Central bank and government debt management: issues for monetary policy

Andrew Filardo, Madhusudan Mohanty and Ramon Moreno¹

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

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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 maturity ¹						
	Outs governme pere	tanding dom nt debt secu centage of G	nestic irities, as a iDP 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.

	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
Peru⁵	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	

Table 2 Central bank securities

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 byproduct 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 = Columbia; 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	Total	Monetary base and short-term		
	≤ 1year	> 1 year	base		debt		
	(a)	(b)	(c)	a + b + c = (d)	= (a + c) / d		
		In billion	s of US dollars	Ratio			
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		
Memo							
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, 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.





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 expample 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 quantatative 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, nineyear; 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 = Columbia; 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 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 decisionmakers. 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			
	Sovereign bonds	CB securities	 CB settlement & admin services of government bonds
ID	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. 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.	Bank Indonesia certificates (SBI)	Settlement services: yes; via Bank Indonesia – Scripless Securities Settlement System (BI-SSSS) Administrative services:
IN	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. 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.	n/a	Settlement services: no; via the Clearing Corporation of India (CCIL) Administrative services: yes
PH	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. 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).	n/a	Settlement services: yes; via the Philippine Payment and Settlement System (PhilPASS) Administrative services: no
BR	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. The Central Bank of Brazil uses treasury bonds to implement monetary policy, through the purchase and sale of securities on the secondary market.	n/a ²	Settlement services: yes; via the Special System for Settlement and Custody ³ (SELIC) Administrative services: no

	Debt management arrangements and role of central banks, selected economies (cont) Arrangements				
	Sovereign bonds	CB securities	admin services of government bonds		
со	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.	n/a	Settlement services: yes; via the Electronic Negotiation System (ENS)		
	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.		Administrative services: yes		
CL	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. 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.	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	The Federal Government of Mexico, through the Ministry of Finance and Public Credit, is responsible for management and issuance of government securities. 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.	n/a ⁴	Settlement services: no; via the Central Securities Depository (INDEVAL) Administrative services: yes		
HU	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.	Two-week MNB bill	Settlement services: no; via ÁKK (Gov't Debt Management Agency Pte Ltd) Administrative services: yes		

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

Arrangements			CB settlement & admin services of
	Sovereign bonds	CB securities	government bonds
IL	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. 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	Makam (up to one year)	Settlement services: no; via the Development Corporation for Israel (DCI)
	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.		Administrative services: yes
PL	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. 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.	SEBOP central bank bills	Settlement services: yes; via SKARBNET of the Register of Securities; and the National Depository for Securities Admin services: yes
TR	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. 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	Liquidity bills ⁵	Settlement services: yes; via the Electronic Securities Transfer and Settlement System (TIC- ESTS)
	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.		Administrative services: yes

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.

	A	В			
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)		

Table A1 The consolidated public sector balance sheet

С

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)		





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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