manageable 52.4% of GDP by 2010. Along with improved fiscal balance numbers and relatively robust economic performance, the Philippines has earned credit rating upgrades and expects to do more in the near future. In recognition of the country's sustainable fiscal position, debt spreads have narrowed to levels better than those of higher-rated sovereign bond issuers.

Notwithstanding the dividends from reforms, challenges remain for the Philippines on the fiscal side. Weak revenue generation, enactment of revenue-eroding measures by the Philippine Congress and recent underspending have generated concerns for the fiscal authorities. While revenue shortfalls have been manageable, they may contribute to rising deficits in the future. Should the fiscal stance become unsustainable, public expenditure may again be constrained with a corresponding negative effect on economic growth.

With the improvement in the scale of government debt, the debt service burden has also become less of a fiscal drag. From 85% of total government revenue in 2004, the debt ratio fell to 57% by 2010. As a proportion of GDP, the debt service burden likewise dropped to 7.7 % in 2010 from a high of 13.6% in 2006. While the fiscal situation is currently under control, the prospect of either lost opportunities for improved economic performance or future instability requires further thought.

2. Potential for constraints on monetary policy from an unsustainable path for public debt

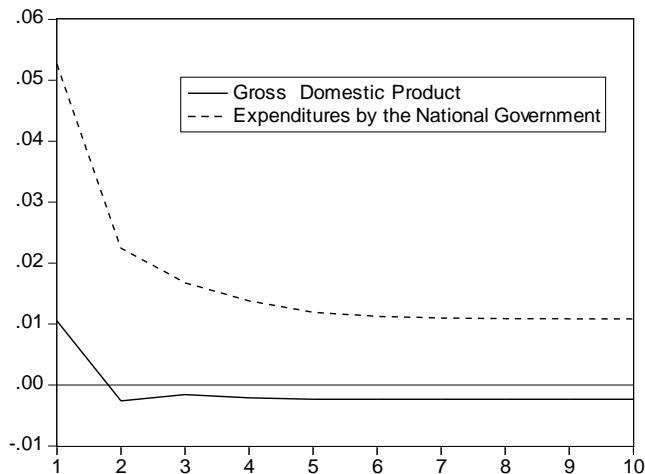
2.1 Measurement of the fiscal policy stance and public debt

As determined by the fiscal authorities, the fiscal policy stance is designed to deliver sound public financing including a commitment to medium-term objectives² combined with the flexibility to respond to changing economic conditions in the short term. Its measurement takes into consideration cyclical movements in the economy and contingent liabilities over the medium term. By cyclically adjusting the fiscal policy stance, important fiscal variables are scaled to GDP to provide some insight into cyclical patterns in the economy. Notwithstanding these measures, impulse responses generated from a vector error correction model (VECM)³ show that public spending has been cyclical and needs to adopt a more countercyclical stance to support the economy against countercyclical spending shocks (Figure 1).

² The medium-term goals of the fiscal programme pertain to fiscal consolidation with a view to meeting a targeted ratio of the fiscal deficit to GDP.

³ The VEC model examines the impact of policy measures adopted during the global financial crisis. Monetary policy was proxied by M3 in real terms while fiscal policy was represented by government consumption. The VEC model is taken from Redoblado (2011). Please see Annex A for details.

Figure 1
Response of national government expenditure to a GDP shock



Public debt measures used in formulating the fiscal stance cover the Local Government Units (LGU), the 14 monitored Government Owned and/or Controlled Corporations (GOCCs), two Government Financial Institutions (GFIs), and three Social Security Institutions. Through the government's fiscal risk management programme, contingent liabilities relating to pensions and health care spending are included in the medium-term fiscal programme. These items are periodically monitored but do not form part of the fiscal budget until assumed by the government. The government's gross debt is measured by netting out deposits placed with the central bank. However, in the presentation of the consolidated public sector debt, the intra-sector debt holdings are netted out. With respect to the measurement of public sector assets when formulating the fiscal stance, these assets (eg central bank assets, state pension funds) are not seen as an offset to gross debt. Otherwise, the ratio of debt to assets would effectively be lower. The fiscal authorities, through the Development Budget Coordinating Committee (DBCC), set fiscal targets such as the key tax and spending priorities while avoiding an unsustainable rise in the burden of public debt.

2.2 Interaction between monetary and fiscal policy

Results from the same model suggest that the BSP and the national government have coordinated their policy actions so that policy sterilisation has been avoided. Both impulse response analysis and variance decomposition show that shocks to domestic liquidity allow for higher spending by fiscal authorities. The reverse is also true as higher government spending increases liquidity in the financial system. Consequently, policy measures undertaken by monetary and fiscal authorities do not offset each other.⁴

Moreover, it was observed that GDP reacts more to monetary policy than fiscal policy. It also seems that policy moves by monetary authorities take effect faster than fiscal policy action.⁵ Also, while GDP is more responsive to innovations in monetary policy than to fiscal policy shocks, monetary policy tends to become countercyclical after roughly five quarters. This may be construed as heading off the inflationary effects of output growth as the slack in the economy is taken up by more economic activity.

⁴ This may of course be subject to some threshold which could be the basis for future research.

⁵ Variance decompositions indicate that monetary policy shocks account for the bulk of the response of GDP.

While benign interaction between monetary and fiscal policy has been observed during the global financial crisis and its aftermath, some concerns have been raised by the BSP on the national government's reduced issuance of government securities, as well as on the topic of possible interest rate repression.

The recent underspending in 2011 has left the national government with sufficient funds for its operations. Despite efforts to ramp up spending in the latter part of the year, the fiscal deficit incurred by the national government has only amounted to 65.9% of the programmed amount for the fiscal year (Table 1).

Table 1
National government fiscal performance

In billions of pesos

	December			January–December				
	2010	2011	Growth (%)	2010	2011	Growth (%)	Q1–Q4 2011 Program	% to Q1–Q4 2011 Program
Surplus/(Deficit)	–44.6	–101.5	127.4	–314.5	–197.8	–37.1	–300.0	65.9
Revenues	103.2	110.2	6.8	1,207.9	1,359.9	12.6	1,411.3	96.4
Expenditures	147.8	211.7	43.2	1,522.4	1,557.7	2.3	1,711.3	91.0

Source: Bureau of the Treasury.

Combined with the high level of liquidity in the financial system, this has led to a pattern of rejected bids in regular auctions of Treasury bills and Treasury bonds during the year. As a result, the amount awarded has, at times, been less than the offer size. In the primary auctions for Treasury bills, awards were below programmed offers on 13 out of 24 auction dates.⁶ The Bureau of the Treasury (BTr) has cited the government's comfortable cash position and that the bids were deemed high as the reason for the rejections.

The BSP has expressed its concerns regarding the pattern of bid rejections. For one, the cash management concerns of the national government have to be weighed against its market-making role in the government securities market. Also, a steady and predictable supply of government securities in primary markets is critical for the proper functioning of credit markets. More importantly, the pattern of bid rejections leads to a higher differential between the benchmark Treasury bill rates and the policy interest rates. It should be noted that Treasury bill rates are used for pricing loans. Possible interest rate repression serves to confuse signals on the price of funding for borrowers. Consequently, an impediment to the efficient transmission of monetary policy has been artificially created.

⁶ In 2010, full awards were not made in 10 of 24 auction dates for Treasury bills.

3. Domestic currency public debt issues in local markets

3.1 Shift from international to domestic financial markets for public debt

Currently, there is sufficient liquidity in the domestic economy to obviate any concerns about the crowding out of private offerings. The BSP has encouraged the national government to access domestic financial markets and take advantage of this liquidity. It has even encouraged the national government to access its foreign exchange needs through domestic borrowing. This can be done in two ways. First, the national government can issue foreign currency-denominated debt to residents because foreign exchange liquidity in the Philippine financial system is also high. A second option is to issue domestic currency debt and then exchange the proceeds with the BSP to meet the government's foreign currency needs.

3.2 Implications for capital market development

Greater domestic borrowing would also promote the domestic capital markets. More domestic issuance would create incentives for the development of market infrastructure. It would also encourage more private firms to issue debt securities in domestic financial markets. Furthermore, as the government is often one of the few safe issuers of long-term debt, it would provide benchmarks that could then pave the way for private issuance of longer-maturity debt securities. This could be a boon for financing long-gestation (eg infrastructure) projects and could encourage greater private participation in infrastructure development.

From the point of view of a central bank, additional resident-sourced sovereign debt would also reduce the incentive of the government to inflate away its debt. With respect to external debt management, domestic issuance would also reduce the currency risks faced by the national government. Also, greater domestic issuance (especially in the domestic currency) would also reduce financial stability concerns.

3.3 Lengthening maturity of domestic government bonds

Higher liquidity in domestic markets also provides the opportunity for stretching the maturity of sovereign debt. The lengthening maturity of public debt would also reduce default risks for borrowers since there would be less exposure to rollover risks or to liquidity risk. As a market signal, issuance of debt with a longer maturity would signal relatively greater fiscal credibility as demand for such debt paper would not be viable without fiscal credibility. Similarly, it would also signal monetary credibility on the part of the central bank. However, the national government should also ensure that its cash flows will meet future liabilities and it must avoid bunching up on maturities. A bunching up on maturities poses risks for rolling over the debt and may even lead to greater volatility in market interest rates.

3.4 Financial stability concerns

(a) Capital inflows and potential for faster transmission of external shocks

As most public debt is held by residents, the country's susceptibility to the effects of a sudden stop is reduced. Also, flows to domestic financial markets have been subdued compared with those into other regional financial markets. Several factors such as the relatively smaller size of domestic markets as compared to regional peers, limited offerings, political uncertainty and risk aversion may explain this effect. As domestic financial markets deepen, exposure to exogenous shocks may increase. However, since the distribution of asset holdings in domestic financial markets has heavily favoured residents, the risk profile is different than if the bulk were held by non-residents, who are more exposed to external shocks.

(b) Reduced issuances as NG fiscal condition improved

Significantly, the dearth of liquidity in short-term Treasury bills has negative implications for capital market development and long-term financial and macroeconomic stability. As the supply of benchmark Treasury bills in primary markets dries up, interest rates fail to reflect actual credit market conditions. Consequently, Treasury bills lose their usefulness as the benchmark for market interest rates and as the basis for loan pricing. Furthermore, the bid rejections and less-than-programmed award size make for higher volumes in succeeding auctions, thereby feeding higher interest rate volatility. Lastly, as the Treasury bill rates are repressed, investors seek higher returns in property and equities markets. These may feed into asset bubbles as the lower rates contribute to mispricing.

4. BSP and public debt management

4.1 BSP's issuance of its own securities

Under its charter, the BSP is not permitted to issue its own debt securities.⁷ Coordination with the Department of Finance (DoF) on issuances of debt securities for the BSP has been considered. However, concerns about such an arrangement have arisen from the implications for the central bank's independence, coordination difficulties and the potential impact on the government's credit ratings.

The national government's issuance of debt securities on the BSP's behalf may undermine the central bank's independence. It should be noted that the government takes on a debt management perspective when it issues debt securities. The differing incentives arising from the separate objectives of fiscal and monetary policy could pose conflicts of interest for the Bureau of the Treasury, part of the Department of Finance, as the expected issuer. Consequently, coordination may be difficult even if detailed agreements are made between the monetary and fiscal authorities. Furthermore, as the national government operates in a more politicised environment, the BSP could be forced to defend its operational decisions to political forums. Such politicisation of the monetary policy implementation process represents an unnecessary distraction in the conduct of monetary policy and imposes transaction costs on the regular policy-setting process.

As capital inflows surge, the need for greater siphoning may ensue. This may require the national government to increase its stock of debt by more than its programmed size. Consequently, its willingness to continue issuing debt securities for the BSP may be diminished. Should it continue to do so, the increase in its debt stock as well as the corresponding negative effects on its debt ratios could trigger concerns on its credit ratings.

Based on the foregoing, it is deemed a better option for the BSP to pursue a proposed amendment to its charter that would again authorise it to issue its own debt securities.⁸ If granted, it would expand the scope of open market operations and enable better inflation management especially in times of excess liquidity.

⁷ Section 92 (Issue and Negotiation of Bangko Sentral Obligations) of Republic Act no 7653 states that "issuance of certificates of indebtedness shall be made only in cases of extraordinary movements in price levels".

⁸ The Charter of the old Central Bank of the Philippines (Republic Act no 265) granted it the authority to issue its own debt securities.

4.2 BSP's role in government debt management

Under Philippine law,⁹ all government borrowing, whether peso- or foreign currency-denominated, require the approval of the Monetary Board. BSP staff examine the effects of these borrowings on monetary aggregates, foreign exchange reserves, the balance of payments and the sustainability of external debt.¹⁰ The implications of these borrowings for monetary policy are also considered.

On a more direct basis, BSP representatives occupy two of the five seats in the auction committee of the Bureau of the Treasury. Their participation in the Auction Committee affords the BSP an inside view of primary markets for government securities and a unique vantage point from which to monitor credit market trends and lending.

Beyond the opportunities afforded by its participation in the Auction Committee and by its role in the approval of government borrowing, the BSP has not engaged in quasi-fiscal operations and unconventional monetary policies as practised by a number of central banks in advanced economies. Consequently, its balance sheet has not been exposed to shocks arising from such practices.

However, the management of surges in capital flows has had a significant effect on its balance sheet. As it accumulates foreign exchange reserves to manage the impact of capital inflows on domestic liquidity and inflation as well as on the exchange rate, the BSP is exposed to foreign exchange risk. Valuation losses from peso appreciation in the face of strong FX inflows have negative implications for the BSP's balance sheet and particularly for its capitalisation.

4.3 Governance arrangements for the coordination of monetary policy and public debt management

Within the BSP, the national government is able to coordinate monetary policy and public debt management through a seat on the Monetary Board. The government representative on the Monetary Board is currently the Secretary of the Department of Finance (DoF). In instances that the DoF Secretary is unable to attend, the usual substitute has been the Treasurer of the Philippines (ie the head of the agency that issues sovereign debt).

NEDA Board and related inter-agency committees¹¹

Beyond the confines of the BSP, its participation in macroeconomic coordination is through the Board of the National Economic and Development Authority NEDA Board).¹² (Annex A lists the composition of the NEDA Board.) To assist the NEDA Board in the performance of its functions and duties, seven inter-agency cabinet level committees were formed. The BSP is also involved in two of these seven committees. These are the Development Budget Coordinating Committee (DBCC); and the Investment Coordination Committee (ICC).

⁹ Section 123 (Financial Advice on Official Credit Operations) of Republic Act no 7653

¹⁰ A ceiling on foreign currency-denominated debt is imposed to ensure sustainability of the external debt.

¹¹ For further details, please see the website of the National Economic and Development Authority (www.neda.gov.ph).

¹² Macroeconomic planning and policy coordination is reposed in the National Economic and Development Authority (NEDA). Its mandate is to formulate development plans and ensure their implementation in the course of policymaking and policy coordination with other government agencies.

The Development Budget Coordinating Committee (DBCC)

The DBCC is composed of the Secretary, Department of Budget and Management as chairperson; the Secretary, Department of Finance as co-chairperson; with the Executive Secretary of the Cabinet and the Director General of NEDA as members. The DBCC is a policymaking body which approves the macroeconomic assumptions and economic policy directions for the preparation of the annual national government budget and for the requirements of the government's medium-term development plan. Specifically, the functions of the DBCC are the following:

1. Recommend for presidential approval the level of the annual government expenditure programme and the ceiling on government spending for social and economic development, national defence, general government and debt service;
2. Recommend to the president the proper allocation of expenditures for development activity between current operating expenditures and capital outlay; and
3. Recommend to the president the allocation for capital outlay under each development activity for the various capital or infrastructure projects.

The BSP participates in the DBCC as a resource institution¹³ providing background information on monetary and financial policy as well as perspectives on economic developments.

The DBCC is the government body through which inflation targets are proposed by the BSP and approved by the economic managers who comprise the Committee. In essence, while the BSP enjoys operational and instrument independence, it is not fully independent in that its inflation targets must be agreed by the DBCC. The central bank participates in the DBCC both at the technical staff level and at the level of senior officials. At the technical staff level, BSP staff provide input on the formulation of macroeconomic assumptions relating to inflation rates, exchange rates, interest rates, oil prices and banking trends. Subject to these constraints, the fiscal budget is computed. The output from the technical level is then forwarded to senior officials who define policy priorities, finalise assumptions and make recommendations to the President. Once finalised, the draft budget is presented to Congress for enactment into the annual General Appropriations Act. The BSP attends budget deliberations in Congress to brief the legislators on economic and financial developments as well as explain the macroeconomic assumptions in its sphere of influence (eg interest rate assumptions).

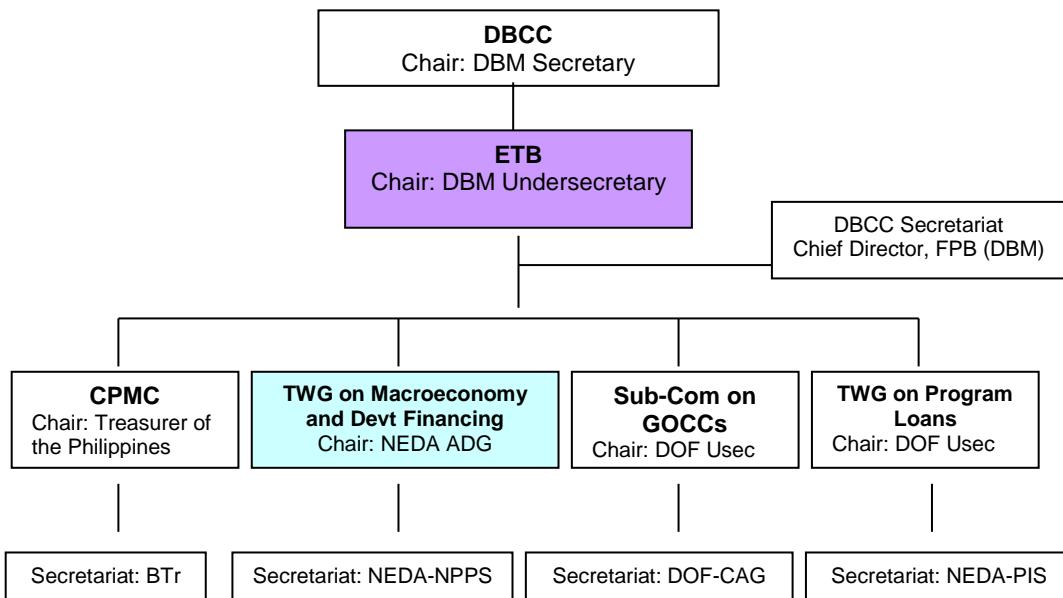
Under the DBCC is the Executive Technical Board (DBCC-ETB) which is responsible for implementing the policy directions firmed up at the cabinet level. The DBCC-ETB is the screening and review body for policies, measures and targets that are recommended to the DBCC. It consists of undersecretaries and directors of the DBCC member agencies, which include: the Department of Budget and Management (DBM), the Department of Finance (DOF), the National Economic and Development Authority (NEDA) and the Office of the President (OP). The DBCC-ETB is chaired by the DBM Undersecretary and receives technical support from DBM that serves as the ETB Secretariat. The DBCC and the DBCC-ETB work through the DBCC Secretariat, which is chaired by the Director of the Fiscal Planning Bureau of the Department of Budget and Management. Similar to the DBCC, the BSP participates as a resource agency providing input to its processes. During an October 2008 meeting of the ETB, the ETB Chairperson clarified the following rights and obligations of the BSP as a resource institution in the DBCC and in its committees:

¹³ Per Executive Order no 232 dated 14 May 1970, the central bank was an original member of the Presidential Development Budget Committee (PDBC) which was renamed DBCC in 1972. The Administrative Code of 1987 ordered the replacement of the central bank by the Executive Secretary in the DBCC membership.

- The BSP's presence in the meetings is counted to establish a quorum;
- The BSP is not a voting member (ie "it does not sign resolutions").

Furthermore, core functions are delegated to Technical Working Groups (TWGs) or Sub-committees. The first of these is the Cash Programming and Monitoring Committee (CPMC). This is tasked with closely monitoring the fiscal performance of the national government and formulating fiscal policies for recommendation to the DBCC. It is chaired by the Treasurer of the Philippines with the Bureau of the Treasury (BTr) as its secretariat. Then, there is the Technical Working Group on Macroeconomy and Development Financing. Its job is to develop macroeconomic models and other statistical tools for planning, forecasting and policy analysis as well as to monitor macroeconomic performance and make economic reports. It is run by an Assistant Director General from NEDA, and NEDA's National Policy and Planning Staff (NPPS) serves as its secretariat. There is also the Sub-committee on Government-Owned and Controlled Corporations (GOCCs). Its task is to monitor the cash flow of the government corporate sector and formulate policies affecting government-owned and controlled corporations for recommendation to the DBCC. It is headed by an undersecretary of the Department of Finance and has the DoF's Corporate Affairs Group as its secretariat. Lastly, the Technical Working Group on Program Loans participates in policy formulation regarding external resource mobilisation. It is headed by an undersecretary from the Department of Finance and has NEDA's Public Investment Staff as its secretariat. The organisational chart of the DBCC is given below (Figure 2).

Figure 2
Development Budget Coordination Committee Organisation



The Investment Coordination Committee (ICC)

The ICC is composed of the Secretary, Department of Finance as chairperson with the Director General of NEDA as co-chairperson. Its members include the Executive Secretary of the Cabinet, the Secretary, Department of Agriculture, the Secretary, Department of Trade

and Industry, the Secretary, Department of Budget and Management and the Governor of the BSP.¹⁴ Its functions under Philippine law are:

1. Evaluate the fiscal, monetary and balance of payments implications of major national projects and recommend to the president the timetable of implementation of these projects on a regular basis; and
2. Recommend to the president a domestic and foreign borrowing programme updated each year, and subsequently, submit to the president a status of the fiscal, monetary and balance of payments implications of major national projects

Aside from formal arrangements for policy coordination, the BSP Governor and the Secretary, Department of Finance along with key officials from their respective agencies hold informal meetings every month. These are usually scheduled every last Friday or Tuesday of a given month. The meetings provide an additional venue for discussing fiscal performance and its implications for fiscal and monetary policy coordination.

5. Conclusion

The fiscal health of the Philippines has improved significantly over the past decade. Notwithstanding the dividends from reforms, challenges remain for the Philippines on the fiscal side.

Econometric results suggest that the BSP and the national government have coordinated their policy actions so that policy sterilisation has been avoided. While interaction between monetary and fiscal policy has been productive during the financial crisis and its aftermath, some concerns have been raised by the BSP on the national government's reduced issuance of government securities as well as possible interest rate repression.

With respect to the shift from international to domestic financial markets for public debt, it should be noted that there is sufficient liquidity in the domestic economy to obviate concerns about the crowding out of private offerings. The central bank is even urging the national government to source more of its financing from domestic markets.

The higher liquidity in domestic markets also provides the opportunity for lengthening the maturity of sovereign debt. However, the national government should also ensure that its cash flows will meet future liabilities as they come and it must avoid bunching up on maturities.

As this issue impinges on financial stability and especially on the attractiveness of public debt to foreign investors, it should be noted that most public debt has historically been held by residents. By the same token, the country's susceptibility to the effects of a sudden and sharp outflow of foreign currency has been limited. However, the dearth of liquidity for short-term Treasury bills has negative implications for capital market development and long-term financial and macroeconomic stability.

The BSP's role in public debt management has been to examine the effect of public debt issuance on the key macroeconomic variables under its purview. Under Philippine law, all government borrowing, whether peso- or foreign currency-denominated, requires the approval of the Monetary Board. On a more direct basis, representatives of the BSP occupy two of the five seats in the Bureau of the Treasury's auction committee.

¹⁴ The Governor is represented in the ICC by a senior member of the Monetary Board.

Ironically, the BSP is unable to directly participate in domestic capital markets, being prohibited by its charter from issuing its own debt securities. The issuance of debt securities for the BSP by means of a collaboration with the Department of Finance has been considered. However, concerns about such an arrangement have arisen from the implications for the central bank's independence, coordination difficulties and the potential effect on the government's credit ratings.

Within the BSP, the national government coordinates monetary policy and public debt management through a seat on the Monetary Board. Beyond the confines of the BSP, the government participates in macroeconomic coordination through the Board of the National Economic and Development Authority (NEDA Board).

The main body through which policy coordination has been conducted has been the Development Budget Coordinating Committee. Aside from formal arrangements for policy coordination, the BSP Governor and the Secretary for the Department of Finance, along with key officials from their respective agencies, hold informal meetings every month. The meetings provide an additional venue for discussing fiscal performance and its implications for fiscal and monetary policy coordination.

Annex A: Policy responses to the global financial crisis: the Philippine Case

In 2010, the Southeast Asian Central Bank Training and Research Centre (SEACEN) initiated an international research project on the “Relative effectiveness of policy choices during the global financial crisis”. Individual country studies were conducted complete with econometric modelling based on a vector error correction specification.

The Philippine case¹⁵ used an empirical model of the form

$$Y_t = f(MP_t, FP_t, Z_t)$$

where Y_t is a measure of economic activity and Z_t refers to other relevant variables while MP_t and FP_t correspond to monetary and fiscal policy responses, respectively. For simplicity but without loss of generality, the logarithmic form¹⁶ of real GDP (LGDP) was used as Y_t ; the log of M3 or domestic liquidity (LM3) represented MP_t , the log of government purchases of goods and services (LGOVCONS) served as FP_t and an indicator of financial markets volatility, SQR_RPHISIX¹⁷ as Z_t . With the exception of SQR_RPHISIX, all the data have been seasonally adjusted. In the error correction specification used, two dummy variables were created to represent the Asian financial crisis (AFC) and the global financial crisis (GFC).¹⁸ For the AFC dummy variable, its value was equal to one from the third quarter of 1998 to the fourth quarter of 1999 and zero, otherwise. For the GFC dummy variable, its value was equal to one from the third quarter of 2007 to the third quarter of 2009 and zero, otherwise.

The model used data from the first quarter of 1995 to the second quarter of 2010. It was recognised that, despite being a relatively robust and flexible model specification, the VECM did not differentiate completely between the pre-crisis and post-crisis periods.

The key findings from econometric estimation are as follows:

1. There appears to be a weakening of long-run economic relationships¹⁹ arising from the recent global financial crisis.

Time and again, tests for co-integration were negated by findings of co-integration breakdown at the endpoints. Explicit inclusion of financial turbulence finally generated a viable co-integration framework for analysis.

¹⁵ See Redoblado (2011).

¹⁶ The use of logarithmic form was necessary to account for the non-linearity arising from the crisis episodes in the sample. Also, vector autoregressive (VAR) models and vector error correction models (VECM) are linear approaches that do not necessarily mitigate non-linearities in the data.

¹⁷ The indicator SQR_RPHISIX was computed as the squared residual from an autoregressive model of the Philippine Composite stock market index, PHISIX. SQR_RPHISIX was included with a view to incorporating uncertainty in financial markets and providing information on general financial turbulence. Its inclusion was deemed a necessity in rendering long-run economic relationships stable.

¹⁸ The dummy variables accounted for the duration of the crisis episodes. For a discussion of the methodology, see Harding and Pagan (2002).

¹⁹ It was found that the link between output, fiscal and monetary policy variables had weakened since the second quarter of 2007. Varying permutations of these variables were tested. These permutations varied in terms of nominal versus real terms, seasonally adjusted versus those with seasonal data, ratios to GDP, differing indicators for monetary policy and fiscal policy. Attempts to include other variables such as remittances were also made.

2. The economy was more responsive to monetary policy action than to fiscal stimulus. Significantly, monetary policy has a stronger and quicker stimulus effect than fiscal policy. This is not surprising given that fiscal authorities have to tackle coordination and planning difficulties in crafting and implementing fiscal policies.
3. There is econometric evidence that the BSP initiates monetary stimuli insofar as it does not conflict with the price stability objective.
There is some evidence to show that, while GDP is more responsive to innovations in monetary policy than to fiscal policy shocks, monetary policy becomes countercyclical after roughly five quarters. This may be interpreted as heading off the inflationary effects of output growth as the slack in the economy is reduced or even eliminated.
4. Macroeconomic coordination has supported the policy response.
The impulse response analysis shows that the BSP and the national government coordinated their policy actions so that policy sterilisation did not occur.

Annex B: **Composition of the NEDA Board**

This mandate is exercised through the NEDA Board which is composed of the following:

1. President of the Republic of the Philippines (as chairperson)
2. Secretary of Socio-economic Planning and NEDA Director General (as vice chairperson)
3. The Executive Secretary of the Cabinet
4. Secretary, Department of Finance
5. Secretary, Department of Trade and Industry
6. Secretary, Department of Agriculture
7. Secretary, Department of Environment and Natural Resources
8. Secretary, Department of Public Works and Highways
9. Secretary, Department of Budget and Management
10. Secretary, Department of Labor and Employment
11. Secretary, Department of the Interior and Local Government

Over the years, the following members of the cabinet were added:

1. Secretary, Department of Health
2. Secretary, Department of Agrarian Reform
3. Secretary, Department of Foreign Affairs
4. Secretary, Department of Science and Technology
5. Secretary, Department of Transportation and Communications
6. Secretary, Department of Energy
7. Deputy Governor, The Bangko Sentral ng Pilipinas²⁰

²⁰ This conforms to Section 124 (Representation on the National Economic and Development Authority) of the BSP Charter.

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A framework for fiscal vulnerability assessment and its application to Poland

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Abstract

The sharp worsening of fiscal positions in the aftermath of the global economic crisis has brought the issues of fiscal sustainability to the fore of economic policy debate. This has focused the attention of policymakers on the broader implications of unsustainable fiscal positions, including the consequences for monetary policy and financial stability. As a result, there is now an increased need for central banks to closely monitor risks to fiscal vulnerability. This note proposes a framework for such an assessment, consisting of five elements: (i) the level of public debt; (ii) the medium-term dynamics of public debt; (iii) long-term sustainability of public debt; (iv) public debt management and the liquidity position of the government; and (v) fiscal rules and institutions. The note also presents a brief assessment of Poland's fiscal vulnerability using the framework described above, and finds that Poland's vulnerability to fiscal risks is quite limited, although there is still a need to correct the fiscal imbalances that could otherwise lead to a build-up of public debt.

Keywords: Public debt, fiscal vulnerability, fiscal sustainability

JEL classification: H63

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Introduction

The global economic crisis has led to a sharp worsening of government finances all over the world. Discretionary fiscal stimulus measures, automatic fiscal stabilisers, reversal of extraordinary revenue windfalls associated with asset price bubbles and the cost of government support to ailing financial institutions have all contributed to this worsening. As a result, public debt in advanced economies has risen from 73% of GDP in 2007 to 104% of GDP in 2011 and is projected to grow further.² Fiscal problems have manifested themselves with particular starkness in the form of a sovereign debt crisis in the euro area, where at least one member state is now widely considered to be insolvent.

These worrisome developments have brought the issues of fiscal sustainability to the fore of the economic policy debate. This has focused the attention of policymakers on the broader implications of unsustainable fiscal positions, including the consequences for monetary policy and financial stability. Blommestein and Turner (2011) argue that the current fiscal environment has set the stage for a new period of fiscal dominance, undermining the traditional division of labour between monetary, fiscal and public debt management authorities. Central bank interventions in sovereign bond markets, in some cases on a considerable scale, are one sign of this. Meanwhile, financial stability is being undermined by the reassessment of risk associated with sovereign bonds held by the financial sector, previously considered risk-free. As noted by Das et al (2011), the relationship between public debt vulnerability and financial stability tends to be procyclical. During a downswing, especially one triggered by financial sector dislocation, maintenance of the asset quality of the government's liabilities is much more critical in containing adverse developments in the real and financial sector. In such a situation, any threat to government solvency will have a negative impact on financial institutions' balance sheets, incomes and capital reserves. This may in turn result in the need for government support to bank resolution and restructuring, ultimately leading to a vicious circle of deteriorating government and financial sector balance sheets.

Another important recent development to be noted in this context is the increased aversion of financial markets to sovereign risk. Schuknecht et al (2010) show that the strength of the response of euro area government yield spreads to a higher public debt ratio increased eightfold in the period following the collapse of Lehman Brothers in September 2008. This increases the risk of a negative self-reinforcing feedback between fiscal sustainability risks and the financial market perception thereof. As has been evident in the euro area sovereign debt crisis, notably in the case of Italy, financial market concerns can aggravate fiscal sustainability problems, as an increase in government bond yields translates into a higher interest burden, thus increasing the size of the adjustment required to stabilise the debt ratio.

In this light, there is now a heightened need for close monitoring of risks to fiscal vulnerability, a role that should be performed by central banks. This note presents a framework for such an assessment and briefly describes its application to Poland.

1. Level of public debt

The headline ratio of public debt to GDP is the most commonly used measure of government solvency. The government budget constraint states that the current level of public debt must be repaid with future primary surpluses. Therefore, the higher the debt ratio, the more difficult it will be for government to generate sufficient surpluses. A higher debt ratio also implies a

² Source: IMF WEO database.

history of fiscal indiscipline, complicating the task of turning the situation around. However, the debt ratio is by no means a comprehensive measure of government solvency. There is also no clear consensus in the literature on what level of public debt may be considered safe.

Some guidance on critical levels of public debt is provided by literature examining public debt developments in countries undergoing financial crises, including sovereign defaults. However, as these events have been largely confined to emerging market countries, at least in the period since the Second World War, empirical findings are also relevant for this group of countries. Reinhart et al (2003) put forward the concept of "debt intolerance" and grouped a sample of 53 developing and developed³ countries according to their measure of debt intolerance. According to these authors, the level of debt intolerance may be explained by the average level of long-term foreign indebtedness and an insolvency risk index. In the case of countries with the highest debt intolerance, a foreign debt level of just 15% of GDP may already indicate a risk of insolvency. Daniel et al (2004) have analysed insolvency episodes in emerging countries over the past 30 years and found that 55% of them occurred when public debt was below 60% of GDP, while 35% of the cases occurred in countries with a debt ratio below 40% of GDP.

Daniel et al point out that the risk of insolvency is greater in emerging market countries due to, among other factors, a lower and more variable ratio of government revenue to GDP and a lower quality of institutions. Therefore, results obtained using a sample of emerging market countries may not be directly translated into conclusions regarding advanced economies.

While there is no sample of defaults in advanced economies, there are a number of quite recent studies that seek to determine the safe level of public debt from the viewpoint of its effect on economic growth. The general finding of these studies is that the negative impact of public debt on growth is non-linear and becomes significantly stronger once debt exceeds a critical threshold of around 90–100% of GDP. Checherita-Westphal and Rother (2010) have analysed this impact on a sample of 12 euro area countries and found that, in some of these cases, the critical threshold could be as low as 70% of GDP. Furthermore, the negative impact of debt on GDP growth appears earlier when there is higher volatility of inflation, interest rates and government spending. Kumar and Woo (2010) obtained similar results using a panel of advanced and emerging economies. Their results indicate, that during the period analysed (1970–2007), an average increase in the debt ratio by 10 percentage points of GDP slowed economic growth by 0.2 percentage points annually, although the effect was slightly weaker (0.15) for advanced economies. After accounting for a potential non-linear relationship between these variables, the authors found that the negative impact of rising public debt on economic growth becomes statistically significant only once debt exceeds 90% of GDP. Reinhart and Rogoff (2010) also observed a similar relationship, in addition indicating that in the case of emerging market economies, the critical level of external debt (public and private) amounts to 60% of GDP.

2. Medium-term dynamics of public debt

The change in the debt-to-GDP ratio may be decomposed into the primary balance, interest rate on government debt and the growth rate of the economy using the well-known equation.

$$d_t - d_{t-1} = \frac{r - g}{1 + g} - p_t$$

where:

³ The sample used in the study dates back 200 years in some cases, thereby covering sovereign default episodes in countries currently classified as developed.

d – debt-to-GDP ratio

r – interest rate

g – GDP growth

p – primary balance ratio to GDP

In order to obtain a true medium-term picture of public debt trends, one may apply cyclically adjusted figures to the equation – ie the cyclically adjusted primary balance and a potential, rather than actual, growth rate. However, at present, uncertainty regarding the cyclical position of the economy is particularly high.

Medium-term prospects for the development of the debt-to-GDP ratio crucially depend on a country's primary balance, the growth prospects of the economy and the risk premium attributed to the sovereign debt of the country in question. At the current juncture, the majority of advanced economies (20 out of 27 for which the IMF WEO provides data) are running a primary deficit, while potential growth estimates for this group of countries are historically low. This implies that public debt ratios around the world are not only high, but also face unfavourable medium-term trends.

3. Long-term sustainability of public debt

As noted by Baldacci et al (2011), fiscal solvency also depends on the extent to which long-term demographic and economic trends will put pressure on the budget. The majority of advanced economies are projected to face substantial fiscal pressures in the coming decades due to population ageing. IMF (2009) calculations show that for advanced countries, the net present value of the cost of ageing is about nine times higher than the estimated fiscal burden of the global economic crisis. A fiscal vulnerability analysis should also take these risks into account.

4. Public debt management and liquidity position of the government

An assessment of fiscal vulnerability also needs to incorporate the structure of the government's balance sheet. As noted by Das et al (2010), the structure of public debt may become a channel or source of vulnerability to the real economy and the financial system. Therefore, this structure should be designed in such a way as to mitigate risk both for the government and for markets. Das et al point to two main sources of vulnerability – foreign currency-denominated liabilities and short-term liabilities. The difficulty in shaping the optimal debt structure lies in the trade-off between the cost of financing public debt and the risks of a given structure. In the past, emerging market economies often relied on foreign-currency borrowing because it was easier to obtain, particularly in the context of less developed local financial markets. Similarly, the cost of short-term borrowing, particularly in less developed financial markets, is also lower thanks to the lower risk premia. However, short maturities entail high rollover and refinancing risk, making the government prone to confidence crises.

The risks associated with large shares of foreign currency and short-term borrowing are illustrated in the financial crisis literature. Short-term debt, usually measured as a total of short-term public and private debt, plays a particularly important role. Hemming et al (2003) show that the share of short-term debt is usually considerably higher in periods directly preceding financial crises. As shown by Furman and Stiglitz (1998), the example of Asian crises indicates that excessive reliance on short-term funding leads to the risk of a self-fulfilling sudden-stop crisis.

As shown by Attinasi et al (2011) using a sample of euro area countries, the structure of public debt and other aspects of sovereign debt management have an impact on sovereign

yields in advanced countries too. Government bond spreads relative to German bunds are shown to be higher with a lower residual maturity of public debt and lower with a higher share of long-term outstanding debt. Spreads are also shown to be higher for countries with a lower liquidity in their sovereign debt markets.

5. Fiscal rules and institutions

Governments worldwide face a dilemma: they need to consolidate their fiscal position while safeguarding very fragile economic growth. A solution often suggested in the economic debate is for governments to make a firm commitment to fiscal consolidation, but to extend its implementation over a number of years, so as not to harm growth in the short run. The problem with this proposal is the credibility of the commitment to consolidate public finances. Once financial markets sense a threat of insolvency, no mere declaration about future adjustment measures is likely to dispel these fears, due to the obvious political risks surrounding such a declaration. A possible way to resolve this problem is through the introduction of fiscal rules and institutions that might help to convince financial markets and other economic agents that sound fiscal policies will be adhered to.

There is an extensive body of literature devoted to studying the impact of fiscal rules and institutions, based on the experience of US states, as well as European governments. The literature (see European Commission (2011) for a brief overview) generally finds that stronger fiscal frameworks are correlated with better fiscal outcomes, although identification of the channels through which this effect takes place has not been straightforward.

Since better fiscal frameworks have a positive impact on fiscal outcomes, while the latter are known to be a key determinant of government bond yields, the implication would be that strong fiscal rules and institutions should improve a government's fiscal prospects as well as the financial markets' perception thereof. This relationship has been shown empirically to hold in the US states, and, in more recent literature, in the EU countries. In particular, Iara and Wolff (2010) show that strong fiscal rules are of great importance in containing sovereign bond spreads, particularly in times of elevated market uncertainty. Under extreme circumstances, stronger fiscal rules can reduce sovereign bond spreads between euro area member states and Germany by as much as 80 to 100 basis points. The legal basis of the fiscal rules in force is found to be of particular importance. The authors argue that national fiscal rules have a beneficial effect by reducing the uncertainty of market expectations of fiscal variables, which is particularly important in times of higher risk aversion.

Feld et al (2011) show similar findings based on a study using data on Swiss cantons. The presence and the strength of fiscal rules in the cantons are deemed to contribute to lower risk premia. These effects are quantitatively quite significant, as the introduction of a strong fiscal rule may contribute to a decline in risk premia of more than 10 basis points.

In view of these findings regarding the impact of fiscal frameworks both on fiscal outcomes and on the financial markets' perception of sovereign risks, such frameworks may be considered another element of the assessment of fiscal vulnerability. Strong and credible rules clearly appear to be an important element in limiting fiscal risks.

Poland: an assessment of fiscal vulnerability

Fiscal deficits increased sizeably in Poland during the economic crisis. This was related to a number of factors, but discretionary anti-crisis stimulus measures or government support for the financial sector were not among them. Fiscal policy had been loosened, but this was related to cuts in taxes and social contributions that had been put in place before the onset of the crisis, as well as a considerable increase in public investment, partly related to the co-financing of EU funds and largely taking place at the local government level. In addition, while Poland is widely known to be the only country in the EU to escape recession in 2009,

the economy did slow considerably and automatic stabilisers were allowed to come into effect. According to European Commission estimates, the output gap deteriorated by 2.9 percentage points of GDP in 2009, as compared with an average worsening of 5.2 points in the EU.

Despite the increase in the deficit to 7.1% of GDP in 2009 and to 7.8% in 2010, public debt increased only moderately, owing to continued economic growth and to privatisation receipts that helped to offset the government's high borrowing requirements. Debt in ESA95 terms rose from a low of 45% of GDP in 2007 to 56.7% of GDP in 2011 (European Commission estimate). This is a quite moderate level, even taking into account that Poland may not yet have fully graduated from the emerging market into the advanced economy club.

The general government primary deficit rose to around 5% of GDP in 2009–10, causing a sharp increase in the ratio of public debt to GDP. At the same time, the good performance of the economy meant that, even in those two years, nominal GDP growth (5.3%) was on average only slightly lower than the interest rate on public debt (5.7%). The outlook for public debt dynamics may be expected to improve considerably in the coming years, notably in connection with fiscal consolidation measures implemented in 2011–12. As a result of these measures, the primary deficit is expected to decline to well below 1% of GDP in 2012.⁴ Although even this proportion may not yet be considered a safe level, the government's declarations point to continued fiscal consolidation. Assuming these plans are fulfilled and that economic growth gradually recovers, the government is expecting the ESA95 debt-to-GDP ratio to decline steadily to around 50% of GDP in 2015.⁵

Chart 1

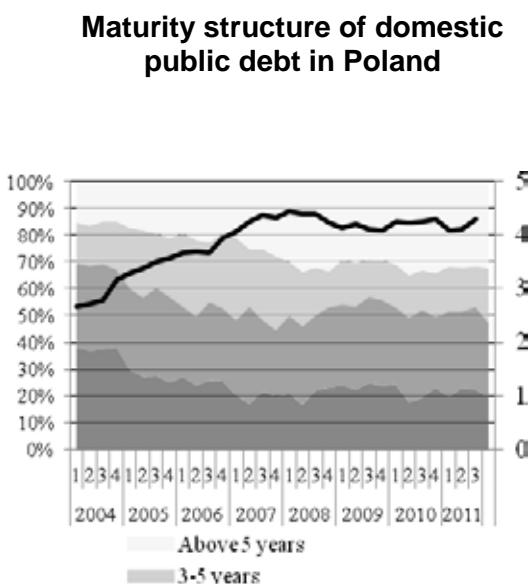


Chart 2



Source: Ministry of Finance.

* Public debt according to the domestic definition

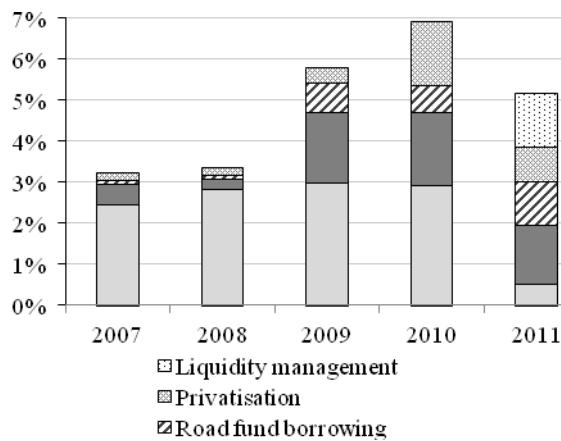
Source: Ministry of Finance.

⁴ According to the latest IMF forecast (December 2011), the general government deficit is expected to fall to 3 1/4% of GDP in 2012. Interest payments may be expected to reach close to 3% of GDP.

⁵ According to "The Public Finance Sector debt management strategy in the years 2012–15" accompanying the 2012 budget draft, submitted to Parliament in December 2011.

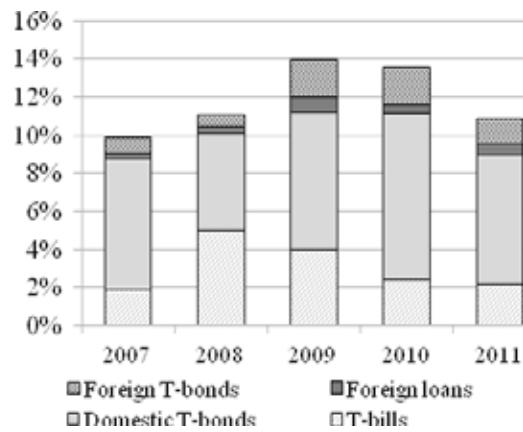
The financial crisis has not affected the debt management strategy and the structure of public debt to any large extent. As a result of the liquidity crisis in 2008, the debt managers offered more Treasury bills that year, as shown in Chart 4. However, this was a temporary development that did not materially impact the maturity structure of public debt – the average maturity declined slightly in 2009, but stayed at a level well above that seen in 2004–07 (Chart 1). The currency structure of debt issuance changed more visibly during 2009–10, as the share of bonds issued on international markets increased, driven partly by strong demand.⁶ The overall increase in net borrowing requirements in 2009–10 has been financed largely by higher foreign borrowing, the transfer of road construction financing to the National Road Fund⁷ and, particularly in 2010, increased privatisation receipts. Meanwhile, net domestic issuance by the Finance Ministry debt managers has remained broadly stable at a level of around 3% of GDP (Chart 3).

Chart 3
Financing of net borrowing requirements of the central government
(% of GDP)



Source: Ministry of Finance.

Chart 4
Financing of gross borrowing requirements of the central government
(% of GDP)



Source: Ministry of Finance.

The increased share of foreign financing does imply an increase in exchange rate risk, although this shift was quite moderate. Nonetheless, the elevated exchange rate volatility during 2011 has been perceived by the markets as a factor that could lead to a large increase in the debt-to-GDP ratio and even cause it to reach the prudential threshold of 55% of GDP. In the end, these fears have proved to be unfounded, after NBP interventions have helped to reduce the exchange rate volatility.

The higher share of foreign financing at the same time implies a lengthening of the average maturity, as foreign debt is generally issued for longer periods. The overall (domestic and foreign) average maturity of central government debt reached an all-time high of 5.45 years at the end of the third quarter of 2011.

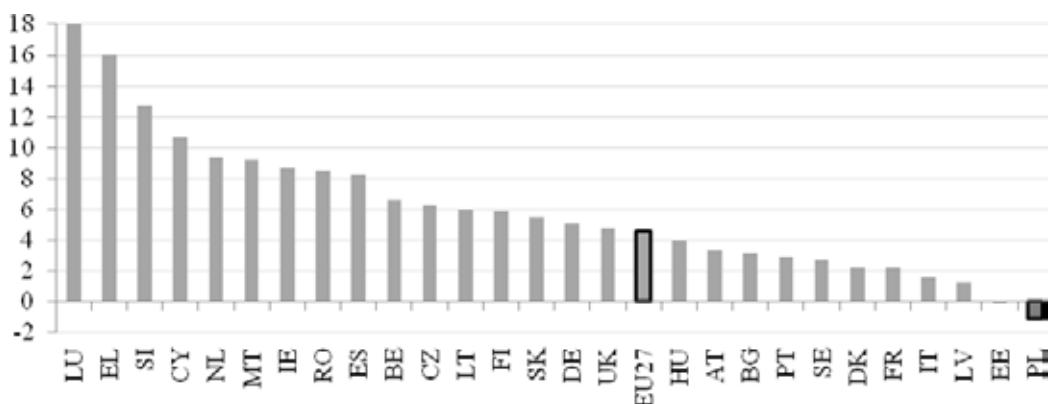
⁶ For example, in mid-July 2009, Poland issued benchmark bonds worth \$2 billion in the US market but, in view of exceptionally strong demand, the issue was reopened two weeks later and another \$1.5 billion was issued.

⁷ The Fund obtained funding independently – from loans from international financial institutions (eg the EIB) and through issuance of “road bonds” conducted by the state bank BGK.

Government financing is also exposed to rollover risk. In Poland's case, the scale of this risk is, *inter alia*, related to the share of non-resident investors on the domestic Treasury bond market. This share is currently at one of the highest levels in the market's history, having risen to almost 32% in the autumn of 2011, up from a low of 15% in early 2009. If non-resident investors were to suddenly withdraw, this could potentially imply liquidity problems for public debt management. As a precautionary measure, the government maintains sizeable cash reserves that averaged around 2.6% of GDP in 2011. For emergency use, the government has also secured a Flexible Credit Line (FCL) from the IMF.

Poland's population is currently projected to age more rapidly than most others in the EU – the old-age dependency ratio being projected to increase from 21% in 2010 to 71% in 2060, while in the EU on average it is set to rise from 28% to 58%.⁸ In spite of this, according to the European Commission Sustainability Report 2009, the long-term impact of ageing on public finances is among the lowest in the EU, as ageing-related expenditure is actually projected to decline by 1.1 percentage points of GDP between 2010 and 2060.

Chart 5
**Projected change in ageing-related public expenditure
 between 2010 and 2060**
 (percentage points of GDP)



Source: European Commission Sustainability Report 2009.

The underlying reason is a far-reaching reform of the pension system introduced in 1999, which transformed a defined-benefit pension system into a partly-funded defined-contribution system. As a result, future pension benefits will be directly linked to an individual's career history and will take into account life expectancy. In addition, pensions will be partly financed from a mandatory funded pillar, relieving the pressure on public finances.

Poland has a well established fiscal policy anchor, consisting of a constitutional ceiling on public debt of 60% of GDP, accompanied by prudential thresholds of 50% and 55% of GDP. These limits are set out in the public finance act, the breaching of which triggers fiscal adjustment measures. The constitutional basis makes the rule an exceptionally strong one. Besides Germany, Poland is the only country in the EU with a constitutional fiscal rule.⁹ The

⁸ Source: Eurostat. Dependency ratio calculated as ratio of number of persons aged 65+ to those aged 20–64.

⁹ Source: European Commission database on numerical fiscal rules. Spain adopted a constitutional fiscal rule in 2011 which is scheduled to go into effect in 2020.

Polish fiscal rule framework has been in force since 1998, meaning that there is already a considerable body of evidence on its effects. In that time, the debt ratio has exceeded the 50% of GDP threshold and approached the 55% threshold on two occasions, in 2003–04 and 2011–12. In both these instances, the rule signalled the need for fiscal consolidation and policymakers have acted upon this signal. In 2003–04, the government presented and partly implemented the so-called Hausner plan of public expenditure reform, encompassing a number of structural measures that will curb spending in the medium to long term. In 2011–12, the government has also implemented a large-scale fiscal consolidation programme, yielding a cumulative fiscal adjustment of close to 4 percentage points of GDP.

Overall, the assessment presented above indicates that Poland's vulnerability to fiscal risks is quite limited. There is still room for improvement as regards the level of public debt and, in particular, its medium-term dynamics, since there is a need to correct the general government primary deficit. However, longer-term fiscal prospects appear to be quite favourable, as a result of the pension reform introduced in 1999. In addition, Poland's fiscal rule framework may be viewed as an additional factor that will contribute to the soundness of fiscal policies in the future.

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Fiscal policy, public debt management and government bond markets: issues for central banks

Elizaveta Danilova¹

Abstract

This paper covers fiscal policy tools that promote sustainability and their influence on monetary policy in Russia, the Bank of Russia's role in public debt management and main features of the domestic currency public debt market. At present Russia's budgetary circumstances are quite favourable, however, the budgetary system remains exposed to the world financial markets conditions and, above all, to oil prices. To reduce the budget's dependence on oil and gas revenues and accumulate reserves in the event that oil prices retreat a special mechanism for the utilisation of oil and gas revenues within the federal budget has been envisaged. Operations to finance the budget deficit affect the Bank of Russia's monetary policy, however, this effect is not significant. The Bank of Russia's role in public debt management is focused on consulting the Ministry of Finance on government securities' issuance and repayment schedules given the impact on banking system and monetary policy priorities. The main funding source of the federal budget deficit is the government securities' market which has shown swift growth over the last decade. The reforms conducted by the Ministry of Finance and the Bank of Russia including the improvement of financial market infrastructure would promote further market development.

Keywords: Fiscal policy, public debt management, government bond markets, emerging markets.

JEL classification: E62, H63

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1. Fiscal policy: mechanisms that promote sustainability and their influence on monetary policy in Russia

At present, Russia's budgetary circumstances are quite favourable – in 2011, public debt-to-GDP ratio stood at about 10.4% of GDP according to the Ministry of Economic Development. (As of 1 December 2011, the public debt of the Russian Federation amounted to \$163.3 billion.) At the same time, the Russian budgetary system remains exposed to conditions in the world financial markets and, above all, to oil prices.

In 2011, thanks to the strong price for Urals² oil, the surplus of the Russian Federation budget amounted to about \$13.4 billion (0.8 % of GDP). High world prices for energy resources should also contribute to a rather high level of predicted budget revenues in the coming years. At the same time, growing budget expenditures increase the probability of a structural deficit in the long run (the Federal Law on the federal budget envisages a budget deficit for the period 2012–14³). On this basis, public debt will reach about \$380 billion, some 17% of GDP in 2014. But, despite the large public borrowing programme, the debt burden of the Russian Federation remains moderate when compared to that of countries with similar sovereign ratings.

Since 2008, Russia's Budgetary Code has set out a special mechanism for the utilisation of oil and gas revenues within the federal budget with a view to reducing the budget's dependence on oil and gas revenues, as well as to accumulating reserves in the event that oil prices retreat. These revenues, the Code stipulates, should be applied to federal budget expenditures and to the Reserve and the National Wealth Funds.

The Reserve Fund is intended to ensure the financing of the *oil and gas transfer*⁴ in the event of a shortfall in oil and gas budget revenues. It absorbs any surplus in the federal budget's oil and gas revenues over and above the volume of the oil and gas transfer and the Reserve Fund's investment revenues. The prescribed size of the Reserve Fund is limited to 10% of the forecast GDP for the corresponding fiscal year.

The National Wealth Fund's purpose is to co-finance the voluntary pension savings of Russian citizens and to balance the Pension Fund's budget. The National Wealth Fund accumulates the oil and gas revenues of the federal budget that exceed the value of the oil and gas transfer approved for the corresponding fiscal year after the Reserve Fund reaches its prescribed size. It also accumulates the investment revenues of the National Wealth Fund.

The Budgetary Code sets a limit on the *non-oil-and-gas deficit of the federal budget*⁵ (which should not exceed 4.7% of GDP). The non-oil-and-gas deficit is financed by the oil and gas transfer (which is restricted to 3.7% of GDP) and from the deficit financing of the federal budget.

The Reserve Fund was severely depleted in the 2008–09 crisis after the Urals oil price fell from \$140 per barrel to below \$40 per barrel. In October 2008, the Reserve Fund had reached a peak level of \$140.98 billion, of which more than \$80 billion was used to finance the budget deficit.

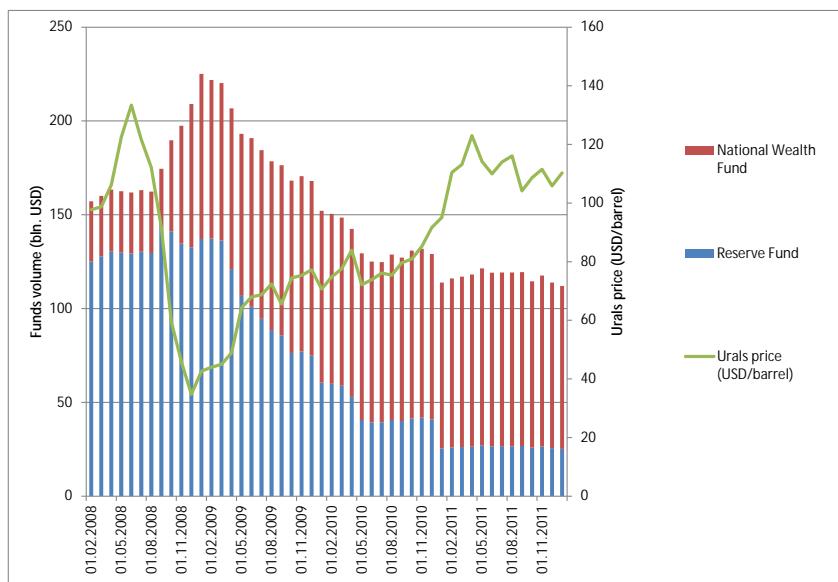
² In 2011, the average level of oil prices amounted to \$110.

³ Base on the following forecast oil prices incorporated in the Federal Budget Law: \$93 per barrel in 2012, \$95 per barrel in 2013, \$97 per barrel in 2014.

⁴ Comprising the oil and gas revenues of the federal budget and the Reserve Fund.

⁵ The non-oil-and-gas deficit of the federal budget represents the difference between the revenues of the federal budget without oil and gas revenues and the revenues from the management of the Reserve and the National Wealth Funds, and federal budget expenditures in the corresponding financial year.

Graph 1
Evolution of the Reserve Fund and National Wealth Fund



Source: Ministry of Finance of Russia; Bloomberg.

In 2010, following heavy anti-crisis spending within the federal budget, it was decided to suspend the use of the above-mentioned mechanism for oil and gas revenues and use them to finance the budget deficit.

In 2011, the non-oil-and-gas deficit dropped to 9.7% of GDP (in 2010, it reached 12.6% of GDP), while oil and gas revenues totalled nearly \$174 billion. As a result the 2011 federal budget generated a surplus of 0.8% of GDP, allowing \$31 billion in oil and gas revenues to be allocated to the planned replenishment of the Reserve Fund.

Table 1
International reserves of the Russian Federation vis-à-vis public debt

Date	Accumulated public debt, \$ bn	Including foreign debt, \$ bn	International reserves, \$ bn
2006	92.4	52.0	303.7
2007	97.9	44.9	478.8
2008	91.6	40.6	426.3
2009	107.0	37.6	439.5
2010	136.9	40.0	479.4
1 December 2011	163.3	35.8	510.9
1 January 2012	n/a	n/a	498.6

Russia's public debt is completely covered by the Federation's international reserves,⁶ which include the Reserve Fund and the National Wealth Fund (see table below). The aggregate assets of the Reserve and National Wealth Funds amounted to \$112.4 billion as of 1 December 2011.

Operations to finance the budget deficit affect the Bank of Russia's monetary policy because allocations of debt securities on the primary market lead to liquidity outflows from the banking sector into general government accounts at the Bank of Russia.

However, this effect is not significant for the following reasons:

1. The volume of government securities is relatively small (at the end of 2011, total outstandings in the OFZ federal loan bonds market was an estimated \$78.4 billion).
2. Most of the borrowed Treasury debt market funds eventually return to the banking system in the form of budgetary expenditure or through allocation of temporarily available budgetary funds to bank deposits (the amount of deposits of the general government in commercial banks totalled approximately \$48.8 billion on 1 December 2011).
3. Credit institutions use the purchased securities as collateral for refinancing operations of the Bank of Russia.

2. The Bank of Russia's role in public debt management

The Bank of Russia supports the government in realising its fiscal policy. In particular, the Bank acts as the agent of the Ministry of Finance in conducting operations with domestic debt securities, taking into account the impact of these operations on the banking system and its own monetary policy priorities. The Bank of Russia submits recommendations to the Ministry of Finance, which sets the key direction for debt policy and issues advice on the issuance, distribution and redemption of government securities on domestic and foreign markets.

The Bank of Russia does not conduct monetary operations of a quasi-fiscal or non-traditional nature. The Bank of Russia is prohibited by law⁷ from financing the federal budget deficit and from buying government securities in the primary market.

In recent years, the Bank of Russia has not frequently been involved in purchasing government securities in the secondary market (other than when fulfilling obligations in repurchase agreements). The Bank of Russia does not make such purchases in order to influence the yield curve. Rather, short-term lending operations are used for this purpose.

Nor do these operations constitute any part of the central bank's anti-crisis policies. During the 1990s, the Bank's purchases of government bonds in the secondary market were the main instrument of liquidity provision to commercial banks (indeed, the volume of government securities held by the Bank of Russia at times amounted to more than twice the monetary base). However, in 2008–09, it was principally credit operations that were used for this purpose. Over the same period, the total amount of purchases of OFZ and foreign currency-denominated government securities by the Bank of Russia amounted to only about

⁶ The international reserves comprise highly liquid financial assets that are held by the Bank of Russia and the Russian Government, including foreign exchange reserves and monetary gold, as well as the foreign currency holdings of the Reserve Fund and the National Welfare Fund.

⁷ Federal Law no 86-FZ dated 10 July 2002: "On the Central Bank of the Russian Federation (Bank of Russia)".

\$5 billion. At the same time, the Bank's claims on credit organisations at the peak of crisis exceeded \$120 billion (for instance, as of 1 February 2009).

The Bank of Russia is also empowered to issue its own bonds. These short-term securities are used to manage excessive liquidity in the banking sector. Between February 2007 and August 2010, the Bank of Russia regularly issued short-term bonds with a maturity of six months. After November 2010, the maturity of this issuance was reduced to three months. Since mid-October 2011, the Bank of Russia has suspended bond issuance due to a shortage of market liquidity.

3. Main features of the domestic currency public debt market

At present, the Government of Russia borrows mainly by issuing debt securities on the domestic market. (Domestically issued securities account for up to 78% of internal public debt in the form of debt securities.)

Before the 2008 crisis (when the government budget was in surplus) domestic public borrowing, in the form of OFZ, was relatively low (ranging between \$5.3 billion and \$7.8 billion annually). Since 2009, however, the budget deficit has been financed mainly via the domestic public debt market. Over the last decade, Russia's rouble-denominated public debt market has increased in volume (doubling over the last two and a half years to \$78.4 billion). At present, federal loan obligations (OFZ) account for a significant share (37%) of the entire Russian rouble-denominated debt market.

The expansion of the public debt market has contributed to the development of the internal money market. For instance, repo operations are developing rapidly. As of end-December 2011, public securities accounted for 26% of domestic repo operations (Graph 2).

Government securities (OFZ) are issued with maturities of up to 30 years. However, the most liquid (benchmark) issues have maturities of up to 10 years. New OFZ issues from the Ministry of Finance have maturities of 10 years or less. The maturity of public debt obligations is not increasing; longer-term issues imply higher borrowing costs under current market conditions.

Despite these positive trends, the Russian public debt market remains underdeveloped. This is due not only to Russia's long period in budget surplus, during which there was no need for large-scale borrowing but also to perceived access problems for international participants in the Russian market. International investors are ready to take credit risk on rouble-denominated debt obligations, but they would require high premiums to compensate them for the risks associated with Russian financial market infrastructure.

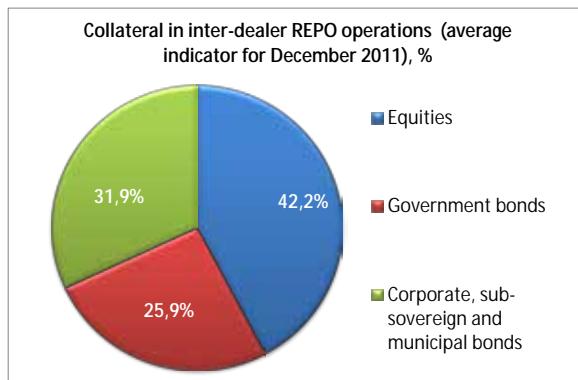
A very limited number of state-associated banks and the Pension Fund of the Russian Federation are the main investors in the public debt market; the share of non-residents in trading is minimal (Graph 3). Thus, the Russian public debt market lacks institutional investors with long-term investment strategies.

In this connection, the Ministry of Finance and the Bank of Russia are seeking to liberalise the public debt market. Until recently, there was only one trading platform for Russian government bonds – a special section of MICEX. Since January 2012, however, government securities can also be traded on the securities section of the combined MICEX-RTS exchange, as well as on the OTC market. The Bank of Russia expects that these reforms will help broaden the investor base to international participants, as well as improve the market's liquidity and capacity.

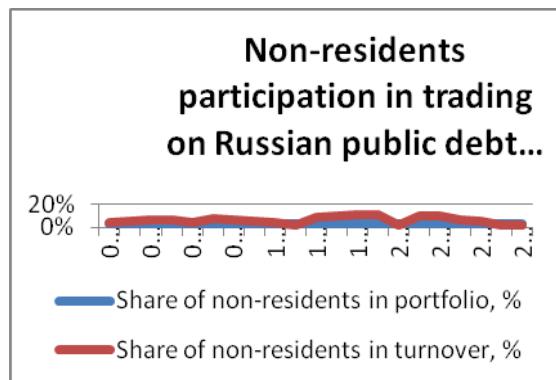
The Federal Law of 7 December 2011 no 414-FZ "On the Central Depository" provides that, from 1 July 2012, central depositories active in the Russian market will be able to open custody accounts for foreign nominee holders of international centralised depositories or securities settlement systems as well as national depositories, securities settlement systems

and clearing organisations. This provision is expected to increase the attractiveness of the Russian government securities market to foreign investors by mitigating the risks faced by foreign investors who use such financial market infrastructures (FMIs) in their jurisdictions. At present, foreign FMIs can only open accounts at Russian depositories, which exposes foreign investors to risks in the event of financial problems at foreign FMIs.

Graph 2



Graph 3



Source: Bank of Russia

As non-residents account for a minimal level of Russian debt holdings at present, the reorientation of public borrowing towards the domestic market will not expose the market to a higher degree of risk from external shocks and does not present any additional risk to financial stability.

Aspects of fiscal/debt management and monetary policy interaction: the recent experience of Saudi Arabia

Abdulrahman Al-Hamidy¹

Abstract

As Saudi Arabia's oil export revenues constitute about 90% of its budget, its fiscal policy is largely a function of developments in the oil market. Over the years, a countercyclical fiscal stance has been used to reduce the volatility of domestic growth against the background of vacillating oil revenues. Given the structure of the economy, the need is to continue to encourage the private sector to assume a greater role in the country's diversification efforts. Reflecting the dominance of fiscal policy in Saudi Arabia and its impact on economic growth, the primary aim of monetary policy is to assure exchange rate stability with a view to providing an environment that is conducive to financial stability and sustainable growth. The interaction between monetary and fiscal policy has changed in the current global economic and financial climate. Greater cooperation between the fiscal and monetary authorities has become indispensable in meeting macroeconomic objectives. It is envisaged that policy interaction can return to normal modes of operation as the global economic recovery takes hold.

Keywords: Saudi Arabia; experiences; fiscal; monetary; policy interactions; countercyclical; exchange rate; stability.

JEL classification: E32, E44, E52, E63, F31

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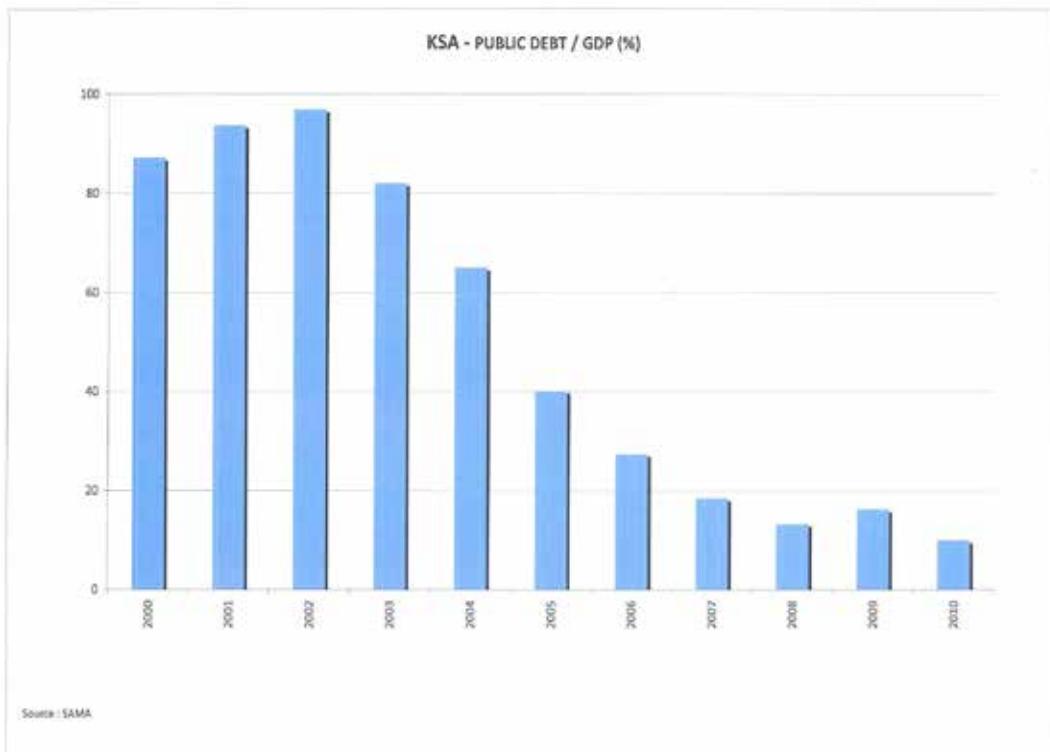
1. Introduction

The current euro zone sovereign debt crisis and worsening debt dynamics in major industrial economies reflect elevated risks in sovereign overindebtedness with adverse consequences for economic growth in affected countries. In an age of fiscal austerity and overstretched monetary policy accommodation, the conventional interaction appears to be losing its effectiveness in reviving the economy.

2. Saudi Arabia's experience

(i) Relevance of export revenues in the oil sector

As Saudi Arabia is a resource-based economy, with oil export revenues constituting about 90% of its budget, its fiscal policy is largely a function of developments in the oil market. Over the years, a countercyclical fiscal stance has been used to reduce the volatility of domestic growth against the background of vacillating oil revenues. With the improvement in the oil market since 2003, fiscal spending has risen and there have been enlarged fiscal surpluses. In fact, part of these cumulative budget surpluses has been used to redeem government debt, which stood at about 10% of GDP by the end of 2010, down from its peak of over 100% in 1999. As is the case in most emerging market economies, fiscal policy remains dominant in stimulating private sector growth.



(ii) Policy challenges for the Saudi government

In Saudi Arabia, all oil revenues accrue to the government. While higher oil revenues are beneficial, they also entail many challenges. The three major and competing considerations are: (a) cyclical, ie containing inflation, which calls for fiscal restraint; (b) secular, ie ensuring

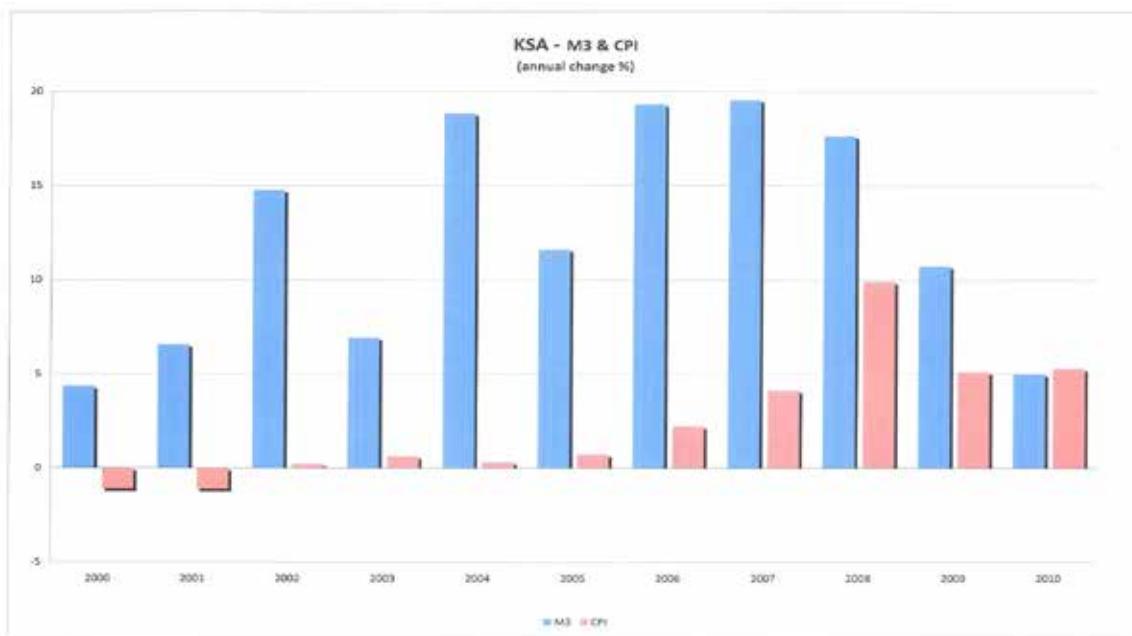
that oil revenues are distributed through investments in value-added sectors with a focus on projects that are job-creating and socially valuable; and (c) the preservation of intergenerational equity with the twin plans of accumulating foreign assets and increasing economic diversification by investing in physical and social infrastructure. The government budget prioritises spending in health, education and infrastructure. Putting a high weight on ensuring intergenerational equity and long-term fiscal sustainability is consistent with short-run cyclical considerations when inflationary pressure is high (ie consistent with fiscal restraint). Creating a favourable environment for long-term economic diversification via public investment is consistent with a more expansionary fiscal policy. During the past decade, the diversification motive has been particularly strong in Saudi Arabia, as reflected in massive investment programmes.

(iii) Monetary policy

Saudi Arabia's monetary regime is effectively its exchange rate regime. SAMA's monetary policy objectives are to maintain the dollar/rial exchange rate within the framework of the pegged exchange rate regime with a view to pursuing price stability and safeguarding financial stability.

In a fixed exchange rate regime, interest rate policy is largely influenced by monetary developments in the anchor currency country. Notwithstanding this limitation, there are other policy options, such as the application of reserve requirements and prudential guidelines on bank credit to steer monetary policy in the desired direction.

Higher interest rates and exchange rate appreciation have limited impact on curbing inflation that is driven by supply shocks such as higher food prices, as consumption of such goods tends not to be credit-financed. Since demand for food is price-inelastic, higher interest rates can constrain overall demand but will have little effect on food prices. In the recent past, Saudi Arabia's inflation has been largely driven by supply shocks, which cannot be successfully addressed by higher interest rates. Indeed, rate hikes are more likely to soften growth than dampen prices. But inflation has moderated recently in line with falling food prices and softening rent charges.



(iv) The monetary process and causative factors for the money supply

The monetary process in an oil-based economy differs from that in non-oil economies. In Saudi Arabia, the receipt of oil revenues adds to government deposits with no immediate impact on domestic liquidity. When the government injects these revenues into the domestic income stream through its domestic expenditure, the inflow of foreign exchange is translated into domestic liquidity. Similarly, external government transactions have no impact on domestic liquidity. It is the private sector's transactions with the rest of the world that affect domestic liquidity. Given a relatively limited home production base and an open economy, the private sector's payments for imports and other external transactions far exceed its receipts from abroad. Private sector imports are highly influenced by government spending, which remains the driving force in the economy. Hence, the government's net domestic expenditure and the private sector's balance of payments deficit control domestic liquidity and provide the basis for constructing causative factors for changes in broad money M3.

The following table for monetary developments in 2005 and 2006 is quite revealing due to monetary policy transition during this period. There was a marked acceleration in M3 growth to 19.3% in 2006 from 11.6% in 2005. SAMA's prudential measures slowed down the expansion in bank claims on the private sector (SAR 40.1 billion in 2006 vs SAR 122 billion in 2005). At the same time, the deficit in the private sector's balance of payments continued to grow, owing to the sustained increase in imports (SAR 289.4 billion in 2006 vs SAR 238.3 billion in 2005). These two factors had the effect of slowing M3 growth, but they were substantially offset by the government's increased net domestic expenditure, which amounted to SAR 270.2 billion in 2006 compared with SAR 159 billion in 2005. Miscellaneous factors also exerted a larger expansionary influence on broad money in 2006 as compared to 2005. In short, the government's net domestic expenditure is the major driving factor behind M3 growth.

Causative factors for changes in broad money (M3)

Billions of riyals

	2005	2006
Change in M3 (19.3% in 2006 vs 11.6% in 2005)	57.6	106.9
Causative factors		
Net domestic expenditure of the government*	159.0	270.2
Change in bank claims on the private sector	122.0	40.1
Change in bank claims on non-financial public sector enterprises	2.5	3.3
Private sector balance of payments deficit	-238.3	-289.4
Other items (net)	12.4	82.7
Total	57.6	106.9

* Domestic expenditure less domestic revenue of the government.

Source: SAMA 43rd Annual Report.

(v) Interaction of fiscal and monetary policy

Fiscal policy is dominant in Saudi Arabia and affects monetary policy through direct and indirect channels.

An expansionary fiscal policy would warrant a restrictive monetary policy in normal times to curb inflationary pressures and vice versa (direct channel).

A more recent analysis regarding the latest developments in advanced economies is that expectations of continuing large budget deficits may trigger a lack of confidence in economic prospects, warranting an expansionary monetary policy to support the financial system (indirect channel).

A third area where fiscal and monetary policies come together is the development of financial markets. On the fiscal side, liquid markets that facilitate deficit funding are crucial for economic development and growth and they also enable the central bank to conduct market-based operations.

Before the crisis, a standard measure during times of buoyant economic growth was to rebalance the macroeconomic policy mix by tightening monetary policy. Following the global crisis in 2008, both fiscal and monetary policies in Saudi Arabia were set in the same expansionary direction to support demand and ensure continued growth and prosperity. This is an example of how the government has been able to pursue a countercyclical policy against a comfortable cushion, built in good times, in the form of state reserves from cumulative budget surpluses. SAMA's accommodative monetary policy was not adopted primarily to support the banking system, which has shown its resiliency during the crisis. In fact, the capital adequacy ratio of Saudi banks has averaged 16.5% in the last three years. Inflation has been contained and credit conditions have remained favourable, allowing SAMA to keep monetary conditions easy.

(vi) Development of the financial system

The Saudi financial system has developed and grown significantly over the past decade. In 2003, a Capital Market Authority was established under the CMA Law to regulate and supervise the securities sector. Since 2003, the CMA has licensed many investment companies, asset management firms, brokers and financial advisors. The emergence of these firms has contributed to the expansion in market activities.

Regulatory coverage of the financial sector was further broadened to include insurance through the enactment of the Cooperative Insurance Companies Control Law of 2003, which entrusted SAMA with the responsibility of supervising Saudi Arabia's insurance sector. At the time of the law's enactment, there was only one licensed company, operating in the country, namely the National Cooperative Company for Insurance (NCCI). Other participants in the insurance sector were branches and agencies of foreign companies that were registered with the Ministry of Commerce. The Insurance Law prescribes that companies wishing to do insurance business in the Kingdom must obtain a license from the authorities. At the end of 2010, some 34 licensed insurance companies were operating in the Saudi insurance market.

The banking system has also expanded phenomenally. The number of banks operating in the Kingdom more than doubled from 11 in December 2000 to 23 by September 2011. Of these banks, 11 are branches of foreign banks and four represent Saudi-foreign joint ventures.

Under the supervision and guidance of the Saudi Arabian Monetary Agency (SAMA), the central bank, the Saudi banking system has become a sound, stable and dynamic banking system. The banks offer a wide range of products and services that can be increasingly accessed through ATMs, internet and phone banking. Over the decades, the Saudi banking system has adopted best international practices in corporate governance, risk management, risk disclosure and transparency. Saudi banks were among the leaders in fully implementing the Basel I framework in 1992 and the Basel II framework in 2008. The banking system is now preparing for the implementation of Basel III on the timelines proposed by the Basel Committee. Over the years, the Saudi banking system has been characterised by strong capital adequacy, ample liquidity and high levels of loan loss coverage. In fact, SAMA has

encouraged banks to raise capital and provisioning levels on a countercyclical basis. Given a prudent and conservative supervisory stance, there has been no incidence of a bank failure in Saudi Arabia and Saudi banks have shown resilience in the face of recent large regional and global shocks.

In recent years, Saudi banks have remained profitable with the average banking system ROA and ROE at end-December 2010 improving to 1.9% and 13.2% respectively. Furthermore, the banks are highly liquid (with a liquid assets-to-deposits ratio of 36%) and well provisioned against loan losses. In short, Saudi banks are poised to strengthen their performance in coming years as their risk management practices are set to improve further as a result of the shift to Basel III.

For its part, SAMA stands ready to ensure that the banking system is endowed with adequate liquidity to meet the genuine credit needs of the economy. When required, it provides liquidity to banks through its repo facility, foreign exchange swaps and placement of deposits on behalf of autonomous government institutions.

Since the establishment of the Capital Market Authority in 2003, there has been a significant expansion in capital market activity. By the end of December 2010, the number of listed companies had almost doubled to 148 and market capitalisation had reached about SAR 1.3 trillion. By the end of 2010, the number of transactions had reached 19.5 million worth a total of SAR 759 billion. In the asset management sector, the number of investment funds had reached 243 with total assets under management of SAR 94 billion. There is also a nascent sukuk and bond market where total issuance since the market's start-up stands at SAR 43 billion (as at December 2010).

Also of some importance in the Saudi financial system are the five specialised credit institutions that have played an important role in providing long-term credit to vital sectors such as industry, agriculture and real estate. These institutions are funded from loan repayments and the central government's budget. Total disbursements by these institutions since their inception to end-December 2010 amounted to about \$106 billion.

There are also many other non-bank financial institutions, including leasing companies, insurance companies and licensed money changers. These account for only a small share of total financial system assets but their transaction volumes and quality are on the rise.

Performance indicators of the banking sector

End of period

	2000	2005	2010
Number of licensed banks	11	15	23
Total assets (percent of GDP)	65.0	64.7	85.0
Total private sector loans (percentage of private sector GDP)	61	121	154
Risk-weighted capital/assets ratio	21.0	17.8	17.1
Liquid assets/customer deposits	56.0	34.0	35.7
Loans-to-deposits ratio	50.1	67.5	74.0
Leverage ratio	11.2	12.7	14.4

Conclusion

The challenges confronting Saudi Arabia's fiscal policymakers arise from the finite, volatile and uncertain nature of the oil revenues on which the state budget depends. Oil revenues are also influenced by Saudi Arabia's systemic role as a leading producer in stabilising the oil market. This of course means that, on an intergenerational basis, Saudi Arabia is swapping oil revenues for monetary reserves in order to develop its economic base and encourage the private sector to assume a greater role in the country's economic diversification efforts. Given the dominance of fiscal policy in Saudi Arabia and its impact on economic growth, monetary policy aims primarily at exchange rate stability with a view to providing a monetary environment that is conducive to financial stability and sustainable growth over time.

The interaction of fiscal and monetary policy has changed in the current global economic and financial climate. Greater cooperation between fiscal and monetary authorities has become indispensable in meeting macroeconomic objectives. It is envisaged that policy interaction can return to normal modes of operation as the global economic recovery takes hold.

Development of the government bond market and public debt management in Singapore

Monetary Authority of Singapore

Abstract

This paper describes the growth of the Singapore Government Securities (SGS) market. It elaborates on the balanced budget policy of the Singapore government, explains how SGS are issued unrelated to fiscal needs and describes how a liquid SGS market is used to establish a robust government yield curve for the pricing and development of the domestic corporate debt market. Recent developments in the SGS market, the issuance of central bank debt and future challenges are included in the paper.

Keywords: National Government Expenditures and Related Policies, National Budget, Deficit and Debt, National Debt, Debt Management, Macroeconomic Policy, Macroeconomic Aspects of Public Finance and General Outlook

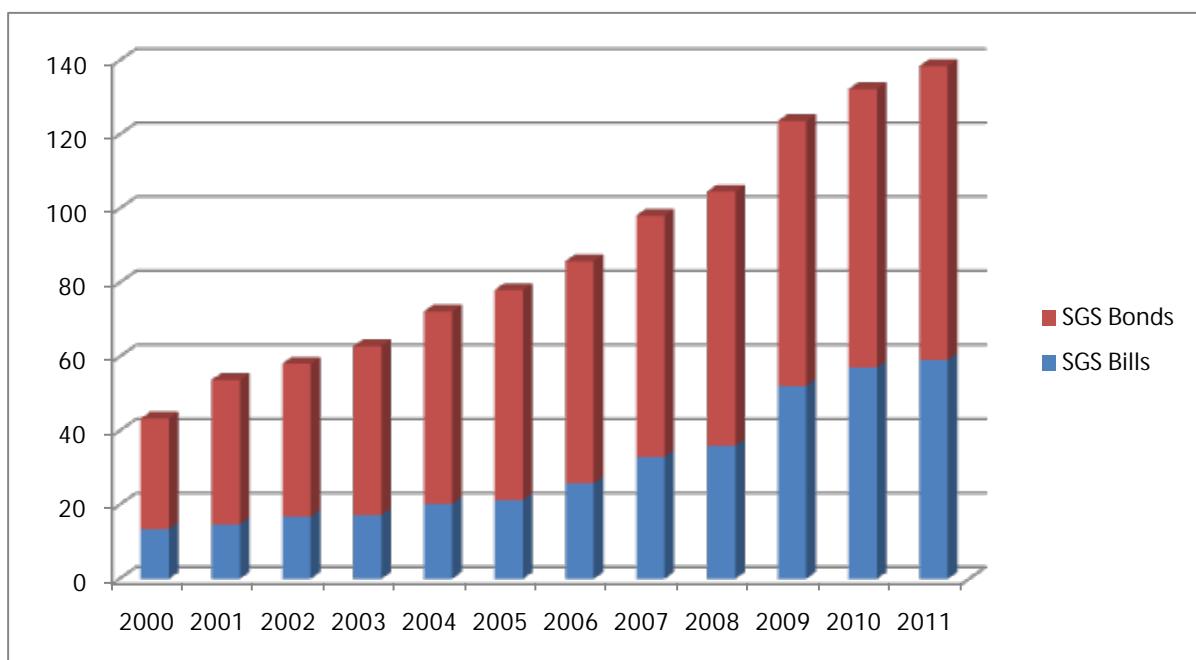
JEL classification: H5, H6, H63, E6

(A) Singapore Government Securities (SGS)

Overview of the bond market

The Singapore bond market has grown considerably in terms of size, depth and liquidity in the last decade. As an indication, market capitalization in the government bond (SGS) market has increased over three-fold from S\$43.3 billion in 2000 to S\$138.5 billion in 2011 (see Chart 1). The sovereign curve was also extended twice during this period, starting with a 15-year issuance in 2001 followed by a 20-year issuance in early 2007. As an indication of the market's maturity and demand for even longer benchmarks, the curve was further extended with the introduction of a 30-year issuance in April 2012, marking another critical milestone in the growth of the government bond market.

Chart 1
Growth of SGS (2000–2011) – in S\$ billions



In line with its growth, the SGS has been gradually included in widely followed bond indices during this period. As an example, Singapore was entered in Citigroup World Government Bond Index (WGBI) in January 2005, and the SGS is similarly included in the Barclays Capital Global Aggregate Index and JP Morgan World Government Bond Index, amongst others.

(B) Singapore's fiscal strength and motivation for SGS issuance

Strong fiscal position

The Singapore government operates on a balanced budget policy and does not need to finance its expenditures via the issuance of government bonds. It has enjoyed healthy budget surpluses over terms of government in the past decades and does not have any external debt. The main focus of the government's expenditure is on the delivery of essential public goods and services to residents, with national security, education, public housing,

health care and economic infrastructure development forming the key areas in the national budget.

Funding for government expenditure programmes is primarily dependent on Singapore's tax policies, which are among the most competitive in the world and are designed to enhance Singapore's economic competitiveness and promote long-term economic growth. This combination of fair tax policies and prudent expenditure programmes has made up the government's successful fiscal policy over the years. Embedded within this set of fiscal policies is the belief that the private sector is the engine of growth, with the role of the government being to provide a conducive and stable environment for it to thrive. Also, all tax and expenditure policies are justified on microeconomic grounds and focus on supply-side issues.

Against this backdrop, the government was able to ensure no build-up of net debt¹ while growing the pool of reserves to a state that allows it to be tapped in a sustainable manner to supplement the government's budget needs. As an indication of the government's fiscal rectitude, the Protection of Reserves Framework in the Constitution further stipulates that only reserves accumulated during each term of government can be spent, hence further ensuring that the strength of the government's fiscal position is not easily eroded.

The availability of a significant reserve pool also strengthens Singapore's financial standing, while giving the central bank the capacity to intervene in the FX market in support of the Singapore dollar (SGD). This is particularly important for Singapore given that its monetary policy is centered on the management of the trade-weighted basket of exchange rates of its major export competitors and sources of imports. Hence, rather than being constrained in any manner, Singapore's fiscal strength has actually helped the MAS in the management of the SGD in monetary policy implementation.

Catalyzing growth of the domestic bond market

SGS are marketable debt instruments of the government of Singapore, comprising short-term Treasury Bills (T-bills) as well as longer-term SGS bonds. As the fiscal agent of the Singapore government, the MAS is empowered to undertake the issuance and management of SGS on its behalf. The issuance of T-bills and SGS bonds is governed by the Local Treasury Bills Act (LTBA) and the Government Securities Act (GSA), respectively, with separate debt ceilings set by resolutions in Parliament and approved by the President. As of April 2012, the authorised borrowing limits (representing amounts that the Minister of Finance is able to borrow at any point) for T-bills and bonds were S\$60 billion and S\$490 billion, respectively. In accordance with the GSA, all proceeds from securities issuance, and any investment returns derived from the proceeds, are paid into the Government Securities Fund (GSF). Payments from this fund are limited to the payment of interest and repayment of principal, and are a statutory obligation. This framework ensures that the government borrowing is not used to fund the government's expenditures.

Given the strong fiscal position, the Singapore government is in a unique position where domestic debt securities are issued unrelated to fiscal needs. In fact, the SGS was originally issued to satisfy banks' needs for risk-free assets in their liquid asset portfolios; the focus subsequently shifted to developing the domestic debt market after the Asian financial crisis. A focused issuance program was introduced aimed at building large and liquid benchmark bonds, primarily through larger issuance of new SGS bonds and reopening of existing issues to enlarge the free float and re-channel liquidity from off-the-run issues to benchmark bonds,

¹ The Singapore government has assets well in excess of its liabilities, which includes investments in the Government of Singapore Investment Corporation and Temasek Holdings.

which helped catalysed the growth of the market. With the improvement of liquidity to the market, the provision of a robust government yield curve was possible, thus stimulating the growth of the domestic corporate debt market which was able to price off the benchmark curve. This is important as growth of the corporate debt market will facilitate greater financial disintermediation towards direct financing (via the financial markets) instead of indirect financing (via bank credit), hence providing an avenue of matching savers and those in need of capital outside the banking system and lowering the borrowing costs for domestic corporates.

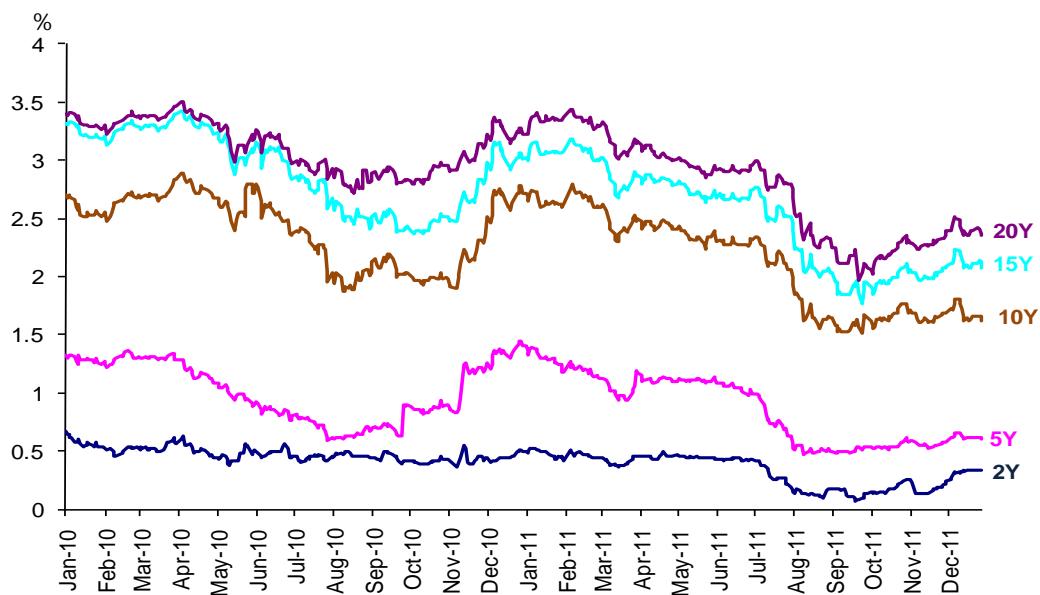
In view of these considerations, Singapore is able to continue enjoying short- and long-term credit ratings from international credit rating agencies, despite the significant growth in government debt over a short period of time. The three main international rating agencies (Moody's, Standard and Poor's, and Fitch) continue to accord Singapore the highest, AAA, credit rating.

(C) Recent development in the SGS market and issuance of central bank debt

Global capital flows and their impact on SGS yields

Towards the end of 2011, Singapore saw strong capital inflows, similarly to Japan and Switzerland, largely motivated by the global risk aversion from the uncertainty over the debt crisis and policy uncertainties in both the US and the EU. As these flows end up largely invested in highly rated safe haven assets such as the SGS, yields have declined sharply since the start of 2011 with a bull-flattening bias (see Chart 2). This is also broadly in line with price movements in global safe haven assets, which highlights sustained confidence in the resilience of Singapore's economy and the government's fiscal discipline.

Chart 2
SGS Benchmark Yields since Jan 2010



Looking ahead, increased volatility in domestic financial markets cannot be ruled out if economic and financial conditions in the advanced economies become markedly weaker,

resulting in contagion shocks. However, the impact of any sudden capital outflows from the SGS market would likely be mitigated since the SGS remains one of the few highly rated sovereign assets and local institutions continue to be dominant investors in the SGS market.

Central bank debt security – MAS bills

In addition, since April 2011 the MAS has issued MAS bills, which are central bank bills for money market operations aimed primarily at financial institutions to help increase the availability of high quality liquid assets and manage banking system liquidity. While similar to the T-bills in many ways, these central bank bills are essentially money market instruments, with shorter tenors ranging from four weeks to three months.

MAS bills are negotiable, so banks needing liquidity can sell them or pledge them as collateral in the interbank repo market or enter into repo transactions with the MAS through the Intraday Liquidity Facility and the Standing Facility. The initial issuance will be kept to S\$20 billion to start, which can be increased based on subsequent sterilization requirements. The development of MAS bills is particularly apt in the face of the changing regulatory landscape, which has seen greater demand for government and central bank debt securities along with a growing banking system and higher liquidity requirements. In this regard, MAS bills will help to meet the needs of banks in Singapore for more regulatory and liquid assets.

(D) Challenges and key policy considerations

While the government bond market has grown significantly in the last decade, developments in the recent global environment and regulatory landscape have also highlighted a couple of areas for review and policy considerations. Firstly, given the current low yield environment, which is likely to persist, the implication of negative yield auctions for short-dated SGS is a particular cause for concern, in terms of both its implications and its potential impact on institutional as well as retail investors. Another area is how the use of the central bank debt (MAS bills) can be further expanded as an instrument for sterilization requirements over the use of T-bills, which will alleviate the need for the government to raise more debt in managing capital inflows. This is likely to be explored gradually in the next few years as the issuance of MAS bills continue to grow and reach a steady state.

Fiscal policy, public debt management and government bond markets: issues for central banks

Lesetja Kganyago¹

Abstract

To reinforce the long-term sustainability of public finances, the South African National Treasury has proposed a set of fiscal guidelines informed by three principles, namely: a counter-cyclical fiscal stance, long-term debt sustainability and inter-generational equity. Owing to the sound management of the fiscus during the six years of strong economic growth (2002–2007), budget surpluses and fiscal space were created.

The South African economy entered the 2008–2009 recession with healthy public finances and comparatively low levels of debt. The issuance of domestic government bonds and Treasury bills alongside government cash balances remains the government's primary source of financing. This reflects the healthy, liquid and deep domestic bond market in South Africa. Domestic government debt accounted for 90.1 per cent of total gross debt of the national government in 2010/11. The government's total gross loan debt (comprising domestic and foreign debt) increased from R990.6 billion in the 2010/11 fiscal year to an estimated R1.2 trillion in 2011/12. As a ratio of gross domestic product, the national government's total gross loan debt increased from 36.0 per cent to an estimated 40.1 per cent during this period and is expected to plateau at just over 42 per cent in 2014/15, which should allay concerns over debt sustainability.

The financing of fiscal deficits recently had no adverse impact on monetary policy, despite the shift from international to domestic markets for public debt. The build-up of government deposits with the central bank reflects the government's funding of foreign exchange purchases for purposes of foreign reserve accumulation. The growth in the central bank's balance sheet over the past six years reflects the accumulation of foreign reserves and was not due to any sort of quantitative easing policies pursued by the central bank. The central bank issues its own debt paper. The central bank is a full participant on the National Treasury's debt management committee.

Keywords: Sustainability of public finances, government debt-to-GDP ratio, government debt maturity profile, liquid, deep and transparent government debt markets, debt management coordination, yield curve for government debt, capital flows into domestic debt markets, public debt and monetary policy

JEL classification: E52, E62, H63

¹ Deputy Governor, South African Reserve Bank.

A. Is monetary policy constrained by unsustainable paths of public debt?

To reinforce the long-term sustainability of public finances, the South African Minister of Finance has proposed a set of fiscal guidelines informed by three principles, namely, a counter-cyclical fiscal stance, long-term debt sustainability and inter-generational equity

i. The fiscal stance

The National Treasury (NT) considers a host of measures when determining the fiscal stance. These include the budget balance, the primary balance (which is a key driver of fiscal sustainability), the current balance (to determine how much borrowing is being undertaken for consumption expenditure), and the cyclically adjusted budget balance (to account for the effects of the business cycle on revenue). All of these measures are at the consolidated level, which covers the national and provincial governments, social security funds, and selected entities, and are projected over a 3-year rolling time frame and updated bi-annually.

South Africa publishes information on its stock of debt on both a gross and net basis. Net loan debt consists of total domestic and foreign debt, less the cash balances of the National Revenue Fund. These cash balances consist of deposits in rand and foreign currency.

Owing to sound management of the fiscus during the preceding six years of strong economic growth (2002–2007), the economy was doing well, with budget surpluses recorded in the 2006/07 and 2007/08 fiscal years, which helped to create fiscal space. The South African economy entered the 2008–2009 recession with healthy public finances and comparatively low levels of debt.

The issuance of domestic government bonds and Treasury bills (TBs) alongside government cash balances remained the government's primary source of financing. This reflects the healthy, liquid and deep domestic bond market of South Africa. Domestic government debt accounted for 90.1 per cent of total gross loan debt of the national government in 2010/11, with foreign debt accounting for the balance.

The national government's total gross loan debt, which comprises domestic and foreign government debt, increased from R990.6 billion in the 2010/11 fiscal year to an estimated R1.2 trillion in 2011/12. As a ratio of gross domestic product, the national government's total gross loan debt increased from 36.0 per cent to an estimated 40.1 per cent during this period. The government debt-to-GDP ratio is projected to plateau at just over 42 per cent in 2014/15, which should allay concerns over debt sustainability.

Retirees in South Africa have two main sources of income: the means-tested state old age pension and private pensions. There is no statutory obligation to contribute to either. In some firms, participation in a pension fund is a condition of employment, but there is no obligation for workers to preserve these savings if they lose or change jobs. Millions of South Africans are unable to save adequately for retirement and rely on the old age pension, even though it might provide an income well below average career earnings.

South Africans obtain medical care either through the public health system or through contributory medical schemes. In pursuing a more equitable and effective health system, the government recognises the complementary role of public and private health services. Proposals for a national health insurance (NHI) system are currently under review, along with other elements of a 10-point strategy for revitalisation of health services. Health insurance is a way of paying in advance for some or all of the costs of health care.

Local government finances are monitored by the Intergovernmental Relations Division of the NT, and published in the annual Local Government Budgets and Expenditure Review. Monthly finance reports are published on the NT website.

The NT also projects national gross loan debt and net loan debt (ie gross debt less cash balances) using a variety of methods, in order to determine whether debt is rising indefinitely over time. More recently, the NT has begun publishing estimates of provisions, contingent liabilities, and the overall public sector borrowing requirement. Three-year national debt projections are published bi-annually, but the NT also considers longer-term projections when setting the budget.

The NT publishes medium-term estimates of the costs of the health system, the social grants system and the balances of social security funds. The NT is preparing a long-term fiscal report, to be released in 2012, which will discuss the long-term pressures on the fiscus of population changes.

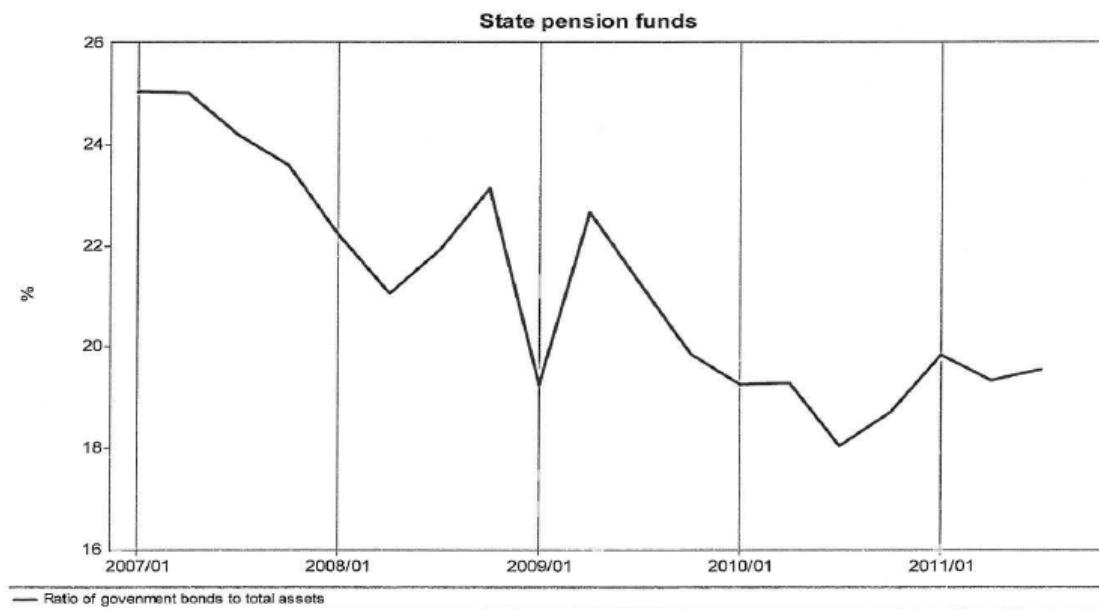
ii. **Stock of public sector assets**

Central bank assets

At the end of March 2012, foreign assets amounted to approximately 90 per cent of the South African Reserve Bank's (Bank) total assets of R457 billion. The NT has funded approximately 31 per cent of the official gross gold and foreign exchange reserve accumulation. These purchases were funded out of excess income of the NT and therefore do not reflect additional government debt. The official foreign reserves are owned by the Bank, and cannot be seen as off-setting government debt. The Bank has a portfolio of rand-denominated government bonds amounting to R8.6 billion at the end of March 2012, or 1.9 per cent of total assets. These bonds were not acquired in the primary market, but were obtained from the NT as settlement of realised currency valuation losses on foreign exchange holdings and forward contracts. In terms of the Reserve Bank Act, local currency valuation profits/losses of the official gold and foreign exchange reserves are for the account of the NT.

State pension funds

State pension funds are funds administered by the NT, Transnet, Telkom and the Post Office. The value of government bonds held by these funds increased from R191 billion in the first quarter of 2007 to R221 billion in the fourth quarter of 2011. As a percentage of total assets, holdings of government bonds declined from 25 per cent to 20 per cent over the same period. This indicates that the financing of government debt by state pension funds has declined somewhat since 2007. These funds seemed to have switched from government to public corporation bonds, as the ratio of the latter to total assets increased by 5 percentage points. The government has recently provided guarantees on some bonds issued by public corporations such as Eskom and Sanral. State pension funds have also increased investment in bonds issued by the private sector.



iii. Financing of fiscal deficits and monetary policy

Normally, the financing of fiscal deficits would not affect monetary policy. However, financing pressures increased due to higher deficits, and this could have a monetary impact, especially if the Bank has to issue securities to manage money market liquidity. Government assistance to the central bank to accumulate foreign reserves would be curtailed as funds would be applied to more pressing priorities. Deficit financing pressures could compel the government to broaden funding sources and borrow offshore for use in the domestic market. The government would be faced with selling such funds to the central bank, but this would have unintended consequences in that liquidity would be injected into the domestic money market which would need to be sterilised. In order to overcome this problem, the government could opt to sell foreign currency in the domestic market, but this would result in the appreciation of the local currency.

Recently, the government has opted to place foreign exchange deposits with the Bank to avoid the money market liquidity impact of foreign exchange accumulation.

B. Domestic currency public debt issued in local markets

iv. Shift from international to domestic markets for public debt

The domestic capital markets remain the primary source of funding for the government's gross borrowing requirements. The purpose of borrowing in the international capital markets is to finance the government foreign currency commitments and to establish benchmarks for local public entities to borrow in the international market. The country's foreign debt as a percentage of gross loan debt is estimated to decrease from 9.9 per cent in 2010/11 to 5.9 per cent in 2014/15.

v. Money market development

Short-term borrowing consists of TB issuance. Provinces and some public entities are required to invest their surplus cash with the Corporation for Public Deposits (CPD), and the government borrows from the Corporation for its financing activities. The government TB portfolio has been diversified from 91-day and 182-day bills to also include 273-day and 364-day maturities. The short-term debt portion of the government's total gross loan debt,

mainly TBs, increased from 6.4 per cent in 2000/2001 to 13.7 per cent in 2010/11. It is expected to decrease to 13.0 per cent in 2014/15.

In 2010, the money market migrated to the dematerialised Money Market Settlement System (MMSS) of Strate. Initially only new TB issuances since 26 February 2010 were issued, cleared and settled electronically. By February 2011, all TBs were dematerialised. Beneficial ownership is recorded and updated in Strate's Securities Ownership Register (SOR) and ownership information is provided to all the issuers.

Government deposits with the Bank increased considerably from levels of around R70 billion at the end of 2009 to approximately R132 billion at the end of March 2012. These deposits largely sterilised liquidity injected into the money market, emanating from foreign exchange transactions by the Bank.

The increase in government deposits with the Bank since 2009 was mainly the result of a sharp rise in foreign currency-denominated deposits, which increased from R2.9 billion in December 2009 to R30.9 billion in December 2010 and R67.6 billion in March 2012.

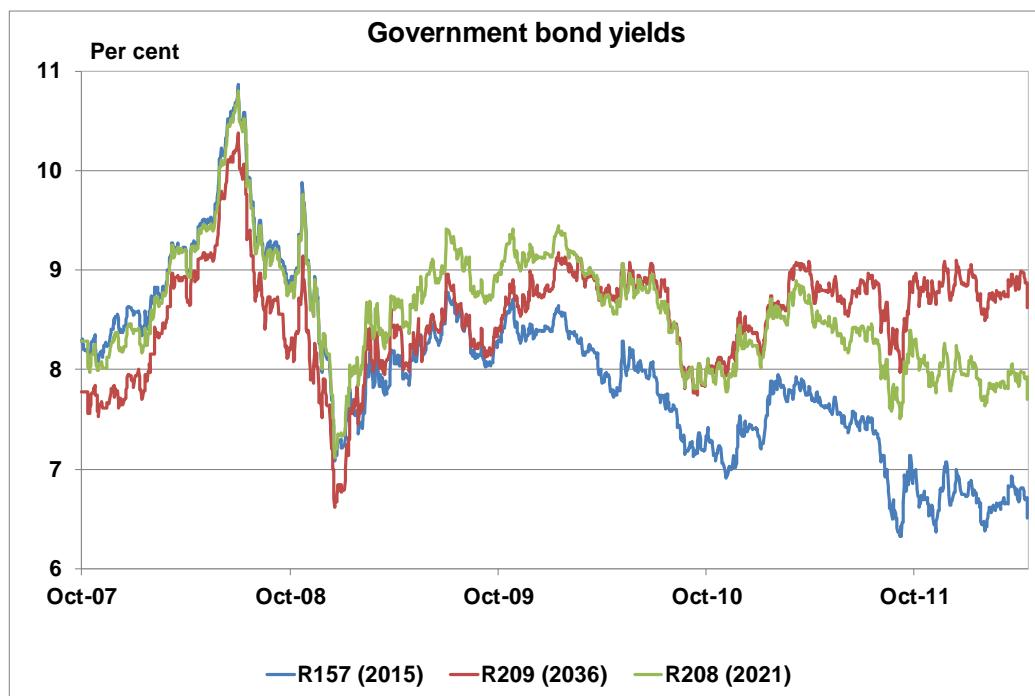
vi. Lengthening maturity of domestic government bonds and developing yield curves

Holdings of government bonds by the Bank remained broadly on the same level for the past six years, with generally the same bonds being held in its portfolio.

The NT switched approximately R15 billion of short-term government bonds maturing between one and two years into longer-term bonds during 2011/12 to manage the refinancing risk of the government debt portfolio. The accompanying table indicates the average, original and remaining maturity in years of all national government bonds, weighted by the outstanding amounts in issue. Further switch auctions are planned for 2012/13.

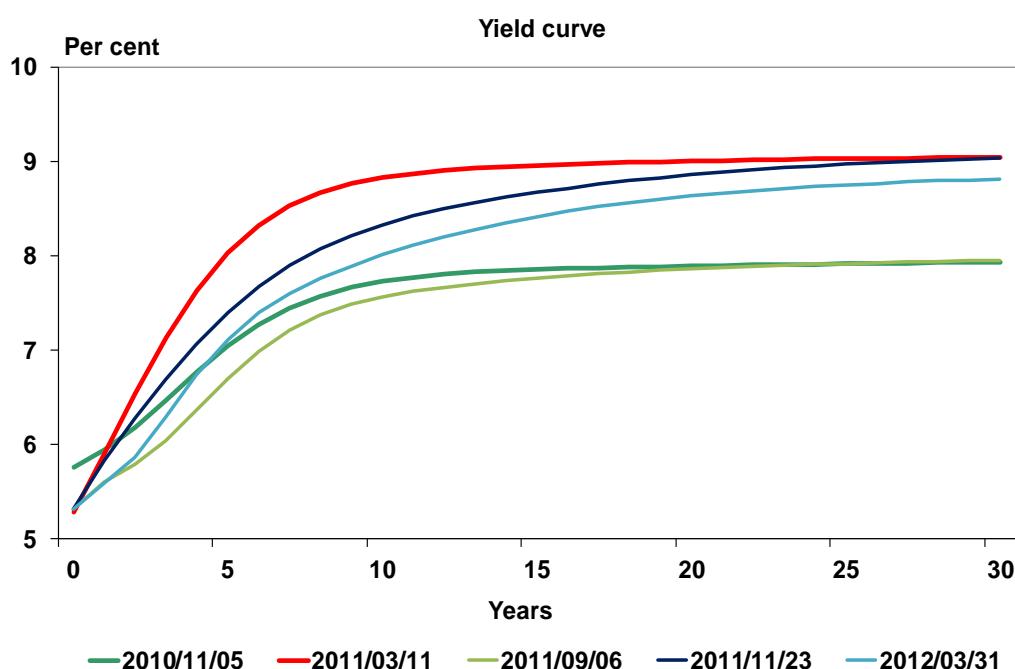
National government total amounts outstanding	2002	2003	2004	2005	2006	2007	2008	2009	2010	Sep 2011
Weighted average original maturity in years	17.3	16.6	15.4	16.0	16.8	17.4	18.4	18.1	18.3	19.4
Weighted average remaining maturity in years	9.0	8.3	8.3	8.2	8.4	8.5	10.0	10.6	10.8	11.3

From the beginning of 2007 to July 2008, bond yields increased in response to inflationary concerns arising from record-high prices of oil and food. Bond yields then declined sharply until December 2008, before increasing again up to July 2009 in reaction to, among other things, the notable increase in the supply of government bonds. From July 2009 to November 2010, bond yields decreased as a result of the appreciation in the exchange value of the rand, the reductions in the repurchase rate, the release of better-than-expected consumer inflation data and strong non-resident demand for domestic bonds, before fluctuating higher up to the beginning of 2011. After experiencing an inverted yield curve from the end of 2006, the yield curve normalised in mid-2009 and has since remained positive sloping.



Except for the short end, which remained anchored to the unchanged repurchase rate, the level of the yield curve across the rest of the maturity spectrum declined from March 2011 to September 2011, before increasing up to November 2011 following the depreciation in the exchange value of the rand. The unusually flat yield curve from the middle area of the curve to the long end steepened from September 2011 to November, as the issuances of longer-term bonds were more significant and as a result of the switches. Since September 2011, the yield curve has moved marginally downwards.

As yields of longer-term bonds increased more pronouncedly than the shorter-term bonds from September to November 2011, the yield gap, measured as the difference between the yields at the extreme long and short ends of the curve, widened from 264 basis points on 6 September 2011 to 372 basis points on 23 November, but has narrowed to 334 basis points on 18 April 2012.



vii. Financial stability risks related to deeper domestic financial markets

Larger capital inflows, more assets and liquidity to support speculative activity

In the aftermath of the global financial and economic crisis, interventions by authorities to stabilise financial systems introduced cyclical imbalances that run the risk of becoming structural in nature. In this way, historically low interest rates and high levels of liquidity in advanced economies caused investors to borrow in these countries and invest in high-yielding assets in EMEs (carry trade). Furthermore, EMEs recovered much quicker from the effects of the global financial and economic crisis, making them attractive destinations for international investment flows. These imbalances created the risk of excessive capital flows to emerging markets, increasing the risk of asset-price bubbles followed by collapses in prices. These risks arise when capital flows are not matched by economies' ability to absorb the flows productively.

Despite the relatively lower economic growth rate in the latter part of 2010 compared to the first half, EMEs remained an important driver of global economic growth and recorded a 7.5 per cent economic growth rate for 2010 as a whole. Countries in developing Asia grew the most rapidly of all EMEs, reaching an average economic growth rate of 9.7 per cent during 2010. Economic growth in EMEs is estimated to have slowed to 6.2 per cent in 2011, as their developed trading partners experienced a significant loss of momentum. In its latest edition of the World Economic Outlook (WEO),² the IMF forecasts that EME economic growth will moderate somewhat further in 2012, before reaccelerating mildly in 2013, to 6.0 per cent. The IMF, however, still points to lingering downside risks. Key risks for EMEs include a rapid rise of inflation pressures and overheating pressures, partly driven by capital inflows.

Faster transmission of external shocks

The South African bond and foreign exchange markets are extremely liquid. With no exchange controls applicable to non-residents, the domestic markets are popular for the hedging of exposures in other markets. Moreover, these deep and liquid domestic markets are convenient for the outright selling/buying of foreign exchange and other securities. The domestic bond market is also a favourable destination for carry trades out of the US, the UK and Japan. The experiences of 2010 and 2011 (year-to-date), however, demonstrated that due to the high level of liquidity, the domestic markets, especially the foreign exchange market, can be extremely volatile, with the exchange rate serving as a key transition channel of global instability into our market. Recent volatility in the rand was therefore the result of global instability and negative sentiment which triggered risk on/risk off trading scenarios, and not really due to domestic circumstances.

The monetary policy transmission mechanism in the domestic market is still seen as being predominantly via the credit channel, with credit priced off the prime lending rate. The pricing of credit from both the money and bond market yield curves has grown significantly. The short end of the bond yield curve is mainly affected by expectations regarding the central bank's monetary policy stance, while the longer end is driven mainly by inflation expectations, explaining the relatively long transmission period between short- and long-term interest rates.

² April 2012.

C. Central banks and public debt management

viii. Central bank debt paper

The Bank issues SARB debentures in terms of section 10(1)(i) of the South African Reserve Bank Act, 1989 (Act No. 90 of 1989). The SARB debentures are issued solely for liquidity management purposes in the domestic money market, that is, to drain excess liquidity from the market. They are issued with maturities of 7, 14, 28 and 56 days. The outstanding amount of SARB debentures in the market was R31.2 billion at the end of November 2011, and R21.0 billion at the end of March 2012.

The Bank issues SARB debentures in the shorter end of the money market curve while the government issues in the longer end. Furthermore, TBs are at times issued at interest rates above the repurchase (repo) rate, whereas debentures are issued at rates at or below the repo rate. The Bank occasionally encounters difficulties in issuing its own securities.

The NT issues TBs for cash management purposes. These are money market instruments with maturities of 91, 182, 273 and 364 days. The outstanding amounts were R54.8 billion, R35.8 billion, R38.0 billion and R31.4 billion, respectively, at the end of November 2011, and R46.5 billion, R36.3 billion, R38.7 billion and R34.8 billion, respectively, on 13 April 2012. NT auctions are on different days to those of the SARB debentures. Furthermore, the NT coordinates the issuance programme of the broader public sector.

ix. Short-term vs long-term public debt

The central bank's involvement in government debt management is on an agency basis to conduct auctions for primary issuance of bonds and TBs.

Historically, the government has co-operated with the central bank when raising currency debt. Initially, proceeds from foreign currency loans were applied against the Bank's oversold net open position. Since then, the government has continued to support the Bank's efforts in foreign exchange reserve accumulation.

x. Domestic vs foreign currency debt

The current arrangement between the Bank and the NT is that the proceeds of the government's offshore borrowing are deposited with the Bank. Furthermore, the NT has funded a substantial portion of the accumulation of foreign reserves in recent years. The purchases are funded out of revenue overruns. However, foreign exchange swaps are also extensively utilised to fund foreign exchange purchases. Outstanding foreign exchange swaps conducted for this purpose amounted to USD6.6 billion at the end of November 2011 and USD7.0 billion at the end of March 2012. These swaps will also eventually be funded by the NT.

xi. Central bank balance sheets and by quasi-fiscal operations

The Bank is not involved in quasi-fiscal operations or unconventional monetary policies. The growth in the size of the Bank's balance sheet over the past five years was therefore due to the policy of the monetary authorities to accumulate foreign reserves in order to reduce the country's external vulnerabilities, and not to unconventional monetary policies (or quantitative easing).

xii. Governance arrangement for the coordination of monetary policy and public debt management

A Memorandum of Understanding (MOU) between the Bank and the government sets out a framework for a consultative process. This MOU also sets out a framework for the formation

of Standing Committees to oversee macro-economic, banking and financial market, financial and regulatory, and international relation issues. The Standing Committee on Banking and Financial Markets contributes, among other things, to the primary objective of debt management policy of minimising debt costs within acceptable risk levels. The Bank also sits as a full participant on the Debt Management Committee chaired by the NT.

Fiscal policy and its implication for central banks

Suchada Kirakul¹

Abstract

Over the past decade, prudent fiscal management has served Thailand well in cushioning the impact of the global financial turbulence. However, going forward, fiscal risks which include a weakened global economic outlook, unbalanced fiscal structure and growing contingent liabilities may have implications for fiscal debt sustainability in the medium term. Since the credibility of fiscal policy greatly influences the conduct and effectiveness of monetary policy, central banks have an incentive to monitor fiscal positions closely. At the same time, it is important to preserve central bank independence and credibility to ensure that the central bank can carry out its primary mandate. In relation to this, policy coordination between the central bank and the government is crucial both in terms of policy stance and public debt management, which will also help foster bond market development and promote financial stability.

Keywords: Thailand public debt, fiscal and monetary policy, fiscal risk

JEL classification: E52 E61 E62 H63

¹ Bank of Thailand.

1. Introduction

The credibility of fiscal policy greatly influences the conduct and effectiveness of monetary policy. Monetary policy is more effective when the private sector trusts that the government will not resort to inflationary deficit financing. Therefore, central banks have an incentive to monitor fiscal positions closely as: (1) the governments may be tempted to call on central banks for debt financing, which would then directly damage the central bank's credibility; and (2) fiscal policy can have a significant impact on the economy as well as the financial markets.

Analysis of fiscal policy and public debt sustainability often hinges on the expected path of public debt. Underlying the projected debt dynamics are factors such as the ability of the government to raise revenues or limit expenditures, medium-term growth prospects and market sentiment that may influence the cost and availability of financing. Rising contingent liabilities, especially those that are less transparent and implicit in nature, may result in a surprise public debt overshoot. The next section of this country paper will offer a brief review of Thailand's public debt development. The paper will then highlight a number of concerns regarding fiscal policy and public debt, followed by important implications for the central bank.

2. Country experience: Thailand

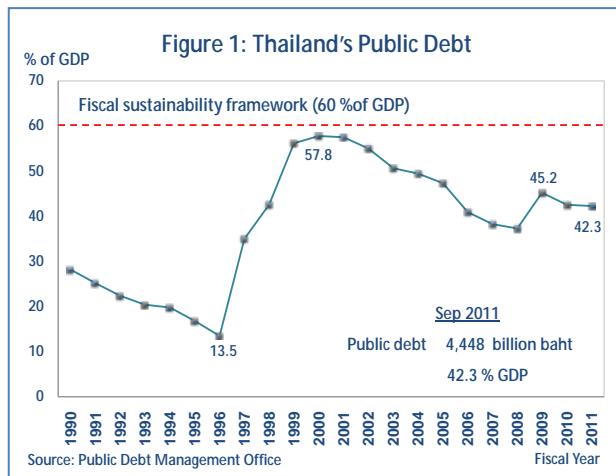
2.1 Development of the fiscal position and public debt

Over the past 25 years, Thailand's public debt path has reflected prudent fiscal management overall – never exceeding the fiscal sustainability guideline of 60 percent of GDP even during the 1997 Asian crisis. Below is a short discussion of two notable episodes in the evolution of Thailand's public debt.

1. *The pre- and post-Asian crisis: 1990 to 2007*

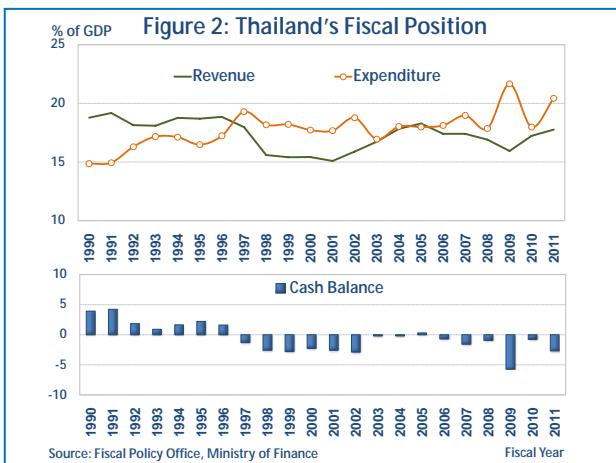
As depicted by Figure 1, the public debt-to-GDP ratio was on a declining trend from 1990 up to the onset of the Asian crisis, bottoming out at 13.5 percent of GDP in 1996 after nine consecutive years of fiscal surpluses. Then, during 1997–2000, there was a sharp rise in public debt to a peak of 57.8 percent of GDP in 2000, as a result of the financial sector bailout during the crisis and the countercyclical role of the public sector to restore the economy². Efforts to reduce the public debt level to achieve fiscal consolidation then followed, and when coupled with the strengthening economy, led to a continuous decline in ratio of public debt to GDP until 2007.

² It should be noted that the total amount of public debt already incorporates the outstanding debt of the Financial Institutions Development Fund (FIDF).



2. *Cushioning the impact of the global financial crisis: 2007 onwards*

As in many countries, the global financial crisis necessitated a fiscal expansion in Thailand. Besides running sizable budget deficits during the past five fiscal years (FY2007–2011), the government also engaged itself in borrowing to mobilize funds for additional investment projects under the “Strong Thailand” project (FY2009–2012), totaling around 3.5 percent of GDP. Moreover, with many upcoming government initiatives to maintain the incumbent government’s popularity, coupled with extraordinary spending to mitigate the negative impact of the recent flood disaster (e.g. urgent relief expenses to assist adversely affected people, spending to restore confidence, and the medium- and long-term investment projects in water management system infrastructure of preliminarily around 3.5 percent of GDP), the government’s expenditure is likely to expand substantially in the periods ahead. Though these efforts have been vital to counter a deep and long recession and propel the economy forward, the fiscal consolidation plan will inevitably be delayed.



At present, the current public debt level is roughly 40 percent of GDP – this figure already incorporates the FIDF debt totaling 1.14 trillion baht at the end of 2011. This level is considered manageable and has some room for fiscal deficit; however, the debt level will likely continue rising in the medium term. Should the global economy be weaker than expected, fiscal consolidation could be further delayed and the debt-to-GDP figures could be even higher and closer to the threshold. There are also a few concerns regarding fiscal risks in the medium term, as discussed in the next sub-section.

2.2 Fiscal risks in the medium term

1. ***The weakened global economic outlook will likely weigh on domestic growth prospects, implying the possibility of a greater need for fiscal stimulus in the periods ahead.*** While fiscal stimulus can be quite effective in smoothing economic cycles, caution must be exercised in ensuring not to over-stretch the fiscal room. In particular, as we head into a period of heightened uncertainties, some insurance, i.e. retaining some fiscal buffers for emergency, may be needed, though this seems difficult to achieve given politicians' short policy horizon. The key to lessening this risk is to better align the length of the policy horizons of politicians and institutions charged with the economic and financial stability mandate.
2. ***The unbalanced fiscal structure may limit fiscal room, resulting in greater reliance on debt financing and declining debt service ability.*** Currently, Thailand's fiscal structure is unbalanced in two ways. First, expenditures have been growing on average twice as fast as revenues during the past five years, owing to a rapid increase in expenditures associated with social welfare and education, and the continued expansion of government initiatives. On the other hand, revenue collection, averaging about 17 percent of GDP, is modest compared to other emerging countries, owing to a narrow tax base and numerous tax exemptions and deductions. Second, the expenditure side is fairly skewed towards current spending. During the past 10 years, capital expenditure has declined from 24 percent to 17 percent of total budget in 2011. Taking into account infrastructural investment through Public-Private Partnerships (PPPs), the amount is still low. The low public investment is a concern in terms of the country's medium-term growth potential that will come back to affect revenue collection, increase the budget deficit, and further fuel the uptrend in public debt. Furthermore, with GDP growing at a slower pace while public debt continues to rise, the debt-to-GDP ratio may edge up further and risk becoming unsustainable in the medium term. To address the problem of an unbalanced fiscal structure, there is a need to implement fiscal reforms, especially tax reform and current expenditure cut-back with a view to ensuring fiscal sustainability.

Table 1: The Growth Rate of Revenue, Expenditure and GDP
(percentage and average per fiscal year)

Fiscal Year	1997-2006	2007-2011
Expenditure	4.9	8.8
- Social welfares ^{1/}	7.0	12.5
- Education	5.8	11.3
- Other Expenses ^{2/} (excluding principal and treasury repayment)	4.5	6.6
Net revenue	4.7	4.2
Nominal GDP	6.3	6.5

Remarks: ^{1/} including health care benefits, social securities benefits and housing spending
^{2/} including economic, administrative, defensive, environmental, religion, cultural and entertainment expenditures.

Source: The budget document, Bureau of the Budget

3. ***Growing contingent liabilities may reduce balance sheet transparency and increase the possibility of a debt surprise that could be particularly negative for the financial markets and financing costs of the government.*** While explicit government guarantees are already included as part of public debt, the number of government initiatives implemented through government/state owned institutions, for example Specialized Financial Institutions, has increased in recent years. Though

these activities do not instantaneously create liabilities for the government, in the event that a systemic risk concern arises from significant losses from such activities, the government will be called upon to rescue the institutions in order to maintain confidence. From this perspective, this represents an implicit contingent liability for the government, and efforts should be made to evaluate its fiscal burden. There are several ways to reduce this risk, including (1) bringing such government initiatives on balance sheet; and (2) putting in place a mechanism to ensure effective risk management of the institutions concerned. There is also a risk of creating market distortions. While there are reasons to support the government's role in addressing market failures, care must be taken to not introduce market inefficiencies, for example favorable treatment for certain segments, distorted pricing, and monopoly. To reduce this risk, it is important to strategize the method and timing of exit policies of some government initiatives, involving the private sector as appropriate.

Taken together, these fiscal risks may have important implications for Thailand's fiscal debt sustainability in the medium term, thus deserving serious attention. Moreover, growth in public debt will also imply a higher financing burden, which during an economic expansion may lead to the crowding out of private sector access to sources of funds, inhibiting private sector activities. In addition, with higher indebtedness, the sovereign credit rating may be affected, resulting in a higher cost of financing. The bottom line is that fiscal adjustments will still be required in Thailand to mitigate risks from the global economy and to raise the country's growth potential. At the same time, efforts must be made to ensure that any stimulus measures are based on longer-term economic stability considerations with a view to limiting the risk of fiscal dominance in monetary policy, which is addressed in the final part of this paper.

3. Implications of fiscal risk for the central bank and challenges ahead

The fiscal risks highlighted in section 2 and their impact on public debt sustainability will likely have implications for the central bank in the following ways.

1. ***Closer coordination between the central bank and the Ministry of Finance on fiscal and monetary policies is essential.*** The recent European debt crisis has underscored the multifaceted nature of the interrelations between fiscal policy, monetary policy and overall financial stability. Though Thailand's fiscal position is still strong and the country is nowhere near on the verge of a debt crisis, addressing this institutional arrangement issue early on is worthwhile. As the main public institutions responsible for the country's macroeconomic policy, coordination between the central bank and Ministry of Finance is therefore crucial. Information sharing, cooperation and coordination between the two institutions need to be ensured in order to put in place sound and coherent macroeconomic policy as well as to better align the length of the policy horizons of the government and the central bank so that everyone is on the same page regarding the country's long-term prospects and risks. In Thailand, the country's main economic institutions meet yearly to discuss the appropriate government budget framework for each fiscal year. The discussion focuses on the outlook for economic and monetary conditions, revenue collection, issuance of government bonds and the sustainable level of public debt, to name but a few. The challenge, however, remains in finding ways to further strengthen and improve this coordination mechanism to ensure greater effectiveness and further stimulate open and candid policy discussions.
2. ***All non-standard measures taken by the central bank must be restricted to extraordinary circumstances and be temporary, with a clear exit strategy.*** This is to ensure that the central bank can carry out its primary mandate of price stability.

It has often been the case that emerging economy central banks are required to take on a number of development functions, pursuing “quasi-fiscal operations” such as extending credit to priority industries, e.g. a coordination mechanism between the central bank and banks to extend credit – soft loans – to flood-affected SMEs. Such practice entails a risk of impairing monetary policy effectiveness, i.e. interest rate pass-through, while the problem of market failures (both credit access and availability) prevail. In this case, the central bank needs to closely gauge the impact of such activities on the money market and conduct appropriate monetary operations – a costly action, but nevertheless important to ensure that monetary policy transmission is not impaired. An additional challenge is how to eventually phase out this role, despite public expectations and political pressure. The exit plan should be well thought through and clearly spelled out.

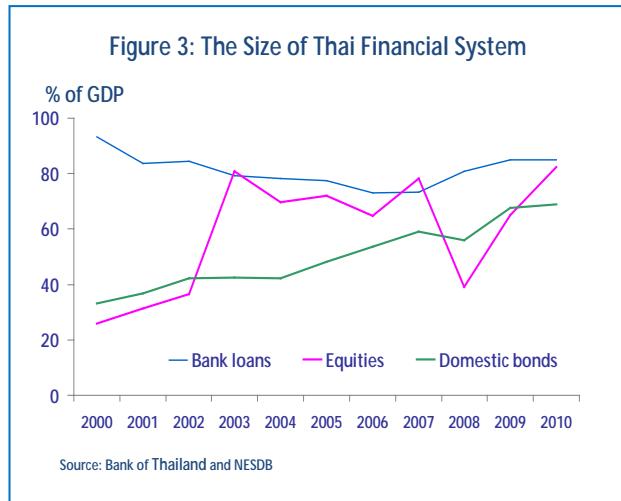
When economic and financial development takes hold, the central bank needs to return to more normal modes of operation, minimizing the fiscal implications of monetary policy operation, in order to achieve the medium-term goal of price stability. While this challenge may be more easily addressed in advanced economies due to greater clarity in terms of the institutional setup which allows a clear exit strategy and loss bearing responsibilities to be devised, developing economies may face a more difficult time due to the likelihood of greater fiscal dominance on the central bank’s operations. Thus, preserving central bank independence and credibility is all the more important at times like this.

3. ***Political pressures on the central bank to monetize the deficit may intensify.*** This would complicate the work of the central bank and damage its credibility, which would ultimately undermine the achievement of its primary objective of price stability.

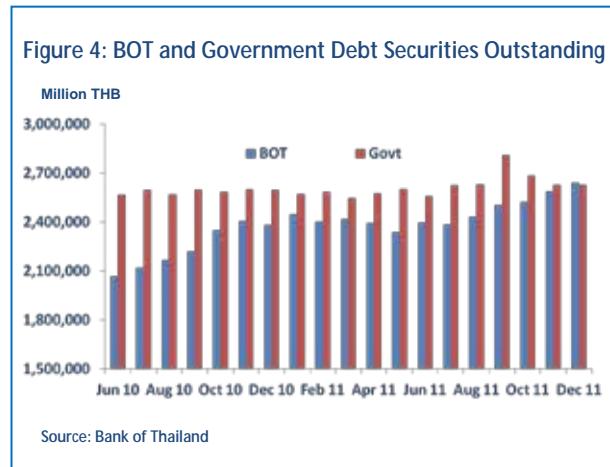
4. **The roles of public debt management and central bank bond issuance in fostering bond market development and promoting financial stability**

- 4.1 **The government and the Bank of Thailand have made continuous efforts to strengthen and deepen the domestic bond market to create a more resilient financial sector**

1. ***The local bond market has grown by more than double over the past decade.*** Financial disintermediation since the 1997 crisis has highlighted the importance of financial markets as viable alternative sources of funds to bank loans. The domestic bond market has doubled in size from 33.2 percent of GDP in 2000 to 68.9 percent of GDP in 2010, while the equity market has more than tripled from 26.0 percent of GDP to 82.5 percent of GDP. On the other hand, bank loans have declined from 93.2 to 85.0 percent of GDP.



2. ***The increasing role of domestic bond market as a source of financing has prompted the need for a deep and liquid bond market.*** The government bond market has grown in breadth and depth with regular issuance of benchmark bonds, a broad investor base, diverse and innovative products, and sound market institutions and infrastructure. Establishing a substantial enough issuance volume has contributed to a more reliable yield curve, thus providing a benchmark for the private sector's bond issuance and enhancing liquidity in the secondary bond market trading. Savings bonds, floating-rate bonds, and inflation-linked bonds are issued to broaden the investor base and provide investors with diversified products as well as risk-hedging instruments.



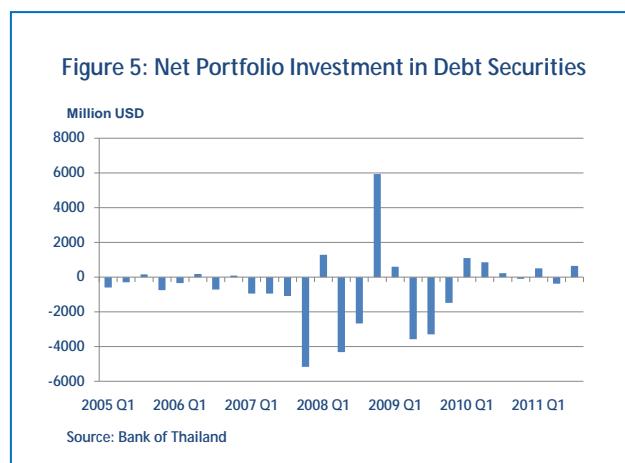
3. ***The BOT has also become an important issuer in the Thai bond market as its sterilization needs grow.*** Since 2003, the BOT has issued its own debt paper on a regular basis as another monetary instrument used to absorb excess liquidity in the system. As of end-2011, total outstanding BOT bills and bonds stood at approximately 2.642 trillion baht, compared with 2.627 trillion baht outstanding of government bonds and treasury bills.

4. ***The BOT coordinates closely with the Public Debt Management Office (PDMO) to ensure the best possible outcome for the bond market as a whole.*** The presence of two "sovereign" issuers may not be ideal as it could cause market segmentation and make both securities less liquid. To mitigate this potential negative impact, the BOT and the PDMO coordinate closely and continually

throughout the year, both formally and informally. The PDMO holds quarterly meetings for the debt management committees, in which BOT representatives take part, to discuss and plan the issuance calendar. To avoid competing with each other, the timing and maturities of issuance are carefully designed for both issuers to complement one another. The government primarily issues longer-term benchmark bonds (e.g. 5-, 7- and 10-year maturities) with the longest maturity of 50 years, while the BOT issues its securities with a maximum maturity of 4 years. Their auctions are also held on different days of the week. In addition, the BOT also facilitated the first issuance of government inflation-linked bonds (ILBs) by providing technical support in the calculation of real yields and pricing along with supportive registration system and helped resolve related regulatory issues to ensure its smooth launch.

4.2 Nevertheless, as cross-border capital flows surge, it is critical to strike a balance between promoting market development and ensuring financial stability

1. ***Foreign participation has enhanced liquidity in the bond market, but large and volatile capital flows have rendered domestic bond markets susceptible to sudden price movements and greater disruption.*** In the early stage of bond market development, non-resident investors were exempted from withholding tax in an effort to attract foreign investors into the domestic debt market, in order to enhance liquidity. However, volatile global market sentiments have heightened volatility in the domestic bond market and occasionally became the primary factor affecting the yield curve – both in the short and the long end. In October 2010, Thailand reintroduced the withholding tax on non-resident investors, in response to a surge in short-term capital inflows which seemed speculative in nature and caused excessive exchange rate volatility. Thus, the role of foreign investment in the domestic debt market needs to be carefully considered in order to reap its benefit without making the country more vulnerable.



2. ***The impact of capital flows on bond yields may hinder monetary policy transmission.*** From time to time, the movement in the short end of the yield curve has misaligned with that of the policy rate due to large capital inflows. As bond yields factor into the pricing behavior of commercial banks and impact retail rates, such misalignment, in effect, may moderate the degree of interest rate pass-through

from the policy rate to retail rates.³ A large proportion of the change in long-term yields in Asia over the last decade can be explained by global factors,⁴ which may subject the cost of long-term funding (via the bond market) to global factors rather than domestic financial conditions. This may, consequently, hinder monetary policy transmission.

³ Pongsaparn R, S Wongwaisiriwat, P Chotewattanakul and S Vimolchhalao (2011), "Challenges to Monetary Operations in a Small Inflation-Targeting Economy: Living with Foreign Exchange Flows", *European Central Bank Workshop on The post-crisis design of the operational framework for the implementation of monetary policy*, Frankfurt am Main (October 2011).

⁴ International Monetary Fund (2011), *Regional Economic Outlook: Asia and Pacific* (Washington, April).

Globalisation of the interaction between fiscal and monetary policy

Mehmet Yörüköglu and Mustafa Kılınç¹

Abstract

The interaction between fiscal and monetary policies evolves over time and differs from country to country. In this study, we first present the case of Turkey. During the 1990s, the country's fiscal deficits and public debt ballooned. Monetary policy was severely constrained by the resulting high-risk outlook for the economy, combined with the underdevelopment of domestic financial markets. In the 2000s, however, a significant fiscal consolidation has allowed fiscal policymakers to move from a procyclical to a countercyclical stance, increasing the effectiveness of monetary policy. In the second part of the paper, we discuss the implications of globalisation for the interaction between fiscal and monetary policy. One possible channel comes from the interplay of the inflation rates, policy rates and real exchange rates between emerging and advanced countries. Structural factors such as differences in consumer baskets and quality measurement error, or convergence processes might lead to higher inflation rates and currency appreciation in emerging countries. It might be desirable to smooth this appreciation and contain excessive exchange rate volatility. In this regard, monetary policy in emerging countries might be constrained by inflation differentials and the low level of policy rates in developed countries. In this case, a possible policy option would be to use fiscal consolidation, a strategy that has been observed in emerging countries over the past decade.

Keywords: Fiscal policy, monetary policy, globalisation, real exchange rates

JEL classification: E52, E62, F42, F31

¹ Central Bank of the Republic of Turkey.

1. Introduction

The global financial crisis of 2008 and Europe's sovereign debt problems have highlighted the importance of the interaction between fiscal and monetary policy. Fiscal imprudence can significantly constrain monetary policymakers by forcing them to take into account additional concerns, such as borrowing spreads. It also weakens the transmission of monetary policy by, for instance, hampering the development of domestic currency markets. In contrast, a sound fiscal policy can help monetary policy both in the short term, by allowing fiscal policy to be conducted in a countercyclical way, and in the long run by strengthening the transmission of monetary policy. A stable fiscal stance improves perceptions of country risk, helps develop the domestic currency markets, and mitigates structural problems such as maturity and currency mismatches.

Turkey presents an excellent case study of how fiscal policy, which significantly constrained monetary policy in the 1990s, evolved into a sound framework that supported monetary policy over the business cycle and strengthened the transmission of monetary policy in the 2000s. Turkey's experience is in line with that of most other emerging countries as presented by Frankel et al (2011). In that paper, the authors show that, over the past decade, many developing countries have moved from a procyclical to a countercyclical fiscal policy and that stronger institutions were partly responsible for this change.

In this paper we first analyse in detail the evolution of fiscal policy in Turkey. We show the implications for financial markets of increasing public debt and high budget deficits, the development of domestic currency financing and dollarisation, and the effectiveness of central bank policies. We note that fiscal dominance arising from increasing public debt tended to "crowd out" the availability of financial funds to the private sector, and hampered the development of domestic currency financial markets. As a result, there was a high degree of dollarisation in deposit/credit markets as well as in public debt instruments. This high level of dollarisation, coupled with the partial dependence of fiscal policy on direct central bank advances, significantly constrained the effectiveness of monetary policy. Exchange rate pass-through was very high and the credit channel was weak. As a result, Turkey experienced very high and volatile inflation in the 1990s. After the banking and currency crisis in 2001, Turkey implemented important reforms in the monetary, fiscal and financial areas. A significant fiscal consolidation has been achieved and the public debt-to-GDP ratio has steadily fallen. Monetary policy was granted independence in 2001, and inflation has since been brought down from above 60% to below 10%. Substantial reforms in financial markets have also improved the health of the banking sector. Overall, in the 2000s Turkey has achieved a solid fiscal consolidation, successful disinflation, the development of domestic currency financial markets and de-dollarisation. Emergence of a strong credit channel along with a lower level of exchange rate pass-through has significantly strengthened monetary policy transmission. During the 2008 global financial crisis, the banking sector's robustness and the strong countercyclical reactions of both fiscal and monetary policies helped the economy to recover quickly from the crisis. At this time, strong fiscal balances contributed to the good risk perceptions of the Turkish economy, and provided a wide operational space for the monetary policy response.

In the second part of the paper, we look at the global dimensions of fiscal and monetary policy interactions. We show that there are persistent differentials in inflation rates between advanced and developing countries, ie over the last decade inflation has been consistently higher in developing countries than advanced countries. Some part of this difference might come from measurement issues between advanced and emerging countries, differences in the CPI basket weights and the convergence process of developing countries. As Yörüköglu (2010) demonstrates, measurement issues and basket differences can make developing country inflation look significantly higher than advanced country inflation. This difference puts upward pressure on both policy rates and the real exchange rates of the developing countries. However, faced with the persistent inflation differential and the resulting steady

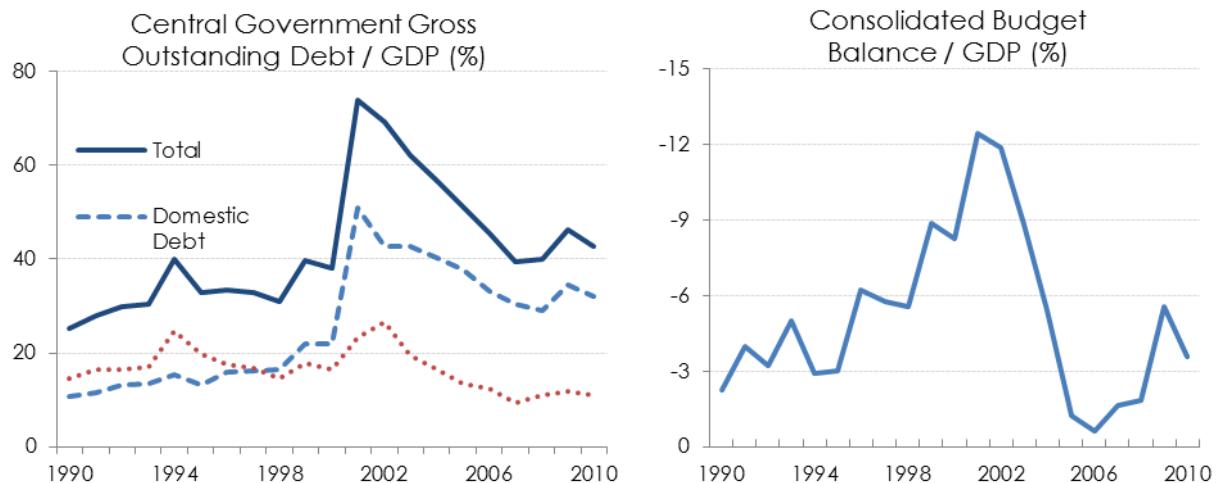
upward pressure on real exchange rates, developing countries might find it optimal to reduce that pressure by consolidating their fiscal balances and applying a tight fiscal policy. For advanced countries, this mechanism works in reverse, in the sense that low inflation along with a depreciating domestic currency helps to loosen their fiscal policy. In this part, we present the relevant data and elaborate on how the global interplay of inflation, policy rates and exchange rates can affect the interaction between fiscal and monetary policy.

In the rest of the paper, Section 2 outlines the fiscal and monetary policy interactions experienced in Turkey, Section 3 outlines the global dimensions of this interaction and Section 4 concludes.

2. Evolution of fiscal-monetary policy interaction in Turkey from the 1990s to the 2010s

Figure 1 presents the evolution of Turkey's public debt and budget balance as a ratio to GDP between 1990 and 2010. As the left-hand panel shows, the gross debt-to-GDP ratio almost tripled from 25% in 1990 to 74% in 2001, mostly due to the domestic debt component. In the same period, the consolidated budget deficit moved from 2.3% of GDP in 1990 to 12.4% of GDP in 2001. This unsustainable path for the fiscal variables greatly increased the riskiness of the Turkish economy as observed in sovereign bond spreads of more than 10 percentage points in 2001. During this period, government finances relied mostly on the domestic credit markets and partly on central bank advances, therefore limiting the development of domestic currency financial markets and hence constraining monetary policy. After the 2001 crisis, significant reforms followed in fiscal, monetary and financial policies. During the reform process, budget deficits fell quickly below 3% and debt stock decreased below 40% as shown in Figure 1. This fiscal consolidation helped the development of financial markets and supported the operational framework for monetary policy.

Figure 1
Public Sector Debt and Budget Balance in Turkey



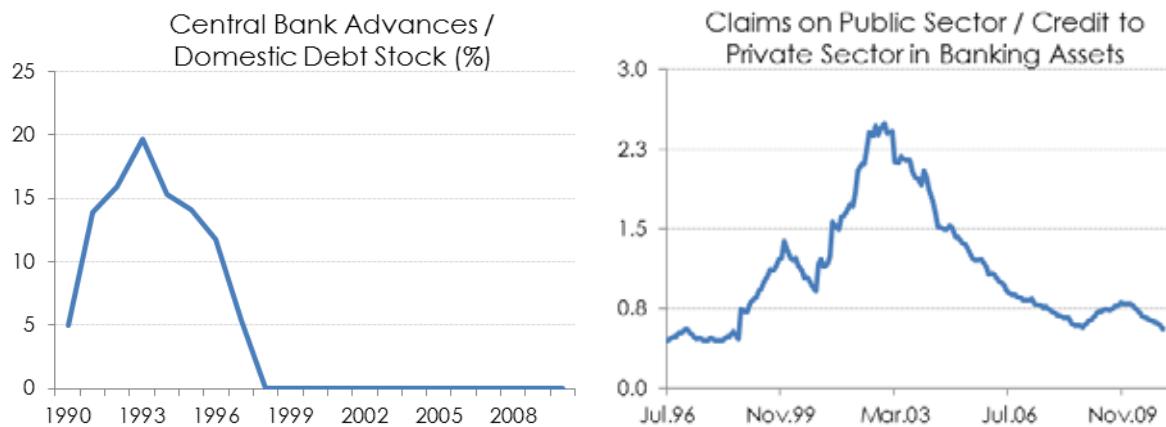
Source: Central Bank of the Republic of Turkey.

2.1. Fiscal dominance and constrained monetary policy in the 1990s

Turkey's deteriorating fiscal position during the 1990s was financed mainly by the domestic banking sector. If we consider the government and the private sector as the two main users of banking assets, we see in the right-hand panel of Figure 2 that the government's share of banking assets increased significantly. By mid-1996, the ratio of public sector claims to private sector credit in banking assets was around 0.45 and this ratio increased to 2.4 by mid-2002. This unprecedented increase in the government use of banking funds was a real challenge for the development of domestic financial markets in that heavy public borrowing can easily crowd out private activity in the banking sector. This moves banks away from their traditional role of credit supplier to the private sector. As a result, private agents may respond by moving to foreign currency funding, as was the case in Turkey. Another dimension of high public debt levels is that some part of this debt was financed by central bank advances. As seen in the left-hand panel of Figure 2, central bank advances increased to around 20% of domestic debt stock in 1993 before going to zero in 1998.

The side effects of fiscal deterioration showed themselves in the low level of financial development, a high degree of dollarisation, high exchange rate pass-through, and the restricted effectiveness of monetary policy. The outcome was high and volatile inflation in the 1990s. Given the low level of financial development in the 1990s (the private credit-to-GDP ratio fluctuated between 15% and 25% from 1990 to 2002), the heavy dependence of the public sector on domestic financial markets created a high level of dollarisation in both public finances and private transactions. The FX share in gross public debt, as shown in the left-hand panel of Figure 3, was close to 60% by the beginning of 2003; and the dollarisation levels for deposits and credit were around 50% from mid-1996 until end-2002, as shown in the right-hand panel of Figure 3. This high level of dollarisation manifested itself as a high level of exchange rate pass-through to domestic prices. As estimated by Kara and Öğünç (2008), the cumulative pass-through to core consumer price inflation in nine months was 48% in the February 1995–April 2001 period (Figure 4, left-hand panel).

Figure 2
Central bank advances to government and fiscal dominance in financial markets in Turkey



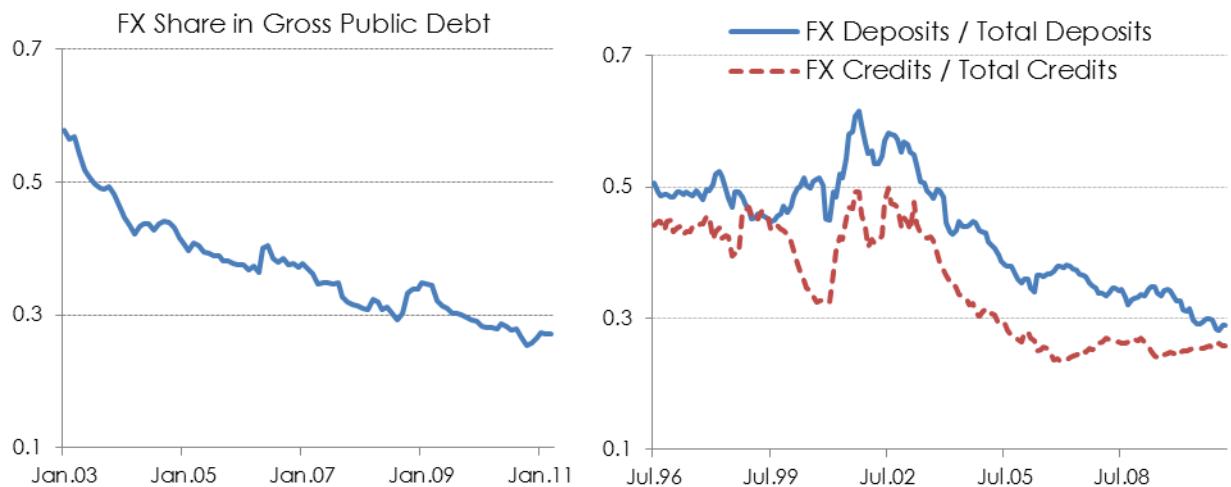
Source: Central Bank of the Republic of Turkey.

Monetary policy was significantly constrained, and in several dimensions, by the resulting fiscal dominance in financial markets, the low level of financial development and the high level of exchange rate pass-through. The underdevelopment of domestic credit markets severely hampered the effectiveness of the credit channel in demand management. Dollarisation also played a part in undermining the effectiveness of this channel. Moreover,

given the high level of dollarisation, exchange rate movements had a strong effect on inflation, and thus became the main determinant of domestic price developments. Exchange rates were largely determined by risk perceptions that were conditioned by public policy in particular and the Turkish economy in general, with the result that monetary policy had to respond mainly to changes in risk appetite and the resulting exchange rate fluctuations. Thus, monetary policy was focused mainly on containing the negative effects of underdeveloped credit markets and high currency mismatches in the domestic economy rather than on directly managing aggregate demand and containing inflation.

Turkey's twin banking and currency crisis in 2001 demonstrated how monetary policy can be tightly constrained by fiscal policy. During the crisis, public debt and the budget deficit reached record levels, aggravating risk concerns for the economy, in a similar way to that seen in the current European debt crisis. EMBI spreads for Turkey increased above 10 percentage points, and the economy experienced an output loss of more than 5%. At the same time, the Turkish lira depreciated significantly. In contrast to a conventional monetary policy during a crisis (similar to the one in developed countries where monetary policy reacts in countercyclical way by decreasing the policy rates to support the economy), monetary policy in Turkey reacted in a procyclical way and the monetary stance was tightened in 2001. This policy action was taken mainly to contain the adverse balance sheet effects coming from the large depreciation of the Turkish lira. In this way, monetary policy was significantly constrained by the imprudent fiscal policy and its consequences such as underdeveloped financial markets and a high degree of currency mismatch in the economy. In addition, fiscal policy had to tighten significantly after the crisis to improve risk perceptions towards the country. Turkey's experience is comparable with that of some heavily indebted European countries in 2011. Continued budget deficits drove public debt to very high levels, worsening risk perceptions and raising concerns about fiscal sustainability. This led to sharp increases in risk spreads. To contain this deterioration in risk perceptions, some European countries resorted to tight fiscal policies even before the end of the 2008–09 global financial crisis. In the process, monetary policy was severely constrained either by the zero lower bound or by the risk concerns that dominated financial markets.

Figure 3
Dollarisation in public debt and in financial markets in Turkey



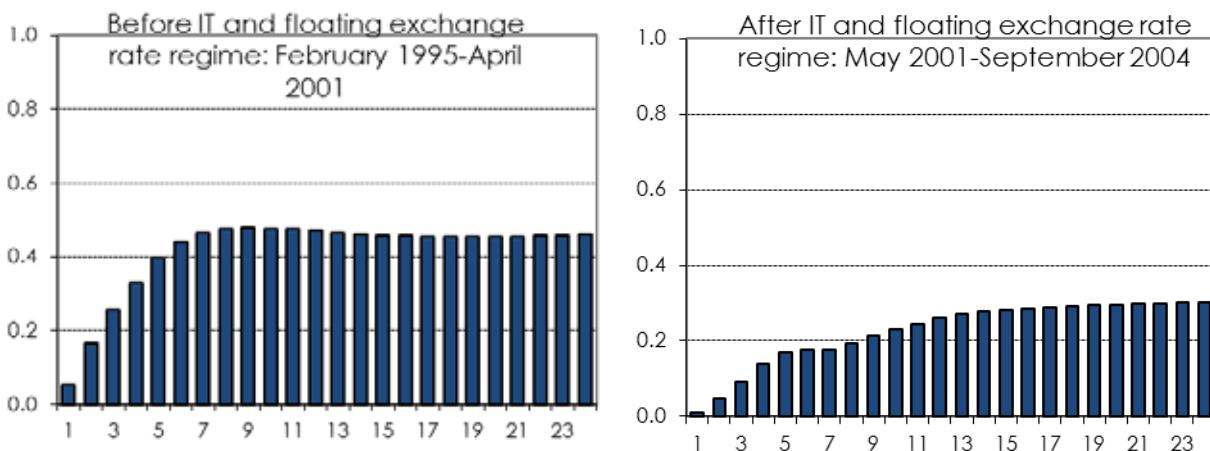
Source: Central Bank of the Republic of Turkey.

2.2. Reforms, fiscal consolidation and independent monetary policy in the 2000s

After the 2001 crisis, Turkey implemented significant reforms in fiscal, monetary and financial policies. On the fiscal side, significant fiscal consolidation has resulted in lower levels of public debt and smaller budget deficits as seen in Figure 1. On the financial side, there has been more prudent regulation and tighter supervision of the banking sector, firms and households. The net foreign asset positions of banks have been curbed and foreign currency borrowing by firms and households has been regulated. On the monetary policy side, central bank advances were reduced in 1998, and the central bank was granted independence in 2001.

Figure 4

Cumulative exchange rate pass-through to core CPI inflation (in months): VAR evidence



Source: Kara, H. and F. Öðünç (2008).

The improved fiscal stance has steadily reduced the degree of fiscal dominance in financial markets. As shown in the right-hand panel of Figure 2, the ratio of public sector claims to private sector credit in banking assets fell from 2.4 in 2002 to 0.6 in the end of 2010. This development was accompanied by the rapid development of financial markets, where the private sector credit-to-GDP ratio rose from around 15% in 2001 to around 50% in 2010. In the meantime, the currency decomposition of government finance has also changed significantly. As seen in the left-hand panel of Figure 3, the share of foreign currency in gross public debt fell from 57.8% in the beginning of 2003 to 26.7% by the end of 2010. Both the reduced fiscal dominance in financial markets and the falling share of foreign currency in public debt instruments have helped the development of domestic currency financial markets, thereby strengthening monetary policy transmission. Financial market reforms have also contributed to the sound development of the banking sector. The banking sector's net foreign asset position of the banking sector has been curbed. Meanwhile, corporate foreign currency borrowing has been restricted to exporting firms and foreign currency borrowing by households has been prohibited. So that currency mismatch risks can be better hedged, the development of hedging techniques has been encouraged in the financial markets. As a result of these reforms, the level of dollarisation in credit and deposits fell from about 50% in 2000 to below 30% at the end of 2010 (Figure 3, right-hand panel).

In addition to improvements in the structural factors underlying fiscal variables, fiscal policymaking has also improved. In Table 1, we see cyclical as measured by the contemporaneous correlation with GDP for the main government variables. Before 2001, total government expenditures were procyclical with a correlation coefficient of 0.19 and they became countercyclical after 2001 with a correlation coefficient of -0.38. Regarding the

composition, government consumption as a ratio to GDP was countercyclical but government investment with all its subcomponents was strongly procyclical. After 2001, consumption has become more countercyclical, and all components of government investment except machinery investment have changed from procyclical to countercyclical. This movement of fiscal policy towards a more countercyclical stance has been also observed in other emerging countries as shown by Frankel et al (2011). A procyclical fiscal policy works against monetary policy. During a demand boom with inflationary pressure, monetary policy would ideally tighten so as to curb demand and ward off inflationary pressure. However, a procyclical fiscal policy puts extra demand pressure on the economy and reduces the effectiveness of monetary policy. Therefore, a change in fiscal policy from a procyclical to countercyclical stance in Turkey and in most emerging countries has been an important change in the interaction of monetary and fiscal policies.

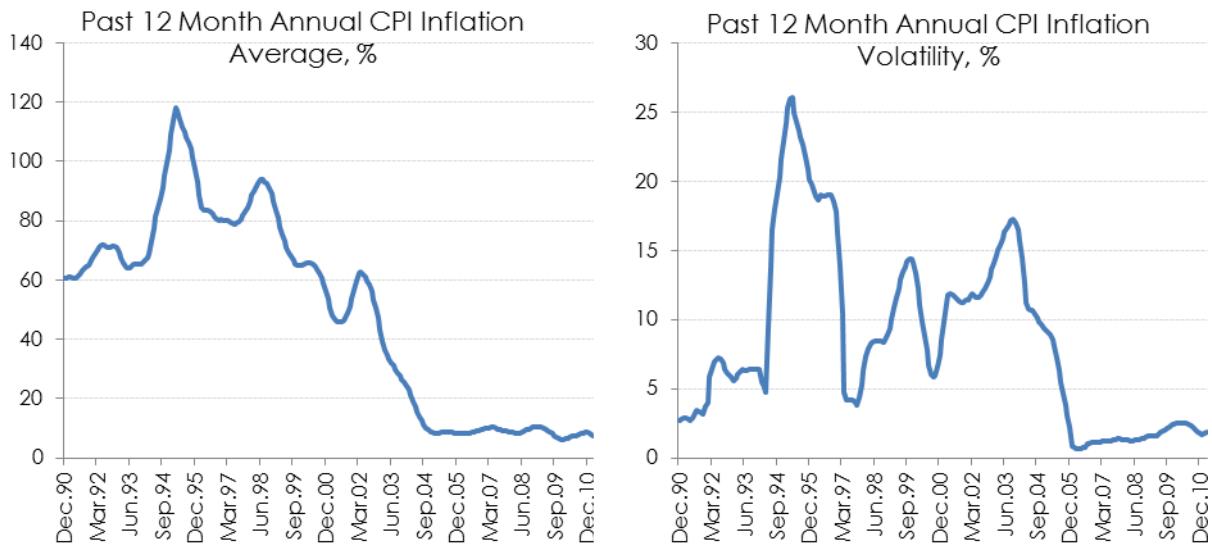
Table 1
Cyclicality of public policy : contemporaneous correlations with GDP

	1987q1– 2001q4	2002q1– 2007q3
Government Consumption and Investment over GDP	0.19	-0.38
Government Consumption over GDP	-0.48	-0.57
Government Consumption-Wages over GDP	-0.92	-0.90
Government Consumption-Other over GDP	0.09	-0.40
Government Investment over GDP	0.34	-0.20
Government Machinery Investment over GDP	0.41	0.20
Government Construction (Building) Investment over GDP	0.27	-0.39
Government Construction (Other Building) Investment over GDP	0.10	-0.10

Source: Central Bank of the Republic of Turkey. All series are seasonally adjusted and HP-filtered. Statistics are for cyclical components.

Important monetary policy reforms were also made in the 2000s. The central bank was made independent in 2001 and price stability was defined as the Bank's main responsibility. As for the exchange rate, a market-based flexible exchange rate policy was adopted to support monetary policy. In 2006, the central bank started implementing a fully fledged inflation targeting policy thereby increasing the transparency and predictability of monetary policy. Favourable fiscal consolidation and the development of the domestic currency credit markets along with policy independence significantly widened the operational space for monetary policy and improved its effectiveness. As seen in the right-hand panel of Figure 4, the exchange rate pass-through to core consumer price inflation in first nine months fell to 21% in the May 2001–September 2004 period. Thanks to a stronger credit channel and the easing of concerns about fiscal risks, monetary policy has been able to focus mainly on the Bank's main responsibility of price stability. As a result, a significant disinflation was achieved during the early 2000s. As shown in Figure 5, inflation fell from above 60% in mid-2002 to below 10% at end-2004 and stayed very stable afterwards. A similar improvement was also observed in the volatility of inflation. Moreover, the lengthening maturity of domestic public debt allowed healthier yield curves to develop, together with a stronger transmission mechanism for monetary policy.

Figure 5
Inflation and volatility in Turkey



Source: Central Bank of the Republic of Turkey.

The global financial crisis of 2008 demonstrated, in a Turkish context, the benefits of a sound fiscal stance and an independent monetary policy. In contrast to the 2001 Turkish crisis, in which economic policies were constrained by heavy public debt and high levels of dollarisation both fiscal and monetary policies responded during the 2008 crisis in a countercyclical fashion to support the economy. Benefiting from the strong stance of fiscal policy and the relatively low level of dollarisation, monetary policymakers were able to ease significantly by cutting policy rates by more than 10 percentage points. These measures were instrumental in the fast recovery of the Turkish economy from the crisis. In the meantime, strong GDP growth and Turkey's favourable fiscal position led to a surge of volatile short-term capital flows into the Turkish economy, as seen in other emerging countries. During the crisis, an unconstrained and independent monetary policy also proved very useful in countering the ill-effects of financial volatility on the economy. The central bank has devised a new policy mix consisting of an interest rate corridor and reserve requirement ratios as the main tools. These policies have proved to be very useful in containing excessive exchange rate movements and in moderating domestic credit growth. This experience has also underlined the importance of an unconstrained monetary policy in effectively supporting the macrofinancial environment.

3. The global dimensions of fiscal-monetary policy interaction

Economic activity has become substantially globalised in the last two decades. During this period, the mutual integration of the advanced and developing countries has proceeded rapidly and, as a result, the policy actions of one group of countries exert a considerable effect on those of the other. One prime example of such policy spillovers was the quantitative easing policies of advanced countries during and after the global financial crisis of 2008. The resulting surge of short-term capital flows into developing countries has confronted their policymakers with substantial macroeconomic challenges.

The globalisation process also has possible implications for the interaction between fiscal and monetary policies. One such channel might come from the sustained differences in

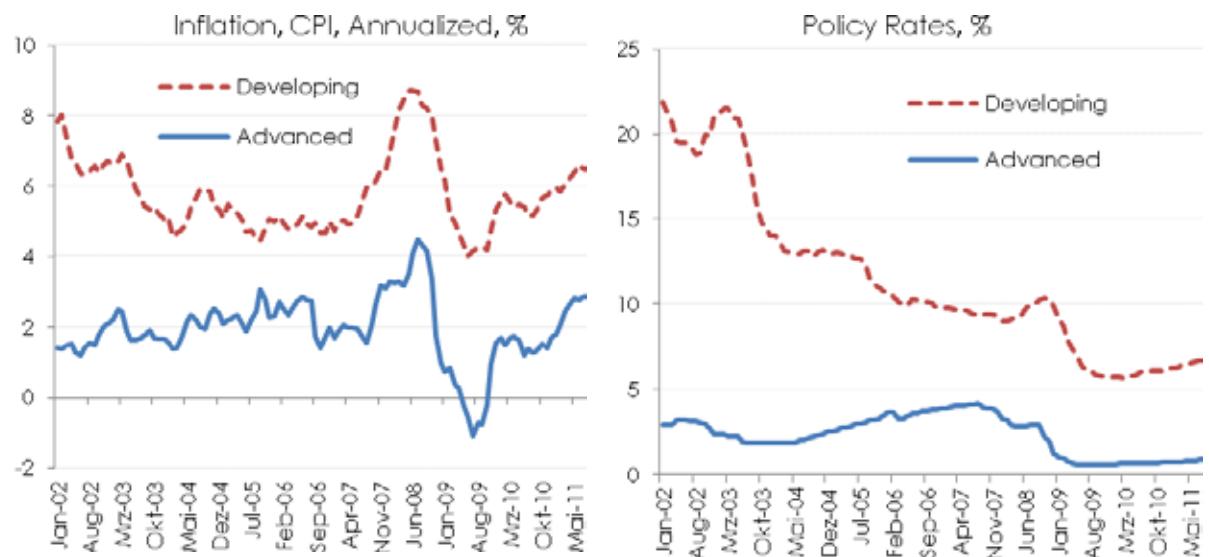
certain macro variables between advanced and emerging countries. A sustained difference in inflation and policy rates deriving from structural factors in the two country groups would have implications for real exchange rates with the result that the fiscal stance of advanced and developing countries might endogenously differ from each other as observed in the data.

3.1. The inflation differential between advanced and developing countries

The last decade has witnessed a persistent difference of inflation between advanced and emerging countries. As shown in the left-hand panel of Figure 6, consumer price inflation averaged around 6% in developing countries and 2% in advanced countries during the 2000s.

Figure 6

Inflation and policy rate differentials between advanced and developing countries



Source: IMF.

Yörükoglu (2010) discusses several structural factors that might be partially responsible for the difference in inflation rates. One factor is the differing weights of inflation baskets. The weight of food and energy items is larger and the weight of technology items is smaller in the inflation baskets of developing countries than in those of advanced countries. Food and energy goods usually have high demand elasticity and low supply elasticity. So, during sustained growth periods, the price of food and energy goods increases substantially, as observed in the 2000s. For technological goods, inflationary pressures tend to be dampened by rapid improvements in technology. Therefore, even if inflation trends at the sector-based level are very similar for different countries, differences in the weightings can cause persistently higher inflation rates in developing countries. To conceptualise the argument, assume that price indices in advanced (A) and emerging (E) countries consist of food plus energy prices (FE) and other goods prices (G) with geometric weights, ie

$$P_t^i = \left(P_{i,t}^{FE} \right)^{\alpha_i} \left(P_{i,t}^G \right)^{1-\alpha_i}, \quad i=A, E.$$
 For simplicity, assume that prices of FE and G are determined worldwide and they are the same in all countries. Then, the inflation differential between countries would be

$$p_t^E - p_t^A = (\alpha_E - \alpha_A)(p_t^{FE} - p_t^G)$$

where p_t is the inflation at time t . This expression implies that, even though inflation rates at the sector-based levels of FE and G are the same, as long as the food and energy (FE)

goods inflation rates are higher than those of other goods ($p_t^{FE} > p_t^G$) and the weight of FE is higher in emerging countries ($a_E > a_A$), then emerging country inflation would be higher than in advanced countries ($p_t^E > p_t^A$)

Another factor underlying the inflation differential is the measurement bias in inflation. As outlined by Yörükoglu (2010), three possible biases affect the measurement of inflation, namely the quality bias, the new goods bias, and the outlet substitution bias. All these biases are expected to be larger in developing countries. For example, Bils and Klenow (2001) estimate the quality bias for the United States to be 2.2% per year. The evidence for developing countries is scarcer, but Filho and Chamon (2008) for Mexico and Brazil, and Arslan and Ceritoğlu (2011) for Turkey estimate the quality measurement bias as around 3% per year. In the process of technological catch-up, convergence and the urbanisation of developing countries, the measurement biases in inflation are expected to be higher in these countries. These structural factors may also help to explain why the inflation targets of inflation targeting developing countries are higher than those of inflation targeting advanced countries.

3.2. Implications for real exchange rates, monetary policy and fiscal policy

One implication of the persistent inflation differential between advanced and developing countries is the sustained appreciation of real exchange rates.² As the left-hand panel of Figure 7 shows, in the 2000s the real exchange rates of developing countries have steadily appreciated, a process that has been only occasionally interrupted by crises. In contrast, advanced country real exchange rates have been mostly stable in this period.

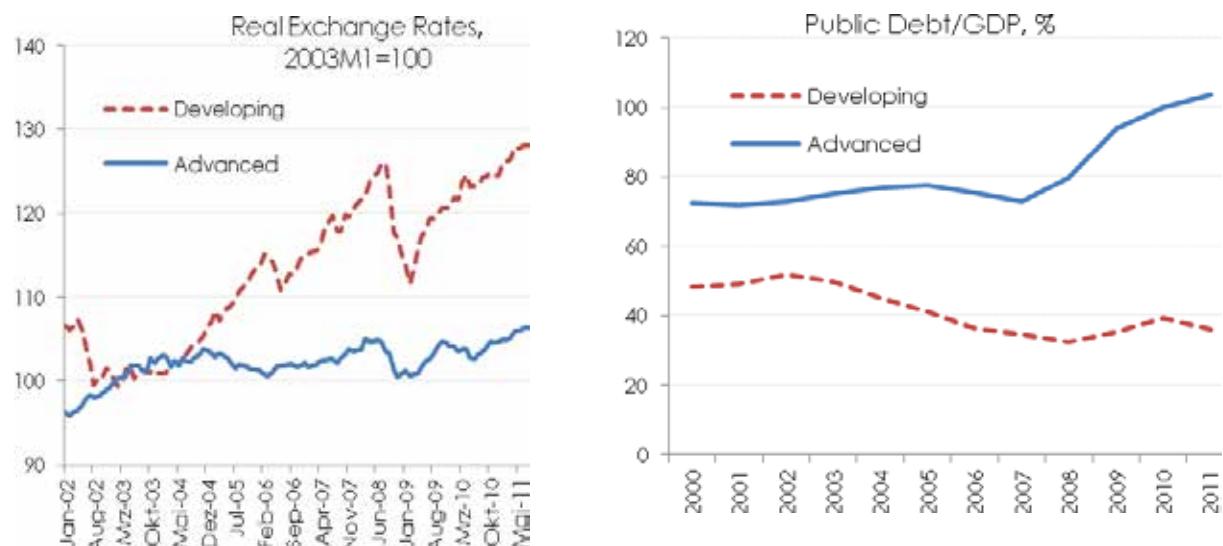
Several reasons might account for the appreciation of real exchange rates in developing countries. One of the more fundamental mechanisms would be the so-called Balassa-Samuelson effect arising from the differences in technological growth between advanced and developing countries. If, in the process of convergence, technological growth happens to be larger in developing countries, then prices increase faster in developing countries and, as a result, the real exchange rate appreciates. But there might be other reasons for this appreciation. As discussed above, biases coming from the measurement of inflation would also put an appreciation pressure on the measured real exchange rates of developing countries. Also, when we look at the period between 2003 and 2008, we see that the real exchange rates of developing countries appreciated by around 30%. This period was a period of abundant global liquidity and significant capital flows to developing countries. Overall, some fundamental long-term factors and some short-term factors underlay the appreciation of developing country real exchange rates in the 2000s.

The fundamental factors that drive currency appreciation are the result of deep economic forces. Thus, policies intended to constrain the resulting appreciation would be neither effective in the long run nor in the interests of society. However, temporary factors might increase the volatility of real exchange rates and accelerate their appreciation. As real exchange rates are also an asset price, they at times react strongly to news and expectations of future variables. Such fast and volatile exchange rate movements stand in contrast to real variables that adjust slowly in response to price signals. Real exchange rates are significant as relative prices, and sound signals deriving from real exchange rate movements are vital for the proper adjustment of the economy.

² In this period, nominal exchange rates have been largely stable, implying that the inflation rate differential has been transformed into real exchange rate appreciation for developing countries.

Policymakers face the task of containing the adverse effects of volatile and rapidly appreciating real exchange rates. Recent research also supports the idea that policies which lean against real exchange rate misalignments are welfare-improving, as shown by Corsetti et al (2011). The question is how to design the optimal policy framework. Monetary policy and macroprudential policies could be seen as the usual policy fronts against misalignments. But for monetary policy there are some possible tradeoffs in an open economy when containing the effects of exchange rate appreciation. Usually, exchange rate appreciations are associated with capital inflows to the economy and strong domestic growth. If policy rates are lowered to slow the appreciation of the domestic currency, then monetary policy might be too loose to be appropriate for domestic inflation, output and credit conditions. Since there is already a differential between the inflation rates of advanced and developing countries, there is an implied differential for policy rates also. Therefore, monetary policy in developing countries can be thought as being restricted by the inflation differentials and the policy rates of advanced countries. Nevertheless, some innovative ways of using monetary policy remain in such circumstances. For example, it is possible to reduce the lower bound of the interest rate corridor as was done in Turkey during the first half of 2011, thereby increasing the volatility of interest rates with a view to deterring very short-term or carry trade capital flows (Central Bank of the Republic of Turkey (2011)).

Figure 7
Real exchange rates and public debt in advanced and developing countries



Source: IMF.

Fiscal policy is another possible tool for addressing the related problems of rapidly appreciating real exchange rates and their volatility. Fiscal policy cannot usually respond as quickly as monetary policy, but a change in its direction can exert a substantial effect on real exchange rates. One way of actively using fiscal policy in response to external factors would be fiscal tightening or fiscal consolidation. Over time, the fiscal authority might reduce debt levels by cutting budget deficits. Lower budget deficits and public debt imply lower public demand for domestic output, as explained in Frankel and Razin (1992). Some part of this lower demand would fall on the non-tradable part of output and, as a result, the real exchange rate would come under downward pressure. As a measure of fiscal consolidation in developing countries, we can look at the ratio of public debt as a percent of GDP in the right-hand panel of Figure 7. This ratio fell from 52% in 2002 to 32% in 2008 for developing countries. This 20 percentage-point reduction in the gross-debt-to-GDP ratio means a significant fiscal consolidation for these developing countries, with possible effects on external factors such as the net foreign asset position and real exchange rates.

There is considerable theoretical and empirical literature about the effects of fiscal policy on real exchange rates.³ On the theoretical side, both real business cycle and new Keynesian models predict that, in response to an expansionary fiscal policy shock, the real exchange rate will appreciate (Monacelli and Perotti (2010); Ravn et al (2007)). In open economy models, a rise in government spending erodes household net wealth and, as a result, consumption falls. Because of the strong risk-sharing in these models, the real exchange rate appreciates in support of the fall in consumption. On the empirical side, the evidence is rather mixed. A number of studies find that expansionary fiscal shocks lead to depreciation (Kim and Roubini (2008); Monacelli and Perotti (2010); Ravn et al (2007)), whereas other studies report an appreciation of the real exchange rate (Penati (1986); Beetsma et al (2008); Benetrix and Lane (2009)).⁴ Evidence for the effects of fiscal policy on real exchange rates in developing countries is scarcer. For example, Agenor et al (1997) show with a structural VAR analysis that in Turkey an increase in government expenditure over GDP leads to a real appreciation of the Turkish lira. So a fiscal consolidation could also lead to a depreciation of the currency. This result is consistent with the predictions of the standard models.

One crucial element in these studies is whether these fiscal policy shocks are anticipated. Usually fiscal policy actions entail legislative and implementation lags, so that there is a news effect when a fiscal action is first announced. Ramey (2011) studies in detail the importance of the timing of government expenditure shocks for the United States and notes that it is crucial to control for the timing to get reliable results.⁵

This timing or anticipation explanation is also important for developing countries. For example, in Turkey, the government publishes three-year projections of fiscal variables such as revenues, expenditure, primary and general budget balances and the level of public debt. Consistent with the theoretical and empirical literature, a policy of announcing and implementing a fiscal consolidation in the coming years would put a downward pressure on the domestic currency. Therefore the strong fiscal consolidation in developing countries during the 2002–08 period (Figure 7, right-hand panel) can be seen both as a way of strengthening the fundamentals in these countries as well as the endogenous response of policymakers to the large appreciation of their currencies.⁶ Overall, the structural differences between advanced and developing countries can create persistently higher inflation in developing countries than in developed countries. This difference can put a strong upward pressure on the currencies of developing countries. Using monetary policy to ameliorate this pressure would create tradeoffs because, in an open economy, the monetary policy of a developing country might be constrained by inflation differentials, developed country policy rates and financial stability issues. As an alternative policy aimed at relieving upward pressure on the exchange rate, developing countries can resort to fiscal consolidation as

³ Hebous (2011) reviews the related theoretical and empirical literature about the effects of discretionary fiscal policy on macroeconomic variables including real exchange rates.

⁴ This evidence is mostly for advanced countries and the evidence for developing countries is very scarce owing to limited data.

⁵ This paper shows that, in the United States, once timing is taken into account, consumption of services increases and that of all other consumption items decreases in response to fiscal shocks. If we take these as relative demand changes for services and other goods, one might expect that prices of services (a proxy for non-tradable goods) would increase relative to prices of other goods (a proxy for tradable goods) and then the real exchange rate would appreciate.

⁶ Another related motive might be to restrict the current account deficit in developing countries by fiscal consolidation. Usually, high appreciation periods are associated with strong growth and a rising current account deficit in developing countries. Then fiscal consolidation can be seen as a way of both reducing the appreciation pressure and containing the current account deficit (see, for example, Kim and Roubini (2008) and Kumhof and Laxton (2009)).

seen in the 2000s (Figures 6 and 7). This interplay of inflation, real exchange rates, interest rates and fiscal policy shows how fiscal-monetary policy interactions might have been globalised.

3.3. Fiscal policy and real exchange rates in Turkey

We undertake a simple empirical exercise to track the effects of government expenditures on real exchange rates in Turkey. In our methodology, we closely follow Ravn et al (2007) and estimate a vector autoregression model of the form:

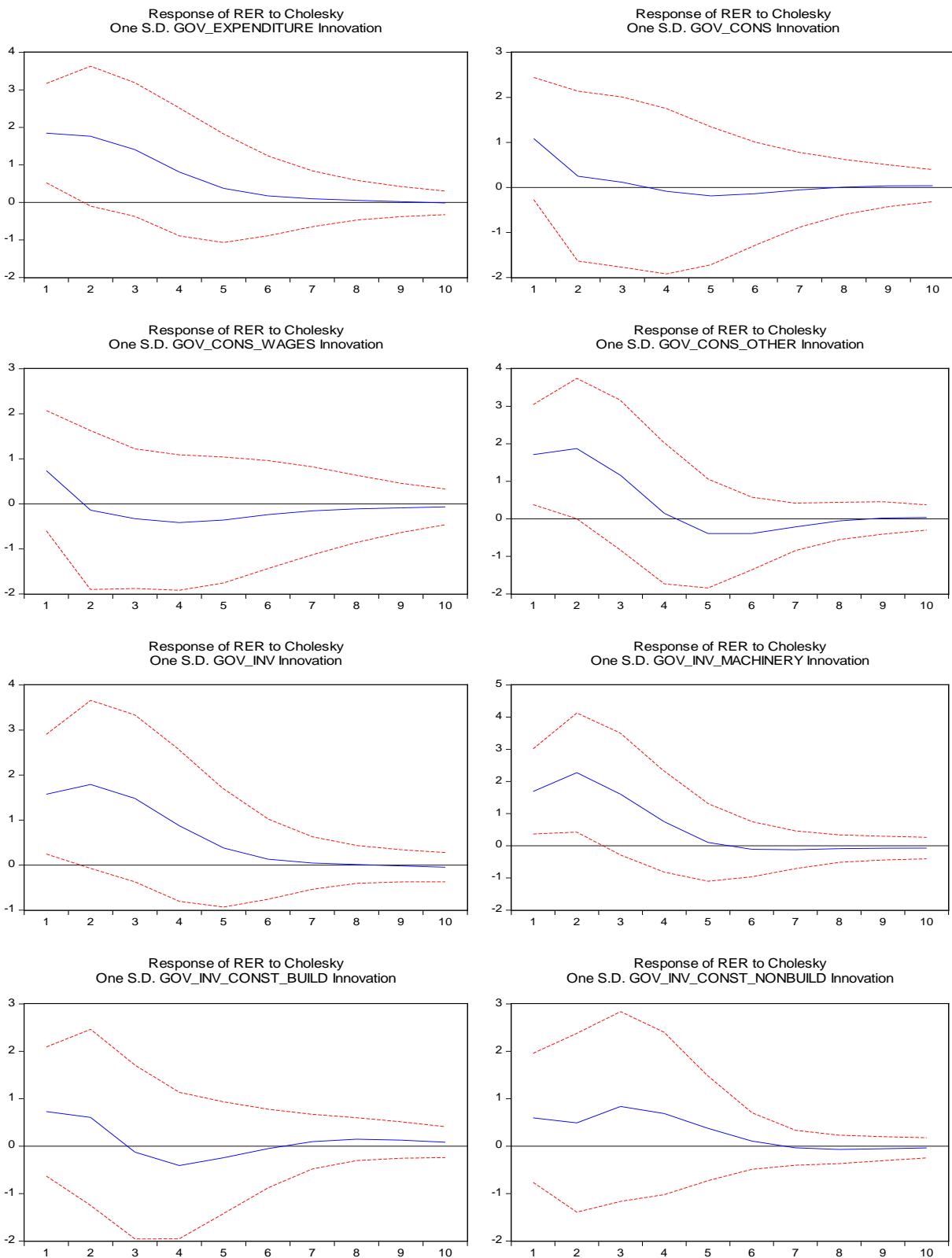
$$A \begin{bmatrix} \hat{g}_t \\ \hat{y}_t \\ \hat{c}_t \\ \widehat{nxy}_t \\ \widehat{rer}_t \end{bmatrix} = B(L) \begin{bmatrix} \hat{g}_{t-1} \\ \hat{y}_{t-1} \\ \hat{c}_{t-1} \\ \widehat{nxy}_{t-1} \\ \widehat{rer}_{t-1} \end{bmatrix} + \varepsilon_t$$

where \hat{g}_t is government expenditure (or its subcomponent) over GDP, \hat{y}_t is real GDP, \hat{c}_t is private consumption over GDP, \widehat{nxy}_t is the trade balance over GDP and \widehat{rer}_t is the consumer price index-based real exchange rate. All variables are from the Central Bank of the Republic of Turkey. We first seasonally adjust all the series and then apply an HP filter to get the cyclical components. For GDP and the real exchange rate, we take the percentage deviation from trend as the cyclical component and for other variables we take the absolute deviation from trend as the cyclical component (because they are already in the ratio to GDP form). Here an increase in the real exchange rate is defined as an appreciation of domestic currency. ε_t is the vector of disturbances and L is the lag operator.

We estimate the vector autoregression model with quarterly data from 1Q 1987 to 3Q 2007. For identification, we follow a Cholesky decomposition such that government expenditures only respond to its own innovations in the same quarter. Figure 8 presents the impulse response function of real exchange rates to one standard deviation shocks in government expenditures. We present all impulse responses for the subcomponents of government expenditures. We see that in no case does an increase in government expenditure lead to a depreciation. Moreover, in the case of total government expenditure, government consumption expenditure other than wages, government investment and government investment of machinery, we see that a spending increase leads to a significant appreciation in the currency.

With these results, we see that both a fiscal worsening (as in an increase of Turkey's government expenditure over GDP from 11.7% in Q3 1995 to 16.1% in 2Q 2000 or an increase of public debt over GDP from 32.9% in 1995 to 74.1% in 2001) or a fiscal consolidation (such as the fall in government expenditures over GPD from 16.1% in Q2 2000 to 12.3% in Q1 2007 or a decrease in public debt over GDP from 74.1% in 2001 to 39.6% in 2007) would have significant effects on real exchange rates. This relationship between fiscal policy and real exchange rates presents an extra dimension to the interaction between monetary and fiscal policies. When monetary policy faces serious trade-offs regarding the movements of currency, an active fiscal policy might provide additional operational space for monetary policy by constraining exchange rate movements.

Figure 8
Impulse response of real exchange rates (RER)
to one standard deviation innovation in government expenditures



4. Conclusion

Fiscal policy is an important determinant of the effectiveness of monetary policy. A strong fiscal stance can increase the effectiveness of monetary policy by promoting the development of domestic financial markets and of longer maturity yield curves, thus reinforcing the economy's risk structure and reducing structural weaknesses such as mismatches and pass-through in the economy. A weak fiscal position severely restricts the scope for monetary policy because it increases the potential for problems in the above-mentioned channels. This relationship between fiscal and monetary policy is dynamic, changing over time both at the country and the global level. The case of Turkey, like that of most other developing countries, shows how fiscal policy evolved during the 1990s within the context of a severely constraining monetary policy into a strong fiscal stance in the 2000s that greatly improved the effectiveness of monetary policy.

Another dimension of fiscal-monetary policy interaction might come from the globalisation of the world economy. Structural factors create inflation differentials between advanced and emerging countries that in turn put steady upward pressure on developing country currencies. However, monetary policies in these countries are constrained by inflation differentials, policy rates in developed countries and financial stability concerns. Hence they cannot effectively soften the appreciation pressures. This might lead to the active use of fiscal consolidation in developing countries to help lessen the appreciation pressures, therefore presenting a new dimension in fiscal-monetary policy interaction at a global level.

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