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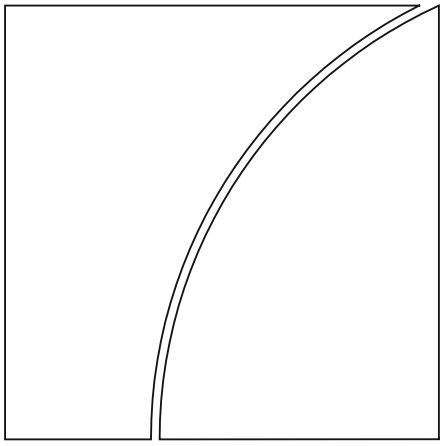

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What do new forms of finance mean for EM central banks?

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What do new forms of finance mean for EM central banks?

An overview

M S Mohanty[1]

The size and the structure of financial intermediation influence the cost of credit, the risk exposure of financial institutions and the effectiveness with which monetary policy is transmitted to the economy. Over the past decade, financial intermediation in emerging market economies (EMEs) has undergone important changes: a higher volume of debt financing has gone hand in hand with a growing internationalisation of financial markets and increased lending to households. The 2015 Deputy Governors meeting examined the implications of these trends for EMEs. Participants discussed three distinct but interrelated topics: (i) the role of banks; (ii) the role of debt securities markets; and (iii) the implications of recent changes in financial intermediation for monetary policy.

One of the main conclusions reached by participants is that greater access of households to bank credit and of EME corporations to domestic and external securities debt markets is a double-edged sword. On the one hand, it has helped foster financial development, diversifying funding sources and reducing credit risk concentration. On the other hand, it has also been accompanied by increased risks and vulnerabilities – as the financial market turbulences of 2015 illustrated (BIS (2015)). Domestic bond markets now react more strongly to global forces. Larger foreign currency debt has made many companies more vulnerable to exchange rate shocks. Credit cycles have also become more pronounced. These developments pose challenges to EME monetary authorities in containing monetary and financial stability risks, raising questions about the appropriate instruments required to stabilise the economy (Sobrun and Turner (2015)).

1. The role of banks

Historically, banks have played a central role in the financial systems of EMEs by allocating domestic savings, transforming the maturity of financial claims and intermediating international capital flows. However, a series of banking crises in the 1980s and 1990s raised questions about the merits of bank-based financial intermediation and triggered initiatives aimed at diversifying financial systems. The Global Financial Crisis that erupted in 2008 was a major turning point in many countries for financial intermediation. An important objective of the meeting was to understand how intermediation models had changed over the past decade and what that meant for the role of banks in the economy.

[1] I am thankful to Claudio Borio, Torsten Ehlers, Masazumi Hattori, Emanuel Kohlscheen, Phurichai Rungcharoenkitkul, Hyun Song Shin, Előd Takáts, Philip Turner and Agustín Villar for comments.

The paper by Ehlers and Villar (2015) notes five major aspects of EME financial systems.

- First, over the 2004–13 period total credit extended to the non-financial private sector of EMEs by banks and bond markets taken together (including through domestic and international channels) has risen rapidly in many countries as a percentage of GDP. This trend picked up particularly sharply after the onset of the Global Financial Crisis of 2008. The growth in total credit has been faster in economies that are more financially open and that have tied their exchange rates to the currencies of advanced economies than those that are less open and allow greater exchange rate flexibility.
- Second, banks continue to remain the main source of credit in EMEs. That said, changes in financial intermediation appear to be significant in China, Chile, Hungary, India and Korea where the share of bank credit in total credit has generally declined over the past decade.
- Third, there have been important changes in the composition of bank assets. The sharp growth in total bank assets has coincided with a rapid increase in bank lending to households, which has been partially offset by a general decline in banks' debt securities holdings and loans to corporations.
- Fourth, strong lending growth has been accompanied by increased access of EME banks to non-core funding sources such as corporate deposits and debt liabilities. The median contribution of corporate deposits to the growth of total liabilities of EME banks has risen from 24% in 2004–09 to 31% in 2009–13. Debt liabilities contributed to 28% of incremental liabilities in both periods.
- Finally, the role of international bank lending in EMEs has declined as such lending has been increasingly replaced by financing through international debt securities. As a result, international bank credit (cross-border claims plus local claims of international banks) as a percentage of total domestic bank credit to the non-bank sector has shrunk rapidly in Latin America (from 50% in 2004 to 30% in 2013), and central and eastern Europe (from 100% to 75%), while it has remained roughly constant at a low level in Asia (15%).

In assessing the significance of these developments, the underlying factors are likely to be more important than the trends themselves. Clearly, financial deepening plays an important role in the trend increase in credit-to-GDP ratio. Yet a key concern expressed in many central bank papers in this volume is that the recent growth in credit may prove more cyclical than structural. Estimates presented by Ehlers and Villar show that, while the bank credit-to-GDP ratio has been generally above its long term trend in many EMEs, the gap has widened to over 10 percentage points in several countries.

Often, the rising trend in bank credit has been reinforced by credit extended by shadow banking institutions, although estimating precisely the assets held by these institutions remains a challenge in EMEs (as is the case in many advanced economies). The paper from the South African Reserve Bank estimates that in South Africa the share of assets held by shadow financial intermediaries in the total assets of all financial intermediaries increased after the 2008 Global Financial Crisis, reaching 18% by the end of 2014, though this is still a relatively small part of the financial system.

Several forces appear to be at work. In most EMEs, easy domestic monetary conditions have boosted both the demand for, and supply of, credit. In many commodity-exporting countries, these domestic conditions interacted with sustained

improvements in terms of trade. Many country papers nevertheless identified easy global financial conditions as the most common factor behind the recent rapid growth of credit. One direct channel appears to work through bank deposits. Since most capital inflows ultimately end up on the balance sheets of banks, they tend to increase the domestic lending capacity (see the note from Indonesia). Second, in several countries banks also funded a significant part of their credit growth by directly accessing international debt markets. Finally, in some countries capital inflows led banks to lower their lending standards, particularly under a competitive threat as their major corporate clients moved to offshore markets. A case in point is the Czech Republic, where banks responded to large non-financial firms' global search for yield by easing lending terms.

Despite strong credit growth, in several countries banking system leverage declined marginally over the past decade (see Table A8 in Ehlers and Villar (2015)). Rising asset prices tend to boost the value of equity when bank portfolios are marked to market. Banks facing capital or value-at-risk constraints thus tend to lend more without having to raise additional capital (Adrian and Shin (2010)). Asset price booms thus make bank credit highly procyclical even without a rise in the measured leverage ratio.

A number of risk factors were discussed. One was the potential vulnerability of EMEs to future credit market reversals. Several participants argued that although debt service ratios are currently moderate, these could rise rapidly once interest rates start to go up. The rapid growth of credit recently observed in many countries has therefore prompted the authorities to implement macroprudential measures. Some countries have introduced credit registries, though there seems to be disagreement over the scope of information that such registries should collect (only negative credit events or a wide range of information about income and liabilities). In the expectation of possible problems, a few countries have contemplated debt restructuring measures to address consumer overindebtedness and insolvency.

Another issue was the extent to which banks were exposed to higher interest rates. Several participants argued that the direct exposure of banks to interest rate risks remains manageable. However, bank borrowing from the debt and wholesale deposit markets can still lead to potential funding problems for the banking system. Although aggregate loan-to-deposit ratios in some regions (in Asia and Latin America, in particular) have been contained below one, they have risen from previously moderate values. In particular, as banks funded a greater part of their incremental lending from corporate deposits, they could be vulnerable to tighter external funding conditions triggering an outflow of such deposits from the banking system.

The exposure of banks to foreign exchange risk could be sizeable, even though regulations might limit currency mismatches within the banking system. While banks may be hedged against currency risk, their borrowers may not. In some EMEs, borrowers still expect an appreciation of the local currency, increasing incentives for unhedged foreign currency borrowing. To reduce these risks, some countries have introduced stress testing while others have raised reserve requirements on foreign currency deposits and/or required banks to hold additional capital.

One concern in countries with more developed foreign exchange markets seems to be the speculative positions of domestic institutional investors, which can have an influence on the dynamics of exchange rates. Extensive use of hedges against currency appreciation can itself generate appreciation pressures. For instance, buying

FX swaps or forwards raises the expected future price of a currency which feeds back into current market prices. Both investors and borrowers could speculate on currency appreciation, leading to large exposures, and potentially disruptive shocks if currency movements were to reverse. A few countries have therefore introduced reporting requirements relating to the holding of foreign exchange derivative positions by corporates.

There was a general recognition that the shift to a subsidiaries-based model of business increased the resilience of EME banking systems to external shocks. If banks enjoy a measure of protection through access to national deposit insurance schemes, or have a large number of retail customers, subsidiaries would be the preferred model because their capital could be segregated from the parent bank. A few participants expressed the view that in the event of a crisis, host-country taxpayers would have to foot the bill – even for foreign banks. Subsidiaries might therefore be more suitable to ring-fence assets, although this increases vulnerability to local conditions. There was a common view that cross-border banking within a region ("regionalisation") heightens the exposure to regional macroeconomic risks. Cooperation between home and host supervisors is thus essential in reducing these risks as well as in limiting the potentially damaging implications of regulatory arbitrage.

2. The role of debt securities market

A clear trend across many EMEs over the past decade is the expansion of debt securities as a funding vehicle. Thus, the combined issuance of debt securities by entities located in EMEs – governments, financial institutions and non-financial corporations together – has grown more than sixfold over the past decade, from $2.5 trillion in 2002 to $14 trillion in 2014 (Hattori and Takáts ((2015)). Although the issuance of domestic debt securities, which is usually denominated in local currencies, constitutes the largest share of activity (about 80%), the issuance of international debt securities by the non-bank sector has risen significantly following the 2008 Global Financial Crisis. The trend has been driven by non-financial corporations, which increased their issuance of foreign currency debt while governments funded much of their fiscal deficits in local currency debt markets.

That said, within this big picture, cross-country differences remain. In many countries, domestic bond markets still largely consist of government debt securities. With a few exceptions (eg Hong Kong SAR and Malaysia), corporate bond markets remain relatively underdeveloped, constraining the supply of long-term finance. At the same time, cyclical factors, such as very low global interest rates, have attracted EME corporations to international debt markets. The paper from the Central Reserve Bank of Peru argues that the preference for issuing debt in international markets reflects a rational decision by EME corporations to access cheaper funds in deeper international capital markets than in more expensive and less liquid domestic markets.

As discussed in many country papers, debt issuance by EME entities offers major benefits, not least by fostering financial development. Bond markets can also help diversify the sources of financing and avoid credit risk concentration in the banking sector. A number of participants emphasised that bond markets are better suited than banks to supply long-term finance for infrastructure. Moreover, debt issuance by EME borrowers in their own currencies reduces currency mismatches. As the paper from

the Hong Kong Monetary Authority argues, the recent increase in debt issuance by EMEs reflects conscious efforts by the authorities to develop local bond markets and regulations restricting banks' exposure to duration mismatches.

Despite obvious benefits, an important issue is the extent to which increased international debt issuance by corporates creates risks. To the extent that cyclical factors dominate, EME borrowers are exposed to a reversal of easy global financing conditions and hence to higher global interest rates. Not only does such an eventuality increase the risk of a drying-up of dollar bond issuance but also increases corporate vulnerability in terms of higher debt repayment and refinancing risks. The interaction between dollar liabilities and large currency depreciation can contribute to magnifying these risks. While EME corporations have increased non-financial investment in recent years, firm leverage in many countries has risen (Graph 5 in Hattori and Takáts (2015)). Another risk is overinvestment that could lower the rate of return on investment. There is evidence that the return on assets of EME corporations has fallen recently and the price-to-earnings ratio has risen, suggesting a risk to funding conditions should equity valuations suffer from higher interest rates.

A few oil-exporting countries have been under stress because of the recent collapse of oil prices. Given that many oil firms have accumulated substantial dollar debt, they are vulnerable to large currency depreciations. How far domestic funding conditions would be affected depends on the level of firm indebtedness and the stock of foreign reserves of a country. While official assistance to mitigate foreign currency liquidity problems of the corporate sector can reduce some of the risks, there are potential moral hazard issues confronting governments and central banks. In this context, some participants argued that there was a need for a better understanding of large firms' complex funding structures so that the balance sheet risks of such firms could be identified and monitored by the authorities on a regular and systematic basis.

Stresses in corporate balance sheets could spread to the banking system. These systemic connections are likely to be important in countries where banks have obtained a large part of their funding requirements from corporate deposits, exposing them to withdrawal pressures. And, by adversely affecting firms' capacity to repay, weaker corporate balance sheets could also feed into the banking system through higher non-performing loan rates.

Another source of risk discussed in several papers is the potential vulnerability of EMEs to the market volatility resulting from a greater involvement of institutional investors and their asset managers in EME debt markets. Hattori and Takáts (2015) discuss several channels through which the portfolio decisions of asset management companies could amplify market volatility. One example is the return and duration mismatches of the portfolios of long-term institutional investors such as pension funds. The search for yield and duration by these investors under conditions of very low long-term interest rates can lead to excessive risk-taking in relatively illiquid markets, causing large price fluctuations. Similarly, asset management companies (AMCs) are guided by several investment constraints (eg relative performance targets, risk limits and minimum credit ratings) that have the potential to create procyclical market dynamics in EME bond and equity funds. There is evidence that investment flows into and out of EME funds tend to show greater clustering than flows into and out of advanced economy markets. In addition, discretionary sales by EME bond funds managers tend to amplify investor redemptions (Shek et al (2015)).

An additional risk could come from carry trade strategies involving EME local debt markets. To the extent that foreign investors have not adequately hedged the foreign exchange risk of their bond investments, and have instead intended to profit from expected currency appreciation, their response to unexpected exchange rate movements could aggravate market volatility. EME residents could make use of dollar debt issuance to undertake similar carry trade strategies. For instance, a recent BIS study of companies from 47 countries outside the United States found that EME non-financial companies had used US dollar bond issuance to take on financial exposures that shared the attributes of dollar carry trades (Bruno and Shin (2015)). The proceeds of such bond issuance were invested in high-yielding bank deposits as well as in shadow banking products and commercial paper.

The paper from Mexico discusses bond market dynamics that could follow from a US monetary policy shock. The authors' results suggest that not only are bond flows highly correlated across countries but the direction of flows is closely associated with US monetary policy announcements, implying that EMEs remain vulnerable to a potential Federal Reserve tightening.

Many participants felt that the recent adoption of regulatory and market oversight measures by a number of countries could prove helpful in containing some of those risks. These measures include, for instance, tighter standards for firms' external funding eligibility and regulations requiring corporations to hedge foreign exchange risk. Moreover, to the extent that bond issuers in EMEs are typically large and of good credit quality, they could be more resilient to negative interest rate shocks than those with weaker balance sheets and credit ratings.

3. Implications for monetary policy

The final session focused on the potential implications of recent changes in financial intermediation for monetary policy. Kohlscheen and Rungcharoenkitkul (2015) present a simple analytical framework to highlight a number of important issues. The general view is that, by strengthening the transmission of the central bank's policy rate to market interest rates, larger and deeper capital markets can help improve the effectiveness of monetary policy in EMEs. To the extent that greater competition from debt markets leads to narrower bank intermediation spreads, the equilibrium (or neutral) policy interest rate required to stabilise the economy may also have to rise.

At the same time, policy challenges in financially open economies can be more complex. First, greater global integration of domestic debt markets means that domestic long-term interest rates become more sensitive to global interest rates, reducing the effectiveness of monetary policy. Additionally, bank credit may become more volatile as funding conditions of the banking system become more closely linked to the global capital market (Shin and Turner (2015)). Finally, greater global debt market integration implies faster transmission of risk aversion shocks, sharper exchange rate movements and, consequently, larger balance sheet movements. All this leads to a stronger "risk-taking channel" of monetary policy (Borio and Zhu (2012)). Evidence presented by Kohlscheen and Rungcharoenkitkul (2015) indicates that credit flows to EMEs are significantly affected by global risk aversion such as the VIX index of US stock market volatility and the exchange rate. And the real effects of these variables have increased because of a stronger response of investment to credit flows.

That said, challenges vary across countries, depending on the structure of the financial system and the regulatory regime. For instance, in Malaysia, despite higher foreign ownership of domestic debt markets, the pass-through of the policy rate has increased because of improved loan pricing, a higher share of floating rate loans in total loans and a limited amount of external corporate debt (see the paper from Malaysia). In Korea, recent changes in financial intermediation did not affect the transmission of the policy rate partly because regulations limiting the loan-to-deposit ratio and the loan risk premium have reduced the potential divergence of bank lending rates from the policy rate. The paper from the Philippines makes the general point that the pass-through of the policy rate to lending rates tends to be greater when the domestic policy rate moves with rather than diverges from global interest rates.

The paper from Chile discusses the policy challenges resulting from global influences on long-term interest rates. Their analysis illustrates the importance of US term premia in generating correlated yield movements, and the potential for destabilising dynamics resulting from the growing presence of volatile investors such as hedge funds and opaque investment funds in EME debt markets. Likewise, the paper from Turkey argues that lower US long-term rates and cheaper global liquidity not only increase bond market volatility but also encourage banks to reduce investment in securities and expand bank lending.

The paper from Israel discusses a generic issue where the external finance premium charged by banks depends on the degree of competition from debt markets. On the one hand, the introduction of more players in credit markets can reduce the oligopolistic nature of the banking system, leading to a lower spread between the deposit and the lending rates, and stronger transmission of monetary policy. On the other hand, a greater importance of capital markets in financial intermediation may accentuate information asymmetry problems between borrowers and lenders, leading to higher risk premia and a weaker monetary transmission mechanism.

In terms of policy responses, some participants argued that monetary authorities in EMEs could play a market-making role in times of adverse external shocks, assuring investors that there would be liquidity in the market. Others stressed that keeping one's own house in order – containing macroeconomic and external imbalances – is a necessary (if not sufficient) condition for preventing financial stress from materialising in the first place.

Macroprudential policy was seen as critical, especially in countries with heavily managed exchange rate regimes, even though evidence of its effectiveness to date is still rather limited. Many viewed strong supervision as an important pre-condition for the success of micro- and macroprudential tools. Hungary's experience, which is discussed in this volume, shows the usefulness of liability-based macroprudential measures (minimum stable foreign currency liability to foreign currency asset ratio in the banking system) in economies with a high degree of euroisation (or dollarisation). When the non-bank sector outside the supervisory umbrella is a source of systemic risks, the next best response would be to limit funding from the regulated entities to such sectors.

There was a general view that global policy coordination is essential for containing market volatility. Most participants agreed that competitive devaluations – what is inherently a non-cooperative game – damage global growth outlook. Even

where coordination of policy decisions is judged not to be feasible, many saw scope for coordinating the communication of policy actions.

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The role of banks

Torsten Ehlers and Agustín Villar[1]

Abstract

Credit has grown at a rapid pace in emerging markets (EMs) over the last 10 years. Banks have played a major role in the extension of credit and have continued to be its main source. Domestic banks have taken over business from foreign banks since 2008. However, developments across EMEs have been heterogeneous, with non-bank financing playing a greater role in the faster growing economies. Important changes have occurred in the composition of bank assets over this period. While the banking sector leverage generally has not increased, banks' sources of funding and recipients of their credit have changed. Bank credit is increasingly flowing to households, in particular, in the form of mortgage loans. Corporate deposits have gained share relative to household deposits, potentially making banks rely on a less stable source of funding. In some EMs, non-core funding (liabilities other than equity and deposits) are playing a greater role in sustaining credit growth by banks. Forward-looking measures point to increased credit risk in many EMs. Interest rate risks remain in many cases with customers, as, for instance, as large share of mortgage loans are variable rate contracts. But interest rates could feed back to credit and funding risks, if defaults on loans rise and corporates respond by discontinuing their supply of deposits.

Keywords: Emerging markets, financial intermediation, banks, bank lending, credit growth

JEL classification: E44, G20, G21

[1] Bank for International Settlements. Agne Subelyte and Diego Urbina provided excellent research assistance. It draws on the BIS survey conducted for this meeting. The replies are presented in summary tables in the appendix.

Introduction

Historically, banks have been the main supplier of credit in emerging market economies (EMEs). In the 1990s, market-based finance began to compete with bank lending. Since 2008, this structural shift has continued in parallel with the exceptionally easy global financial conditions ushered in by the accommodative monetary policies in major advanced economies. How have these changes affected financial intermediation in EMEs? In particular, has the role of banks changed? Has the development of debt securities markets combined with global cyclical forces made banks more vulnerable to credit and funding risks? And how has the role of foreign banks in EMEs changed?

EME banks have not changed their business models in the same way as those in advanced economies did in the run-up to the financial crisis. In the advanced economies, banks rapidly expanded their balance sheets by buying securitised debt, financed mostly with short-term debt instruments such as commercial paper ((Adrian et al (2012) and Acharya and Schnabl (2010)). In contrast, EME banks have relied more on deposits.

This does not mean that EME banks are less risky. Although they have reduced their leverage over the past decade, forward-looking indicators point to heightened credit risk in many EMEs. In a number of economies, the gap between private credit-to-GDP and its long-term trend is positive and large. Already sizeable private sector debt service ratios would increase further with higher interest rates. Moreover, the management of liquidity could become challenging in some EMEs. As banks have relied on deposits to fund long-term loans, deposit withdrawals – in particular, by corporates – could expose banks to increased funding risk. Their reliance on non-core debt is sizeable in some economies.

Post-crisis, many EMEs have seen banks withdraw from the hardest-hit countries. Over the past five years, as domestic credit has expanded rapidly, the relative reliance on direct cross-border bank credit has actually declined in all major EM regions. And foreign banks are increasingly operating through local offices (branches and subsidiaries). The exception is emerging Asia, where a more regional model of cross-border banking seems to be taking shape.

The rest of the paper is organised as follows. Section 1 discusses the relative importance of bank credit in EMEs. Section 2 illustrates the changes in the structure of bank assets and liabilities. Section 3 discusses the potential credit, interest rate and funding risks in the banking sector. The final section briefly reviews the role of international banks.

1. Credit financing and the role of the banking sector

Private sector credit grew rapidly across EMEs over the decade to 2013, driving up credit-to-GDP ratios, particularly since 2008 (Table 1, left-hand columns). In some EMEs, expanding credit pushed the ratio to new heights. While the share of bank credit in total private sector credit declined in several EMEs (Table 1, right-hand columns), banks continue to be the main source of credit (see also country notes from the Czech Republic, Indonesia and the Philippines). There is also evidence that banks

have faced increased competition from debt securities markets in financing some EME borrowers, particularly after 2008.[2, 3]

In several EMEs, private sector credit is increasingly provided by other sectors and financial intermediaries. For example, the sharp fall in the share of domestic bank credit in China reflects the strong expansion of cross-border borrowing and the activities of trust companies, as international portfolios have sought greater exposure to the economy (Ma and Villar (2014)). In Korea, the non-banking sector provides about one third of private sector credit. In Hungary, a banking crisis has cut the banks' share. In contrast, banks have been regaining market share in Mexico and Turkey despite greater competition from fast-developing bond markets.

A drawback of these data is that financial accounts (flows of funds) are available for only a small group of economies. As a result, most private sector credit estimates are based on BIS data for (domestic and cross-border) private sector bank borrowing and debt securities issues.[4] Thus, the estimates exclude debt obtained through the issuance of *domestic* securities unless these are held by banks. This might be a considerable amount, given increased issuance in EMEs in recent years.

State-owned banks continue to play an important role in a few EMEs. One reason is that only small changes have been made to ownership structures over the past decade (Appendix Table A1). State-owned banks hold a dominant position in Algeria, China and India, and constitute a large share of banking sector assets in Argentina, Indonesia, Brazil, Russia and Turkey (and, to a lesser extent, in Korea and Thailand). At the same time, state ownership is negligible in a few countries, such as Hong Kong SAR and Israel. Beyond the pattern of ownership, government intervention seems to have declined (Mohanty and Turner (2008)). Governments have lifted interest rate controls and seem to be interfering less in credit allocation.

[2] These trends will be described in more detail in the second background paper for this meeting on "The role of debt securities markets".

[3] See country note from the Bank of Korea for this meeting.

[4] For Colombia, Peru, the Philippines and Israel, the estimation follows the methodology used in the BIS publication, but it is not being published.

Private sector credit and domestic bank lending in EMEs

Table 1

	Total credit to non-financial private sector (as a share of nominal GDP)[1]			Bank credit to non-financial private sector (as a share of total credit to non-financial private sector)		
	2004	2007	2013	2004	2007	2013
Emerging Asia						
China	124	118	181	96	91	75
Hong Kong SAR	164	183	261	90	83	81
India	38	50	59	96	93	92
Indonesia	29	28	41	87	93	89
Korea	139	160	185	74	76	67
Malaysia	131	114	135	96	96	100
Philippines[2]	41	34	41			
Singapore	101	97	139	91	84	87
Thailand	109	97	127	97	98	97
Latin America						
Argentina	13	15	16	64	76	94
Brazil	34	45	76	88	93	93
Chile	85	94	123	71	71	63
Colombia[2]	26	33	44			
Mexico	23	27	34	34	45	41
Peru[2]	20	23	37			
Central and eastern Europe						
Czech Republic	69	78	98	39	52	55
Hungary	81	112	121	48	47	39
Poland	43	57	79	59	65	65
Other EMEs						
Algeria						
Israel[2]	88	99				
Russia	37	53	68	67	71	75
Saudi Arabia	39	46	43	88	85	95
South Africa	61	80	73	96	95	94
Turkey	21	37	70	72	75	89
United Arab Emirates						

[1] BIS calculations of total credit to private non–financial sector. [2] Total credit to the private sector estimate based on domestic bank credit to private sector (IMF, *International Financial Statistics*, line 22d), plus cross-border loans to the non-bank sector, less government exposure from BIS consolidated banking statistics, plus international debt securities issued by non-financial corporations.

Sources: IMF, *International Financial Statistics*; national data; BIS international banking statistics; BIS securities statistics.

2. Banks' balance sheets and potential risks

A key question is whether favourable global financing conditions have encouraged procyclical behaviour by banks and a build-up of risks on their balance sheets. Relying on balance sheet data for such analysis is fraught with difficulties for reasons outlined below. Nevertheless, a cross-sectional look at banking sectors might help to unveil common features across different economies.

2.1 Bank assets

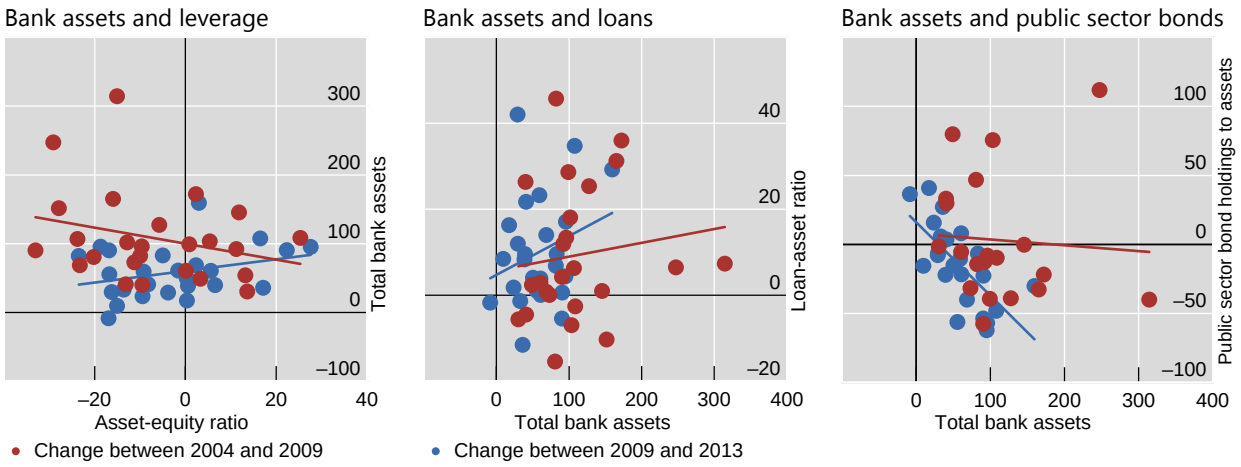
EME bank assets have grown strongly over the last decade (Appendix Table A8), but without lifting bank leverage (asset-to-equity ratio). In the country sample for the whole decade, leverage marginally decreased (ie somewhat more than half of the changes in asset-to-equity ratio are negative) despite the significant growth rates in bank assets. By splitting the sample into two periods (Graph 1, left-hand panel), two outlier observations seem to weigh on the whole panel relationship. In the period 2009–13, there is a slightly positive, albeit less than proportional, relationship between changes in bank total assets and in leverage (asset-to-equity ratio) in the cross section.

The procyclicality of bank leverage tends to obtain where bank portfolios are marked to market, as when tradable securities are held and value-at-risk constraints are binding (Adrian and Shin (2010a,b)). This analysis is based on a very crude measure of leverage that stems from accounting standards which vary widely across EMEs. But EME banks still follow a more traditional business model and are less engaged in investment banking activities than are their advanced economy counterparts.

The strong growth in EME bank assets shifted the composition of assets towards a higher share of loans (Graph 1, centre panel). In 2009–13, the increase in the shares

Bank leverage, asset growth and credit

Percentage changes — Graph 1



Source: BIS questionnaire.

of loans appeared to be stronger, hinting at a continued strong expansion of bank credit.

While bank assets grew, the share of government debt securities holdings in their total assets fell (Graph 1, right-hand panel). The rise in loan ratios is mirrored by a reduction in the share of government bonds in total assets (see country note from Colombia). As banks shifted their portfolio from government bonds to loans, they kept roughly steady the holdings of other (private) securities and financial instruments as a share of their assets. Such holdings are generally comparatively low (Appendix Table A4).

Even though changes in the composition of EME bank loan portfolios vary widely (Appendix Table A5), some general trends stand out. First, the median share of loans to non-financial corporates has declined slightly (from 48% in 2004 and 48% in 2009, to 44% in 2013), which is mirrored mainly by a rise in the share of loans to households. The increase in this median share across EMEs is most visible from 2004–09 (35% to 38%). Since 2009, it has edged up only slightly (to 39%), possibly influenced by a tightening of regulation in many economies (see country note from Korea). But shares vary considerably between countries. In Peru, the share of corporate loans was around 70% in 2013. This share can be much smaller in countries with highly developed bond markets (ie Singapore, 25%), or where loans to the public sector play an important role (ie the Czech Republic, 23.5%).

Second, lending to the household sector is concentrated in residential mortgages; but the pattern is not homogeneous (Appendix Table A9). In 13 out of 23 countries for which information was provided, residential mortgage loans account for more than half of household loans, including in several of the largest or financially more developed EMEs. In nine economies they account for over 10% of total assets, in Chile, the Czech Republic, Malaysia and Hungary for over 15%, and in Poland, Israel and South Africa for over 20%.

2.2. Debt liabilities

How has this asset growth been financed and has the mix of debt liabilities changed? Debt liabilities comprise four funding sources: (i) retail deposits; (ii) corporate deposits; (iii) long-term debt securities (bonds); and (iv) other non-core funding. Sources (iii) and (iv) are typically considered non-core liabilities. Other non-core liabilities include interbank claims[5] and short-term debt securities. These are usually the least stable sources of funding, as they can quickly dry up under stress (Hahm et al (2013)).

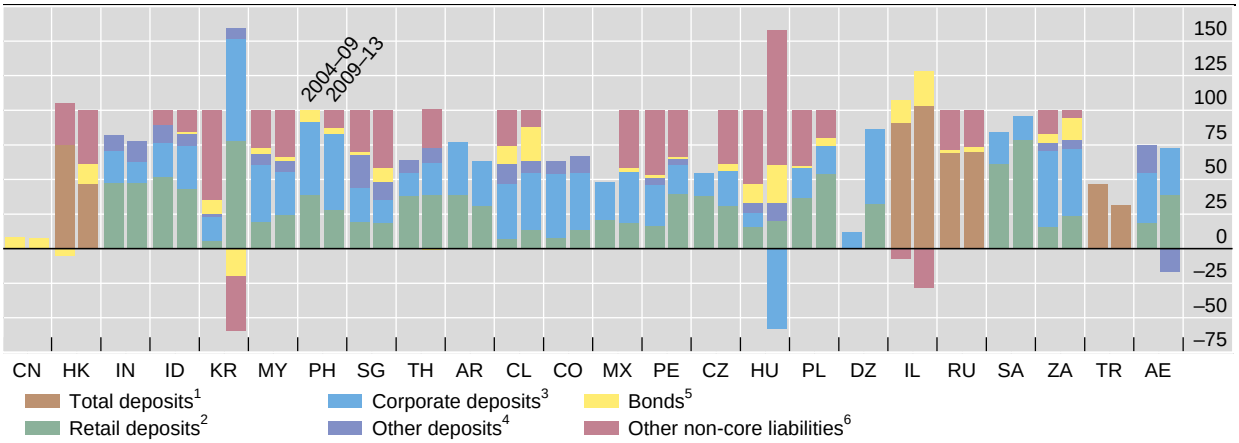
Deposits in general have contributed the most to the growth in liabilities over the last 10 years (Graph 2). Across EMEs, retail and corporate deposits made the greatest contribution to total liabilities growth. The median contribution of corporate deposits was 24% and 31% of total debt liability *growth* in 2004–09 and in 2009–13, respectively. For households deposits the median contribution was 21% and 31%, respectively.

Another major source of bank funding was other non-core liabilities. Across all countries in the sample, its mean contribution was 28% of total debt liabilities in both

[5] It refers to other liabilities than deposits from banks, as those are included in corporate deposits.

Bank debt liabilities

Contributions to total growth in debt liabilities, in per cent — Graph 2



AE = United Arab Emirates; AR = Argentina; BR = Brazil; CL = Chile; CN =China; CO = Colombia; CZ = Czech Republic; DZ = Algeria; 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; VE = Venezuela; ZA = South Africa.

[1] For Hong Kong SAR, Israel, Russia and Turkey, full breakdown of deposits by sector was not provided, therefore total deposits are shown. No data on deposits were provided by Brazil and China. [2] Retail deposits = deposits from households. [3] Corporate deposits = total deposits from non-financial and financial corporates. [4] Other deposits = deposits other than from households or corporates. [5] Bonds = tradable long-term debt securities. Data for Algeria, Argentina, Colombia, India, Saudi Arabia, Turkey and the United Arab Emirates were not provided. For Brazil, data for 2004 and 2009 were not provided. For the Czech Republic, Mexico and Thailand, data for 2004 were not provided. For Russia, only domestic debt securities. [6] Other non-core liabilities = all liabilities other than equity, deposits, or bonds.

Source: BIS questionnaire.

2004–09 and 2009–13. However, the banking sectors where financial markets are more developed (such as Hong Kong, Korea and Mexico) seem to rely on non-core debt financing to a greater extent.[6]

Despite its growth, banks' bond financing still accounts for no more than a small share in total liabilities (Appendix Table A2). In Hungary, Colombia and Israel, where bond financing has increased the most, its contribution to the growth in total debt liabilities was still lower than that of deposits.[7]

3. Credit, funding and interest rate risks

The fast growth in bank assets and the changes in the composition of banks' assets and liabilities raise questions about credit, interest rate, currency and funding risks.

[6] An exception is Hungary, where a decline in deposits seems to have been substituted by non-core financing.

[7] For India, Brazil, Algeria, Turkey and the United Arab Emirates, the numbers for bond financing are not available.

3.1. Credit, interest rate and currency risk

Are there signs that the rapid expansion of bank assets in EMEs has exposed banks to heightened credit risk? Balance sheet measures of credit risk losses, such as non-performing loan ratios or loan loss provisions, signal low risks. In both emerging Asia and Latin America, non-performing loan ratios have been declining and are usually between 2% and 3% of total loans. In central and eastern Europe, non-performing loan ratios have increased since 2008, and are around 6% at the median. Loan loss provisions are low relative to operating income across virtually all emerging markets (median EM Asia = 12%, LatAm = 18%, CEE = 11%).

But, statistics based on balance sheet items are insufficient measures of credit risks or potential instabilities (Lowe (2002)). Crucially, given accounting rules, they function more as backward-looking measures than as leading indicators of potential financial distress. And they may even give misleading signals as profits tend to be high and provisions low during the boom stage of the financial cycle (Borio and Drehmann (2009)).

Forward-looking metrics may signal risks ahead for the banking sector in a number of EMEs (BIS (2014)). Rapid growth in bank assets has fuelled a fast rise in private credit-to-GDP ratios. The credit-to-GDP gap – the deviation of credit-to-GDP ratio from its long-run trend – has proved to be a fairly reliable indicator of future banking sector distress (Borio and Lowe (2002)), with a typical lead time of two or more years ahead. Sceptics argue that emerging market economies (EMEs) are more likely to be undergoing a period of financial deepening, which renders the specification of the trend for the calculation of the credit gap problematic. Yet Drehmann and Tsatsaronis (2014) have shown that the credit gap also performs well for EMEs, albeit not as well as it does for the group of advanced economies.

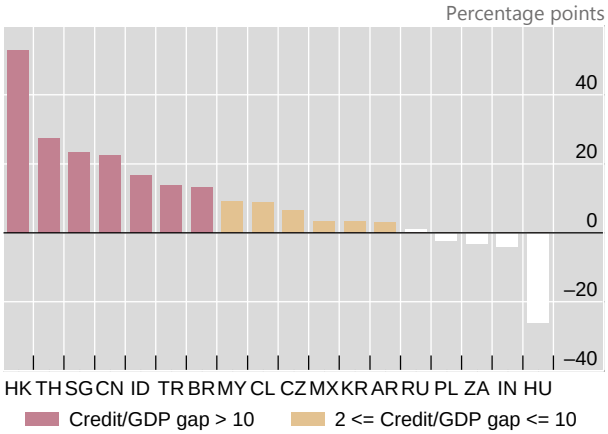
For China, India, Hong Kong SAR and other economies in Asia, as well as Brazil and Turkey, the credit-to-GDP ratio is more than 10 percentage points above its long-run trend (see Graph 3, left-hand panel). This is a threshold at which the Basel III framework suggests that the countercyclical buffer rate should be set at its maximum level (Basel Committee (2010)). Hong Kong has recently activated countercyclical capital buffers, in part as a response to a high credit-to-GDP gap (HKMA (2015)).). For many other EMEs such as Korea, Mexico and South Africa, credit-to-GDP gaps are approaching levels that deserve close attention.

While credit-to-GDP gaps are a fairly reliable predictor of strains at long horizons, high debt service ratios (DSRs) provide better signals for horizons of a year or so (Drehmann and Juselius (2014)). DSRs tend to peak just before strains materialise. While increases in the credit-to-GDP ratio result in steady cumulative increases in the DSR, it is rising or falling interest rates that cause the sharpest changes. The DSR's explicit dependence on interest rates is one link between monetary policy and financial stability. Substantial increases in interest rates, possibly triggered by the normalisation of US monetary policy, could push up debt service costs in many EMEs to critical levels (Graph 3, right-hand panel). In Brazil and Turkey, a 250 basis point increase in rates could result – ceteris paribus – in debt service costs greater than 6 percentage points above their long-run average; assuming that increases in interest rates are fully passed through to lending rates. Levels of more than 6% over the long-run average are critical for financial stability risks. For China, this ratio would be considerably higher.

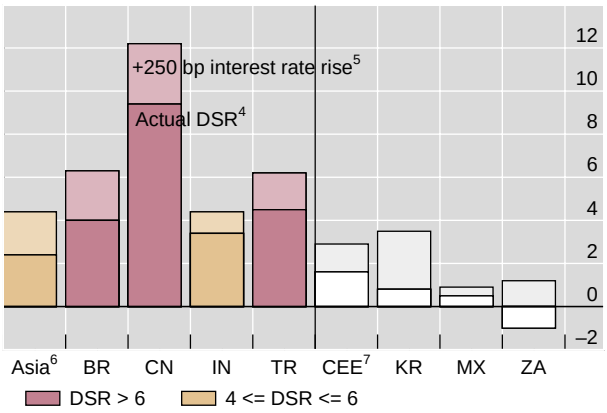
Early warning indicators for domestic banking crises signal risk ahead[1]

Graph 3

Credit-to-GDP gap, latest figures[2, 3]



Debt service ratio (DSR) – impact of a 250bp increase in interest rates[4, 5]



AR = Argentina; BR = Brazil; CEE = central and eastern Europe; CL = Chile; CN = China; CZ = Czech Republic; HK = Hong Kong SAR; HU = Hungary; ID = Indonesia; IN = India; KR = Korea; MX = Mexico; MY = Malaysia; PL = Poland; RU = Russia; SG = Singapore; TH = Thailand; TR = Turkey; ZA = South Africa.

[1] Thresholds for red bars are chosen by minimising false alarms, conditional on capturing at least two thirds of the crises over a cumulative three-year horizon. A signal is correct if a crisis occurs in any of the three years ahead. The noise is measured by the wrong predictions outside this horizon. Beige bars for the credit-to-GDP gap are based on guidelines for countercyclical capital buffers under Basel III. Beige bars for DSRs are based on critical thresholds if a two-year forecast horizon is used. For a derivation of critical thresholds for credit-to-GDP gaps, see Drehmann et al (2011). For debt service ratios, see Drehmann and Juselius (2012). [2] Difference of the credit-to-GDP ratio from its long-run, real-time trend calculated with a one-sided HP filter using a smoothing factor of 400,000, in percentage points. [3] Q3 2014 for the Czech Republic, Hungary, Korea and Mexico; Q2 2014 for other countries. [4] Assuming that an increase of 2.50 percentage points in interest rates is fully transmitted to lending rates and that all the other components of the DSRs stay fixed. [5] Difference of DSRs from country-specific long-run averages since 1985 or later depending on data availability and when five-year average inflation fell below 10% (for Russia and Turkey, the last 10 years are taken). [6] Hong Kong SAR, Indonesia, Malaysia and Thailand. [7] The Czech Republic, Hungary, Poland and Russia.

Sources: National data; BIS; BIS calculations.

Increases in interest rates are also a source of market risks, given banks' debt securities holdings. In some economies, total debt securities holdings exceed 20% of total assets. Unless banks are fully hedged against interest rate risks, a rise in interest rates would induce losses. In particular, government bonds, which can be of relatively long maturity in an increasing number of EMEs, carry notable duration risk. For instance, for bonds with a duration of seven years and a yield of 3.5%, a 250 basis point increase in interest rates would cause a loss of roughly 17%. In some economies, government bond holdings represent more than 15% of total bank assets (Hungary, India, Poland and Turkey). In many jurisdictions, banks are required to hold capital against interest rate risk and may be hedged. Nevertheless, very large increases in interest rates could expose unhedged positions and squeeze banks' equity buffers.

To the extent banks are not hedged against interest rate increases, these would also increase funding costs. This could, in turn, squeeze banks' operating margins and reduce buffers against potential credit losses. Higher financing costs would be especially felt where banks rely heavily on non-core debt liabilities. A proper assessment of interest rate risk would require detailed knowledge of the maturities of liabilities and the use of hedging instruments. Nevertheless, a relevant dimension covered in the BIS survey is the share of fixed and flexible rate loans. Among respondents, the banking sector charges flexible interest rates on more than 50% of outstanding loans (Graph 4, right-hand panel, and Appendix Table A10). While this may help insulate banks to some extent, deposits have shorter average maturities and

pay interest rates that are adjusted more frequently. In addition, in many banking sectors the share of variable-rate deposits is also high; sometimes higher than that for loans (the Czech Republic, Malaysia and Brazil).

Another dimension of potential credit and interest rate risks is foreign currency lending. Loans to non-financial corporates and households in foreign currency – mostly US dollars outside CEE – are a feature of the banking sector in a number of EMEs. A concern is that higher US interest rates and further dollar appreciation might raise the debt burdens. In some countries, a large share of bank assets is denominated in foreign currency, suggesting that bank borrowers may be exposed to substantial currency mismatch (Appendix Tables A6 and A7).

3.2. Funding risks

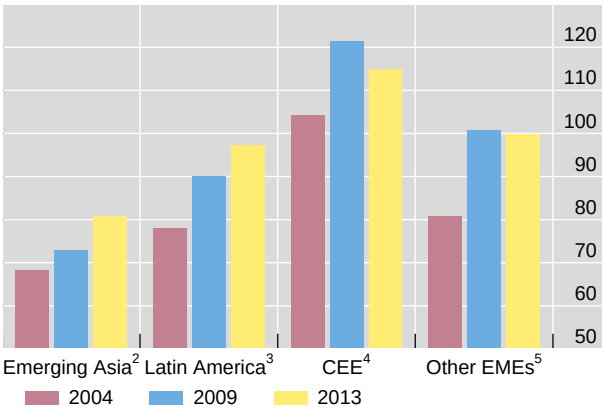
High loan-to-deposit ratios (LDRs) are a potential source of funding risk. LDRs have increased over the last 10 years – and from relatively high levels (Graph 4, left-hand panel). Out of the 24 countries in the sample, 14 had LDRs greater than 90% in 2013, and nine above 100%. In some cases LDRs have declined since 2008, but from very high levels (see Appendix Table A8).

A sudden withdrawal of deposits would force banks to switch to other funding sources or to fire-sale assets. Attracting additional deposits would likely require higher rates. And tapping capital or interbank markets might prove difficult if financial conditions deteriorated. A concern is the possible behaviour of large corporate depositors (see second background paper on "The role of debt securities"). The median share of corporate deposits in total deposits increased from 33% in 2004 to

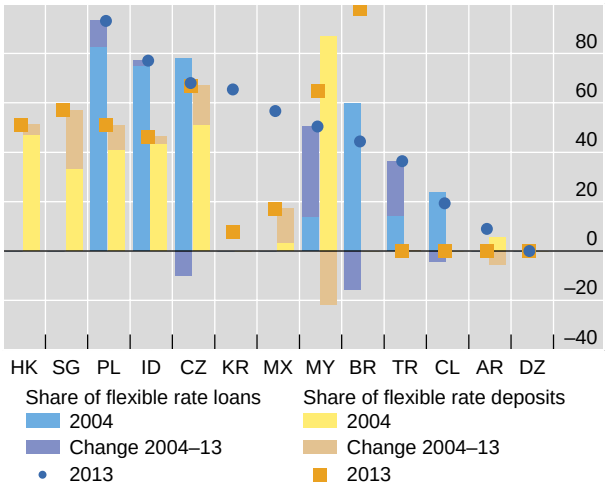
Loan-to-deposit ratios and variable vs fixed rate contracts

In per cent — Graph 4

Median loan-to-deposit ratios[1] in major EM regions



Share of variable rate bank loans and deposits



AR = Argentina; BR = Brazil; CEE = central and eastern Europe; CL = Chile; CZ = Czech Republic; DZ = Algeria; HK = Hong Kong SAR; ID = Indonesia; KR = Korea; MX = Mexico; MY = Malaysia; PL = Poland; SG = Singapore; TR = Turkey.

[1] Gross loans over total deposits. [2] Emerging Asia = China, India, Indonesia, Hong Kong SAR, Korea, Malaysia, the Philippines, Singapore and Thailand. [3] Latin America = Argentina, Brazil, Chile, Colombia, Mexico, Peru and Venezuela. [4] Central and eastern Europe = the Czech Republic, Hungary and Poland. [5] Other EMEs = Algeria, Israel, Russia, Saudi Arabia, South Africa, Turkey and the United Arab Emirates.

Source: BIS questionnaire.

44% in 2009, after which it stabilised. In a few countries, non-financial corporate deposits now exceed those of households (Algeria, Colombia and South Africa; see also Appendix Table A2).

4. Role of international banks and their business models

International banks have historically played a substantial role in private sector financing in EMEs. After the Lehman default in 2008, however, foreign bank lending declined considerably. And in the wake of the euro area crisis in late 2011, European banks retreated further from cross-border lending, driven by their deteriorating financial health (Avdjiev et al (2012)). Have international bank business models become more local in response? Have regional banks stepped into the void?

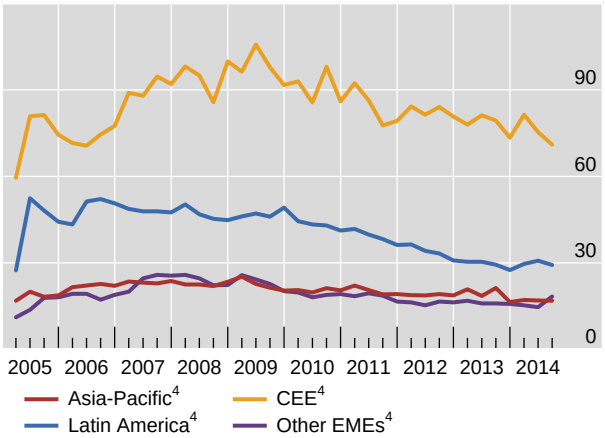
4.1. The role of international bank credit in EMEs

Overall, the role of international bank credit in EMEs has declined (Graph 5, left-hand panel). In Latin America, the median ratio of foreign bank credit (cross-border plus local bank credit by foreign banks) to domestic bank credit for the non-bank sector was around 50% in 2004. Since then, it has declined to roughly 30%. In central and eastern Europe, the same ratio dropped from 100% in 2009 to roughly 75% at the end of 2013. In some Latin American countries, foreign bank credit used to be of

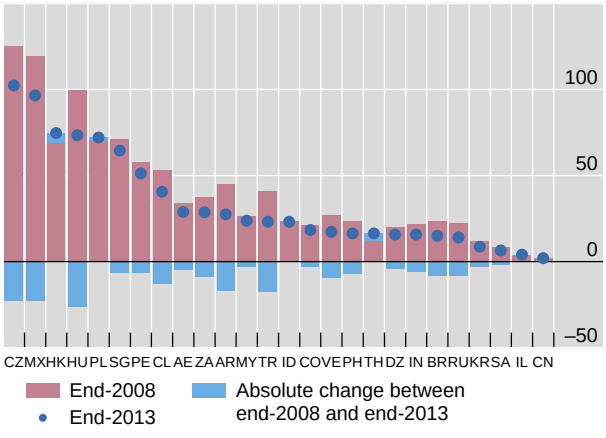
Cross-border and local claims by foreign banks to the private sector[1, 2]

As a percentage of domestic bank credit to non-financial private sector — Graph 5

By recipient region[3]



By recipient country



AE = United Arab Emirates; AR = Argentina; BR = Brazil; CEE = central and eastern Europe; CL = Chile; CN = China; CO = Colombia; CZ = Czech Republic; DZ = Algeria; 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; VE = Venezuela; ZA = South Africa.

[1] Outstanding foreign claims on the non-bank private sector on an ultimate borrower basis. Foreign claims comprise international claims (cross-border claims in all currencies and local claims of foreign bank offices in foreign currencies) and local claims of foreign bank offices in local currency. [2] Data from all the BIS consolidated reporting countries. [3] Median value of the region. [4] For a definition of the regions see the footnotes to Graph 4.

Sources: IMF, *International Financial Statistics*; national data; BIS consolidated banking statistics.

similar importance in the late 1990s, but by end-2013 the ratio was significantly below 50% in most countries (Graph 5, right-hand panel). Despite this decline, foreign credit remains an important funding source in many EMEs. In many emerging Asian economies, the relative importance of foreign bank has traditionally been smaller and has not changed dramatically over the last 10 years.

4.2. International bank business models and regionalisation

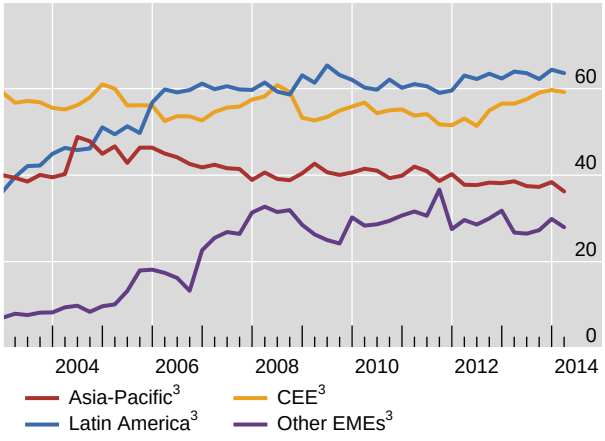
International banks' locally intermediated lending is considered to be less volatile than cross-border lending (García-Herrero and Martínez Pería (2007), McCauley et al (2012)). Already prior to 2008, a gradual new trend toward more localised banking models had emerged (intermediation through local offices, branches and subsidiaries).

This trend continued after 2008, except in emerging Asia. The trend is most visible in Latin America: from 2004 to 2013, the ratio of claims denominated in local currency from local offices in total foreign bank claims rose from about 45% to over 60% (Graph 6, left-hand panel). In central and eastern Europe, the same ratio declined slightly after 2008, but has since recovered to around 60% for the median country. In emerging Asian economies, it has generally not increased since 2008 (Graph 6, right-hand panel).

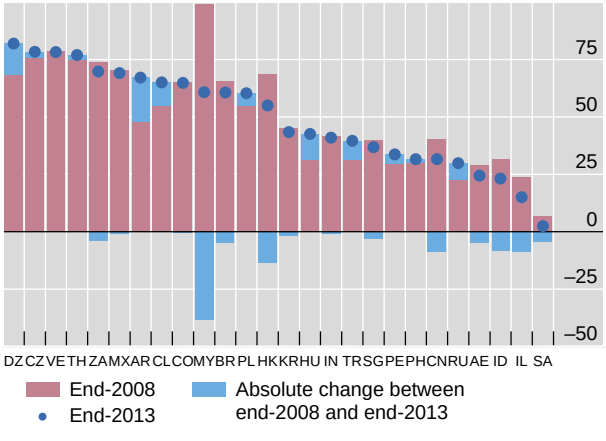
Channels of foreign bank intermediation

As a percentage of total foreign claims[1, 2] — Graph 6

Local claims of foreign bank offices in local currency by counterparty region[2]



Local claims of foreign bank offices in local currency by counterparty country[2]



AE = United Arab Emirates; AR = Argentina; BR = Brazil; CEE = central and eastern Europe; CL = Chile; CN = China; CO = Colombia; CZ = Czech Republic; DZ = Algeria; 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; VE = Venezuela; ZA = South Africa.

[1] Outstanding foreign claims on an immediate borrower basis. Foreign claims comprise international claims (cross-border claims in all currencies and local claims of foreign bank offices in foreign currencies) and local claims of foreign bank offices in local currency. [2] Data aggregated across 26 BIS reporting countries which report local claims of foreign bank offices in local currency: Australia, Austria, Belgium, Brazil, Canada, Chinese Taipei, Denmark, Finland, France, Germany, Greece, India, Ireland, Italy, Japan, Korea, the Netherlands, Norway, Portugal, Singapore, Spain, Sweden, Switzerland, Turkey, the United Kingdom and the United States. [3] For a definition of the regions, see the footnotes to Graph 4.

Source: BIS consolidated banking statistics.

For the part of foreign bank credit that is locally intermediated, lending via subsidiaries appears to have been less volatile than that via branches during the financial crisis (Hoggarth et al (2013)). Since 2009, local intermediation is increasingly taking place through subsidiaries (Appendix Table A12), probably in response to the financial crisis. Local funding ratios are generally quite high for subsidiaries (Appendix Table A13). This helps to better insulate them from funding shocks to the parent bank. The subsidiary-based model clearly prevails in Latin America and most countries in central and eastern Europe (as well as in Turkey). In some emerging Asian countries, however, branches remain the prevalent form of local presence. This likely reflects more stringent regulation on branches in some countries.

Appendix

Banking sector assets: ownership

As a percentage of total assets — Table A1

	Private domestic			Foreign-owned			State-owned		
	2004	2009	2013	2004	2009	2013	2004	2009	2013
Emerging Asia									
China	17	24	29	2	2	2	65	60	52
Hong Kong	32	30	28	68	70	72			
India	19	20	21	7	8	7	74	72	73
Indonesia	41	40	43	13	13	13	41	39	36
Korea	52	47	48	6	12	9	23	22	24
Malaysia	72	70	69				7	7	7
The Philippines	75	76	77	14	11	10	11	13	13
Singapore	25	27	32	75	73	68			
Thailand	64	58	57	9	14	14	17	20	21
Latin America									
Argentina	31	31	28	29	28	28	39	39	43
Brazil[1]	33	37	35	19	18	15	44	43	48
Chile	44	44	49	40	38	34	16	16	16
Colombia	55	63	69	15	18	18	15	5	5
Mexico[2]	17	22	24	66	62	58	17	15	16
Peru	57	59	58	26	22	24	12	11	8
Central and eastern Europe									
Czech Republic[3]	0	0	1	97	97	95	3	3	4
Hungary	26	27	27	63	64	62	5	4	5
Poland	3	5	8	65	68	63	26	21	22
Other EMEs									
Algeria	3	0	0	4	11	14	93	89	86
Israel	99	98	98	1	2	2			
Russia	54	42	40	8	18	15	38	39	44
Saudi Arabia									
South Africa	94	70	74	6	27	26			
Turkey	58	53	51	4	15	19	38	32	31
United Arab Emirates	13	18	18	23	19	19	64	63	64

[1] For Brazil, figures on state-owned banking corporations include development banks. The percentage shares of development banks' assets in total banking sector assets were 12.6%, 13% and 13.6% in 2004, 2009 and 2013, respectively. [2] For Mexico, figures on state-owned banking corporations include only development banks. [3] For Czech Republic, 2013 figure on private domestic banking corporations and figures on state-owned banking corporations are confidential.

Source: BIS questionnaire.

Banking sector assets and liabilities: main categories

As a percentage of total assets — Table A2

	Assets								
	Cash and deposits with central bank			Credit (debt securities and loans)					
				Total			Of which loans		
	2004	2009	2013	2004	2009	2013	2004	2009	2013
Emerging Asia									
China		14	14		72	64	60	54	51
Hong Kong	3	5	3	51	54	61	30	31	38
India	6	6	4	75	72	75	36	48	52
Indonesia	18	18	12	78	77	76	44	57	66
Korea	2	2	2	62	58	60	45	45	48
Malaysia	13	12	9	70	62	64	59	50	52
The Philippines	8	14	26		72	67		48	48
Singapore	1	1	2	40	49	59	27	34	48
Thailand	2	2	2	77	75	77	65	62	65
Latin America									
Argentina	14	18	20	56	66	72	30	44	57
Brazil[1]	9	5	8	64	65	64	38	47	48
Chile	5	6	6	68	71	67	51	57	58
Colombia	5	6	6			69	44	52	55
Mexico[2]		7	6		66	64	37	37	41
Peru	19	16	20	61	57	59	46	46	53
Central and eastern Europe									
Czech Republic	17	10	13	90	89	91	68	70	71
Hungary[3]	7	3	4	65	69	76	50	47	46
Poland	4	5	4	79	85	86	58	66	65
Other EMEs									
Algeria	25	37	30	57	50	58	39	41	50
Israel	4	11	11	71	69	81	62	59	68
Russia	4	4	4	73	79	81	63	67	70
Saudi Arabia							49	52	56
South Africa	2	2	2	85	81	91	78	76	85
Turkey	7	7	12	72	75	75	32	43	58
United Arab Emirates	9	9	10	72	74	66	64	68	60

[1] For Brazil, holdings of cash and deposits with central bank and holdings of debt securities by development banks are excluded. [2] For Mexico, development banks are excluded. Bank loans include transfers to deposit insurance scheme (IPAB). [3] For Hungary, total bank loans do not include loans to non-residents.

Source: BIS questionnaire.

Banking sector assets and liabilities: main categories

As a percentage of total assets — Table A2 (cont)

	Deposits								
	Total			Corporate			Retail		
	2004	2009	2013	2004	2009	2013	2004	2009	2013
Emerging Asia									
China									
Hong Kong	54	60	54						
India	80	77	75	14	19	16	47	45	44
Indonesia	76	78	74	18	20	23	47	47	42
Korea	40	33	41	13	15	18	23	15	19
Malaysia	76	68	65	37	36	34	30	24	23
The Philippines	62	70	71	11	24	33	51	46	38
Singapore	36	44	44	11	14	15	10	12	13
Thailand	70	65	65	13	13	16	49	44	40
Latin America									
Argentina	39	51	54	19	25	27	20	26	27
Brazil									
Chile	56	57	57	35	36	36	18	12	12
Colombia	56	57	58	22	32	34	21	14	13
Mexico[1]	58	51	51	31	28	30	27	23	21
Peru	59	52	54	21	24	22	28	20	26
Central and eastern Europe									
Czech Republic	61	56	54	21	18	19	40	38	35
Hungary	50	40	46	17	13	20	31	22	22
Poland	56	55	57	17	19	18	39	36	38
Other EMEs									
Algeria	64	63	68	64	39	42		24	26
Israel	77	80	82				48	41	40
Russia	61	58	61				28	25	30
Saudi Arabia	74	72	76	23	21	20	51	51	56
South Africa	74	74	72	40	46	46	20	17	18
Turkey	47	43	36				39	37	29
United Arab Emirates	65	63	60	22	28	29	25	18	23

[1] For Mexico, development banks are excluded.

Source: BIS questionnaire.

Banking sector assets and liabilities: main categories

As a percentage of total assets — Table A2 (cont)

	Other liabilities (non-core financing)						Equity		
	Total non-core financing			Of which bond financing					
	2004	2009	2013	2004	2009	2013	2004	2009	2013
Emerging Asia									
China				5	6	7	4	6	7
Hong Kong	42	36	42	4	1	6	4	4	4
India	14	16	18				6	7	7
Indonesia	13	11	13	2	1	1	11	11	13
Korea	54	61	51	7	8	6	6	6	8
Malaysia	16	21	25	0	2	2	8	11	11
The Philippines	25	19	18	1	3	4	13	11	11
Singapore	60	51	51	2	2	4	4	5	5
Thailand	19	22	23		8	4	11	13	12
Latin America									
Argentina	50	36	34				11	12	12
Brazil						21	11	11	9
Chile	36	36	35	5	9	13	8	7	8
Colombia	38	36	33				6	7	9
Mexico[1]	34	38	39		7	6	8	11	10
Peru	30	39	36	4	3	2	11	10	10
Central and eastern Europe									
Czech Republic	29	33	34		6	6	11	11	12
Hungary	41	52	44	10	11	10	9	8	10
Poland	36	37	33	1	1	2	8	9	10
Other EMEs									
Algeria	32	31	25				4	6	7
Israel	16	14	12	1	5	8	7	6	6
Russia	26	26	27	1	2	3	13	16	12
Saudi Arabia	16	14	11				10	13	13
South Africa	17	20	20	2	4	6	8	7	8
Turkey	41	45	54				13	12	11
United Arab Emirates	25	22	27				10	15	13

[1] For Mexico, development banks are excluded.

Source: BIS questionnaire.

Banking sector assets: outstanding credit by recipient sector

As a percentage of total bank credit[1] Table A3

	Households			Non-financial corporations			Public sector			Non-residents		
	2004	2009	2013	2004	2009	2013	2004	2009	2013	2004	2009	2013
Emerging Asia												
China					50	49						
Hong Kong	21	16	13							33	39	37
India	17	21	27				53	44	40	0	0	0
Indonesia	24	34	39	27	30	37	46	34	21	1	1	1
Korea	32	29	31	41	46	48	17	13	11			
Malaysia	44	44	45	42	37	37	8	14	12	0	2	4
The Philippines		9	12		24	34		32	29		13	7
Singapore	18	15	17	16	16	23				45	48	44
Thailand	38	44	47	46	36	32	12	16	17	2	2	3
Latin America												
Argentina	16	28	34	21	32	36	61	40	30	1	0	0
Brazil[2]	24	32	34	33	39	40	39	24	20	1	1	1
Chile	33	36	38	41	44	46	14	12	6	2	2	2
Colombia			33			39			23			3
Mexico[3]		21	24		39	40		36	32		1	1
Peru	17	23	25	58	58	62	15	15	9	2	1	0
Central and eastern Europe												
Czech Republic	13	26	25	20	21	19	47	33	37	17	15	14
Hungary	27	33	29	46	33	29	21	29	38			
Poland	26	47	46	28	23	21	30	26	28	17	4	3
Other EMEs												
Algeria	0	7	6		78	81	31	15	13	0	0	0
Israel	28	35	39	50	43	36	12	12	13	9	10	11
Russia	10	15	21	64	54	45	11	7	4	8	15	13
Saudi Arabia												
South Africa		42	38		31	27		8	6		8	18
Turkey	13	21	26	30	35	50	56	42	22	2	2	1
United Arab Emirates	7	6	7	55	61	51	14	16	24	22	9	11

[1] Total bank credit = loans + debt security holdings by banks. [2] For Brazil, holdings of debt securities by development banks are excluded. [3] For Mexico, development banks are excluded. Public sector loans include transfers to deposit insurance scheme (IPAB).

Source: BIS questionnaire.

Banking sector assets: holdings of debt securities and other financial instruments

As a percentage of total assets — Table A4

	Total holdings of debt securities and other financial instruments[1]			Holdings of private debt securities			Holdings of government or central bank debt securities		
	2004	2009	2013	2004	2009	2013	2004	2009	2013
Emerging Asia									
China					9	9		10	5
Hong Kong	20	23	23	15	14	15	5	9	8
India	41	28	27	5	2	2	33	22	21
Indonesia	33	20	10	2	2	2	31	19	8
Korea	17	14	12	8	7	6	9	6	5
Malaysia	37	32	33	5	5	5	5	8	7
The Philippines		25	20		5	4		18	14
Singapore	15	17	13	10	10	6	4	5	4
Thailand	12	13	13	6	4	3	7	8	9
Latin America									
Argentina	25	22	16	2	2	2	23	20	14
Brazil[2]	27	18	17	3	4	6	23	14	11
Chile	17	14	10	8	6	6	9	8	4
Colombia			14			2			13
Mexico[3]		29	23		11	9		18	14
Peru	15	10	6	6	2	1	9	9	5
Central and eastern Europe									
Czech Republic	23	21	22	9	8	6	13	12	14
Hungary	28	37	34	4	3	4	11	19	26
Poland	21	19	21	1	1	2	20	18	19
Other EMEs									
Algeria	18	9	8	0	1	0	17	7	8
Israel	23	19	19	2	4	3	7	7	9
Russia	10	11	11	3	7	9	7	4	2
Saudi Arabia									
South Africa	24	19	18	2	1	1	5	5	5
Turkey	80	63	33	1	1	1	39	31	16
United Arab Emirates	8	6	6	7	4	4	1	2	2

[1] Excludes cash holdings and deposits with central bank. [2] For Brazil, holdings of debt securities by development banks are excluded. [3] For Mexico, development banks are excluded.

Source: BIS questionnaire.

Banking sector assets: loans by recipient sector

As a percentage of total loans — Table A5

	Households			Non-financial corporations			Public sector			Non-residents		
	2004	2009	2013	2004	2009	2013	2004	2009	2013	2004	2009	2013
Emerging Asia												
China					65	57						
Hong Kong	35	28	20	45	46	43				11	20	30
India	36	31	39	41	38	35	17	19	18	0	0	0
Indonesia	42	47	45	47	41	42	10	12	12	1	0	0
Korea	45	38	38	47	50	52	2	2	2			
Malaysia	51	54	55	43	39	37	1	2	2	1	2	3
The Philippines		14	17		34	44		10	11		12	4
Singapore	27	22	21	20	21	25				36	40	44
Thailand	45	53	56	49	40	36	4	6	5	2	2	3
Latin America												
Argentina	30	42	43	33	43	43	36	14	14	2	1	0
Brazil	41	45	47	54	51	48	4	3	4	1	1	1
Chile	44	45	45	54	54	53	1	1	1	1	1	1
Colombia	43	42	42	48	50	49	8	7	5	1	1	4
Mexico[1]	27	37	38	36	46	46	36	15	15	1	2	1
Peru	23	28	29	76	71	70	1	0	0	0	0	0
Central and eastern Europe												
Czech Republic	18	33	32	26	27	23	43	25	29	13	15	16
Hungary	36	49	48	60	48	47	5	3	5			
Poland	35	60	61	37	30	27	7	6	8	22	4	4
Other EMEs												
Algeria	0	9	7	100	91	93	0	0	0	0	0	0
Israel	33	41	47	57	49	42	3	3	2	7	7	9
Russia	12	18	25	72	59	50	1	1	2	7	14	13
Saudi Arabia	35	25	30	54	69	65	9	4	4	3	2	1
South Africa		45	41		33	28		2	1		9	18
Turkey	28	36	34	66	60	64	3	2	1	3	2	1
United Arab Emirates	8	6	8	62	66	56	15	15	23	14	6	8

[1] For Mexico, development banks are excluded. Public sector loans include transfers to deposit insurance scheme (IPAB).

Source: BIS questionnaire.

Banking sector assets: currency composition by categories

Percentage share in foreign currency — Table A6

	Loans			Debt securities			Mortgages		
	2004	2009	2013	2004	2009	2013	2004	2009	2013
Emerging Asia									
China	6	6	6						
Hong Kong	23	27	44	63	65	73	0	0	0
India									
Indonesia	22	15	17	5	5	13	35	65	22
Korea	7	9	7	5	6	4			
Malaysia	3	2	4		3	8			
Philippines		21	15		47	44			
Singapore	49	55	60						
Thailand	7	3	6		0	0	0	0	0
Latin America									
Argentina	11	13	4	25	17	12	2	5	2
Brazil[1]	13	8	8	7	6	7	2	0	0
Chile	12	12	14	17	3	6	0	0	0
Colombia	6	4	9			1	0	0	0
Mexico[2]	12	11	12			0		0	0
Peru	75	51	46	44	26	30	93	57	39
Central and eastern Europe									
Czech Republic	17	17	19	18	13	15	6	2	0
Hungary	31	61	52	4	12	9	8	75	62
Poland	34	34	30	6	4	5	57	65	50
Other EMEs									
Algeria	0	0	0	0	0	0		0	0
Israel	29	18	17	24	29	20			3
Russia	30	30	23	30	19	18	45	20	4
Saudi Arabia	13	11	6						
South Africa			10			9		0	0
Turkey	40	32	33	34	19	18	0	0	0
United Arab Emirates							32	9	8

[1] For Brazil, holdings of debt securities by development banks are excluded. [2] For Mexico, development banks are excluded. Bank loans include transfers to deposit insurance scheme (IPAB).

Source: BIS questionnaire.

Banking sector assets: loans by recipients – currency composition

Percentage share in foreign currency — Table A7

	Domestic households			Non-financial corporations			Domestic government and public sector corporations			Non-residents		
	2004	2009	2013	2004	2009	2013	2004	2009	2013	2004	2009	2013
Emerging Asia												
China												
Hong Kong	3	3	5	21	22	41				85	73	75
India												
Indonesia	1	1	2	40	27	30	18	23	30	94	82	87
Korea												
Malaysia			0	5	3	7	63	1	0	40	38	47
The Philippines		1	1		17	18		2	1		100	99
Singapore												
Thailand	0	0	0	9	6	11	5	0	2	92	59	70
Latin America												
Argentina	5	3	1	19	26	9	4	0	0	100	100	100
Brazil			1	21	14	13			1	100	100	100
Chile	0	0	0	19	20	24	16	25	73	93	97	100
Colombia	0	0	0	10	7	13	5	1	4	37	37	46
Mexico[1]	3	1	0	28	19	22	1	9	8	99	56	91
Peru	61	37	34	80	57	51	10	33	4	100	57	77
Central and eastern Europe												
Czech Republic	0	0	0	19	19	22	7	7	6	70	67	78
Hungary	13	66	54	43	58	50	22	24	55			
Poland	24	37	32	24	25	25	6	9	17	75	83	80
Other EMEs												
Algeria	0	0	0	0	0	0	0	0	0			
Israel	4	3	2	35	20	15	15	8	0	100	100	100
Russia	16	11	2	27	25	19	2	0	0	89	81	81
Saudi Arabia							21	32	14	100	79	71
South Africa			0			3			2			47
Turkey	3	2	0	51	47	49	100	55	57	93	80	81
United Arab Emirates												

[1] For Mexico, development banks are excluded. Public sector loans include transfers to deposit insurance scheme (IPAB).

Source: BIS questionnaire.

Banking sector: leverage, asset growth and loan-to-deposit ratio

Table A8

	Asset-to-equity ratio			Change in assets[1]		Loan-to-deposit ratio[1]		
	2004	2009	2013	2009/04	2013/09	2004	2009	2013
Emerging Asia								
China	25	18	15	152	90			
Hong Kong	26	27	25	49	59	56	52	70
India	17	14	14	165	83	46	62	70
Indonesia	9	9	8	99	96	58	73	90
Korea	18	16	13	73	10	111	136	117
Malaysia	12	9	9	81	50	78	73	81
The Philippines	8	9	9	54	61		69	68
Singapore	24	22	21	40	29	74	77	108
Thailand	9	8	8	41	61	93	95	99
Latin America								
Argentina	9	8	8	82	159	78	86	105
Brazil	9	9	11	127	91			
Chile	13	14	12	92	55	91	100	102
Colombia	16	14	11	102	82	77	90	95
Mexico[2]	12	9	10	69	40	63	72	79
Peru	9	10	10	146	68	78	90	97
Central and eastern Europe								
Czech Republic	9	9	9	60	24	112	124	131
Hungary	11	12	10	103	–9	100	116	99
Poland	13	12	10	96	33	104	121	115
Other EMEs								
Algeria	23	16	14	90	41	61	65	73
Israel	14	16	16	30	17	81	74	83
Russia	8	6	8	314	95	103	116	116
Saudi Arabia	10	8	8	107	39	66	72	75
South Africa	12	15	13	109	29	105	103	117
Turkey	8	8	10	172	108	68	101	164
United Arab Emirates	10	7	8	247	36	99	108	100

[1] In per cent. [2] For Mexico, development banks are excluded. Bank loans include transfers to deposit insurance scheme (IPAB).

Source: BIS questionnaire.

Banking sector assets: residential mortgage loans

Table A9

	As a percentage of total assets			As a percentage of household loans		
	2004	2009	2013	2004	2009	2013
Emerging Asia						
China						
Hong Kong	9	7	6	81	77	72
India						
Indonesia	3	5	6	14	18	21
Korea	12	11	13	62	65	68
Malaysia	15	13	15	50	49	51
The Philippines		3	4		51	45
Singapore	5	5	8	67	73	76
Thailand	10	12	11	34	35	29
Latin America						
Argentina	4	5	4	47	26	18
Brazil	2	3	7	13	15	30
Chile	20	17	17	90	67	66
Colombia	10	8	8	54	37	35
Mexico[1]	4	7	8	44	51	49
Peru	6	7	9	57	53	62
Central and eastern Europe						
Czech Republic	10	19	18	81	82	78
Hungary	11	18	18	64	78	80
Poland	7	21	24	33	52	60
Other EMEs						
Algeria		2	3		57	89
Israel	15	17	22	73	68	69
Russia	0	3	5	3	28	27
Saudi Arabia		4	6		29	34
South Africa	23	26	22		77	63
Turkey	1	5	6	9	34	32
United Arab Emirates	2	10	8	44	229	176

[1] For Mexico, development banks are excluded.

Source: BIS questionnaire.

Banking sector assets: loans – contractual terms of interest rate charged

Table A10

	Fixed rate[1]			Variable rate[1]			Average contractual repricing interval[2]		
	2004	2009	2013	2004	2009	2013	2004	2009	2013
Emerging Asia									
China									
Hong Kong									
India									
Indonesia	23	22	22	75	77	77			
Korea			35			65			
Malaysia	87	70	50	14	30	50			
The Philippines								2.4	3.0
Singapore							0.9	0.6	0.5
Thailand									
Latin America									
Argentina			91			9			
Brazil	40	50	56	60	50	44			
Chile	76	77	81	24	23	19	2.8	3.2	3.5
Colombia									
Mexico		49	43		51	57		0.1	0.1
Peru									
Central and eastern Europe									
Czech Republic	22	26	32	78	74	68	2	2	2
Hungary							3	3	3
Poland	17	9	7	83	91	93			
Other EMEs									
Algeria	100	100	100	0	0	0			
Israel									
Russia									
Saudi Arabia									
South Africa									
Turkey	86	60	64	14	40	36		1	2
United Arab Emirates	100	100	100						

[1] As a share of total loans, in per cent. [2] Average maturity in years.

Source: BIS questionnaire.

Banking sector liabilities: deposits – contractual terms of interest rate paid

Table A11

	Fixed rate[1]			Variable rate[1]			Average contractual repricing interval[2]		
	2004	2009	2013	2004	2009	2013	2004	2009	2013
Emerging Asia									
China									
Hong Kong SAR	53	47	49	47	53	51			
India									
Indonesia	52	49	49	43	47	46	2.7	2.9	3.4
Korea			92			8	18.6	8.5	7.7
Malaysia	13	21	35	87	79	65	0.4	0.4	0.4
Philippines								0.6	1.4
Singapore	67	54	43	33	46	57	0.4	0.3	0.3
Thailand									
Latin America									
Argentina	95	98	100	5	2	0	0.1	0.1	0.1
Brazil			2			98			
Chile	100	100	100	0	0	0	0.6	0.4	0.4
Colombia									
Mexico	97	87	83	3	13	17	0.3	0.8	1.8
Peru									
Central and eastern Europe									
Czech Republic	49	45	33	51	55	67	0.6	0.5	0.6
Hungary							0.2	0.3	0.3
Poland	59	51	49	41	49	51			
Other EMEs									
Algeria	100	100	100	0	0	0			
Israel									
Russia									
Saudi Arabia									
South Africa									
Turkey	100	100	100	0	0	0	0.2	0.2	0.2
United Arab Emirates	100	100	100						

[1] As a share of total deposits, in per cent. [2] Average maturity in years.

Source: BIS questionnaire.

Banking sector assets: residential mortgage loans – contractual terms of interest rate charged

As a percentage of residential mortgage loans — Table A12

	Fixed interest rate			Variable interest rate		
	2004	2009	2013	2004	2009	2013
Emerging Asia						
China						
Hong Kong SAR	5	1	1	95	99	99
India						
Indonesia	2	1	5	99	99	95
Korea		5	26		95	75
Malaysia		29	28		72	72
Philippines						
Singapore	Minority	Minority	Minority	Majority	Majority	Majority
Thailand	0	0	0	100	100	100
Latin America						
Argentina			71			29
Brazil	100	100	100	0	0	0
Chile	70	80	86	30	20	14
Colombia	13	88	86	87	12	14
Mexico		96	96		4	4
Peru						
Central and eastern Europe						
Czech Republic	Majority	Majority	75	Minority	Minority	25
Hungary						
Poland	9	2	0	91	98	100
Other EMEs						
Algeria		100	100		0	0
Israel			25			75
Russia						
Saudi Arabia						
South Africa						
Turkey	100		100	0		0
United Arab Emirates						

Source: BIS questionnaire.

Banking sector assets: total assets and loans of foreign bank subsidiaries and branches

In per cent

Table A13

	Subsidiaries						Branches					
	Assets as a share of total foreign-owned banks' assets			Loans as a share of their total assets			Assets as a share of total foreign-owned banks' assets			Loans as a share of their total assets		
	2004	2009	2013	2004	2009	2013	2004	2009	2013	2004	2009	2013
Emerging Asia												
China		84	87		53	43		16	13		58	48
Hong Kong SAR	34	38	39	43	37	36	66	62	61	13	13	17
India	0	0	0				100	100	100	44	37	41
Indonesia	33	40	40	61	59	69	67	60	60	41	49	58
Korea	0	0	0				100	100	100	10	5	8
Malaysia				55	50	55						
The Philippines	12	14	14		47	49	88	86	86		41	42
Singapore	5	7	9	0	9	27	95	93	91	7	9	14
Thailand	12	33	35	72	67	67	88	67	65	61	62	56
Latin America												
Argentina	73	81	88	47	47	63	27	19	12	39	35	53
Brazil												
Chile	86	98	99	71	66	75	14	2	1	58	10	17
Colombia	100	100	100	57	60	66	0	0	0			
Mexico	100	100	100	39	38	42	0	0	0			
Peru	100	100	100	56	54	60	0	0	0			
Central and Eastern Europe												
The Czech Republic	90	88	90	58	63	61	10	12	10	59	39	51
Hungary	100	90	88	51	56	55	0	10	12		37	33
Poland	99	92	96	45	59	61	1	8	4	20	60	33
Other EMEs												
Algeria	59	81	76	95	52	51	41	19	24	19	23	36
Israel	0	29	38		77	70	100	71	62	56	24	28
Russia												
Saudi Arabia											81	56
South Africa	6	82	80	14	3	1	94	18	20	19	24	20
Turkey	86	98	99	47	59	60	14	2	1	7	14	10
United Arab Emirates												

Source: BIS questionnaire.

Banking sector assets and liabilities: loans and liabilities – currency composition

In per cent

Table A14

	Subsidiaries						Branches					
	Local currency loans as a share of total subsidiaries loans			Funding raised from local sources in local currency as a share of total liabilities			Local currency loans as a share of total branches loans			Funding raised from local sources in local currency as a share of total liabilities		
	2004	2009	2013	2004	2009	2013	2004	2009	2013	2004	2009	2013
Emerging Asia												
China		64	74					41	47			
Hong Kong	91	89	74	65	62	50	62	64	41	20	17	16
India										68	57	60
Indonesia	35	54	48	30	40	27	52	50	36	30	20	22
Korea							59	40	33	59	41	43
Malaysia	90	95	89	62	68	65						
The Philippines		66	81		57	70		87	91		37	38
Singapore				2	9	24				8	11	10
Thailand	96	97	88	95	68	73	62	90	75	63	66	41
Latin America												
Argentina	91	84	96	78	74	89	92	87	98	74	76	87
Brazil	80	93	90	80	87	83						
Chile	86	92	85	65	76	73	90	38	42	59	60	50
Colombia	92	95	94	98	97	97						
Mexico	89	89	87	63	56	54						
Peru	26	48	54	90	83	87						
Central and eastern Europe												
Czech Republic	92	93	93	71	73	69	92	80	86	40	43	50
Hungary	59	31	41	31	34	32		37	42	0	3	3
Poland	69	62	64	71	68	72	70	54	75	74	43	28
Other EMEs												
Algeria	100	100	100	54	63	69	100	100	100	56	59	75
Israel		100	100		97	99	36	31	34	39	51	49
Russia	59	85	87	49	54	66						
Saudi Arabia								91	90		38	55
South Africa			81			83			73			59
Turkey	66	74	83	34	37	47	0	67	60	60	17	19
United Arab Emirates										36	38	31

Source: BIS questionnaire.

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The role of debt securities markets

Masazumi Hattori and Előd Takáts[1]

Abstract

Debt securities markets in emerging market economies (EMEs) have grown over the past decade. The growth was particularly strong for domestic debt securities, which have increased from around one third of EME GDP to around one half. Although international debt securities have demonstrated slower growth, bonds still overtook bank loans in international financing flows. This growth was, however, heterogeneous, reflecting economy-specific factors. While bonds bring economic benefits, especially in funding diversification, the rapid growth in debt securities markets also raises financial stability risks.

Keywords: Debt securities, bonds, emerging markets

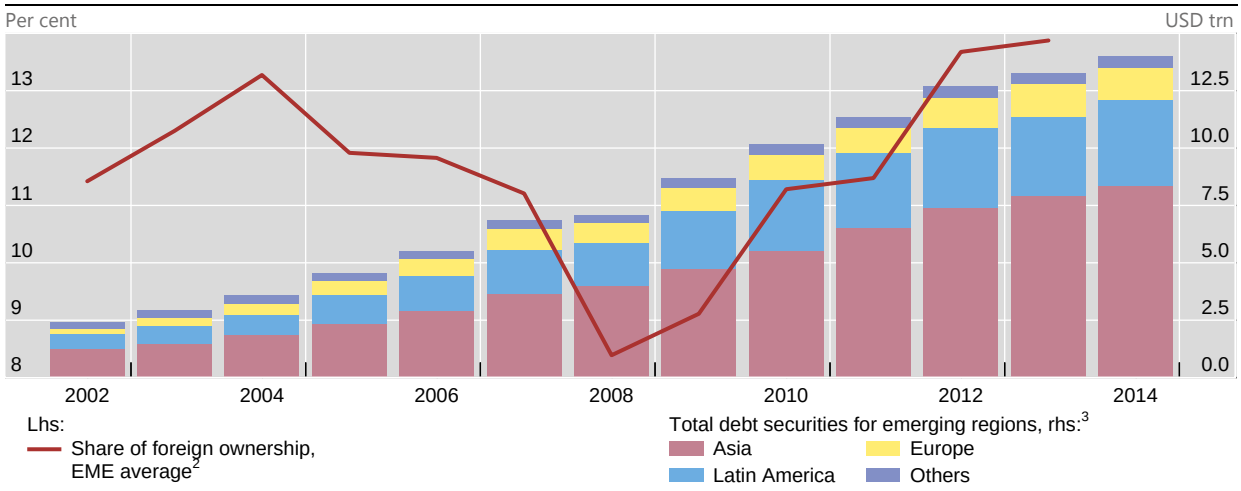
JEL: F21, F65, G15

[1] Bank for International Settlements. Agne Subelyte and Diego Urbina provided excellent research assistance. Any remaining errors are the authors' own.

Introduction

Debt securities issuance in emerging market economies (EMEs) has surged in the past decade: the volume outstanding went from around USD 2.5 trillion in 2002 to over USD 14 trillion in 2014 (Graph 1). The role of foreign financing also grew after the financial crisis: not only did international issuance increase fast, but foreign investors bought domestic bonds in large quantities (red line). As a result, bonds overtook loans in *international* financing flows after the financial crisis – the so-called "second phase" of global liquidity (Shin (2013)). This expansion brings benefits; however, as the taper tantrum in May 2013 shows, it also raises new risks.

The growth of total debt securities and foreign ownership[1] Graph 1



[1] By residence. Total debt securities for Brazil, Chile, Colombia, India, Indonesia, Korea, Mexico, the Philippines and South Africa are calculated as the sum of international debt securities by residence and domestic debt securities by residence; for 2014, data up to Q2. [2] Foreign ownership results from the IMF *Coordinated Portfolio Investment Survey* (Table 16.2: Derived Portfolio Investment Liabilities, Total Debt Securities). [3] For Asia, sum of China, Hong Kong SAR, India, Indonesia, Korea, Malaysia, the Philippines, Singapore and Thailand; for Latin America, sum of Argentina, Brazil, Chile, Colombia, Mexico and Peru; for Europe, sum of the Czech Republic, Hungary, Poland, Russia and Turkey; for others, sum of Israel, Saudi Arabia and South Africa.

Sources: IMF, *Coordinated Portfolio Investment Survey*; BIS securities statistics; BIS calculations.

This note explores these issues. The first section summarises recent developments in debt markets; the second discusses key benefits and risks.

1. Trends in debt security issuance

In this section, we mostly rely on the BIS debt securities statistics, which provide a comprehensive database on all EME sectors' issuance. Importantly, these data may deviate from country information received through questionnaire responses – in

some cases substantially.[2] While these discrepancies are not entirely unexpected,[3] they suggest that some caution be exercised in interpretation. Reconciling the databases is an area for future work and research. Furthermore, wherever required, the analysis is supplemented by the questionnaire data relating to maturities and other issuance terms.

Domestic and international debt securities

Debt securities can be classified as either domestic or international, depending on the place of issue. Most debt securities are issued domestically, ie by EME residents in their local market, typically in local currency (Gruić and Wooldridge (2012)). Domestic debt securities comprise approximately 80% of the total outstanding, which was around USD 12 trillion at end-2014 (Graph 2, first panel). Traditionally, the public sector, with around one half of the total volumes, dominates domestic issuance. However, local currency bond issuance by EME non-financial corporations has grown at a much faster pace since 2007, with the stock quadrupling to around USD 2 trillion by end-2014 (second panel).

Not surprisingly, the stock of *domestic* debt securities increased strongly also relative to GDP, from less than one third in 2002 to almost one half in 2014 (Graph 2, first panel, red line). While debt issuance by the public sector largely reflects the size of fiscal deficits, debt issuance by firms depends more on their funding model. For instance, in spite of the relatively small size of Korea's economy compared with China's, corporates from these two countries had almost equal amount of debt securities outstanding in 2014.

EME *international* debt securities issuance has also grown rapidly, reaching USD 2.5 trillion in 2014 based on the nationality of the issuer – ie the location of the issuer's headquarters rather than the residence of the issuing unit (Graph 2, third panel).[4] From the early 2000s, international debt issuance by governments declined in importance as borrowing shifted more to the domestic market. In contrast, issuance by both banks and (private) non-banks has picked up sharply since 2009 (fourth panel). With the outstanding stocks exceeding USD 1.2 trillion in 2014, non-bank corporations accounted for around half of all international debt securities. International issuance by non-banks has been traditionally strong in Korea – but also accelerated in other countries, such as Brazil.

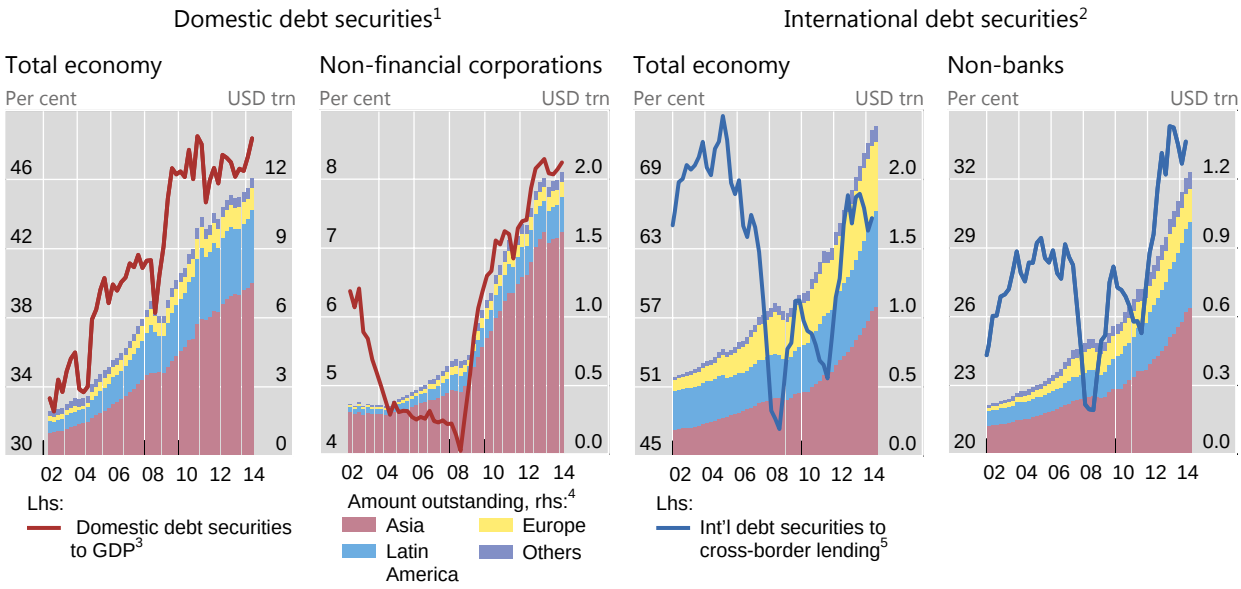
[2] For the differences for total debt securities, see Appendix Table A1. The differences tend to be smaller for government debt securities (Appendix Table A2) than for financial and non-financial corporations (Appendix Tables A3 and A4, respectively).

[3] For instance, Borio et al (2013) find that, even for the United States, figures from BIS data on external bank loans considerably exceed those based on flow of funds.

[4] In the following, we will use data based on nationality. The main reason, as the Box explains in more detail, is that it better reflects financial risks than residence-based statistics do. Furthermore, international debt securities statistics are able to distinguish between banks and non-banks as opposed to just financial vs non-financial corporations. This is relevant because many non-financial corporations use their non-bank financial subsidiaries to issue debt securities internationally – and thereby the non-bank category reflects the risks taken by non-financial corporations more accurately.

Domestic and international debt securities

By sector and region — Graph 2



[1] By residence. For the Czech Republic, Hong Kong SAR and Poland, calculated as the difference between total debt securities by residence and international debt securities by residence. [2] By nationality. [3] For the total economy, as a percentage of nominal GDP. [4] For Asia, sum of China, Hong Kong SAR, India, Indonesia, Korea, Malaysia, the Philippines, Singapore and Thailand; for Latin America, sum of Argentina, Brazil, Chile, Colombia, Mexico and Peru; for Europe, sum of the Czech Republic, Hungary, Poland, Russia and Turkey; for others, sum of Israel, Saudi Arabia and South Africa. [5] Sectoral international debt securities as a percentage of the sum of all BIS reporting countries' cross-border loans vis-à-vis emerging market economies.

Sources: IMF, *International Financial Statistics*; national data; BIS locational banking statistics; BIS securities statistics; BIS calculations.

Clearly, in many EMEs, international debt issuance has grown faster than cross-border bank lending post-crisis. Taking EMEs as a whole, the evolution of international debt issuance relative to cross-border bank lending resembles a V-shaped pattern – the sharp decline during the 2008 financial crisis ushered in a strong recovery (Graph 2, third and fourth panels, blue lines).[5] This pattern owes much to the non-bank sector, which has stepped up securities issuance after the financial crisis.

Properties of debt securities

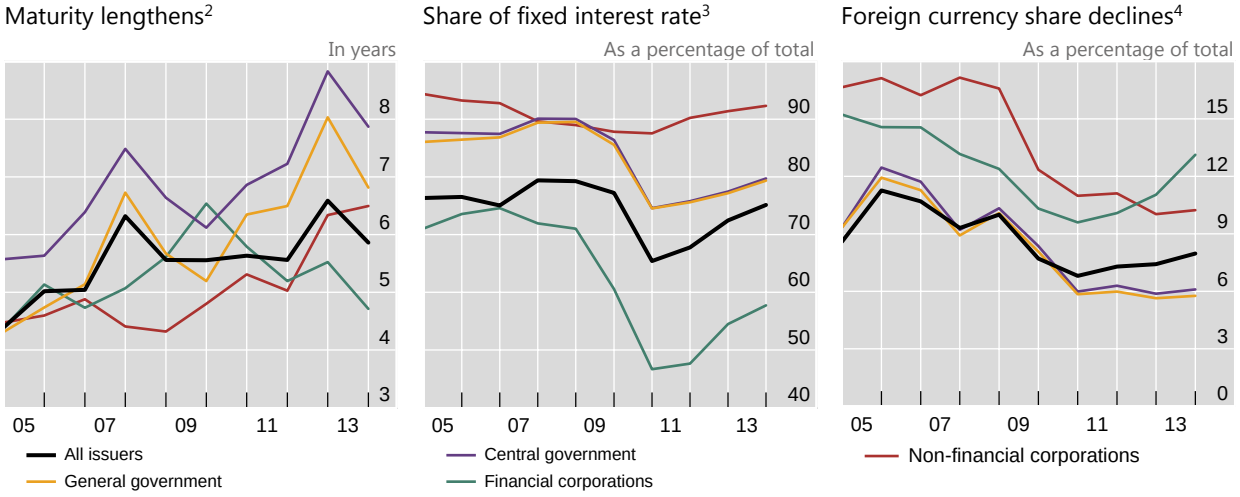
A key fact about EMEs' debt issuance is the lengthening maturity (Graph 3, left-hand panel). While this has been true for all borrowers (black line), it has been particularly marked for non-financial corporations (red line).[6] That said, many EMEs are still likely

[5] Strictly speaking, the two data series are not fully comparable. The locational cross-border bank loan series show how much residents of a given EME borrow from banks resident in other (BIS reporting) countries, whereas the international debt securities nationality-based data series show how much debt securities EME firms and their foreign subsidiaries issue outside their local markets. In other words, the bank lending series is defined based on the residence of the borrower *relative to the residence of the lender*, whereas the international debt securities series is defined based on the residence of the borrower *relative to the market of issuance*.

[6] The often used, but incomplete, Dealogic database on debt securities suggests a less pronounced increase in maturities (Appendix Graph A4).

to face large debt redemptions in the next few years (Appendix Graph A2). And, naturally, the duration has increased, as roughly three quarters of bonds have been issued at fixed interest rates (centre panel).[7]

Properties of debt securities[1] Graph 3



[1] Total debt securities, by residence; aggregated for the following EMEs: Algeria, Argentina, Brazil, Chile, China, Colombia, the Czech Republic, Hong Kong SAR, Hungary, India, Indonesia, Israel, Korea, Malaysia, Mexico, Peru, the Philippines, Poland, Russia, Saudi Arabia, Singapore, South Africa, Thailand and Turkey. [2] For maturity, weighted average of the countries listed in footnote 1, excluding Argentina, Hungary, Mexico, Poland and Saudi Arabia. [3] For fixed interest rate, weighted average of the countries listed in footnote 1, excluding Algeria, Argentina, India, Indonesia, Saudi Arabia and Singapore. [4] For foreign currency share, weighted average of the countries listed in footnote 1, excluding Argentina and Mexico.

Source: BIS questionnaires; for detailed country-specific data, see Appendix Tables A5–A7.

Furthermore, the foreign currency share of total debt securities has declined slightly (Graph 3, right-hand panel). The main reason has been the rise in local currency-denominated domestic issues. Among foreign currencies, the dollar is the dominant currency for most EME borrowers, representing slightly less than three quarters of all issues (Appendix Graph A2, right-hand panel). The dollar's role strengthened further post-crisis, as many issuers and investors shied away from the euro. However, the euro's share rebounded after 2011, and by 2014 it had returned to its 2007 level.

Heterogeneity in growth and foreign ownership

Despite these broad trends, there are cross-country differences. Consider first the evolution of total debt securities in relation to GDP between 2007 and 2013 (Graph 4, left-hand panel). Taking all EMEs together, the share of total debt securities increased from around 47% to 53% of GDP (blue dot). Across countries, however, the share ranged from close to zero (in Saudi Arabia) to over 100% (in Brazil, Hong Kong SAR, Korea, Malaysia, Singapore) at end-2013. Moreover, between 2007 and 2013 the share actually declined in China among a few other countries, while it increased

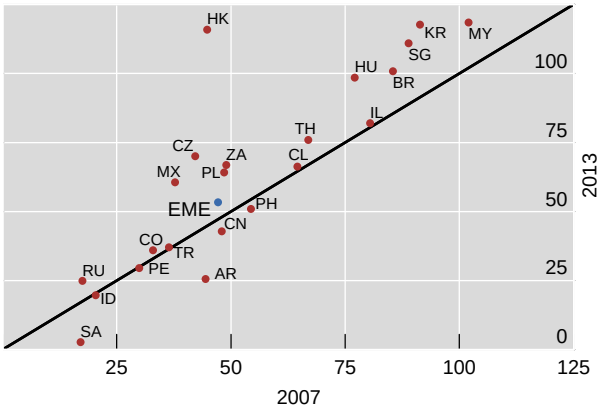
[7] The Dealogic database would suggest an even larger share of fixed-term instruments than the questionnaire response (Appendix Graph A3; and Graph A4, centre panel).

rapidly in most of the rest (red dots above the 45° line). The share more than doubled in Hong Kong SAR.

Debt securities: role in the economy and foreign ownership

In per cent — Graph 4

Total debt securities as a share of GDP[1, 2]



Foreign ownership share of total debt securities[1, 2, 3]

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

[1] Total debt securities for Brazil, Chile, Colombia, Indonesia, Korea, Mexico, the Philippines and South Africa are calculated as the sum of international debt securities by residence and domestic debt securities. [2] For Chile, Q1 2008 instead of Q4 2007. [3] Foreign ownership results from the IMF *Coordinated Portfolio Investment Survey* (Table 16.2: Derived Portfolio Investment Liabilities, Total Debt Securities).

Sources: IMF, *Coordinated Portfolio Investment Survey* and *International Financial Statistics*; national data; BIS securities statistics; BIS calculations.

Non-resident investors have been especially eager buyers: their share of total debt securities increased from around 11% in 2007 to 14% in 2013 (Graph 4, right-hand panel, blue dot).[8] The increase also reflects changing investor behaviour: while traditionally non-residents invested mostly in international issues, they have become increasingly active in domestic markets post-crisis. As in other respects, the divergence across countries is large: foreign ownership ranged from less than 10% in China to almost 50% in Hungary at end-2013 (see vertical axis). The increase of foreign ownership was particularly strong in Indonesia, Mexico, Poland and Turkey.

[8] The share of foreign-owned securities needs to be treated cautiously because its evolution also reflects changes in *valuation*. In the calculation of the share, the numerator, ie foreign holdings of EME debt securities, is (mostly) based on market value (IMF CPIS), while the denominator, total debt securities, is based on book value (BIS securities database). This implies, for instance, that the rapid increase in foreign ownership after 2008 partly reflects the recovery in bond prices. The aim of limiting these valuation effects also motivates using 2007 as a base for comparing post-crisis developments.

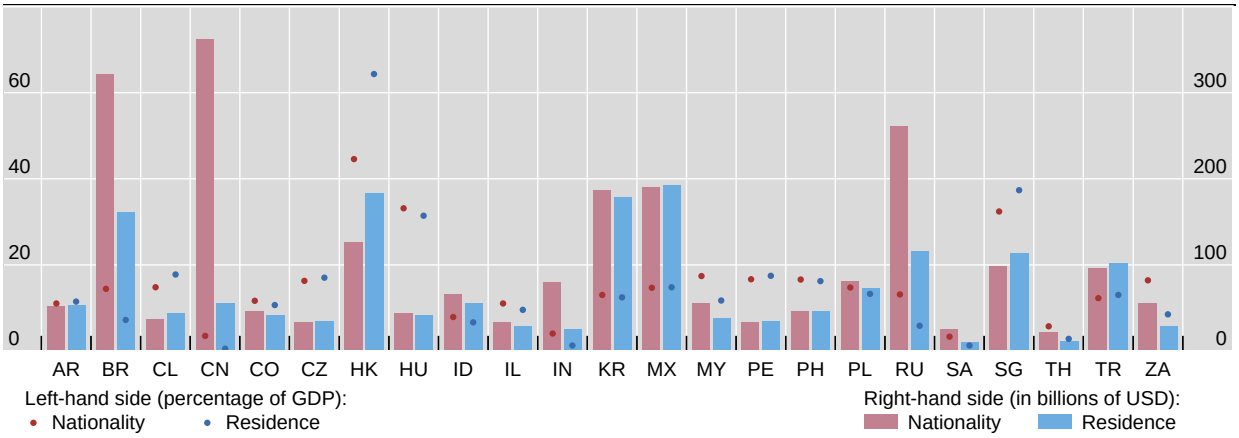
Nationality and residence basis for international debt securities

In the case of international debt securities, ie debt securities issued by EME residents in other jurisdictions, it is relevant to distinguish between residence- and nationality-based data. (While the same differentiation between residence and nationality basis could also be applied to domestic debt securities, the difference there is marginal.) A simple example illustrates the difference. A subsidiary of a Brazilian company registered in the Cayman Islands issues bonds to international investors in London. The bonds are clearly international, as they are issued by an EME resident outside the domestic market. However, it is not straightforward to which economy to link the issue. Based on the *residence* of the issuer, the bond is linked to the Cayman Islands. However, based on the *nationality* of the issuer, it is linked to Brazil.

The difference between residence- and nationality-based international debt securities is substantial in many EMEs, but by no means in all (Graph A). The difference, which in aggregate points to higher issuance on a nationality basis, started to emerge after 2005 and grew post-crisis (Appendix Graph A1, right-hand panel). In absolute terms, five economies are responsible for most of the difference: Brazil, China, Hong Kong SAR, India and Russia (compare the heights of red and blue bars). In some cases, this reflects capital account restrictions, which offshore issuance can avoid. Offshore issuance, of course, benefits financial centres, for which residence-based issuance is therefore higher. For instance, this is true of Hong Kong SAR, where Chinese corporations are very active. Although Singapore shows the same pattern, the difference there is small. In financial centres, the debt securities stock is also higher relative to the GDP (dots).

International debt securities[1]

Outstanding stocks at Q2 2014, all issuers — Graph A



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; ZA = South Africa.

Sources: National data; BIS securities statistics; BIS calculations.

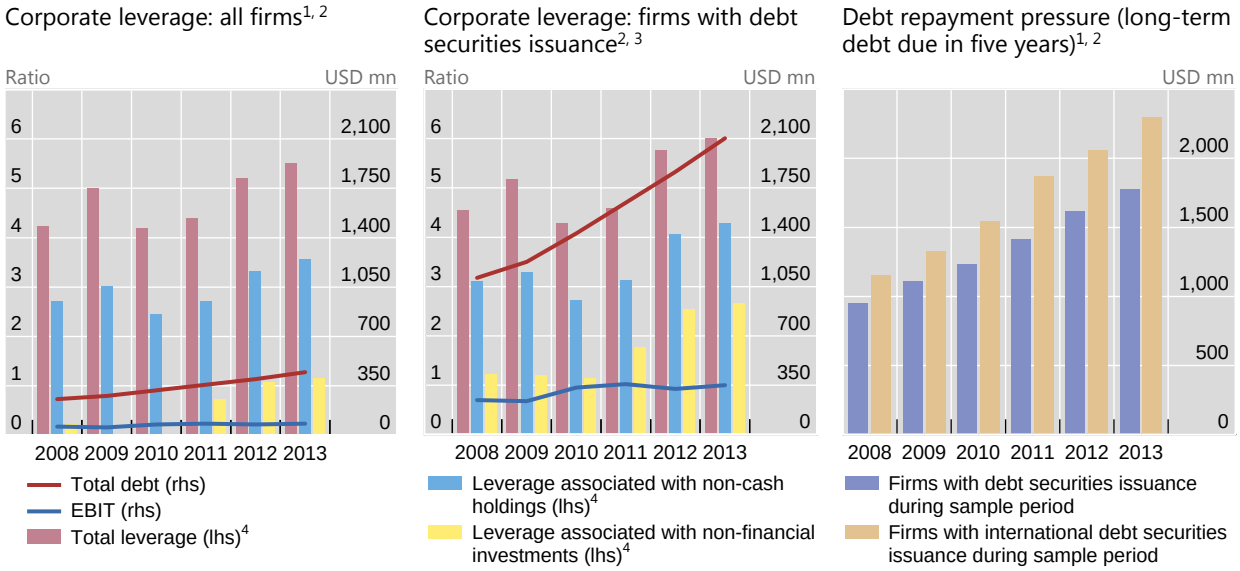
In principle, the use of residence or nationality should depend on the question at hand. In this paper, we tend to use the nationality basis when describing international debt securities, for two main reasons. First, the nationality based data may better reflect the location of the financial risks, by allocating it to the jurisdiction where the corporation is headquartered. For instance, in crises the liabilities of these non-residents can be swiftly transferred to residents and ultimately to the public. Second, the risks posed by non-resident entities, which are shown by the nationality based data, are hardly visible in traditional residence-based statistics, such as the balance of payments.

2. Benefits and risks

Corporates' access to funds and financial health

The development of debt securities markets, as described in the previous section, has broadened the financing options of EME corporates. Bonds complement, and in some cases replace, traditional bank financing. This has several benefits. Increased access to debt markets can diversify firms' funding sources, thus protecting them against dysfunctions in a single intermediation channel. From an economy-wide viewpoint, debt markets mitigate concentration of credit and maturity risks on the banking system, reducing potential disruption to credit supply (the so-called "spare tyre" role of bond markets). And, increased competition in various funding markets can also increase efficiency in financial intermediation, which in turn can reduce funding costs.

Corporate leverage and repayment pressure — Graph 5



[1] All non-financial corporations listed throughout the sample period in the Emerging Market Deputy Governors' Meeting (EMDGM) participating countries. [2] Simple averages across all firms. [3] Non-financial corporations listed throughout the sample period and with debt securities issuance during the sample period in the EMDGM participating countries. [4] Total leverage is total debt divided by earnings before interest and taxes (EBIT). For leverage associated with non-cash holdings, cash and equivalents are subtracted from total debt. For leverage associated with non-financial investments, financial assets (cash and equivalents, stock holdings, bond holdings and total lending) are subtracted.

Source: Capital IQ.

Additionally, the development of domestic currency bond markets leads to more complete financial markets. Not only do they help to develop benchmark yield curves and hedging markets but, by fostering a broader domestic investor base, they also enable more risk transfer among investors.[9, 10] Thus, domestic currency bond markets

[9] The benefits of the development of domestic currency bond markets and its impediments for EMEs have been much discussed. See, for example, CGFS (2007).

[10] Avalos and Moreno (2013) discuss how a broadened investor base helped deepen domestic FX derivatives markets, which lessened the stress in FX markets in Chile at the time of the Lehman bankruptcy.

can help to widen investment opportunities and increase the resilience of the economy to external shocks, particularly by reducing the risk of currency mismatches. As highlighted in the notes from Hong Kong SAR and Peru, these expected benefits have in many cases given rise to government initiatives to develop domestic currency bond markets.

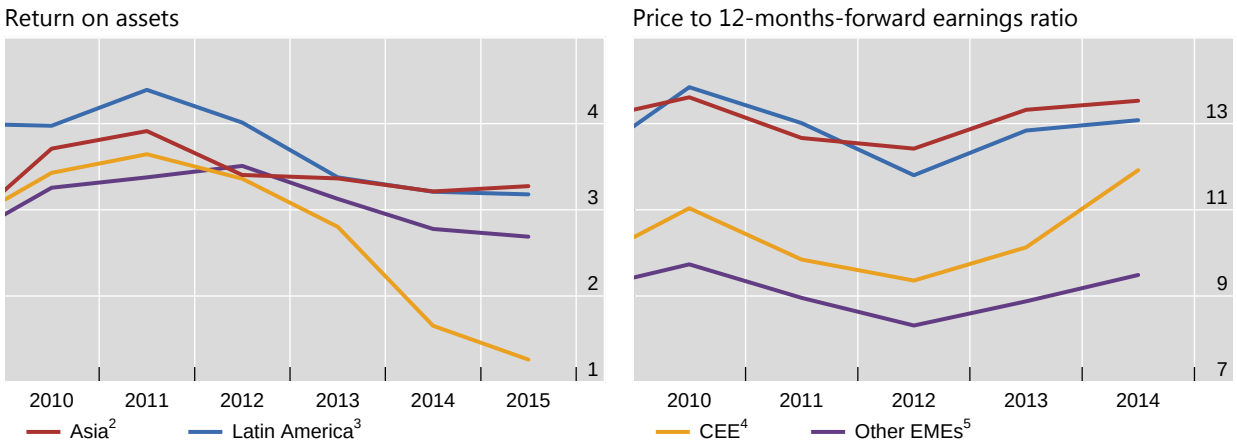
Indeed, in recent years, non-financial investment grew faster in EME corporations' which had access to bond markets (Graph 5, compare yellow bars in left-hand and centre panels). While this partly reflects favourable global funding conditions, it suggests that access to bond markets can boost non-financial investment, and thereby growth in EMEs. In particular, some sectors such as oil and gas are especially known to have used the international debt markets to substantially increase production capacity.

At the same time, this greater access to bond financing has also gone hand in hand with increased leverage in relation to earnings (Graph 5, left-hand and centre panels). Again, this increase in leverage is particularly pronounced for firms that have issued debt securities (centre panel). The resulting higher leverage and increased indebtedness can expose EME corporations to potential vulnerabilities, especially if and when the current relatively easy funding conditions become tighter. Several channels might play a role.

Corporate profitability and equity valuation[1]

Ratio

Graph 6



[1] Simple averages across the countries in the region. [2] China, India, Indonesia, Hong Kong SAR, Korea, Malaysia, the Philippines, Singapore and Thailand. [3] Argentina, Brazil, Chile, Colombia and Mexico. [4] The Czech Republic, Hungary and Poland. [5] Israel, Russia, South Africa and Turkey.

Sources: Bloomberg; Datastream.

First, easier access to funds from debt securities issuance can distort corporate investment decisions and reduce profitability – which would, in turn, make firms more vulnerable to changes in the external environment. While the asset size of EME corporations has expanded, return on assets has fallen, suggesting that many EME corporations might have levered up excessively (Graph 6, left-hand panel). Investors' valuation of EME equities measured by the price-to-earnings ratio has also risen since 2012, suggesting that equities are now more expensive (right-hand panel). This higher

valuation might, in turn, imply that a deterioration in funding conditions or the external environment might trigger a correction (right-hand panel).

Second, the risk of currency mismatches is significant (Graph 3 and Appendix Graph A2, right-hand panel). In fact, the recent dollar appreciation has already created difficulties for many EME corporates that have issued US dollar-denominated debt securities.

Finally, the refinancing risk may have grown, as gross debt repayments by EME firms have increased substantially over the past six years (Graph 5, right-hand panel). These pressures are clearly higher for firms that have accessed international debt securities markets (compare the beige with the blue bars).

In sum, recent evidence suggests that easy access to debt securities financing has potentially increased corporate leverage and reduced profitability thereby possibly sowing the seeds of vulnerabilities. On top of those, the sharp decline in oil prices in recent months could add to the vulnerabilities of many EME oil-exporting firms. To the extent that lower oil prices lead to a deterioration of oil-exporting firms' balance sheets, it will negatively affect the pricing of their debt securities, making debt rollover and new issuance difficult.[11]

Corporate debt securities issuance and domestic financial stability

Beyond the conventional measures of corporate health, increasing international corporate debt issuance, unless properly managed, could potentially raise systemic risks for financial institutions. Graph 7 illustrates how this may occur (Shin (2013)).[12] Corporate deposits provide a particular channel through which banks' balance sheets are closely interlinked with those of non-corporate firms. Easier global monetary conditions may in particular result in higher corporate bank deposits as firms deposit parts of the proceeds from increased debt securities issuance. This link can lead to procyclical bank lending as corporate deposits increase bank funding exactly when international monetary conditions are relatively easy, and reduce bank funding when they are tighter – amplifying the impact of banks own funding. Hence, changes in global financing conditions would affect banks and, in turn, through them even those firms, such as SMEs, which are otherwise sound and profitable – and are not exposed to international financial markets directly.

In fact, debt issuance and corporate deposits seem to be closely related in many EMEs. In particular, higher debt issuance often coincides with larger corporate deposits (Appendix Table A8). Moreover, greater financial investment by non-financial firms, possibly backed by funding from debt issuance, seems to have made

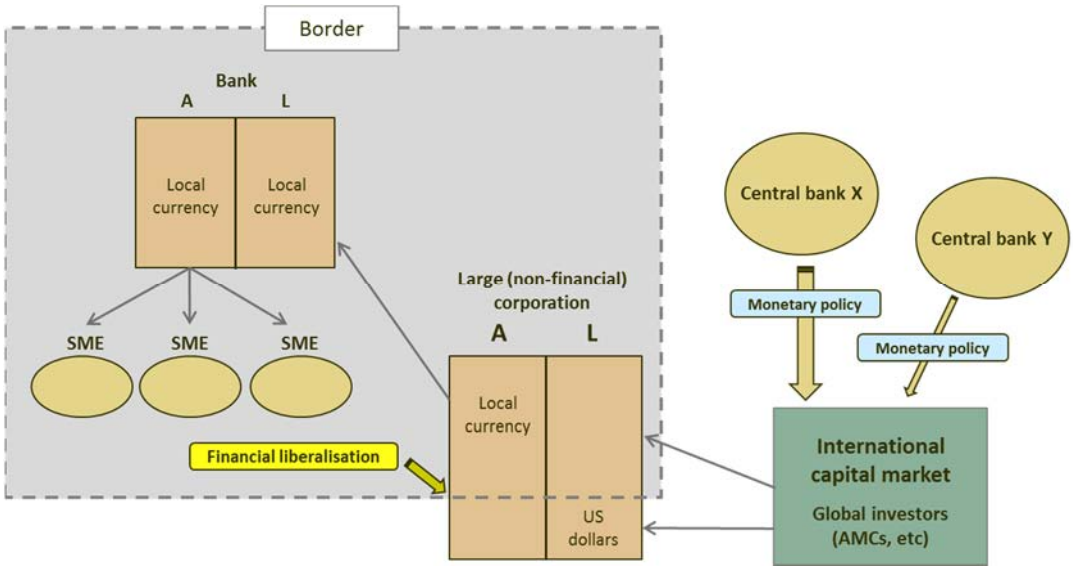
[11] BIS (2015) discusses financial aspects of the recent sharp decline in oil prices. Faced with higher debt service costs, oil-producing firms may respond to lower oil prices by increasing rather than decreasing oil production, which can precipitate further price declines. In addition, a pullback by swap dealers from oil derivatives markets might force these firms to deal directly in those markets, thus increasing oil price volatility.

[12] We have seen a past case in point: Japan in the late 1980s. Non-financial corporations, especially large corporations, tapped international capital markets after financial liberalisation and deposited the funds in the domestic banking system. Domestic banks used the increased deposits for lending to small and medium-sized enterprises (SMEs) and to sectors related to real estate (Appendix Graph A5).

banks' deposit funding more fragile one in many EMEs by reducing the share of retail deposits compared to corporate "demand" deposits (Graph 8; and Graph 5, centre panel).

Debt securities in the context of global financial intermediation

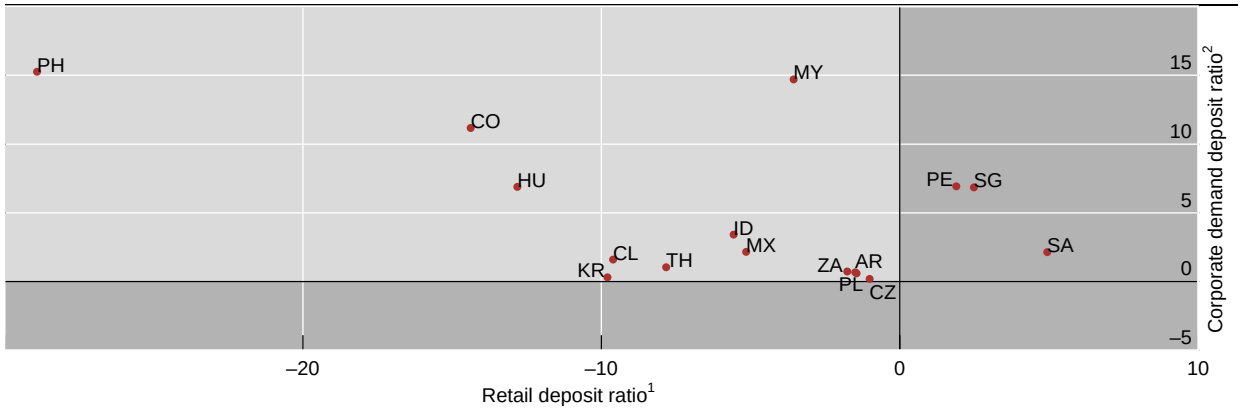
Graph 7



The changing structure of bank deposit funding

In percentage points

Graph 8



AR = Argentina; CL = Chile; CO = Colombia; CZ = Czech Republic; HU = Hungary; ID = Indonesia; KR = Korea; MX = Mexico; MY = Malaysia; PE = Peru; PH = Philippines; PL = Poland; SA = Saudi Arabia; SG = Singapore; TH = Thailand; ZA = South Africa.

[1] Absolute change in the ratio of retail deposits to total deposits between 2004 and 2013. [2] Absolute change in the ratio of corporate demand deposits to total deposits between 2004 and 2013. For South Africa, between 2008 and 2013.

Source: BIS questionnaire.

Although this negative correlation is partly mechanical, it could also be a source of risk to financial stability. Retail deposits are the most stable source of funding for banks. In contrast, corporate deposits, especially demand deposits, are more volatile in times of stress. This interconnectedness between non-financial corporates' balance

sheets and banks' balance sheets could pose risks particularly when external funding conditions deteriorate.[13]

Foreign ownership of EMEs' debt and potential market volatility

Another aspect of EME vulnerability arises from the behaviour of foreign investors that hold considerable amounts of EME debt securities, in both domestic and international markets. There is no question that increased foreign participation has brought many benefits, including an enlarged investor base and enhanced liquidity. With a broader investor base, EME bond issuers have more financing options in terms of instruments and currency denomination. However, a greater presence of foreign investors can also create potential stress, if a change in global financial conditions causes them to run for the exit, driving prices down and straining market liquidity.

In particular, the behaviour of global asset management companies (AMCs) that are major investors in EME debt securities can significantly influence market volatility. Asset managers face various constraints in their investment decisions, such as relative performance targets, internal risk limits and minimum ratings of securities to purchase that may motivate them to chase yields in relatively illiquid EME assets. This short-term focus on the part of AMCs can make EME bond prices more vulnerable to repricing risks and sudden stop dynamics and can amplify shocks emanating from changing global monetary conditions.

Ultimate investors may also contribute to this volatility. Shin (2010) argues that institutional investors such as pension funds can destabilise markets with their procyclical investment strategy to match market values of their assets with liabilities. And retail investors might not be very stable investors either.

[13] As discussed in the note from Bangko Sentral ng Pilipinas, banking system stability should be assessed from various standpoints, such as banks' profitability and their capital and asset quality. Our focus here is on funding risks resulting from the deposit structure.

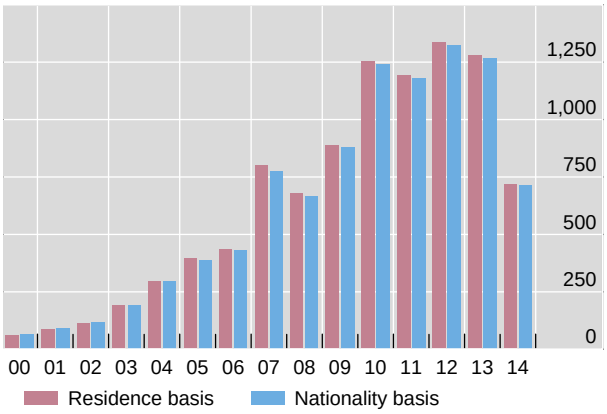
Appendix

Appendix Graphs

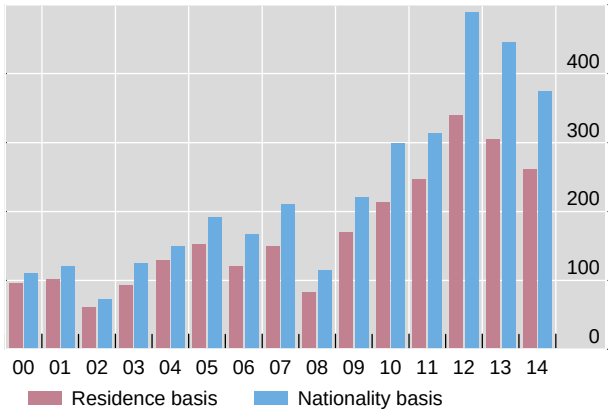
Annual gross issuance[1]

In billions of US dollars — Graph A1

Domestic debt securities



International debt securities



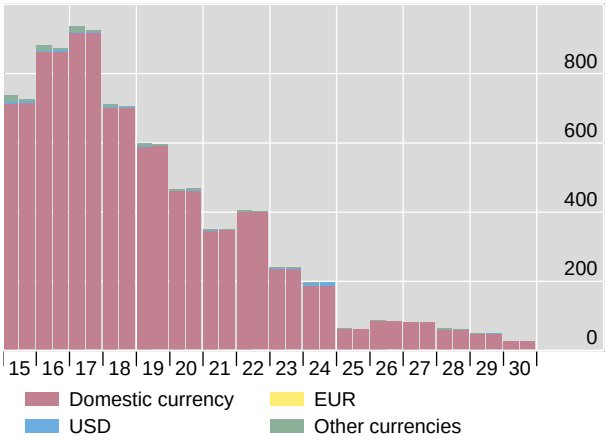
[1] Sums across Argentina, Brazil, Chile, China, Colombia, the Czech Republic, Hong Kong SAR, Hungary, India, Indonesia, Israel, Korea, Malaysia, Mexico, Peru, the Philippines, Poland, Russia, Saudi Arabia, Singapore, South Africa, Thailand, Turkey, the United Arab Emirates and Venezuela.

Sources: Dealogic; BIS calculations.

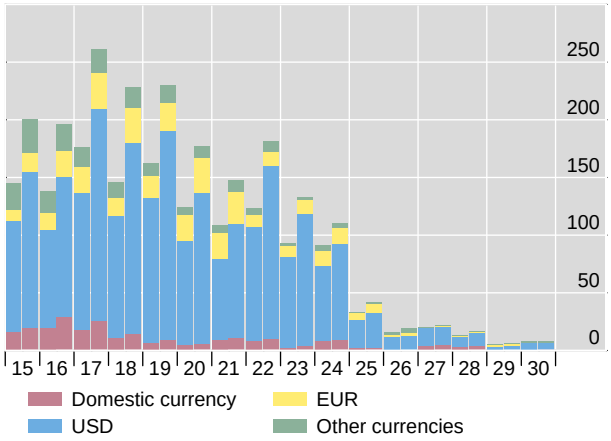
Redemption schedule

By currency denomination, by residence (first bar) and nationality basis (second bar), all sectors, in billions of US dollars — Graph A2

Domestic debt securities (DDS) basis



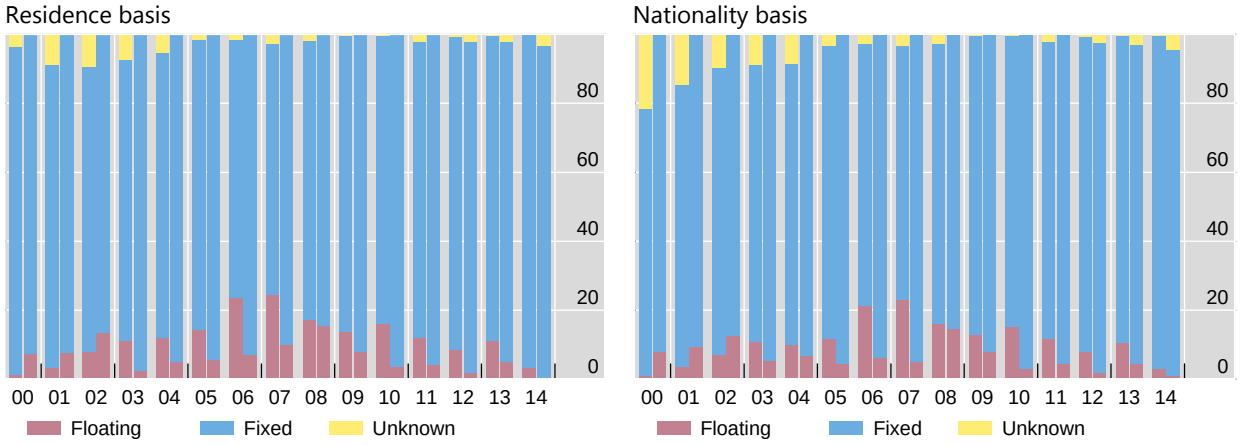
International debt securities (IDS) basis



Sources: Dealogic; BIS calculations.

Types of interest rate in non-financial corporate sector issuance[1]

As a percentage of total issuance — Graph A3

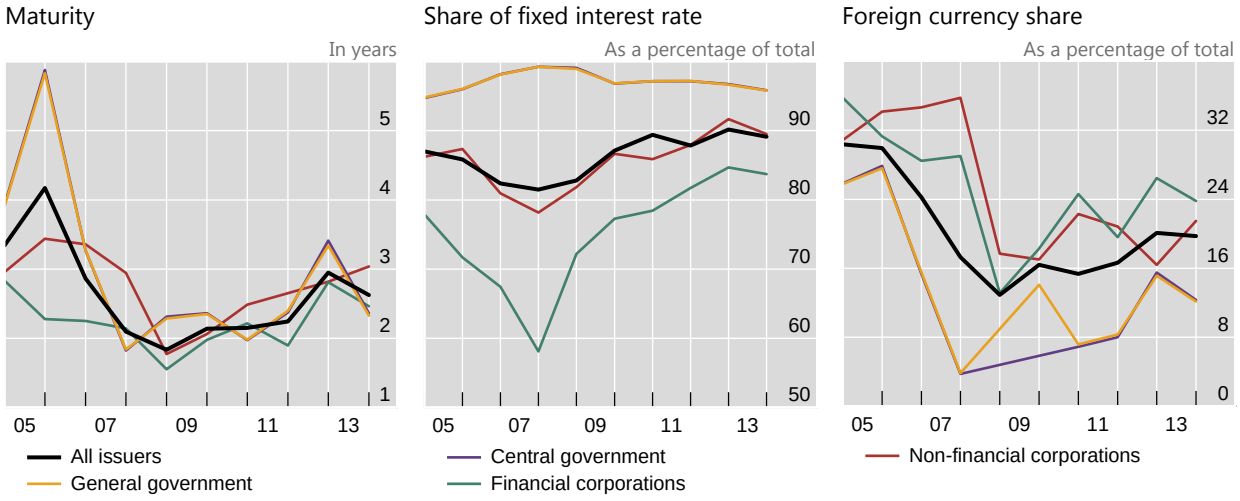


[1] DDS (first bar) and IDS (second bar).

Source: Dealogic.

Properties of debt securities[1]

Graph A4



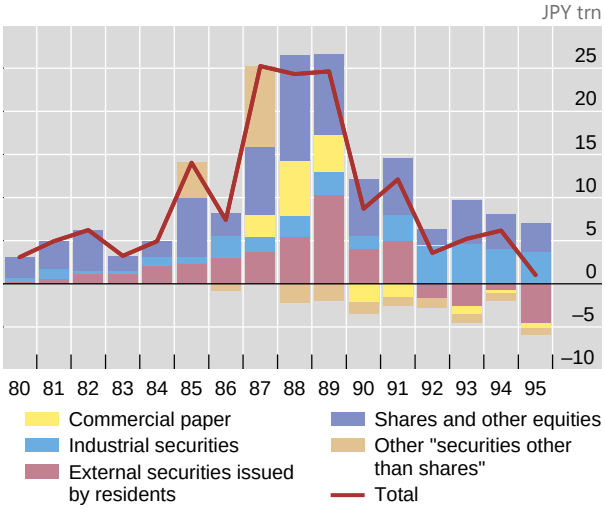
[1] Weighted average for IDS and DDS, by residence; aggregated for the following EMEs: Argentina, Brazil, Chile, China, Colombia, the Czech Republic, Hong Kong SAR, Hungary, India, Indonesia, Israel, Korea, Malaysia, Mexico, Peru, the Philippines, Poland, Russia, Saudi Arabia, Singapore, South Africa, Thailand and Turkey.

Sources: Dealogic; BIS calculations.

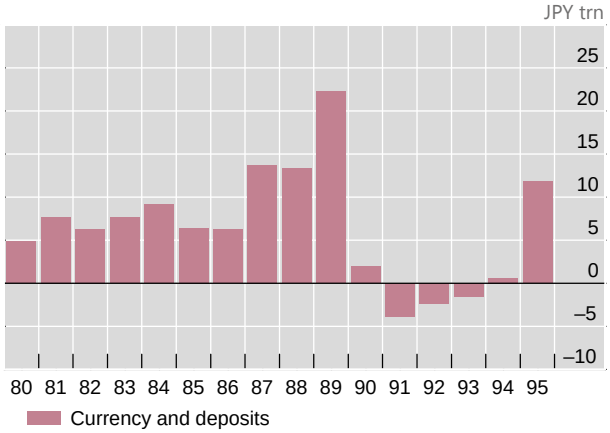
Link between global capital market and domestic banking system: Japan's bubble economy in the late 1980s[1]

Graph A5

Security fund-raising by non-financial corporations (flow)



Financial investment by non-financial corporations (flow): currency and deposits



[1] See Hattori et al (2009) for more detailed analyses.

Source: Bank of Japan, Flow of Funds Accounts.

Appendix Tables

Comparison of total debt securities from BIS statistics with those from questionnaires[1]

Percentage point deviation between the questionnaire as base to BIS, total debt securities data — Table A1

	04	05	06	07	08	09	10	11	12	13
Emerging Asia										
China	19.00	35.48	46.78	38.77	41.13	27.58	20.52	6.58	–0.31	–9.53
Hong Kong SAR	7.48	11.55	15.81	23.12	28.85	22.25	16.38	8.96	0.97	–2.05
Korea[2]	0.11	0.09	0.21	0.60	1.76	1.41	1.43	1.27	0.95	0.62
Malaysia	…	16.36	20.43	10.30	19.34	13.15	11.45	11.38	10.08	11.56
Philippines[3]	2.57	1.07	–0.04	–2.25	–4.54	–7.85	–7.05	–5.14	–7.20	–2.69
Singapore	0.27	0.13	0.16	–4.11	0.24	–0.21	–0.56	4.74	8.91	17.95
Thailand	11.44	0.00	–1.65	0.00	–0.45	0.15	–0.30	–0.45	–0.14	–0.51
Latin America										
Brazil[3]	…	…	…	…	…	…	38.48	41.26	45.65	46.55
Chile[2, 4]	…	…	…	…	38.51	42.84	19.47	17.23	10.45	4.26
Colombia[3, 5]	–3.11	–0.45	0.49	1.37	–0.20	–4.17	–9.41	–6.91	–7.23	–4.51
Mexico[2]	…	…	…	…	…	–1.37	–1.57	–0.44	–0.18	0.16
Peru[2, 5]	89.98	55.36	46.62	68.69	47.35	38.34	53.99	39.56	60.44	31.26
Central and eastern Europe										
Czech Republic	…	…	–0.01	1.02	–1.34	–1.54	–4.70	–3.69	–2.31	–0.15
Hungary	–0.36	0.23	–0.62	–0.28	1.83	0.18	–0.63	0.67	–0.09	–0.17
Poland[6]	7.54	11.60	8.75	7.57	4.45	7.74	10.90	12.73	12.94	14.89
Other EMEs										
Israel[7]	48.12	54.62	50.11	45.37	25.87	32.29	24.41	21.60	21.41	12.76
Russia	–68.17	–0.45	0.07	0.02	1.30	–3.28	–1.73	–1.85	–0.59	–0.18
South Africa[2]	17.93	15.39	15.42	16.33	19.91	23.97	23.91	22.08	19.10	16.81
Turkey	0.66	0.49	0.53	0.13	1.18	0.53	–0.14	–0.26	0.17	0.58

[1] On a residence basis. [2] Comparison using BIS domestic debt securities. [3] BIS total debt securities calculated as the sum of international and domestic debt securities. [4] Data sent in questionnaire are obtained from the Budget Office and may not tally exactly with the external debt data published by the Central Bank of Chile, given different methodologies. [5] BIS debt securities calculated using publicly available data. [6] Data for financial corporations other than banks and for non-financial corporations comprise only securities issued domestically. Bonds issued by Bank Gospodarstwa Krajowego for the National Road Fund are presented as general government debt. [7] Data sent in questionnaire are for securities tradable only in Israel.

Sources: BIS securities statistics; BIS questionnaires.

Comparison of general government debt securities from BIS statistics with those from questionnaires[1]

Percentage point deviation between the questionnaire as base to BIS, total debt securities data — Table A2

	04	05	06	07	08	09	10	11	12	13
Emerging Asia										
China	–11.67	–11.20	–8.18	–4.70	–4.30	–3.13	–3.02	–2.51	–2.89	–3.16
Hong Kong SAR	–0.02	0.01	0.03	–0.06	0.00	–0.02	–0.01	0.01	0.00	0.00
India	–91.97	–88.24	–87.45	–86.51	–85.70	–86.55	–90.93	1.90	4.14	1.52
Korea[2]	0.01	–0.07	0.02	–0.01	0.00	0.00	0.01	0.02	0.00	0.00
Malaysia	…	6.24	4.19	2.84	1.03	–2.33	–1.62	–2.80	–4.21	–4.08
Philippines[3]	1.22	1.36	1.62	1.15	1.81	1.25	1.04	2.18	0.02	4.62
Singapore	0.19	–0.08	–0.19	–0.02	–0.27	–0.20	–0.28	–0.67	–0.44	–0.37
Thailand	–0.36	0.00	–1.65	0.01	–0.45	0.15	–0.30	–0.45	–0.14	–0.33
Latin America										
Argentina	…	…	14.02	11.52	9.71	0.24	–1.78	–15.75	–23.07	–28.56
Brazil[3]	55.67	42.27	37.28	37.62	47.86	52.40	47.02	48.07	52.97	54.39
Chile[2, 4]	…	…	…	…	37.34	29.78	7.92	0.77	–1.73	1.31
Colombia[3, 5]	13.37	15.58	14.36	15.05	13.04	8.75	3.91	5.22	4.78	4.05
Mexico[2]	…	…	…	…	…	–1.94	–2.22	–0.26	–0.18	0.16
Peru[2, 5]	–35.04	–11.20	–6.98	–1.41	–0.75	–0.42	–0.03	0.49	0.86	0.81
Central and eastern Europe										
Czech Republic	…	…	–0.01	1.34	–2.11	–2.88	–7.72	–5.13	–3.78	–0.14
Hungary	–0.53	0.17	–0.71	–0.46	1.76	0.12	–0.58	0.73	–0.02	–0.04
Poland	–2.49	–0.42	0.23	0.55	–0.89	–1.44	–2.29	–1.50	–2.05	–2.30
Other EMEs										
Israel[6]	32.66	33.53	31.29	26.83	21.13	19.62	17.74	16.60	16.64	15.55
Russia	…	–0.68	0.38	0.06	3.74	0.26	0.25	0.15	0.30	0.45
South Africa[2]	11.51	12.37	14.20	15.99	20.44	29.61	29.23	27.80	25.26	23.03
Turkey	0.68	0.49	0.52	0.14	1.17	0.54	–0.16	–0.26	0.16	0.57

[1] On a residence basis. [2] Comparison using BIS domestic debt securities. [3] BIS total debt securities calculated as the sum of international and domestic debt securities for general government. [4] Data sent in questionnaire are obtained from the Budget Office and may not tally exactly with the external debt data published by the Central Bank of Chile, given different methodologies. [5] BIS debt securities calculated using public available data. [6] Data sent in questionnaire are for securities tradable only in Israel.

Sources: BIS securities statistics; BIS questionnaires.

Comparison of financial corporations' debt securities from BIS statistics with those from questionnaires[1]

Percentage point deviation between the questionnaire as base to BIS, total debt securities data — Table A3

	04	05	06	07	08	09	10	11	12	13
Emerging Asia										
China	83.46	116.94	126.24	112.58	114.69	82.19	71.22	30.12	14.97	4.10
Hong Kong SAR	–8.97	0.46	4.17	14.83	29.31	54.37	38.25	16.60	–0.89	–6.19
Malaysia	…	109.29	143.24	43.62	66.34	46.95	8.87	15.23	–1.14	5.22
Singapore	0.05	0.10	0.47	0.72	0.61	–0.53	–0.91	20.24	34.28	52.07
Thailand	…	0.00	–1.65	0.00	–0.45	0.15	–0.30	–0.45	–0.14	–0.33
Central and eastern Europe										
Czech Republic	…	…	–0.01	0.61	–0.17	0.19	–0.26	–1.47	–0.11	–0.14
Hungary	0.71	0.69	–0.13	0.30	1.81	0.08	–0.66	0.55	–0.38	–0.10
Poland[2]	172.15	285.15	169.74	143.80	154.44	431.29	692.98	417.83	330.93	352.36
Other EMEs										
Israel[3]	124.39	198.79	159.56	176.79	130.21	122.30	81.92	66.20	61.75	6.37
Russia	–0.94	–0.39	–0.41	–0.53	3.14	–1.33	–1.68	–2.11	–1.23	–0.60
Turkey	–5.34	…	13.32	–2.55	2.75	–4.28	–0.35	–0.15	0.11	0.54

[1] On a residence basis. [2] Data for financial corporations other than banks and for non-financial corporations comprise only securities issued domestically. Bonds issued by Bank Gospodarstwa Krajowego for the National Road Fund are presented as general government debt. [3] Data sent in questionnaire are for securities tradable only in Israel.

Sources: BIS securities statistics; BIS questionnaires.

Comparison of non–financial corporations' debt securities from BIS statistics with those from questionnaires[1]

Percentage point deviation between the questionnaire as base to BIS, total debt securities data — Table A4

	04	05	06	07	08	09	10	11	12	13
Emerging Asia										
China	–24.27	–9.35	–1.25	4.31	–8.79	–8.66	–13.20	–14.71	–19.36	–35.51
Hong Kong SAR	134.17	98.31	110.40	107.56	81.62	64.68	41.49	17.08	12.71	11.59
Korea[2]	84.05	86.47	84.55	94.72	111.55	104.09	117.04	113.90	125.13	125.65
Malaysia	…	0.82	–1.02	0.52	19.34	19.87	30.64	29.87	39.66	39.35
Philippines[3]	–4.35	–7.85	–18.19	–31.55	–25.99	–37.14	–38.39	–25.03	–28.67	–18.40
Singapore	0.60	0.47	0.28	0.35	0.68	0.18	–0.70	0.10	–0.48	–0.02
Thailand	–0.36	0.00	–1.65	0.01	–0.45	0.15	–0.30	–0.45	–0.14	–1.29
Latin America										
Brazil[3]	…	…	…	…	…	…	80.34	99.70	92.99	84.69
Chile[3, 4]	–48.47	–58.52	–65.99	–69.91	3.97	5.98	3.64	4.90	6.39	4.90
Colombia[3, 5]	–68.17	–72.33	–67.71	–60.29	–58.47	–44.78	–47.37	–36.91	–32.98	–12.27
Mexico[2]	…	…	…	…	…	51.65	61.60	70.77	78.01	80.22
Peru[2, 5]	68.62	36.42	17.79	4.26	8.79	–2.67	–1.04	2.84	2.34	–20.62
Central and eastern Europe										
Czech Republic	…	…	0.01	0.57	–0.18	0.21	–0.28	–1.48	–0.10	–0.13
Hungary	–3.77	–0.88	–1.12	1.35	5.17	5.14	–1.48	0.58	0.89	–5.11
Poland[6]	172.09	142.36	75.75	64.22	36.31	47.27	46.61	38.49	51.52	69.14
Other EMEs										
Israel[7]	269.65	157.33	100.37	56.89	0.43	31.61	15.70	9.66	9.63	8.67
Russia	–0.31	0.00	–0.02	0.41	–2.05	–7.08	–3.54	–3.39	–0.91	–0.38
South Africa[2]	0.06	0.63	0.90	0.61	–0.69	–0.50	–0.16	–0.67	–0.28	–0.31
Turkey	…	…	…	…	…	…	0.04	–2.74	1.43	0.40

[1] On a residence basis. [2] Comparison using BIS domestic debt securities. [3] BIS total debt securities calculated as the sum of international and domestic debt securities. [4] Data sent in questionnaire are obtained from the Budget Office and may not tally exactly with the external debt data published by the Central Bank of Chile, given different methodologies. [5] BIS debt securities calculated using publicly available data. [6] Data for financial corporations other than banks and for non-financial corporations comprise only securities issued domestically. Bonds issued by Bank Gospodarstwa Krajowego for the National Road Fund are presented as general government debt. [7] Data sent in questionnaire are for securities tradable only in Israel.

Sources: BIS securities statistics; BIS questionnaires.

Average maturity at issuance by residence of borrower

In years; all sectors — Table A5

	04	05	06	07	08	09	10	11	12	13
Emerging Asia										
China	4.40	6.40	5.50	8.40	6.00	5.90	7.00	6.60	7.20	6.10
Hong Kong SAR	2.20	2.10	1.70	2.10	1.60	1.00	1.00	1.00	1.00	1.00
Korea[1]	4.00	4.20	4.50	4.70	4.90	5.10	5.40	5.80	6.20	6.70
Malaysia	4.36	3.12	3.05	3.61	4.08	4.42	4.41	4.72	5.18	5.49
Thailand	…	…	…	…	…	6.43	6.47	6.73	6.92	7.55
Latin America										
Brazil	…	…	…	…	…	…	3.60	3.50	6.00	3.60
Colombia	6.50	5.70	8.70	5.60	5.40	7.50	6.00	5.90	9.70	7.40
Peru	5.80	4.70	1.60	2.80	1.40	1.20	1.00	2.10	1.40	1.80
Other EMEs										
Russia[2]	4.93	4.57	5.69	6.54	6.64	4.57	5.04	5.50	6.37	7.18
Turkey	3.83	4.38	5.05	5.17	5.63	5.51	5.92	6.54	6.74	7.66

[1] Based on maturity at bond issuance. [2] Weighted average of international and domestic debt securities.

Source: BIS questionnaires.

Share of foreign currency denomination by residence of borrower

In per cent; all sectors — Table A6

	04	05	06	07	08	09	10	11	12	13
Emerging Asia										
China	0.00	0.40	0.50	0.50	0.30	0.30	0.20	0.10	0.00	0.00
Hong Kong SAR	45.80	46.70	46.20	43.90	41.30	22.20	25.40	38.40	47.20	53.10
Korea	0.00	0.00	0.01	0.02	0.05	0.05	0.03	0.02	0.02	0.02
Malaysia	0.00	0.00	0.00	0.00	0.00	0.01	1.09	1.15	0.97	1.01
Philippines	40.40	38.90	38.30	34.80	33.50	34.00	32.30	31.50	27.40	28.00
Thailand	9.57	7.96	6.32	4.31	4.02	3.07	2.28	1.87	2.25	3.73
Latin America										
Brazil	…	…	…	…	…	…	4.50	5.60	5.70	5.40
Chile	35.10	29.20	28.30	21.70	21.80	19.80	22.60	25.90	26.10	28.60
Colombia	22.20	16.90	15.40	14.60	16.00	11.10	9.60	18.00	18.20	16.80
Peru	50.10	39.10	35.40	25.50	23.70	22.40	18.50	16.80	13.00	13.20
Central and eastern Europe										
Czech Republic	12.60	14.90	8.60	9.20	14.30	17.10	21.10	20.90	22.90	24.60
Hungary	21.80	27.00	30.30	31.00	34.60	32.80	32.40	34.50	31.20	31.00
Poland[1]	14.00	21.00	21.00	18.00	21.00	21.00	22.00	24.00	24.00	22.00
Other EMEs										
Israel[2]	0.90	1.00	1.03	2.03	1.60	1.31	1.04	1.03	0.89	0.66
Russia	0.00	56.65	52.98	50.45	50.70	44.12	41.97	38.99	40.30	42.25
Turkey	30.00	27.80	28.20	23.60	24.50	20.10	17.80	20.80	21.90	27.90

[1] Data for financial corporations other than banks and for non-financial corporations comprise only securities issued domestically. Bonds issued by Bank Gospodarstwa Krajowego for the National Road Fund are presented as general government. [2] In Israel data sent in questionnaire are only for tradable securities.

Source: BIS questionnaires.

Share of fixed interest rate products by residence of borrower

In per cent; all sectors — Table A7

	04	05	06	07	08	09	10	11	12	13
Emerging Asia										
China	60.30	56.93	54.99	71.28	70.54	74.07	75.63	82.40	88.84	90.24
Hong Kong SAR	79.40	80.80	79.60	77.60	79.50	87.60	89.30	89.00	87.30	88.60
Korea	95.30	97.30	97.90	98.00	98.10	97.30	97.00	97.60	97.30	97.50
Thailand	…	…	…	…	…	75.93	75.61	75.41	75.14	77.65
Latin America										
Brazil	…	…	…	…	…	…	16.80	15.90	16.60	16.60
Chile	96.21	98.70	98.72	99.04	82.25	98.70	95.09	99.42	99.12	96.55
Colombia	79.80	84.90	58.00	55.70	61.30	49.20	48.00	53.90	48.10	58.90
Mexico	…	…	…	…	…	46.21	48.09	46.43	47.09	47.61
Peru	97.40	98.80	95.70	97.90	99.40	99.00	99.20	99.10	97.80	96.60
Central and eastern Europe										
Czech Republic	100.00	100.00	100.00	100.00	100.00	99.99	100.00	99.98	99.99	100.00
Hungary	73.70	77.80	78.00	77.30	75.30	66.50	68.80	66.90	66.00	63.80
Poland	84.66	84.90	83.83	80.90	82.52	85.23	83.33	82.12	77.01	75.51
Other EMEs										
Israel[1]	76.21	78.82	82.46	78.99	81.61	83.12	78.01	90.29	92.11	91.82
South Africa	22.00	21.00	23.00	24.00	70.00	71.00	71.00	70.00	68.00	69.00
Turkey	…	…	66.10	68.00	68.20	66.60	70.90	75.50	78.10	82.10

[1] Debt information is for securities tradable only in Israel.

Source: BIS questionnaires.

Change in the role of debt securities and corporate deposits in the economy

Changes between 2004 and 2013, in percentage points — Table A8

	Ratio of debt securities outstanding to nominal GDP		Ratio of corporate debt securities outstanding to nominal GDP[1]		Ratio of corporate deposits to total deposits
Hong Kong	73.2	Hong Kong	44.0	The Philippines	28.9
Czech Republic	57.3	Israel	21.7	Colombia	19.6
Thailand	43.7	China	20.6	United Arab Emirates	15.1
Hungary	35.3	Hungary	20.3	Korea	12.1
Malaysia	28.5	Thailand	20.0	Hungary	10.4
Korea	26.0	Chile	15.3	South Africa	8.9
Israel	25.4	Czech Republic	12.8	Indonesia	7.1
China	19.2	Russia	11.6	Thailand	6.3
Chile	18.7	Singapore	9.1	Peru	5.9
Poland	16.0	Malaysia	8.5	Mexico	5.1
South Africa	12.7	South Africa	7.9	India	4.5
Russia	8.7	Korea	6.2	Singapore	3.0
Singapore	5.3	Turkey	5.7	Malaysia	2.9
Colombia	3.2	Poland	2.8	Chile	1.6
Peru	2.0	Colombia	1.7	Argentina	1.5
Algeria	–5.6	The Philippines	1.7	Poland	1.4
Turkey	–8.5	Peru	–1.9	Czech Republic	1.0
The Philippines	–13.7			Saudi Arabia	–4.9
				Algeria	–38.0

[1] For Thailand, change between 2005 and 2013. For Czech Republic, change between 2006 and 2013.

Source: BIS questionnaire.

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Changing financial intermediation: implications for monetary policy transmission

Emanuel Kohlscheen and Phurichai Rungcharoenkitkul[1]

Abstract

We show that despite heterogeneous financial intermediation structures in EMEs, bank credit remains a powerful channel of policy transmission in these countries. Credit conditions have been affected by global factors. In particular, our empirical results suggest that exchange rate appreciation tends to boost credit expansion through a currency risk-taking channel. To the extent that new credit boosts growth which in turn generates further appreciation, the link creates the possibility of positive feedback loops. Furthermore, we find that risk premium shocks have had important effects on EMEs, through their impact on both bank and non-bank credit. Against this backdrop, we argue that the standard monetary policy rules may be inadequate in meeting the multi-faceted challenges arising from financial globalization, and there is a growing case for expanding the policy toolkit.

Keywords: monetary policy, bank credit, emerging markets, risk premia

JEL classification: E40, E50, E52, F31, F41

[1] Bank for International Settlements.

Introduction

The scale and characteristics of financial intermediation have changed significantly in emerging markets over the past decade. Credit to the private sector has grown rapidly in many countries, in parallel with the rise of market-based financing (see the note on "The role of banks"). In addition, as EMEs have become more financially integrated with the rest of the world, their interest rates and financial conditions have become more tightly linked to those in advanced economies – a development strengthened by exceptionally easy monetary policy in the major currency areas. At the same time, important cross-country differences in the intermediation structures remain.

This note explores *selected* implications of these changes for monetary policy. The first section identifies some common elements in the evolution of financial intermediation and discusses their implications for the monetary transmission mechanism. What becomes clear is that, despite heterogeneous financial intermediation structures, bank credit remains a powerful channel of policy transmission.

The second section examines the transmission mechanism in an environment in which global factors have gained prominence. Empirical results suggest that exchange rate appreciation tends to boost credit expansion through a currency risk-taking channel. Risk premium shocks have had important effects on EMEs, through their impact on both bank and non-bank credit.

The final section provides a simple framework for considering the implications for monetary policy of changes in financial intermediation, including external influences. In particular, it highlights some policy trade-offs and challenges that EMEs might face when the domestic transmission mechanism interacts with global financial cycles.

1. How has the transmission mechanism changed?

Monetary policy influences economic activity through a number of closely interrelated channels. These include, in particular, changes in interest rates, in asset prices and the exchange rate as well as in the non-price terms and conditions on which banks and markets grant credit. These operate both on new lending (at the margin) and on the existing stock (cash flow and valuation effects). Recently, the impact of monetary policy on perceptions and attitudes towards risk, eg by inducing search-for-yield behaviour, has been receiving greater attention – the so-called risk-taking channel (eg Borio and Zhu (2012)). The evolution of the structure of intermediation can influence the relative strength of these channels.

As the paper from the Bank of Israel for this meeting argues, changes in financial structure can affect monetary transmission mechanism in several ways. First, by changing the composition of bank and non-bank credit in the economy, they can influence how effectively the short-term interest rate is passed through to borrowing and lending rates. These changes would interact with the structure of bank balance sheets, ie the share of assets and liabilities linked to the central bank policy rate through flexible interest rates (or frequency of interest rate setting). Second, changes in financial intermediation can also alter the behaviour of the risk premium that lenders charge. Finally, changes in the availability of credit to various sectors and

borrowers in the economy would influence the responsiveness of both consumption and investment.

In principle, financial deepening should increase the influence of monetary policy on the economy by broadening financial access. Greater competition among financial intermediaries and various market segments would have a similar effect, as would a growing share of variable interest rate loans and deposits in EME banking systems (see Graph 4 in "The role of banks" note).

The continued dominance of bank credit

While trends have differed across regions and across countries, banks continue to play a very prominent role. The median share of bank credit in total credit to the non-financial sector in EMEs was 87% in 2013. At the same time, debt-to-GDP ratios have increased significantly in many EMEs. Together, these observations might suggest that the influence of monetary policy on credit flows has become more important. This would be true for its effects through demand for credit as well as supply (see below).

Against this backdrop, it is useful to assess the role that bank credit may still play in influencing aggregate demand. As an illustration, in this section we focus on investment expenditure, as this is arguably the most sensitive component of aggregate demand.

To address this issue, we follow a simple, non-structural approach. Specifically, we estimate the long-run effects on investment growth of changes in the real short-term interest rate, bank credit deflated by CPI inflation, GDP growth and real effective exchange rate depreciation. The long-run effects are obtained by adding the coefficients of four lags of each variable by one minus the coefficient on lagged investment growth. This highly stylised relationship is estimated for a selection of 12 EMEs, from four continents. Table 1 summarises the results.

Over the whole sample period (Q1 2000–Q2 2014), the real policy rate – the difference between the policy rate and the 12-month actual CPI inflation rate – has a very significant negative effect on investment in EMEs. This finding stands in contrast with the frequently reported failure to identify clear-cut evidence of effects of monetary policy in single-equation settings in advanced economies (eg Banerjee, Kearns and Lombardi (2015)).[2] Of course, the interest rate may also affect investment indirectly, by influencing credit,[3] which then influences investment. And indeed, the results indicate that the growth in bank credit has been associated systematically with stronger investment growth.

[2] For G7 economies, Banerjee, Kearns and Lombardi (2015) show that uncertainty and profits have been the more important drivers of investment, while the link between investment and short-term rates appears to be relatively weak. For earlier references on the weakness of this link, see Chirinko (1993) or Chatelain et al (2003).

[3] The fall in the supply of credit may occur as a consequence of the fall in deposits that typically follows an increase in the base rate, as alternative financial instruments become more attractive to final users. A reduction in the deposit base then pushes banks into more expensive forms of funding.

Investment response to interest rates and bank credit[1]

(Dependent variable: percentage change in real investment levels (difference in logs, sa)[2] Table 1

	Whole sample	2000–07	2008–14
Long-run effects:			
Δ Real interest rate	-0.393***	-0.402***	0.018
	(0.084)	(0.072)	(0.359)
Δ ln (Bank credit)	0.152**	0.120*	0.208**
	(0.072)	(0.067)	(0.104)
Δ ln (GDP)	0.909***	1.251***	0.960***
	(0.205)	(0.347)	(0.208)
Δ ln (REER)	0.218**	0.316***	0.091
	(0.086)	(0.091)	(0.097)
Observations	601	271	330
Sargan test (p–value)	0.381	0.186	0.437

[1] System GMM estimation using the Arellano-Bover dynamic panel estimator. The null hypothesis of the Sargan test is that the instruments are valid. *, ** and *** denote statistical significance at the 10%, 5% and 1%, respectively. Robust standard errors in parenthesis. The sample period is Q1 2000–Q2 2014.[2] Bank credit is an index of bank credit to private non-financial sector measured in local currency, deflated by the CPI. REER is the end of quarter real effective exchange rate index (an increase in the index means a depreciation of the local currency).

Source: Authors' estimations.

There is also some evidence that the independent influence of the interest rate has declined post-crisis, while that captured by credit has risen. This is reflected in the relative size and statistical significance of the corresponding coefficients in two subperiods, 2000–07 and 2008–14. Taking these results at face value, one may suggest some possible (non-mutually exclusive) explanations. As noted, credit has become much more prominent in most EMEs; as a result, it may "soak up" the explanatory power of other variables. In addition, the weaker influence of the short-term interest rate may reflect the greater independent influence of changes in risk premiums for investment, possibly because of a greater impact of external financial conditions (see below). This also highlights the possibility that long-term interest rates as well as bank lending rates and non-rate terms may in fact have become less responsive to current and expected policy rates.

Other pieces of evidence confirm the more prominent role of bank credit. Specifically, in a separate set of tests, we find that the sensitivity of investment to the growth in bank credit is higher in those countries where the share of banks in total credit is higher (see Appendix Table A1).[4] This intuitive result suggests that the previous finding is not spurious.

[4] Here we follow the World Bank corporate survey, which asked firms what proportion of investment is financed by banks. We classify countries in which this proportion exceeds the proportion reported for Germany (which is often referred to as the example of a bank-based system) as having high bank dependence, and the remaining countries as having low bank dependence. The proportion for the first group is 2.3 times larger, on average, than for the second group.

2. The role of external factors

Changes in financial intermediation have taken place against the backdrop of greater financial globalisation and hence stronger cross-border spillovers. While a more developed financial sector may be more responsive to domestic monetary policy, it may also be more vulnerable to shifts in external financial conditions. Indeed, the co-movement of short and long-term rates in the United States and the EMEs strengthened after the financial crisis (Graph 1).[5] Several recent papers have highlighted that the US term premium may have reinforced the co-movements of long-term interest rates across countries.[6] The paper from the central bank of Chile argues that the correlation of the term premium is not limited to the countries with a greater presence of foreign investors in debt markets. In a similar vein, exchange rate movements driven by shifts in global risk appetite have become a source of volatility.

This suggests that changes in intermediation structures may interact with the external environment to influence the transmission of monetary policy. The relationship between domestic credit cycles and the global financial cycle has also become more complex. The two could be related, for instance, via asset prices and foreign debt issuance, both of which can be sensitive to global risk appetite.

In order to assess this, we estimate the relationship between bank credit to the private non-financial sector and a set of possible determinants since 2000 (Table 2). A few findings stand out.

First, domestic factors are important determinants. As expected, a lower policy rate and higher GDP growth boost credit expansion.[7] Inflation, on the other hand, tends to be a drag on financial deepening (although only at the 10% confidence level).

Second, external factors also matter a lot. In particular, greater non-financial corporates' foreign bond issuance boosts bank credit expansion in an economically and statistically significant way. A positive coefficient on non-bank debt issues suggests that, on balance, market debt finance probably did not substitute for bank finance but, rather, complemented it. Very low long-term rates drove many firms to increase their borrowing in debt securities markets (see the paper on "The role of debt securities"). Taken at face value, the estimate suggests that the contribution of foreign non-bank issuance to domestic bank lending lies in the 25–30% range, on average. One possible explanation may be that part of the proceeds of foreign issuance is in turn deposited with domestic banks (Shin (2013)).[8]

[5] See Takáts and Vela (2014) on the correlation of interest rates.

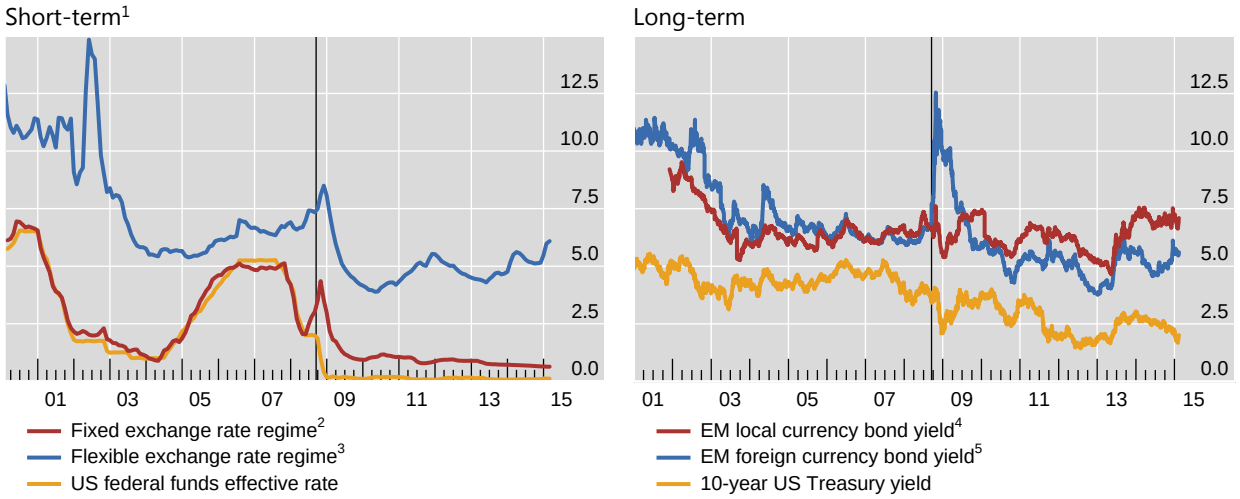
[6] See, for instance, Obstfeld (2014).

[7] Evidence for the bank lending channel in EMEs is provided by Kohlscheen and Miyajima (2015), who find that small bank loans respond more strongly to monetary policy than those of large banks. A possible reason is that small banks tend to have fewer funding alternatives.

[8] The accompanying note on "The role of banks" remarks that the median share of corporate deposits in total deposits in EMEs increased from 33% in 2004 to 45% in 2013.

Interest rates

In per cent — Graph 1



Vertical lines indicate bankruptcy of Lehman Brothers on 15 September 2008.

[1] Three-month Treasury bill yield for Algeria, three-month interbank rates otherwise. [2] Simple average of Hong Kong SAR, Saudi Arabia and the United Arab Emirates. [3] Simple average of Algeria, Argentina, Brazil, Chile, China, Colombia, the Czech Republic, Hungary, India, Indonesia, Israel, Korea, Malaysia, Mexico, Peru, the Philippines, Poland, Russia, Singapore, South Africa, Thailand and Turkey. [4] JP Morgan Government Bond Index – Emerging Markets (GBI-EM), seven to 10 years. [5] JP Morgan Emerging Market Bond Index (EMBI), seven to 10 years.

Sources: Bloomberg; Datastream; JP Morgan; national data.

Third, the exchange rate vis-à-vis the US dollar also has a clear influence on credit growth. The estimates suggest that a 10% appreciation of the local currency is associated with an 85 basis point increase in credit growth in the short run and a 135 basis point rise in the long run. This is consistent with the view that an appreciation of the dollar leads to a deleveraging of global banks, which implies a reduction in cross-border lending to EMEs (Bruno and Shin (2014)). Furthermore, currency appreciation also strengthens the balance sheet of the domestic firms that have accumulated foreign currency debt, improving their ability to raise funds. These effects would be stronger in EMEs with a greater reliance on external financing. To the extent that new credit boosts growth, and this in turn generates further appreciation, the link creates the possibility of positive feedback loops.

Finally, an increase in the VIX index tends to have a significant contractionary effect on domestic credit. A large body of literature, dating back to Pan and Singleton (2008), relates the CBOE VIX option volatility index to risk premia. The results suggest that an increase in VIX reduces credit growth beyond what is implied by the (typically) accompanying depreciation of the exchange rate and the contraction in foreign bond issuance.

Determinants of credit growth in EMEs – an illustration

(Dependent variable: percentage change in bank credit (difference in logs)) Table 2

	Model	
	I	II
Δ ln(Loans) – lagged	0.379***	0.371***
	(0.101)	(0.111)
Δ Policy rate	-0.205***	-0.207***
	(0.058)	(0.054)
Δ ln (Exchange rate)	-0.087***	-0.085***
	(0.022)	(0.023)
Δ ln (GDP)	0.214**	0.185**
	(0.097)	(0.094)
Δ ln (Deflator)	-0.086*	-0.083*
	(0.048)	(0.050)
Δ Non – bank bonds/bank credit	0.256**	0.297**
	(0.123)	(0.110)
Δ VIX		-0.055***
		(0.019)
Observations	470	439
Sargan test (p–value)	0.896	0.820

[1] System GMM estimation using the Arellano-Bover dynamic panel estimator. The null hypothesis of the Sargan test is that the instruments are valid. *, ** and *** denote statistical significance at the 10%, 5% and 1%, respectively. Robust standard errors in parenthesis. [2] The dependent variable is an index of domestic bank credit to the private non-financial sector measured in local currency.

Source: Authors' estimation.

Taken together, these findings indicate that external financial conditions have a significant impact on domestic credit. They also suggest that a tightening of global monetary conditions would dampen domestic credit growth in EMEs. And as US dollar push factors heavily influence corporates' external issuance of high-yield debt, an increase in risk spreads could have a sizeable effect due to a moderation in global investors' search-for-yield and a possible US dollar appreciation.

3. Implications for monetary policy

A number of monetary policy challenges arise when changes in domestic credit conditions and the external environment interact. One question is whether and how monetary authorities should respond to changes in financial intermediation. A second is what instruments central banks should use to respond to such changes.

How should monetary policy adapt?

To help fix ideas, consider a stylised monetary policy rule that an EME central bank might follow in pursuing macroeconomic stability:

$$i = i^* + \alpha(\pi - \pi^*) + \beta(y - y^*) + \gamma(e - e^*) \quad (1)$$

In other words, the nominal policy interest rate i is set in response to the inflation gap $\pi - \pi^*$, the output gap $y - y^*$, and the exchange rate gap $e - e^*$. The starred variables i^*, π^*, y^* and e^* represent the neutral rate of interest, the inflation target, the potential output and the equilibrium exchange rate, respectively. The rule allows for the possibility that EME central banks may wish to resist an appreciation pressure by keeping the policy interest rate lower than otherwise. The response parameters that describe the rule, α, β, γ, implicitly depend, inter alia, on the prevailing transmission mechanism.

Changes in financial intermediation may, first of all, affect monetary policy via the equilibrium or neutral interest rate in the economy (i^* in equation (1), Genberg (2008)). For instance, greater competition may reduce intermediation spreads. In this case, the equilibrium interest rate would rise, as smaller spreads boost aggregate demand.

Changes in financial intermediation may also have cyclical implications for monetary policy. Disregard the exchange rate for the moment. Then, on the one hand, a stronger domestic credit channel should enable monetary policy to respond less to domestic macroeconomic shocks (smaller α and β). On the other hand, financial globalisation could weaken the link between monetary policy and domestic financial conditions, potentially requiring monetary policy to respond more rather than less to shocks (higher α and β). An appropriate policy response would hinge on the relative importance of these two opposing forces. For example, in economies with a higher dependence on market-based financing, the high sensitivity to global financial conditions might outweigh the stronger bank lending channel.

A potential interaction between the exchange rate and the credit channel presents additional challenges. To the extent that a policy tightening induces an exchange rate appreciation that reinforces credit growth (as in Table 2), monetary policy may have a weaker traction on domestic credit conditions. In this case, the policy dilemma takes a stronger form than that discussed in Rey (2013) and Obstfeld (2014). Not only are external factors important for domestic financial conditions, but the effectiveness of domestic monetary policy may be curtailed by procyclical exchange rate adjustments.[9] It is less clear whether monetary policy should react differently to shocks in this context, although the trade-off between macroeconomic and financial stability would worsen.

A standard policy rule may therefore be inadequate in addressing the full range of cross-border spillovers. In particular, there may be cases for monetary policy to respond to changes in the risk premium. The justification for doing so is relatively straightforward in a closed-economy context. For instance, by leaning against financial measures such as credit spreads, monetary policy could improve macroeconomic stability (eg Curdia and Woodford (2010)). In this case, an augmented policy rule would add a risk premium measure to equation (1) and assign it a negative coefficient.

That said, it is less clear if such a simple response carries over to the open-economy context. In particular, the role of exchange rate movements becomes crucial.

[9] Such constraint should be more binding for EMEs where private sector balance sheets have net exposure to foreign currencies on the asset side, thus serving as a procyclical mechanism for the credit channel.

Consider a familiar scenario where an advanced economy's quantitative easing policy induces lower long-term interest rates as well as an exchange rate appreciation in EMEs. The implications for macroeconomic stability are ambiguous: lower long-term interest rates and an exchange rate appreciation have offsetting effects on aggregate demand. For example, tightening monetary policy may be more appropriate in an economy with a lower export dependence (less concern about exchange rate appreciation), and more reliance on market-based financing (greater concern about lower long-term rates). But there is no one-size-fits-all augmented policy rule in this case. Moreover, if an exchange rate appreciation boosts credit growth as noted by Bruno and Shin (2014) and in Table 2 above, then policy tightening could have an ambiguous net impact on credit, and a policy dilemma may again resurface.

Shifts in external conditions could also affect macroeconomic stability in a more dynamic and non-linear way. Market psychology, bubbles, and self-fulfilling expectations could lead to persistent overshooting in asset prices and exchange rates, if left unchecked. As a result, policymakers often assign a high priority to short-term financial market stability. During the QE tapering episodes, several EMEs had to tighten policy despite a widening risk premium in order to regain market confidence and restore financial market stability. Similarly, during episodes of large inflows and risk premium compression, there were concerns that any policy tightening could create self-fulfilling expectations of exchange rate appreciation and thus invite further inflows. When monetary policy responses are guided by such motives, they are necessarily less rule-based and more discretionary.

Nonetheless, concerns with financial stability could provide a rationale for leaning against risk premium shocks. Lower risk premia and funding costs could promote risk-taking behaviour, influencing both credit demand and supply. Private sector balance sheets could adjust procyclically, as higher asset prices raise net worth and allow further credit expansion (Adrian and Shin (2010)). This could sow the seeds of a wrenching adjustment later on, as the process reverses. Forward-looking countercyclical monetary policy can help moderate the amplitude of such financial cycles. It would also help pre-empt problems associated with a debt overhang. Where debt is high, debt servicing ability may become an additional constraint that limits monetary policy space (Juselius and Drehmann (2015)).

Role of other policy instruments

More severe policy trade-offs may stretch the ability of conventional monetary policy to attain its objectives. For instance, macroprudential policy can play a complementary role by restraining the build-up of risk over the financial cycle and by moderating the compression of risk premia during the boom (Borio (2010)). The variety of available macroprudential tools also allows sector-specific imbalances to be addressed (such as the risks of a housing market bubble or the exposure of certain sectors to foreign currency risks) – imbalances that are the root causes of stability risks and have an external origin.

In Korea, for example, strong cross-border financial flows led to private sector balance sheet vulnerabilities arising from currency mismatches. In response, in 2010 the authorities introduced a leverage cap on foreign exchange derivatives and a levy on banks' foreign currency liabilities. Bruno and Shin (2014) find some evidence that the measure reduced the sensitivity of cross-border flows to global factors.

The role and scope of non-monetary policy tools in meeting EMEs' growing challenges has been a subject of intense debate recently. Capital controls, in particular, have gained a wider support as a policy option. Recent works have also provided firmer theoretical justifications for their use (Korinek (2013)). However, empirical evidence of their effectiveness has been mixed. For instance, Forbes et al (2015) found that capital controls do not appear to influence key variables such as exchange rates, capital flows and market volatilities. Other studies found that these measures may affect the composition rather than the volume of capital flows (though such effects may still help enhance resiliency against crisis).

Macroprudential policy also has its limits. In economies where non-resident direct lending accounts for a high share of total domestic credits, macroprudential policies that target domestic banks may be less effective. In addition, since macroprudential policy works by directly influencing the balance sheet of financial intermediaries, it may affect the monetary transmission mechanism. Finally, macroprudential policy may not be very effective when rapid credit growth reflects a generalised imbalance arising from very easy monetary policy. Monetary policy, by its virtue of "getting into all the cracks", arguably still has a key role in safeguarding financial stability (Stein (2013)).

Appendix

Investment response to interest rates and bank credit[1]

(Dependent variable: quarterly percentage change in real investment (difference in logs, sa)[2]) Table A1

	Low bank dependence			High bank dependence		
Long-run elasticities:						
Δ Real interest rate	-0.495***	…	0.511***	-0.158	…	-0.126
	(0.048)	…	(0.060)	(0.181)	…	(0.177)
Δ ln (Bank credit)	…	0.056*	0.036	…	0.355***	0.347***
	…	(0.030)	(0.041)	…	(0.086)	(0.072)
Δ ln (GDP)	1.369***	1.073***	1.283***	0.907***	0.586**	0.642**
	(0.309)	(0.327)	(0.234)	(0.341)	(0.239)	(0.261)
Δ ln (REER)	0.216	0.236	0.245	0.249***	0.220***	0.220***
	(0.208)	(0.208)	(0.221)	(0.077)	(0.058)	(0.062)
Observations	310	310	310	298	291	291
Sargan test (p–value)	0.315	0.465	0.298	0.308	0.382	0.293

[1] System GMM estimation using the Arellano-Bover dynamic panel estimator. The null hypothesis of the Sargan test is that the instruments are valid. *, ** and *** denote statistical significance at the 10%, 5% and 1%, respectively. Robust standard errors in parenthesis. The sample period is Q1 2000–Q2 2014. [2] Bank credit is an index of bank credit to the private non-financial sector measured in local currency, deflated by the CPI. REER is the end-of-quarter real effective exchange rate index (an increase in the index means a depreciation of the local currency).

Source: Authors' estimation.

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Changing patterns of financial intermediation: implications for central bank policy

Central Bank of Argentina

Abstract

As a consequence of the significant economic and financial crisis suffered in 2001-2002, Argentina has experienced a particular path with respect to patterns of financial intermediation. Following the abandonment of the Convertibility Plan in December 2001, it suffered a huge financial and economic crisis. The crisis led the country to introduce significant changes in its regulatory framework; many of them in line with the guidelines introduced by multilateral bodies in the aftermath of the subsequent Lehman Brothers crisis. From that point on, a sounder and more stable banking system was established, which supported a strong economic recovery.

The ratio of credit to GDP reached almost 13% by the end of 2014. Although it remains low by international comparison, it is nevertheless 5.8 percentage points higher than at end-2004. Over the last 10 years, the growth in corporate and household credit lines has driven a strong expansion in private financing. The financial system continues to be funded primarily by a broad mix of domestic, highly atomized, deposits. Retail and other small deposits accounted for 73% of total bank funding as of October 2014.

The regulatory changes implemented by the Central Bank of Argentina (BCRA) include a macroprudential framework that establishes limits on foreign currency lending. Such limits aim at preventing the indirect exposure generated by the granting of loans denominated in foreign currency to agents whose income is denominated in pesos. The regulations introduced by the BCRA allow only funds obtained from deposits in foreign currency to be on-lent to customers who generate income in such currency. The share of foreign currency-denominated lending in total lending granted to the non-financial private sector stood at 6% at the end of October of 2014, down by 68 percentage points from December 2001.

Finally, it is worth noting that relatively large foreign capital flows to emerging market economies (EMEs) with small- or medium-sized domestic financial markets trigger a number of problems for economic policy management. The large amounts of internationally mobile capital surpass the absorption capacity of many EME capital markets and some commodity markets. Capital flows can have a number of side effects for recipient countries, including changes to established monetary transmission channels. Within a scenario of higher gross capital flows, portfolio investment is growing in relation to foreign direct investment (FDI). Given that portfolio investment is intrinsically more volatile, it is important to consider the role played and the impact of the behaviour of global investment funds on EMEs.

Keywords: private financial system's gross exposure, foreign currency lending, credit default levels, public banks' role, currency mismatches exposure, macroprudential policies

JEL classification: E58, G10, G38

Introduction

Over the past 10 years, Argentina's financial system has recovered from one of the deepest financial crises ever experienced (the 2001–02 crisis). From that point on, a number of economic and financial policies were implemented with the objective of re-establishing a sound banking system and providing the necessary conditions for a strong recovery. The "new" financial system that has emerged is now based on a set of guidelines that address the main shortcomings of the Convertibility Plan, among which the explicit lack of a lender of last resort and unfettered currency mismatches can be mentioned. The BCRA has played an active role in this process. Taking this into account, the 2008 global financial crisis was handled adeptly and the financial system did not suffer as much as in the past. Considering the relative magnitudes of international and domestic financial flows, regulatory financial policies were implemented to strengthen both liquidity and solvency indicators, and reduce potentially negative side effects on the banking system.

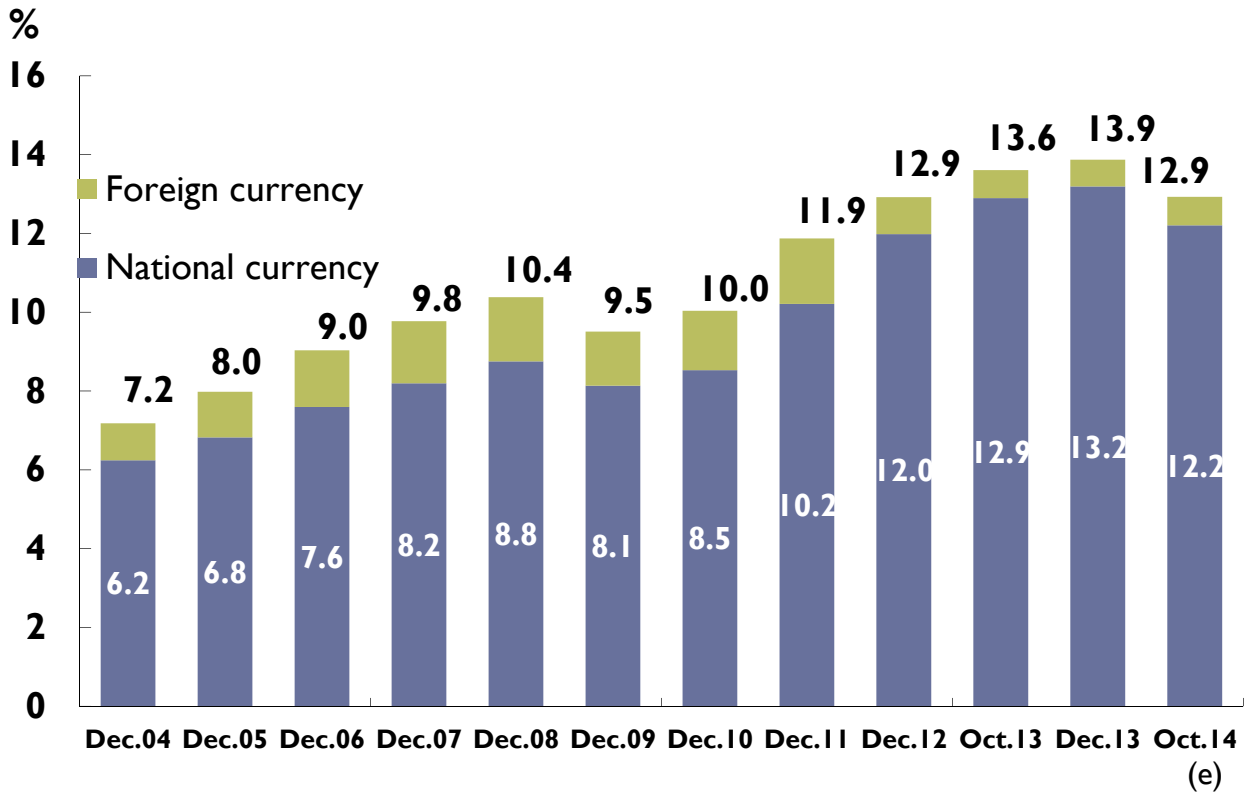
In the following paper, we describe the recent evolution of the domestic banking system, with an emphasis on its main characteristics and on the monetary policy applied by the BCRA.

Bank intermediation

In Argentina, banks have strongly expanded their financial intermediation to the private sector over the last decade. As a result, the ratio of credit to GDP reached almost 13% at the end of October 2014, a 5.8 percentage point increase in comparison with the value recorded at the end of 2004 (Graph 1). Even though the value of this indicator remains low, both in historical terms and in international comparison, a remarkable change was observed in the currency composition of lending. There was a significant reduction in the weight of foreign currency lending: currently, loans denominated in pesos are equivalent to 94% of total lending (Graph 2) while amounted only 26%of the total stock of loans in 2001. The increase in peso-denominated lending has helped to reduce exposure to currency mismatches in the banking system.

Bank credit relative to GDP

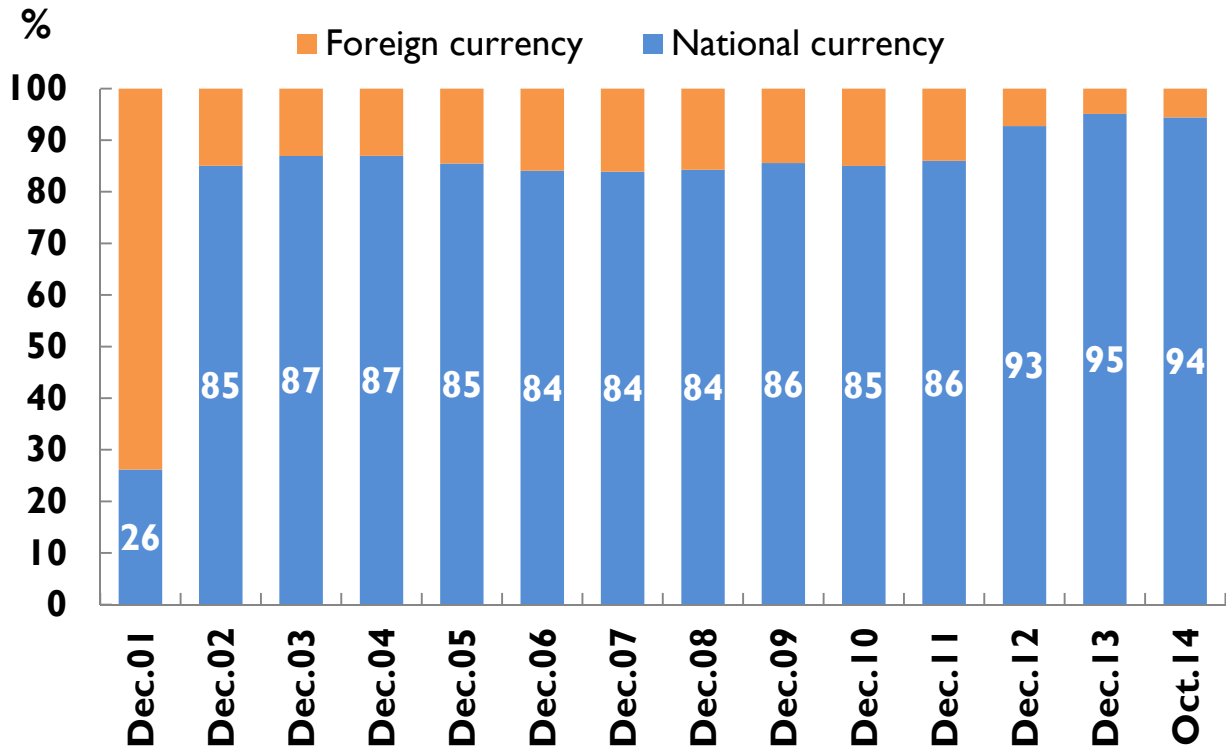
Graph 1



Source: BCRA.

Credit to private sector by type of currency

As a % of the total stock of loans Graph 2

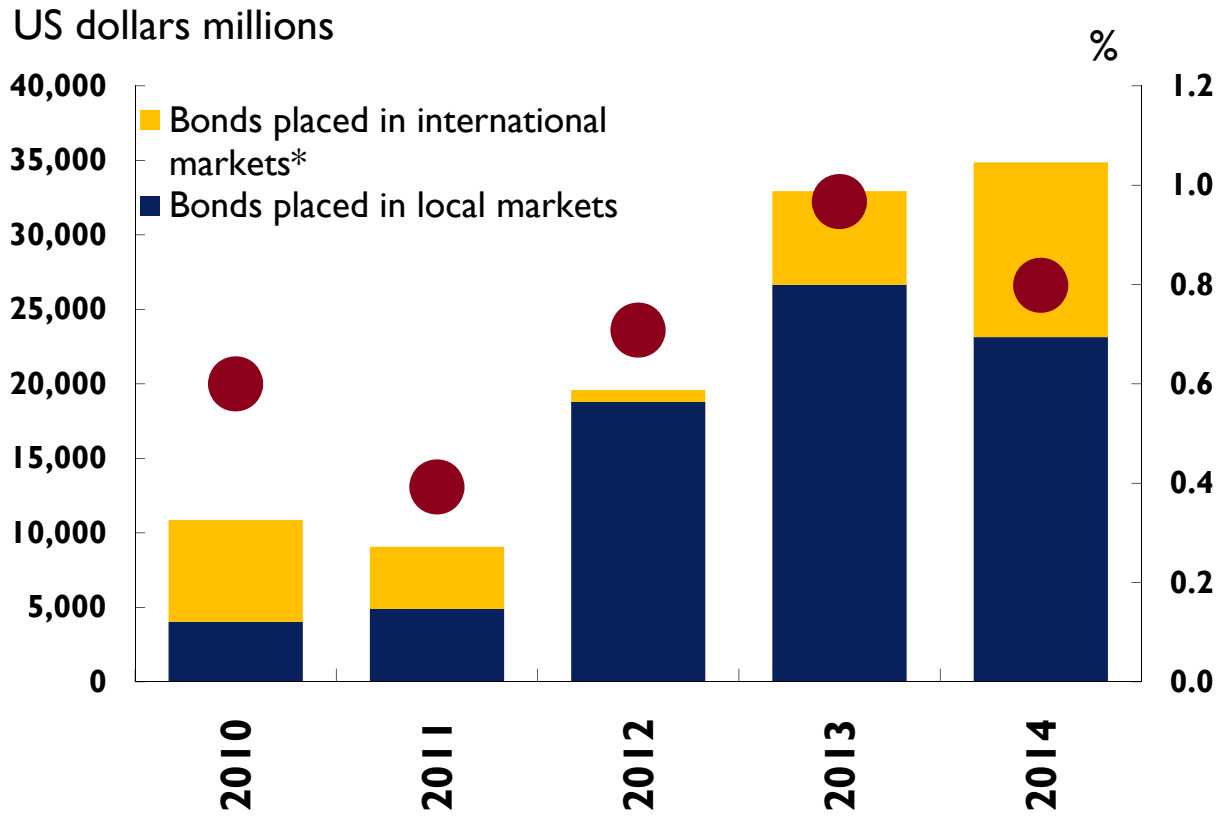


Source: BCRA.

Capital market intermediation

The issuance of debt securities by domestic firms has increased over the past few years, especially since 2012, in both local and international securities markets. That said, gross issuance remains relatively low, at less than 1% of GDP annually (see Graph 3). This Graph shows that financial intermediation remains largely bank-based. In terms of local market transactions, a significant percentage of new financing is related to debt issuance by the financial sector (banks and non-banks). Issuance in international markets is dominated by a few companies, of which the public oil company YPF accounts for the bulk.

Private sector financing – corporate bonds Graph 3



(*) Estimated

Source: BCRA based on CNV, BBCRA, IAMC and Indec.

Structure of domestic banks

Table 1 shows the evolution of the main components of domestic bank assets and liabilities over the last decade. In particular, we can see that:

- An increasing share of monetary regulatory instruments (Lebacs and Nobacs (Ls&Ns) is held by banks. While Ls&Ns represented only 5.8% of assets at the end of 2004, they increased to 12.8% and 14.6% at end-2010 and end-October 2014, respectively.
- The most liquid assets (cash in banks, deposits at the BCRA and repo operations with the BCRA) accounted for 17% of assets in 2004 and reached 21.8% in December 2010, although they dropped to 18.5% by 2014.
- A reduction in credit to the public sector (comprising both loans and securities holdings). Such credit accounted for 42.9% of assets in 2004 but fell by 29 percentage points in the next four years. It amounted to only 9.3% of assets by 2014.
- A consolidation of credit to the private sector as the principal bank asset. In December 2004 (after the effects of the local crisis of 2001–02), credit to the

private sector amounted to only 20.6% of bank assets. After a period of positive growth in lending to households and companies, credit to the private sector rose by 22 percentage points to 42.6% at the end of 2008. This expansion slowed as the global financial crisis affected the local economy. Nevertheless, the share of private sector lending amounted to 48.6% in October 2014.

- In terms of liabilities, over the last decade the domestic financial system turned for its funding to widely dispersed private and public sector deposits of short- and medium-term maturities. Such deposits have become the banks' main source of funds, this representing one of the most important developments for the financial system over the decade. Private sector deposits represented 41% of total bank funding in 2004, 51.8% in 2008 and almost 56% in 2014. Public sector deposits also increased their share in total bank funding, to a level of 18.6% in 2014, 3 percentage points higher than in 2004. This increasing reliance on locally sourced deposits put the domestic banking system on a better footing to face turbulence resulting from the global financial crisis.
- Central bank liquidity channelled to banks in the context of the 2001–02 domestic crisis represented 13.7% of funding at the end of 2004. Such resources were rapidly repaid and accounted for only 0.6% and 0.4% of assets in 2008 and 2014, respectively.
- Market financing (outstanding bonds plus subordinated debt) and foreign lines of credit accounted for 9% of bank funding in 2004, declining to 3.8% in 2008 and 2% in 2010 but gradually recovering over the last few years to 3.8% in 2014. This shift helped to temper the effects of the global financial crisis on the domestic banking system.
- Finally, the net worth of the banking system increased over the last few years from 11.8% of net assets in 2004 to 13.5% in 2014 (Table 1), reflecting the declining leverage of the financial system as a whole.

Financial system balance sheet

As percentage of net assets Table 1

	Dec.04	Dec.06	Dec.08	Dec.10	Dec.12	Oct.14
Assets	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**
Liquid assets	17.0	15.7	20.6	21.8	20.8	18.5
BCRA securities (Lebacs and Nobacs)	5.8	10.5	8.0	12.8	9.2	14.6
Credit to the public sector	42.9	23.7	13.8	12.8	10.0	9.3
Credit to the private sector	20.6	32.7	42.6	42.1	50.9	48.6
Other assets	13.7	17.3	15.1	10.5	9.1	8.9
Liabilities	**88.2**	**86.5**	**87.1**	**88.1**	**88.2**	**86.5**
Public sector deposits	15.6	18.6	20.9	24.0	21.3	18.6
Private sector deposits	41.0	50.4	51.8	53.4	55.7	55.7
Financial deposits	0.3	0.4	0.4	0.2	0.1	0.1
Financial liabilities	0.7	1.9	1.2	0.9	1.1	0.7
Central bank liquidity	13.7	3.1	0.6	0.1	0.5	0.4
Outstanding. bonds	3.9	2.7	1.9	0.7	1.2	1.5
Foreign lines of credits	4.4	1.7	1.4	0.8	0.7	1.0
Subordinated debt	0.7	0.7	0.5	0.4	0.3	0.4
Other liabilities	7.8	7.0	8.3	7.6	7.3	8.2
Net worth	**11.8**	**13.5**	**12.9**	**11.9**	**11.8**	**13.5**

Liquidity risk

Banks increased their strength with respect to liquidity risk. In particular, liquid assets (including Ls&Ns holdings) stood at 48.7% of short-term liabilities in September 2014, evidencing increases of 7.9 percentage points and 6.4 percentage points compared to the end of 2005 and 2008, respectively. The broad liquidity ratio, which includes Ls&Ns holdings in pesos and in foreign currency not used by repo transactions also posted positive changes: the indicator reached 44.2% of deposits by the end of October 2014, which was 3.8 percentage points and 5.2 percentage points above the average figure recorded in 2005 and 2008, respectively. All types of institution raised their liquidity levels. Furthermore, banks usually record surpluses in liquidity compliance in both pesos and dollars, another signal of their strength with respect to liquidity risk.

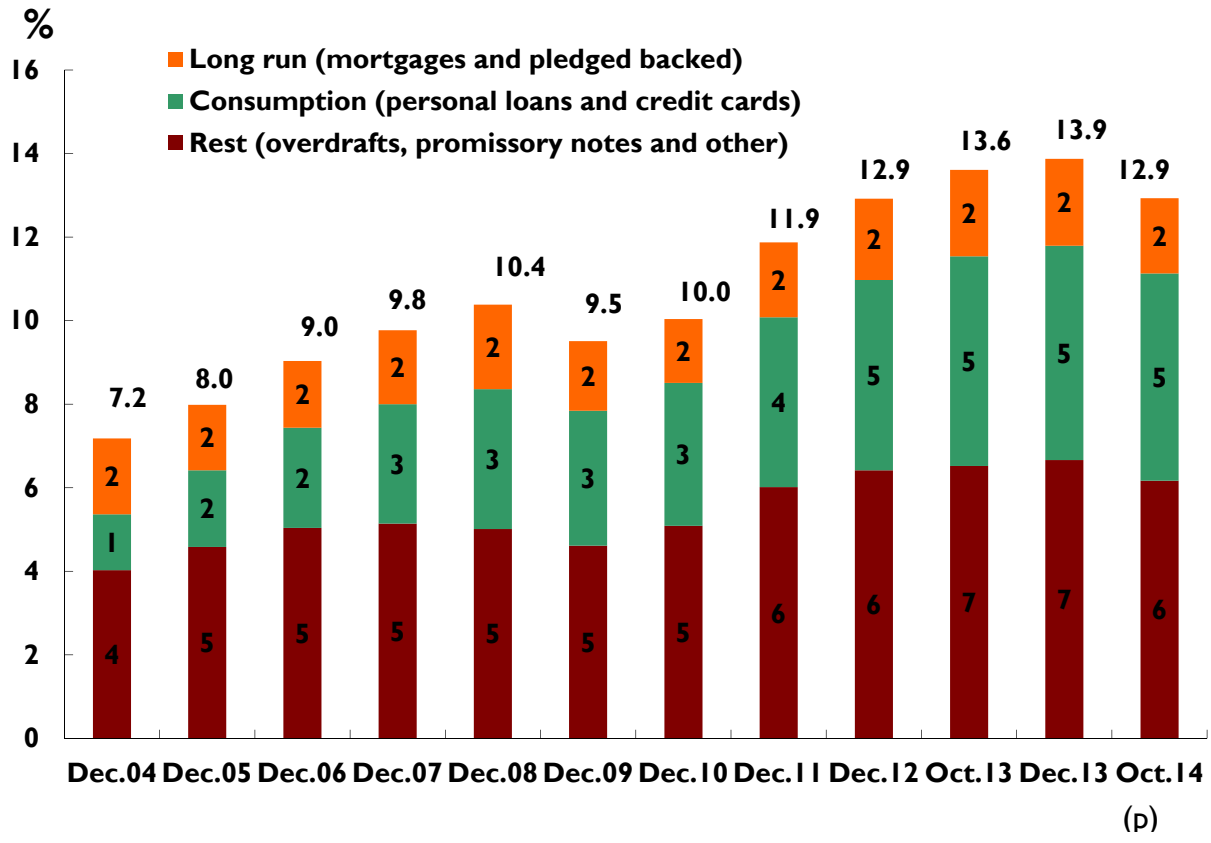
Lending at fixed rates increases exposure to interest rate risk, given that assets usually have a longer term than liabilities. During the last few years, a gradual reduction in the exposure to interest rate risk was observed at the aggregate level, partly in response to financial institutions' lower exposure to the public sector (assets of longer maturities), an increasing bias to short- and medium-term financing and a new approach to interest rate risk management. Thus, for example, the impact of the

rise in domestic interest rates from the end of 2013 had only a marginal impact on financial institutions' net income.

As mentioned earlier, the financial system's gross exposure to the private sector increased significantly over the last decade, reaching 48.6% in 2014 from a low of 20.6% at the end of 2004. This trend was experienced by all groups of banks (private national and foreign entities as well as public ones), although it slowed during 2008–09. The continued recovery of income recorded by households and companies over the last few years – in a context of moderate indebtedness for both sectors – was reflected in falling bank credit default levels. This improvement was coupled with generous provisioning against non-performing portfolios, which helped to keep credit risk exposures low. Private sector defaults amounted to 2% of total lending by October 2014 – below international figures –, with a drop of 16.5 percentage points and 36.6 percentage points vis-à-vis 2004 and 2002, respectively.

Bank credit to private sector

Percent of GDP – financial system — Graph 4

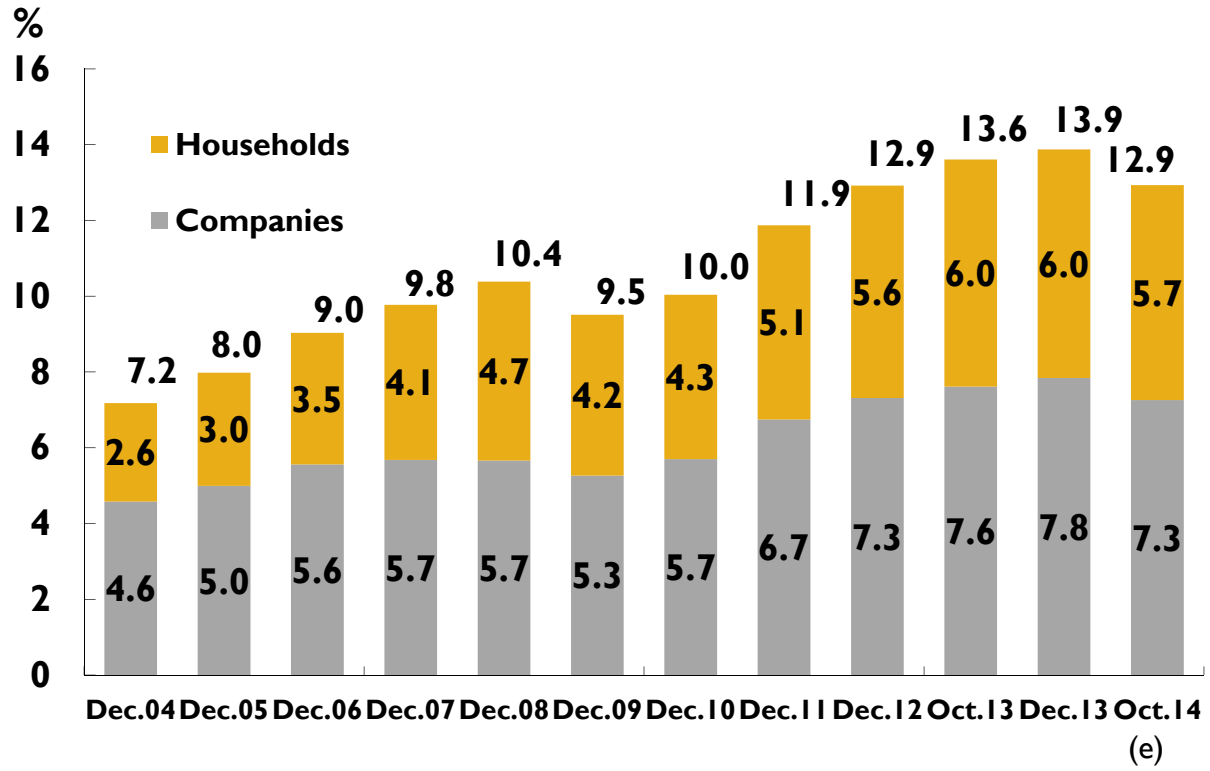


Source: BCRA.

Structure of lending

Regarding the structure of lending, at the end of 2004 almost 36% of total lending to the private sector was channelled to households and 64% to companies. In the next four years (2005 to 2009), the share of lending to households rose by nearly 9 percentage points to 45.5% as consumer lending expanded strongly. Following the impact of the global financial crisis on the local economy, and the introduction of BCRA policies aimed at strengthening productive financing, this trend changed: in 2014 financing granted to households reached 43.8% of the total (of which 80% represented consumer lending) while corporate lending amounted to 56.2%.

Bank credit relative to GDP — Graph 5



Source: BCRA.

By end-December 2013, more than 91% of the total stock of credit was fixed rate, with the remainder at variable rates. The bias towards fixed rate issuance has strengthened during the last few years.

In terms of collateral practices, the ratio of outstanding securitised loans (those with preferred guarantees A[1] and B[2]) to total loans granted to the private sector was about 15.3% in November 2014, some 4.5 percentage points and 6.6 percentage points less than in December 2008 and December 2005, respectively (2.8% with preferred guarantees A and 12.5% with preferred guarantees B). As a result, around 85% of loans were without guarantees. Currently, the default ratios for both types of portfolio are quite similar: 1.7% for loans with preferred guarantees and 2.1% for loans without preferred guarantees.

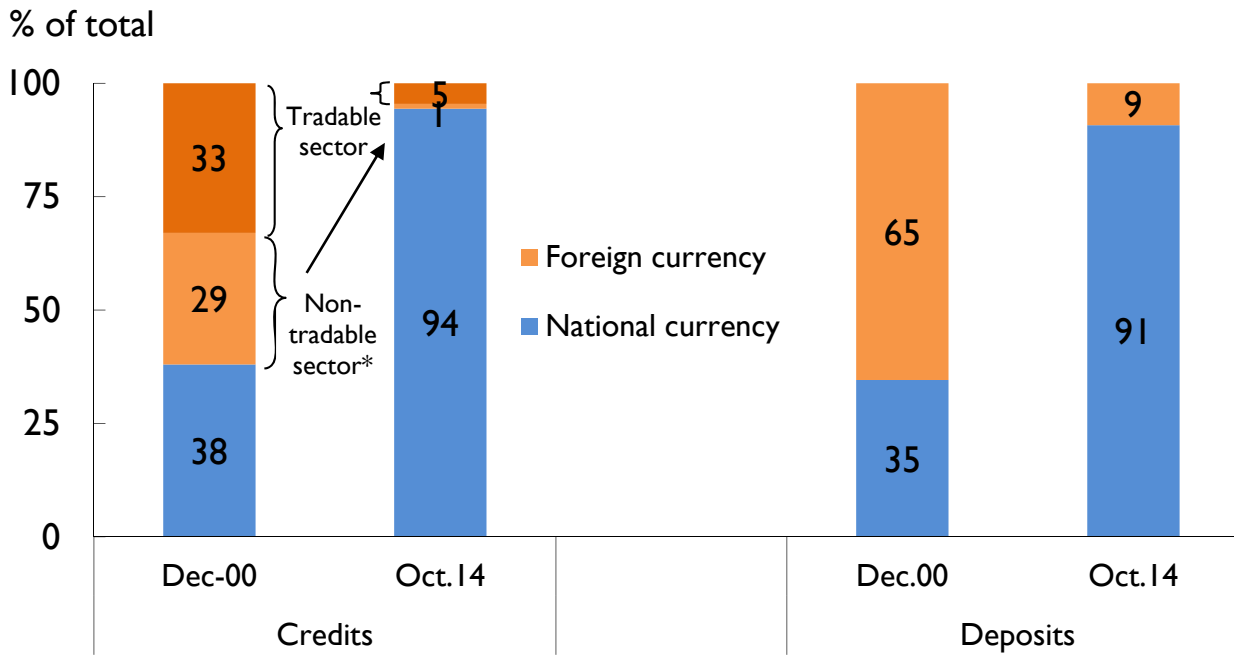
The share of foreign currency loans granted to the non-financial private sector stood at 6% at the end of October of 2014, down by 7 percentage points from December 2004 and by almost 68 percentage points from December 2001. This reduction resulted mainly from the macroprudential framework implemented by the BCRA. The framework established limits on foreign currency lending (see Graph 6). This reduced the financial system's exposure to potential currency mismatches in debtors' balance sheets. In particular, BCRA regulations allow only funds obtained from deposits in foreign currency to be on-lent to customers who generate income in the same currency, thus preventing the indirect exposure generated by the granting of loans denominated in foreign currency to agents whose income is in pesos. Foreign currency borrowers therefore have income that is directly or indirectly generated in that currency.

[1] Preferred A: bonds or paper which are assigned or pledged in such a way that a financial institution is assured of full repayment of the financing by a solvent third party or via secondary markets through which the bonds can be sold. This category includes guarantees in cash, gold, a bank's own certificates of deposit, automatic export reimbursements, certain securities that are pledged (domestic government bonds, BCRA monetary instruments and securities issued by companies rated A or higher that are routinely listed), guarantees and letters of credit issued by foreign banks rated A or higher, certain warrants, the assignment of certain collection rights, such as those derived from public utility bills to consumers (electricity, gas, telephone, water etc), credit card coupons, tariffs and rates for public works concessions, discounted credit titles (deferred payment checks, promissory notes, bills of exchange and credit invoices) for which payment responsibility lies with the assignor (as long as certain conditions regarding risk diversification and credit quality of the issuer are met), guarantees granted by reciprocal guarantee companies on the BCRA register, and certain types of export credit insurance when the policy contemplates effective payment of the credits within 180 days of due.

[2] Preferred B guarantees consist of property rights and third-party commitments, such as first mortgages on property, security interests in identified chattel goods, or possessory pledges in favour of the institution on vehicles and farms, highways and industrial machinery, other export credit insurance and guarantees granted by reciprocal guarantee companies on the BCRA register, financial leasing according to Law 25,248 for property, vehicles and farms, highways and industrial machinery, and certain fiduciary trusts set up in accordance with Law 24,441 to guarantee the payment of loans granted for property construction.

Financial intermediation with the private sector by currency

As a percentage of the entire financial system Graph 6



*Note: non-tradable sector financing estimation includes loans in foreign currency to households, construction sector, gas, water, electricity and other services.

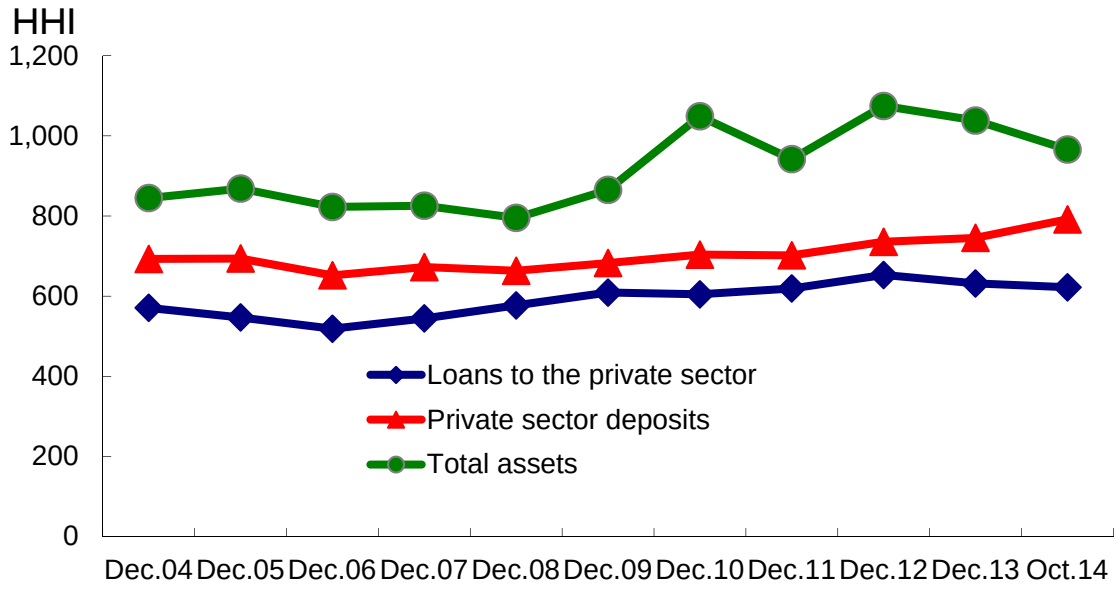
Source: BCRA.

Competition in banking system

As a guide to the intensity of competition in the banking system, a set of measures is generally used to determine market concentration, one of the factors affecting the market's competitiveness. One such measure, the Herfindahl-Hirschman Index (HHI), is a widely used barometer of market concentration. An index value of about 1000/1500 indicates that there is essentially no concentration in the banking system; a value of between 1000/1500 and 2000/2500 could be seen as indicating moderate concentration; and a value above that level would suggest high concentration.

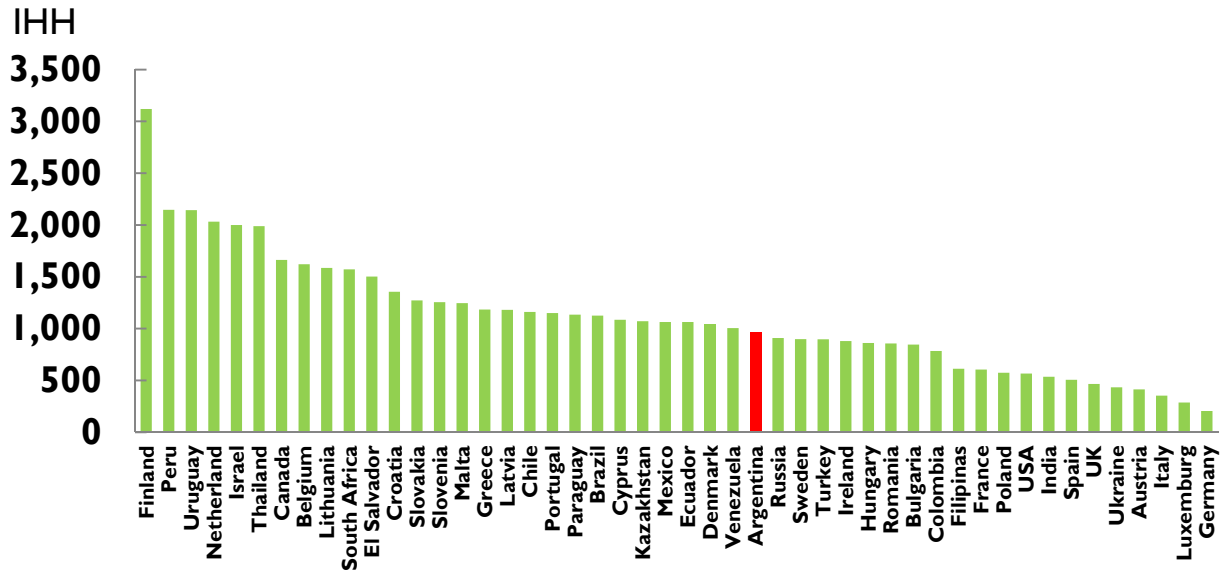
At the end of 2004, the HHI stood at 570 for private sector loans, 690 for private sector deposits and 845 for banking assets. Such values show low concentration levels and suggest a positive framework competition in the domestic market is considerable (Graph 7). These index values have increased marginally over the past 10 years, to 620 for private sector loans, 790 for private sector deposits and 970 for banking assets. This reflects in large part the mergers of some medium-sized private sector banks. A comparison of the local HHI index values with those of foreign banking markets suggests that the concentration of Argentina's banking system is moderate (Graph 7).

Concentration in lending to the private sector as measured by the Herfindahl-Hirschman Index (HHI) Graph 7



Source: BCRA

Cross-country comparison in private sector assets as measured by the Herfindahl- Hirschman Index (HHI) Graph 8

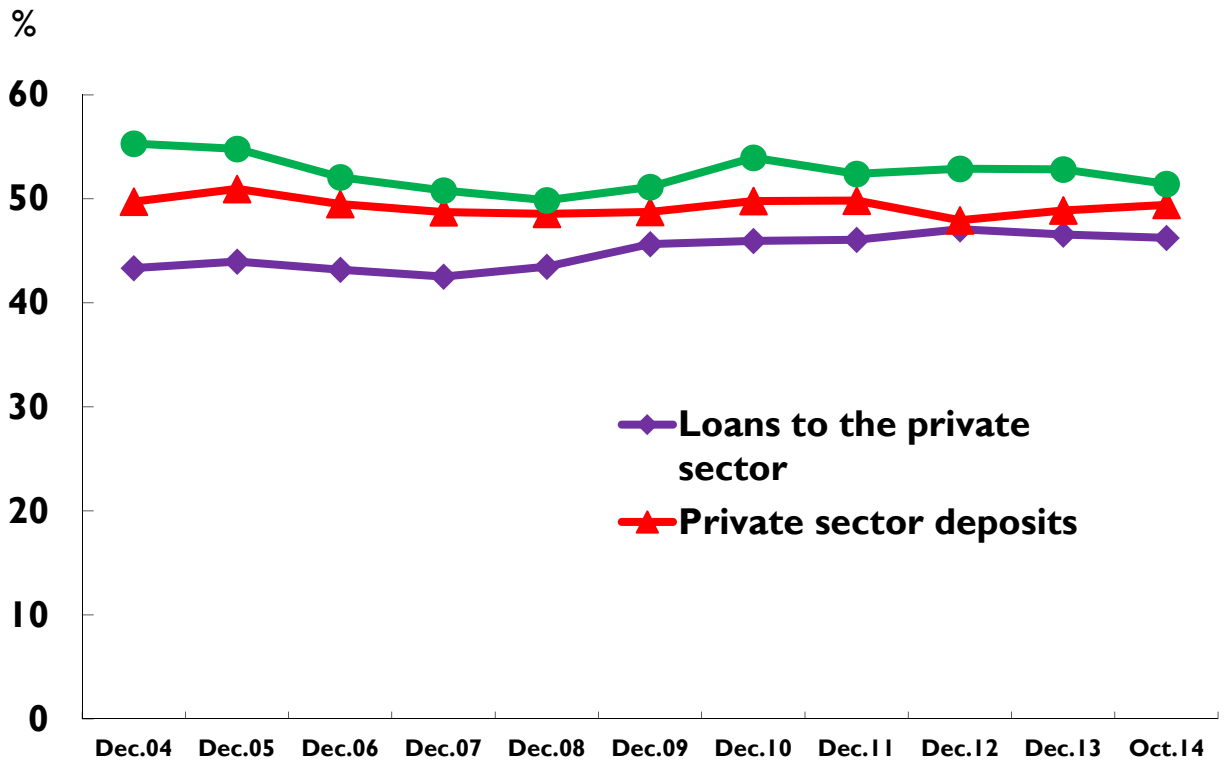


Note: data to 2009, except for Kazakhstan, Romania, Russia, South Africa, Thailand and Ukraine, which are to 2011; Croatia, Lithuania and Turkey to 2010; India to 2008; Brazil, Chile, Colombia, Ecuador, El Salvador, Mexico, Paraguay, Peru, Uruguay and Venezuela to 2014; Argentina to October 2014.

Source: ECB, "EU Banking Structures"; central banks; financial sector supervisors; BCRA.

Another concentration indicator commonly used is the share of the total market accounted for by the five largest banks (Graph 9). This indicator shows no significant change in the last few years.

Market share of lending by the five largest entities — Graph 9



Source: BCRA.

Public sector banks

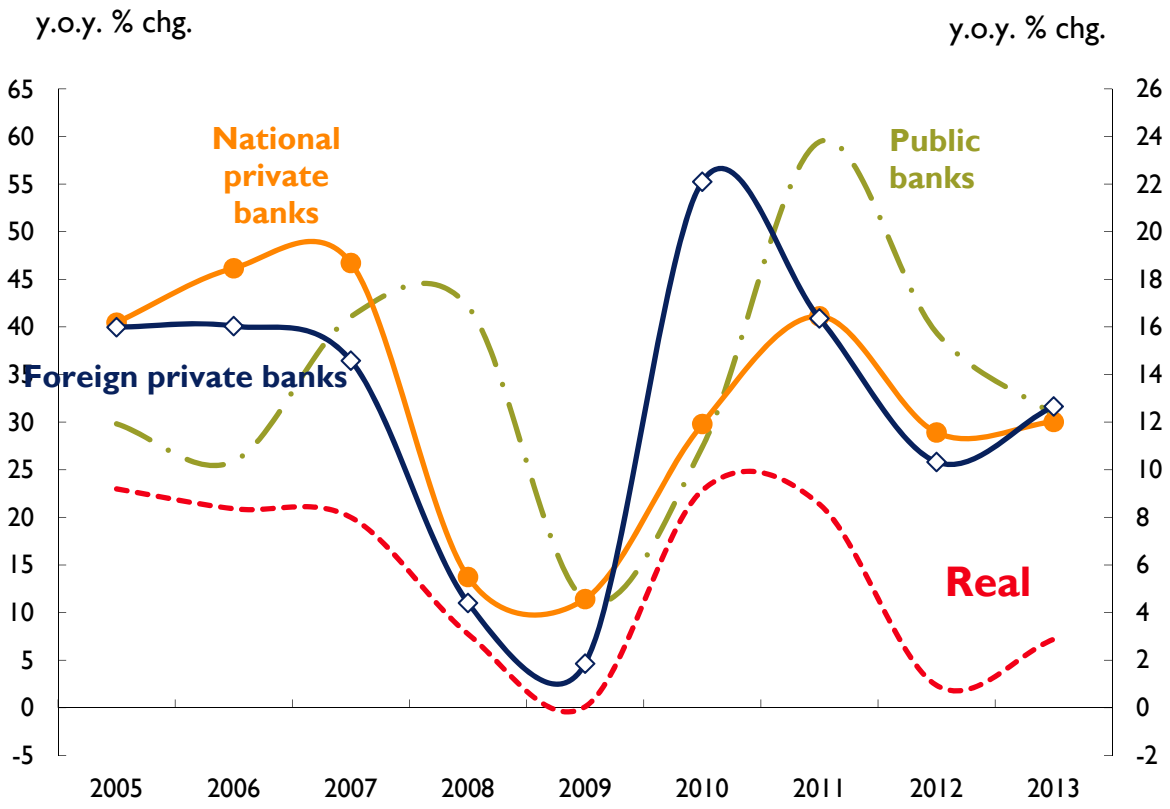
The role of public sector banks is to channel credit to households in favourable financial conditions and badly covered by private banks and, more importantly, to finance investment and productive activities. One of their most important activities is to finance small-and medium-sized enterprises (SME) across the country's different jurisdictions, especially in localities without a well developed private sector financial infrastructure. Public sector banks generally account for a relatively greater share of loans in the longer-maturity segment of the banking market.

Moreover, it should be noted that in Argentina public sector banks have supported the expansion of credit during periods of economic slowdown, showing a relatively less procyclical evolution compared with private sector banks (both locally and foreign-owned, Graph 9). This was particularly evident during the 2008–09 global financial crisis, when public sector banks partially compensated for the procyclical behaviour of private sector entities.

No significant changes were seen in the post-crisis business models of international banks in the domestic market. Deposits continued to be the primary source of funds and to be channelled mainly to the private sector. It should be noted that foreign private sector banks exhibited procyclical behaviour during periods of stress, with credit slowing sharply during the peak of the crisis, and recovering strongly afterwards (Graph 10).

Credit to the private sector

Year-on-year percent change by group of banks — Graph 10



Sources: BCRA; INDEC.

Measures adopted by the BCRA to promote productive credit

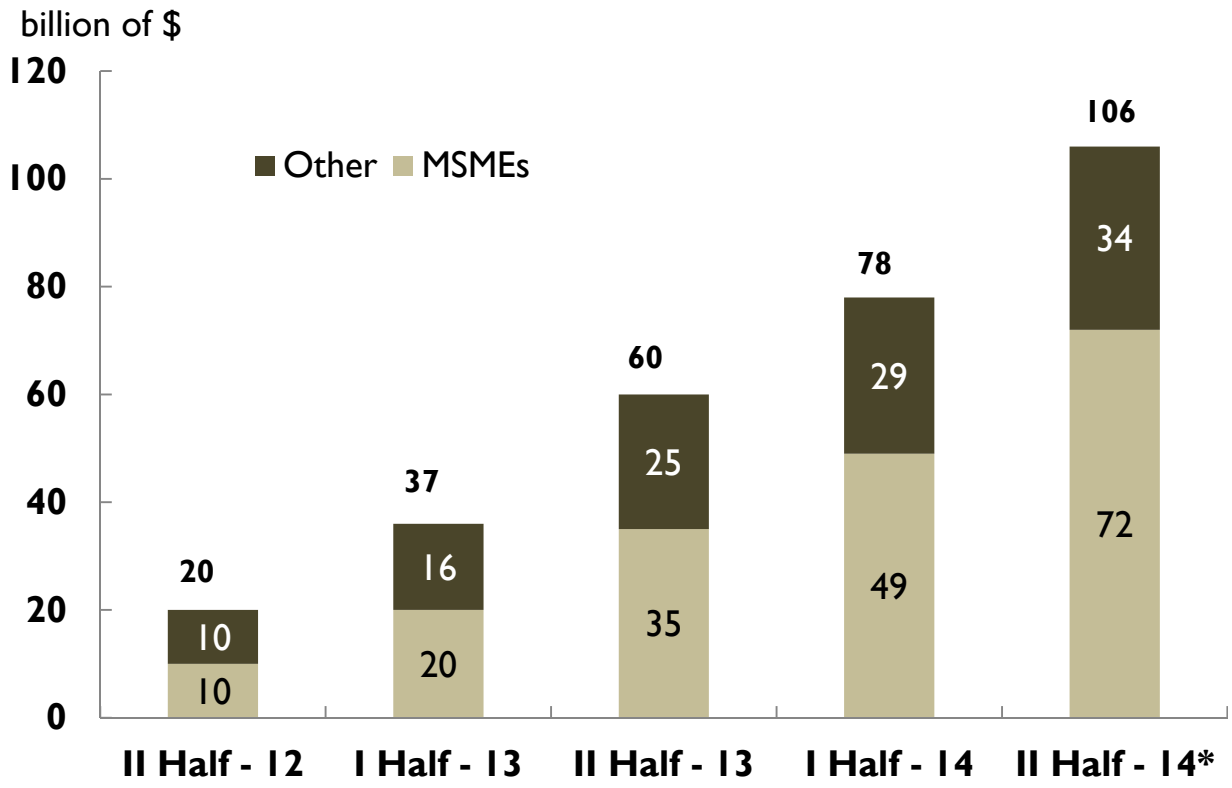
In addition to the active role played by public sector banks, the BCRA has taken several measures in the last years to promote productive investment, paying particular attention to micro, small- and medium-sized enterprises (MSMEs), and to the country's various regions. Moreover, in 2014 regulatory changes were adopted to expand credit at favourable conditions to underprivileged families. Such initiatives should contribute to increase the share of credit relative to GDP and to expand credit

for the financing of productive activities in total lending to the private sector. Some of the measures that could affect the way the monetary policy transmission channels operate are listed below:

- *Bicentennial productive financing programme:* since 2010, the BCRA has made funds available to financial institutions through overdrafts for a maximum term of five years. Banks must provide guarantees through national public bonds or other public sector assets that cover at least 125% of the overdrafts received. Financial institutions may offer domestic currency loans to finance investment projects in the productive sector with an average term of up to two and a half years, and with a maximum total financial cost set by the BCRA at the time of each auction.
- *Credit line for productive investment (LCIP):* the facility was established in July 2012 to finance the productive sector, with a special focus on MSMEs. Five six-monthly stages have taken place up to 2014 (Graph 11). At each stage, the main financial entities must allocate 5–5.5% of their private sector peso deposits (at a certain date) to the financing of investment projects. Financing is granted usually at a fixed rate of interest for a relatively long term (minimum of three years). Within certain limits, the LCIP allows, among other purposes, for working capital to be extended to MSMEs and for mortgage loans to be extended to families.
- *Cash reserve requirements:* the BCRA's charter allows the central bank to influence the allocation of credit through differentiated reserve requirements. Within this framework, the reserve requirement policy includes incentives for lending entities to grant loans to MSMEs. Since December 2012, a reduction in the minimum cash requirement based on the share of lending to MSMEs in the total of peso loans to the private sector has been implemented (with rates ranging from 0.25% to 3% of total deposits). In addition, there has been a reduction of the Minimum Cash Reserve Requirement (MCRR) in pesos, for an amount equivalent to 16% of financing granted from 1 January 2014 to MSMEs and for more than five years under the LCIP.
- *Reference interest rate regime for loans to families:* in June 2014, regulatory changes were adopted to extend credit on more favourable conditions to families. First, a reference interest rate regime was set for loans to families (basically personal and hypothecated loans) to limit the cost of credit to low-income segments of the population. Additionally, financial institutions were required to ask for prior authorisation to implement increases in fees on financial products and services deemed essential. In addition, in order to avoid distortions, financial institutions were asked to report the total financing cost of a loan at an annual nominal rate of interest instead of at an annual effective rate.
- *"AHORA 12" and "Pro.Cre.Auto":* the government launched both programmes in 2014. The first one was implemented in September to promote the credit card purchases of goods and services with 12 payments that are interest-free. In this respect, 16% of the financing granted through this programme may be applied by financial institutions to reduce their MCRRs. This financing may also be applied to fulfil the fifth stage of the "credit line for productive investment". The second programme seeks to promote the sale of cars that are domestically manufactured through loans granted by Banco de la Nación Argentina.

Credit lines for productive investment – cumulative totals

Credit approved basis Graph 11



*Estimated credit approved during the second half of 2014.

Recent regulatory changes that could affect the transmission mechanism

The change in the structure of the domestic financial system that followed the collapse of the Convertibility Plan had implications for the usual transmission mechanisms of monetary policy, and, consequently, for the policies that were subsequently implemented. Although private sector financing has been growing during the last few years, the supply of funds through the banking system remains low in comparison with regional and international standards. As mentioned above, in 2014 the ratio of private sector loans to GDP stood at around 13% and had yet to recover to the levels reached before the abandonment of the Convertibility Plan. The low ratio of credit to GDP suggests that the credit channel remains somewhat weak in Argentina.

For that reason, regulations implemented over the last few years have aimed at reinforcing capital and liquidity requirements, and at increasing provisions, are expected to have a minimal impact on the bank lending channel. As discussed earlier, the banking system basically intermediates domestic deposits and credits, and there are no highly leveraged domestic investment banks.

Some macroprudential tools, such as limits on foreign currency lending and on financial institutions' positions with the public sector, might affect the transmission mechanism of monetary policy. Considering the limits on foreign currency lending, the regulatory approach has been to constrain the capacity of banks to grant loans in foreign currency: only firms with revenues that are denominated in foreign currency (or denominated in local currency but closely linked to the evolution of the exchange rate), such as those that export their production or substitute imports, can obtain financing in foreign currency. This regulation aims at preventing the credit risk associated with borrowers that have cash flows in domestic currency but debts in foreign currency (ie hidden currency mismatches).

Another regulation that could have an impact on the transmission mechanism is the unremunerated reserve requirement for short-term capital inflows. The specific objective of this instrument is to reduce procyclicality by discouraging short-term capital flows, mitigating the risks resulting from short-term capital flow reversals and reducing financial asset price inflation pressure. This instrument, introduced in 2005 (Decree 616/2005 of the national government), consists of a non-interest bearing reserve requirement (a mandatory deposit) of 30% on capital inflows (loans and portfolio investments) for a year. Moreover, a minimum holding period of one year was established for capital inflows. Foreign direct investment, purchases of debt equity instruments in primary public offerings and foreign-trade financing, among others, are excluded from this measure.

Macroprudential policy

The recent changes in macroprudential policies are not expected to affect the monetary policy transmission mechanism.

Argentina has implemented a range of macroprudential tools to achieve financial stability. Such instruments include, among others, taxes or regulations on short-term capital flows, loan-to-value ratios (LTV), other credit limits, such as debt-to-income ratios (DTI), reserve requirements (minimum capital, cash and liquidity requirements) and measures to address currency mismatches. In the same vein, an administrated floating exchange rate regime, which went hand in hand with the build-up of international reserves, has been used to prevent excessive exchange rate volatility. Other instruments are being evaluated, such as through-the-cycle capital buffers and forward-looking provisioning rules.

These measures – some now incorporated into Basel III and others still being discussed within various regulatory and supervisory forums under FSB guidance – were developed and implemented in some jurisdictions, including in Argentina, well before the global financial crisis as a complement to the Basel II framework (which was more focused on the microprudential aspect of financial regulation).

Argentina is committed to completing the adoption of the new elements of Basel III. In particular, the BCRA plans to introduce a liquidity coverage ratio (LCR), following the internationally adopted standards as of 2015 for the relevant banks. The implementation of this macroprudential tool is not expected to have any effect on monetary policy transmission, as the portfolios of local banks are already highly liquid. However, it will have a positive effect on liquidity risk management.

In line with international commitments, the BCRA has already published its identification methodology for domestic systemically important banks (D-SIBs). The technical analysis for the calibration of the higher capital requirements for D-SIBs is in its final stage and the macroprudential tool is expected to be completely implemented in 2015.

In 2014, the solvency indicators for the financial system remained at a high level. This resulted from book profits and, to a lesser extent, from new capital contributions. While a capital conservation buffer is already in place, total leverage is currently substantially below the regulatory limit. Thus, the domestic financial system is operating with considerable excess regulatory capital overall, with current common equity exceeding the minimum requirements established by the Basel III framework (which will be implemented in full as from 2019). Therefore, the introduction of higher capital requirement for D-SIBs is not expected to have a significant impact on the financial system.

Final considerations

In an environment of liberalised and integrated financial markets, capital inflows and outflows are having greater effects on EMEs than in the past. In addition, the structure of financial markets is changing in term of players and types of fund allocated. An increasing number of documents and studies analyse the effects of those changes, particularly regarding financial stability in the economies involved and the required policy prescriptions.[3] Relatively large flows to EMEs with small- or medium-sized domestic financial markets may lead to a number of potential problems for economic policy management. As Andrew Haldane mentioned there is a Big Fish Small Pond problem where: "the big fish are the large capital-exporting advanced countries and the Small Pond the relatively modest financial markets of capital-importing emerging countries".[4] The enormous amounts of capital that are being allocated in international markets exceed the capacity of many EME capital markets and some commodity markets to absorb it, triggering side effects including changes in the usual monetary transmission channels.

In this respect, it is important to note that within a scenario of larger gross capital flows, portfolio investment is growing in relation to foreign direct investment, and that the first type of financing is intrinsically more volatile than the second. In addition, as mentioned in the IMF's Global Financial Stability Report of April 2014: "herding among funds is on the rise", which is contrary to what was argued by authors such as Calvo and Mendoza.[5] In this reshaping of the global financial architecture, it will be crucial to consider the role played by the so-called global funds and the effects that their behaviour might have on domestic financial systems of EMEs.

[3] IMF, *Global Financial Stability Report*, April 2014.

[4] A Haldane, "The big fish small pond problem", speech at the Institute for New Economic Thinking Annual Conference, Bretton Woods, New Hampshire, 9 April 2012; A Haldane, "The age of asset management?", speech at the London Business School, 4 April 2014.

[5] G Calvo and E Mendoza, "Rational contagion and the globalization of securities markets", *Journal of International Economics*, vol 51, no 1, pp 79–113, June 2000.

Long-term rates and the term premium: evidence from Chile[1]

Sebastián Claro[2] and Carola Moreno[3]

Abstract

Chile is no exception to the high co-movement of sovereign long-term rates observed between EMEs and the United States. In particular, we show that the high co-movement is mainly driven by synchronisation of the term premium. The aggressive monetary policy in developed economies since the financial crisis, and the changing pattern in the profile of investors holding bonds issued abroad, have not only compressed term premia but have also increased their volatility. In this paper, we document these patterns for Chile, showing that in the last few years a larger share of Chilean bonds are being held by investors who are outside the oversight of the US Securities and Exchange Commission, such investors arguably being those who might adjust their portfolios abruptly. This poses a challenge regarding the impact on longer-term rates of monetary policy normalisation in the United States, and the capacity of Chile's monetary policy to stabilise long-term rates in response to large swings in term premia.

Keywords: term structure of interest rates, monetary policy, international finance

JEL classification: E43, E52, F30

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1. Introduction

With few exceptions, emerging market long-term rates have been highly correlated with US long-term rates. If anything, this correlation has increased since 2005 (Turner (2014), Miyajima et al (2012)), arguably as a result of integration in global financial markets. A decomposition of long-term rates into the expected path of monetary policy rates and term premia shows that it is the term premium which is highly correlated across countries, which is consistent with the evidence of independent management of short-term interest rates in some emerging markets in recent decades (Claro and Opazo (2014)). Moreover, the US term premium has compressed significantly in the last few years in a context of highly aggressive monetary policy, albeit with high volatility of that premium.

Two debates have ensued, based on these developments. The first focuses on the extent to which central banks are restricted in their ability to affect monetary conditions if their control on long-term rates is limited by international factors. Eventually, the inability of central banks to materially affect long-term rates could have serious monetary and financial stability considerations (Rey (2013), Obstfeld (2014)).

The second debate is related to the source of compression and volatility in the term premium. One hypothesis is that the decrease in the term premium is the result of an abundance of liquidity in the main financial markets and the search for yield (Hanson and Stein (forthcoming)).[4] According to Hanson and Stein, "easing of monetary policy – even via conventional policy tools in normal times – tends to reduce both the term premiums on long-term Treasury securities and the credit spreads on corporate bonds." Alternatively, Bernanke (2013) argues that a lower volatility of Treasury yields and an increasingly negative correlation between bond prices and stock prices have made bonds more attractive as a hedging asset, which has increased demand for them and compressed their spreads. A drop in inflation volatility in the last decades may also have helped to lower the cost of holding longer-term securities.

Also, the increasing role that investment and hedge funds play in sovereign and corporate bond markets – relative to banks or other long-term investors with buy-and-hold strategies – suggests that some structural changes have occurred. The increasing costs that some regulation – such as the Dodd-Frank Act – have imposed on banks' positions in sovereign and corporate bonds have increased the role of players that, because of their nature, might introduce more volatility in asset prices (Turner (2014), Shin (2013)). Indeed, the relevance of the term premium in determining long-term rates – which arguably are very relevant to determining monetary and financial policies– makes it necessary for central banks to incorporate these considerations into their short-term monetary policy stance.

In this paper we show evidence for Chile on: (i) the high co-movement in long-term rates with those in the United States, (ii) the role played by the co-movement in the term premium in this relationship, and (iii) the role that investment managers play as holders of Chilean corporate and government debt instruments issued in

[4] See also Krishnamurthy and Vissing-Jorgensen (2011), Gagnon et al (2011), D'Amico et al (2012), and Shin (2013). For similar evidence in the United Kingdom, see Joyce et al (2011).

foreign markets. The rest of the paper is structured as follows. In the next section, we present some evidence on correlation between long-term rates in the United States and developing countries, with a special focus on Chile. In Section 3, we show from the decomposition of longer-term rates between the path of short-term rates and the term premium for the United Sates and Chile that it is the term premium component with explains the correlation across rates. In Section 4, we show evidence that investment funds have increased their holdings of Chilean foreign debt in recent years. Finally, Section 5 concludes.

2. Co-movement of longer-term rates

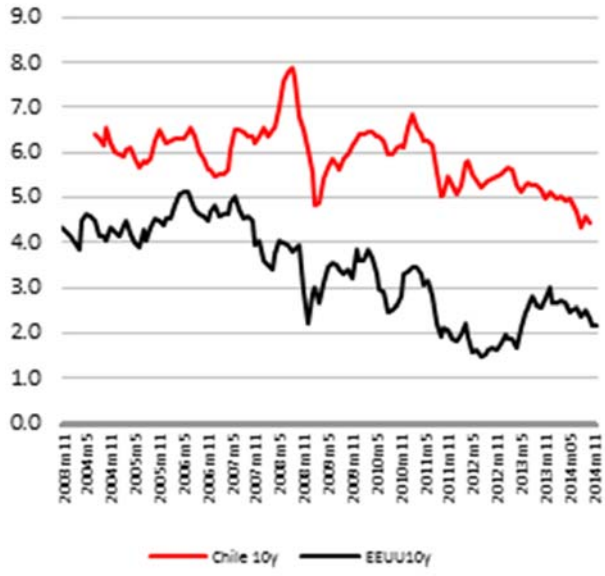
Long-term interest rates tend to be highly correlated across developed countries (Obstfeld (2014) and others.) Taking the 10-year US Treasury bond as benchmark, a 0.6 correlation coefficient is observed on average with other government bond yields for the period 1990–2014.

The importance of external factors such as US Treasury bond yields, global risk aversion measures, and other macroeconomic variables have been widely documented as explaining emerging market yields – and credit spreads – on bonds issued in international markets (see eg Longstaff et al (2011), Central Bank of Chile (2014)). There is less evidence for the influence of external factors on domestically issued government bonds. Turner (2011) and more recently Miyajima et al (2012) are some exceptions, showing that, for a sample of emerging economies, domestic government bond yields between 2000 and 2011 were not significantly related to Treasury bond yields and the Vix index. However, after 2008 the impact of the Treasury bond becomes statistically and economically significant.

Ten-year government bond rates: 2003–14 Graph 1

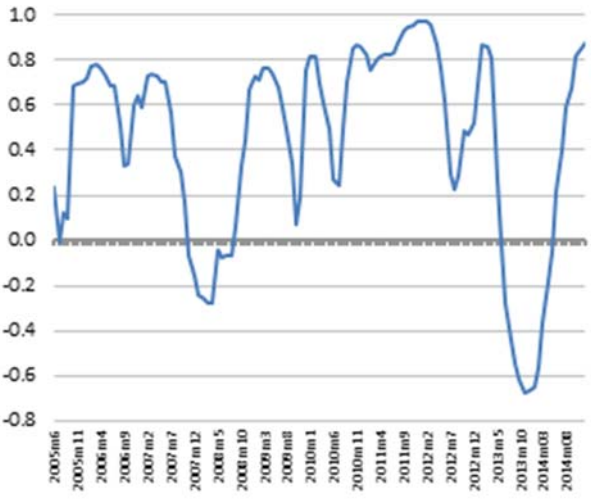
Panel A: US Treasury 10-year and BCP 10-year

(percent)



Panel B: Correlation coefficient

(12-month moving average)



Sources: Central Bank of Chile; Bloomberg.

Panel A in Graph 1 shows the 10-year government bond rates in Chile and the United States since January 2005, and panel B in the same graph shows the 12-month correlation coefficient of both series. As is the case for other developing economies, we observe a high co-movement of long-term rates in Chile and the United States. The sample average of the correlation is 0.4. The high correlation does not seem to depend critically on the share that non-residents represent in the Chilean domestic debt market. The share of foreign investors in the Chilean market is small (estimates range from 2% to 4%), and still the correlation between the yield on the Chilean long-term Central Bank bond (BCP10) and that of the US Treasury bond yield is relatively high: 0.4, on average during the period 2005–14. In contrast, the correlation in Peru is as high as 0.6, where the share of foreigners in domestic government bond market is close to 60% (IMF (2014)).

As is evident from Graph 1, correlation varies over time, as there are a few episodes in which long-term rate movements – at least for short frequencies – differ from those in the United States. One way of addressing this issue is to use the decomposition of long-term rates between the expected path of short-term rates and the term premium, which is the premium required for investing in longer-term securities.

3. Decomposition of longer-term rates

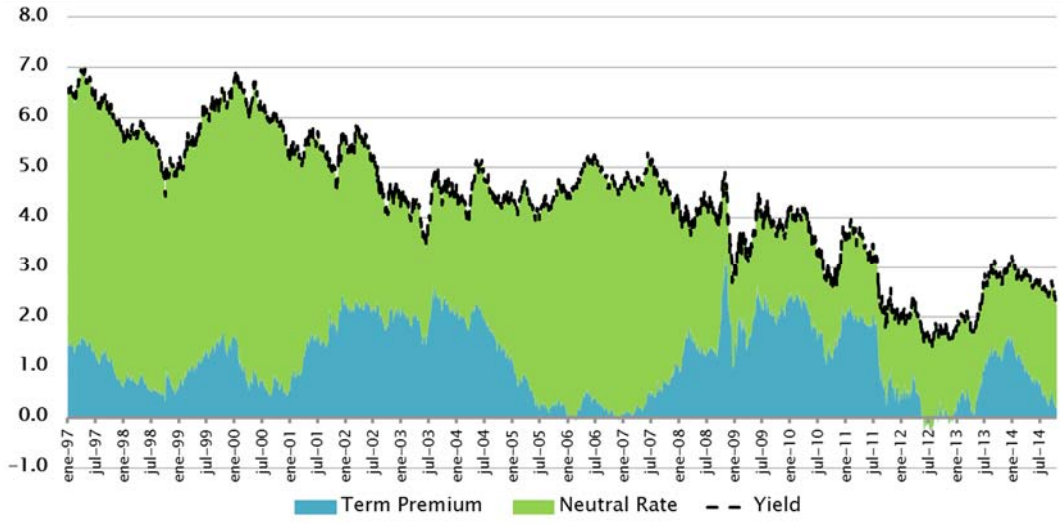
The distinction between the expected path of short-term rates and the term premium is important in several dimensions. First, it is relevant to distinguishing whether the historically low long-term interest rates currently in place reflect an expectation for prolonged low short-term rates – consistent with a secular stagnation hypothesis – or whether they reflect a low term premium. Second, the decomposition is useful for understanding the sources of fluctuations in long rates and for better understanding how the co-movement of long-term rates is compatible with monetary policy rate independence and exchange rate flexibility.

The term premium and the expected path of short-term rates are not observed but rather estimated, and there are different techniques for doing so. In this paper, we use the decomposition of the US Treasury bond calculated at the NY Fed, using the Adrian et al (2013) methodology.[5] Essentially, this methodology proposes a structure for determining the level of neutral short-term interest rates – which reflects the full path of short-term rates implicit in the yield curve – at any point in time as a function of macroeconomic fundamentals. The decomposition of long-term rates for the United States, as done by Adrian et al (2013), shows that in the last few years the most convincing explanation for the decrease in long-term interest rates is the Fed's highly expansionary monetary policy and the expectation that short-term rates will remain low for a long period of time. The fall of the term premium has also played an important part, especially in explaining the volatility of rates (Graph 2).

[5] The term premium is a model-based construct based on market readings of expectations about future variables. When markets are illiquid or very volatile (eg around the Lehman failure), there is a lot of noise in these readings (Turner (2014)).

US Treasuries 10-year interest rate decomposition: 1997–2014

(Percent) Graph 2



Source: Federal Reserve Bank of New York based on Adrian et al (2013).

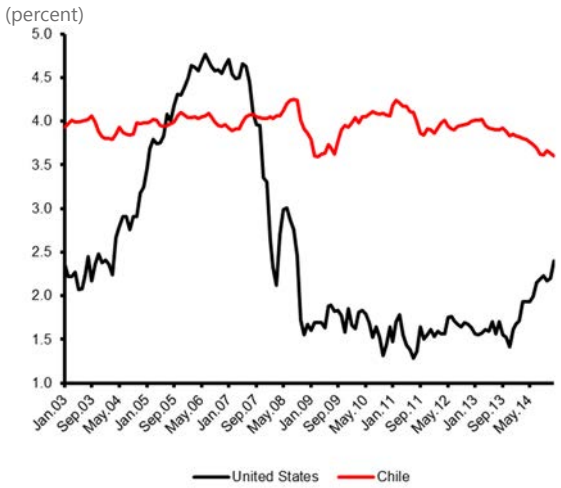
Using a similar methodology, the term premium component of the Chilean domestic long-term bond is estimated and also shows a declining trend.[6] The results show that historically low long-term rates reflect mainly a low term premium, while the path of short-term rates impacts the level of rates through fluctuations in the monetary policy rate. The evidence for Chile, however, shows that short rates quickly incorporate the convergence of short-term rates towards long-term neutral levels. Blake et al (2015) study the term decomposition for Chile and other inflation targeting countries, and show that in the case of Chile the expected path of short-term rates rapidly moves to approximately 5%, regardless of the spot level of monetary policy rates.

Graph 3 compares the two components of long-term rates in Chile and the United States using the Adrian et al (2013) methodology. Panel A shows the evolution of the neutral rate, while panel B plots the trajectory of the term premium. Several conclusions can be drawn. First, it is straightforward to see that the expected path of policy rates in Chile is quite stable, even in a context where short-term rates have fluctuated between 8.25% in mid-2008 to 0.5% in mid-2009. This probably reflects that, during this period, markets incorporated in their expectations that the Central Bank had only a limited ability and willingness to deviate persistently from its long-term neutral stance. This may also reflect the fact that, in this period, the economy had not been subjected to large shocks that would have justified a long deviation, as the figures for the United States suggest. Second, it is also clear that fluctuations in the term premium are much more prevalent, and that overall they are closely linked to those in the United States, with the exception of the 2013–14 episode of large volatility in global bond markets.

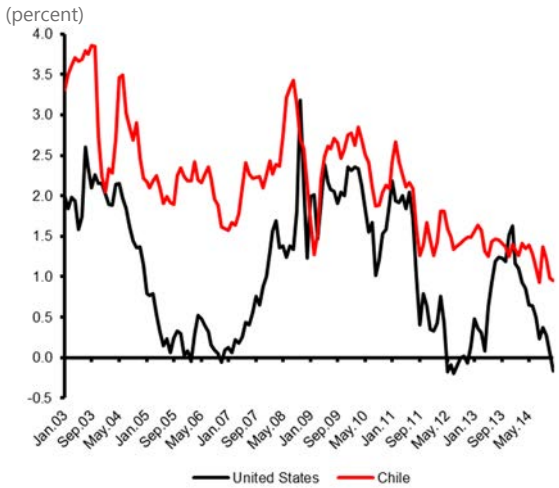
[6] We are grateful to Ceballos et al (2015) for sharing the data set with a decomposition of long-term rates in Chile.

Chilean and US 10-year government bond decomposition Graph 3

Panel A: Expected path of policy rates



Panel B: Term premium



Source: Federal Reserve Bank of New York, based on Adrian et al (2013) and Ceballos et al (2015), for Chile.

A final conclusion, which is implicit in these figures, is that the strong co-movement in long-term rates reflects mainly the high correlation of the term premium, which is statistically and economically significant in the last 10 years. Table 1 reports the simple correlation between long rates for the period January 2003–December 2014 and also the cross-correlation between components. Noticeably, the correlation is low for the neutral rate component, which is consistent with the evidence of monetary independence in Chile in the last 15 years in a context of exchange rate flexibility.[7] In other words, short-term rates could be independent, but the terminal rate may not. Wright (2011) has also documented a high correlation of the term premium across developed economies.

Chile-US 10-year rate correlation, Jan 2003–Dec 2014

(correlation coefficient) Table 1

		10-year US Treasury bond		
		Yield	Term premium	Neutral rate
BCP 10y	Yield	0.623	0.578	0.153
		(0.000)	*(0.000)*	*(0.068)*
	Term premium	0.631	0.629	0.122
		(0.000)	*(0.000)*	*(0.144)*
	Neutral rate	0.262	0.031	0.220
		(0.002)	*(0.712)*	*(0.008)*

Source: Federal Reserve Bank of New York, based on Adrian et al (2013), and Ceballos et al (2015).

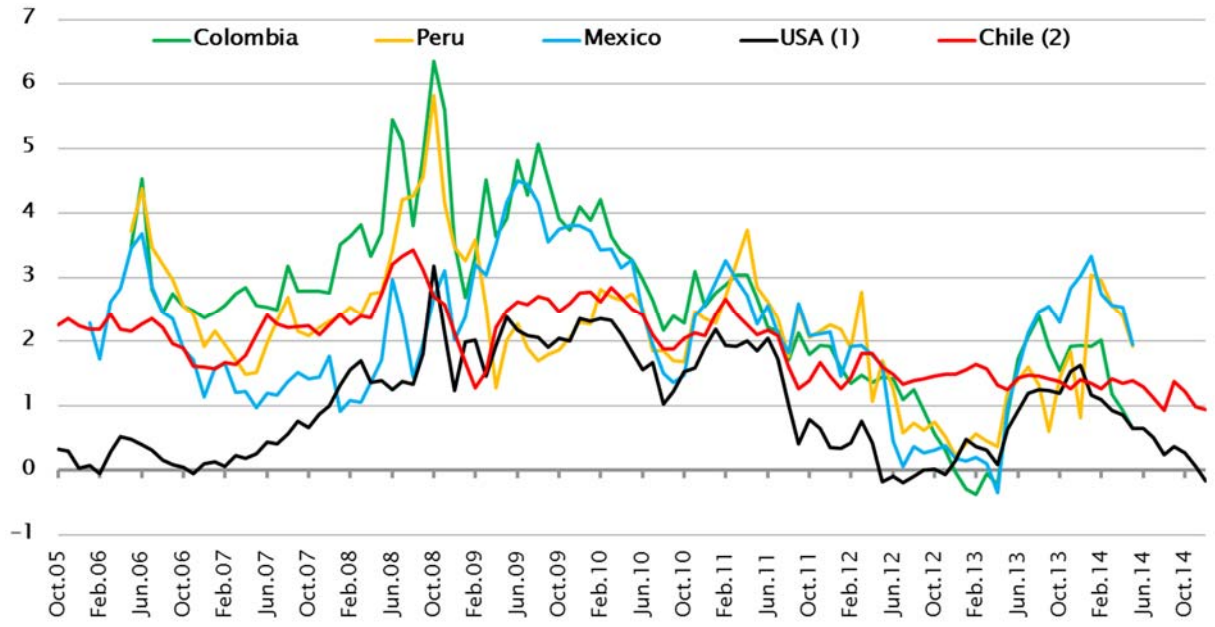
Note: p-values are shown in parenthesis

[7] See Claro and Opazo (2014). See also Claro and Soto (2013) for an account of exchange rate policies in Chile since 2000.

It is important to notice that these correlations vary over time: neither the correlation of long-term rates nor the high co-movement of term premia is stable over time. Two considerations arise. First, the speed and degree to which non-arbitrage considerations generate fluctuations in asset prices across countries depends on market conditions, which vary over time. For example, this might explain why the significant and short-lived jump in the term premium in the United States in mid-2013, associated with the initial tapering discussion, did not have a material impact on Chile's rates. It has been documented that long-term rates in other countries did rise in May 2013 as a result of increases in the term premium.[8] In the case of Chile, both the evolution of short-term rates in a context of domestic deceleration and the lack of response of the term premium contributed to the muted response of long rates. It is possible that the modest presence of non-residents in domestic debt markets delays to some extent or even isolates asset prices from short-lived fluctuations abroad.

Term premium on 10-year rates: United States versus a selection of Latin American countries

(percent) Graph 4



(1) Federal Reserve Bank of New York, based on Adrian et al. (2013); (2) Ceballos et al. (2015).
Source: Blake et al. (2015). Source: Blake et al (2015).

This issue brings us to a second relevant discussion, which is meant to clarify the nature of fluctuations in the term premium, and the role that market participants play in asset price adjustments (IMF (2014)). The sharp response of the term premium in the United States around mid-2013 has raised the question of how volatile asset prices have become, and how sensitive they are to market news in the context of a highly expansionary monetary policy. Some explanations are related to

[8] See "The transmission of unconventional monetary policy to the emerging markets", *BIS Papers*, no 78, 2014.

the changes that market participants have experienced since the financial crisis. According to Turner (2014), when term premia stay continuously low, savers are more willing to invest in short-dated paper, and borrowers are more willing to finance their investments with long-term debt.

One way to approach this discussion proceeds from Graph 4, which plots the term premium of long-term bonds in several Latin American countries since 2006, as computed by Blake et al (2015). Overall, as mentioned above, we observe a high co-movement in the term premium with that of the United States. However, in the 2013–14 period, both Peru and Mexico saw significant fluctuations in the term premium while Chile did not. Because the presence of foreigners in domestic bond markets is significantly higher in Peru and Mexico than in Chile, this might reveal that short-run fluctuations in the domestic term premium might depend on how large the presence of foreigners in domestic bond markets is, as they are the key players that are arbitraging between markets.

When term premia are low, banks are less willing to conduct maturity transformation. So who steps up to the plate? Turner (2014) recognises that it is not fully known who is doing maturity transformation. He explains that there is no simple metric to measure how much a particular bank or insurance company is doing, nor it is not known either how much maturity transformation is done within a country, or how much is done abroad. But anecdotal evidence, surveys and also a combination of debt securities databases, as well as data on primary dealers' stocks, point to an increasing participation by mutual funds and hedge funds. This is the issue we discuss in the next section.

4. The increasing role of international asset managers in debt markets

The 2013–14 episode provides evidence for the role that asset managers are playing in bond markets. Since the 2008–09 financial crisis, non-leveraged institutions have greatly increased their presence in fixed income markets (IMF (2014)). Consistent with this, we can see in Graph 5 the growing role that mutual funds and exchange traded funds (ETFs) have played since 2008 in the US corporate bond market, as brokers and dealers reduce their inventories.[9]

A strong reallocation of portfolios across different groups of asset managers has caused sharp corrections in asset prices, especially in fixed income securities. Although countries with a larger share of non-residents in domestic markets have seen more dramatic changes in financial conditions, there is evidence that throughout the emerging world large fluctuations in the term premium have taken place.

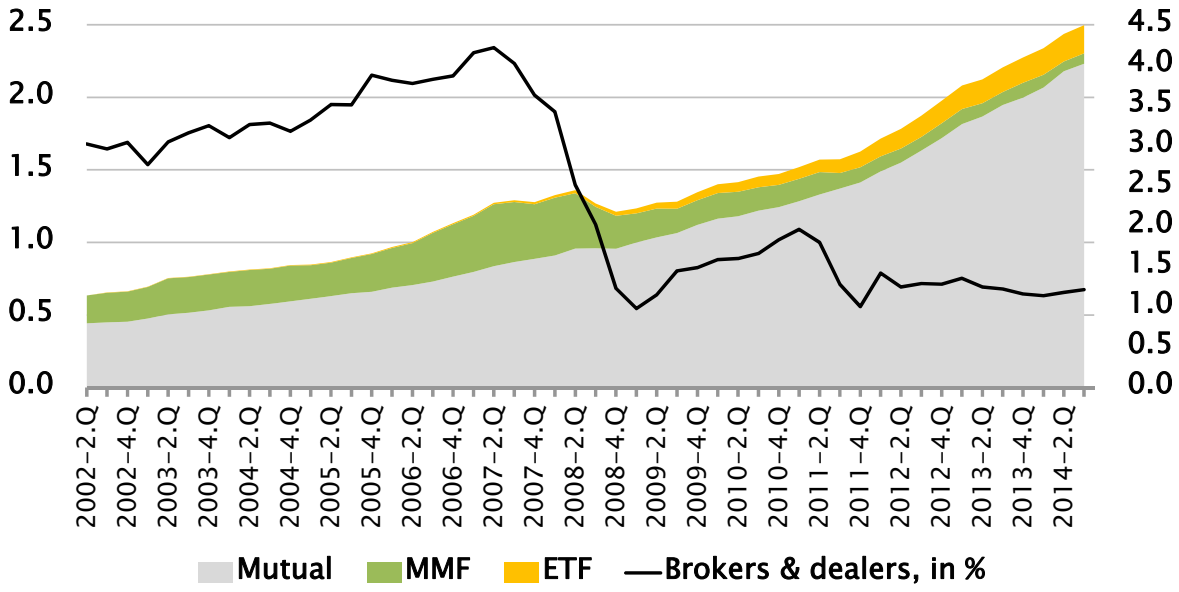
The highly synchronised nature of financial conditions across borders, measured by the high co-movement in risk premia (or alternatively, as many authors have emphasised, by financial flows) is very noticeable. In the pre-crisis period (2003–08), global liquidity was transmitted across leveraged banking

[9] See also Cetorelli (2014).

positions, while after 2010 been bond markets have been the main transmission channel. According to Shin (2013), "The transmission of financial conditions across borders has taken the form of 'reaching for yield', the decline of risk premiums for debt securities and the explosion in issuance of international debt securities that has ensued in order to satisfy the demand." Insurance companies and pension funds have also increased their positions in higher-yielding asset classes, including emerging market debt and equity (BIS (2011)).

ETFs and mutual fund shares in US corporate bond market

(US dollars trillions and percent (right axis)) Graph 5



Source: BIS (2015).

This reallocation of portfolios coincides with a disproportionate growth of fixed income markets since 2008, compared to other asset markets (Feroli et al (2014)). Emerging markets in particular increased the pace and size of their international issuance, while achieving historically low coupon rates, and several countries accessed foreign markets for the first time. "Risk compression" across the yield curve and across high-grade and high-yield bonds was the term most used to refer to this phenomenon.[10]

The increasing participation in securities markets of non-banking institutions might be an undesirable consequence of new regulations. The Volcker rule prohibits banks from engaging in short-term proprietary trading in securities, and commodity futures and options for their own account. It also debars banks from owning, sponsoring or to maintaining certain types of relationship with hedge funds or private equity funds, referred to as "covered funds". One of the unintended

[10] The reduced appetite of US primary dealers for using their own balance sheets for market-making is another possible explanation for the large price swings observed in periods of higher volatility (GFSR (2014)).

consequences of this rule has been a shift in this business to usually less regulated and more opaque financial institutions.

Liquidity in secondary bond markets has declined – another unintended consequence – because primary dealers have cut their inventories and reduced the amount of capital that is allocated to market-making. Portfolio rebalancing will depend on, among other factors, the depth and liquidity of debt markets (Eichengreen and Gupta (2013)). This might be especially relevant in markets for EMEs' debt (Miyajima et al (2012)).

The role of investors, such as mutual funds and ETFs, that are exposed to redemption risk by the ultimate investors could lead asset managers to display a more procyclical behaviour (Shin (2013), IMF (2014)). Also, their behaviour is, in part, motivated by their relative performance ranking (Feroli et al (2014), Raddatz and Schmukler (2012)). Therefore, they seek momentum and investment opportunities so that they can outperform other investors. In fact, they are eager to anticipate the moves of large asset managers so as to act first.[11] They also trade smaller amounts (compared to primary dealers), which does not help market depth and market-making. A direct consequence is that the risk of fire-sales and abrupt changes in asset prices is higher, resulting in increased volatility. Other regulatory changes and accounting conventions could also enhance procyclical behaviour by market participants, contributing to reinforce some shocks and destabilise market prices (BIS (2011), Turner (2011)).

5. The case of Chile

Overall, the patterns of debt issuance in Chile have followed those of other emerging economies. As shown in Graph 6, since 2010 there has been a significant increase in debt issuance by Chilean financial and non-financial firms, in both domestic and foreign markets. The share of foreign issuance has increased significantly, thanks to the improved access for emerging economies in the international debt markets in an environment of low interest rates and the ensuing "search for yield".

Detailed information on the profile of investors holding Chile's foreign bonds is difficult to find. However, we take advantage of a novel Bloomberg database constructed from public information on the investor profile of holders of Chilean fixed income instruments issued in foreign currencies. The sample consists of 102 bonds outstanding as of the third quarter of 2014, with a minimum size of $100 million. Of this total, 60% was issued by the non-financial corporate sector, mostly with a maturity of 10 years or longer.[12] These bonds are roughly representative of the universe of foreign debt issued by Chilean firms and banks, as well as by Chile's government.

Graph 7 shows the composition of the bonds in the sample by year of issuance, type of issuer and credit rating of the issuer. As can be observed, most were issued

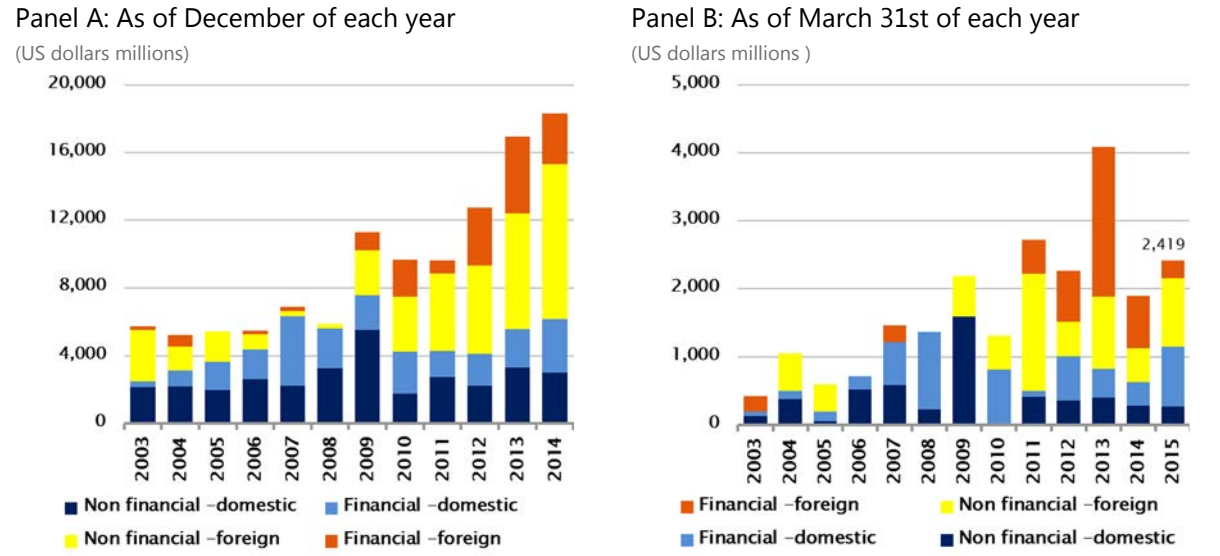
[11] Large asset managers are launching a "dark pool" for equity trading (called Luminex) in an attempt to prevent high-frequency firms from disrupting their trades and raising costs.

[12] Shorter-term bonds are usually issued by the financial sector (banks).

in the last two years, and 28 in 2014 alone. This is not an artefact of the sample – bonds outstanding – as the years 2013 and 2014 were reportedly record years in terms of gross issuance (as seen in Graph 6 and reported in Central Bank of Chile´s Financial Stability Report in 2014). It is worth noting the increased proportion of lower-rated issuers, a trend which is also seen in other markets, as noted above.

Domestic and foreign issuance of Chilean financial and non-financial firms since 2003

Graph 6



Source: Santiago Stock Exchange and Bloomberg

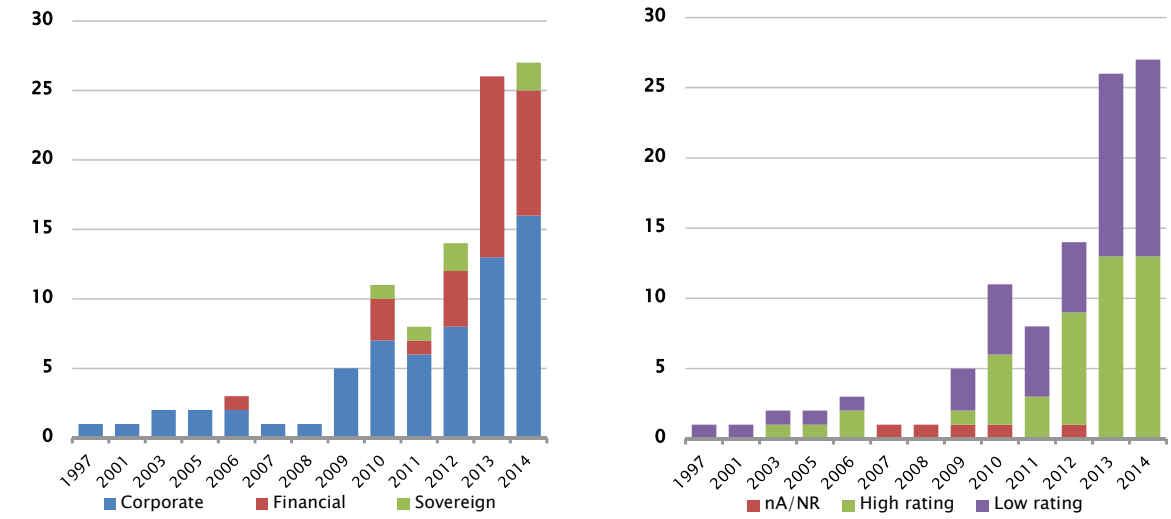
The identity of the holders of these bonds is known for all institutional investors that have filing obligations with the US Securities and Exchange Commission (SEC), and therefore have to regularly disclose their portfolios. This means that the holder's identity is verifiable for only a portion of the total issuance, representing about 30% for corporate and financial bonds and 16% for sovereign bonds. The remaining portions are either in the hands of sovereign funds, whose investment strategy is more linked to the sponsoring country's fiscal policy, or in the hands of more opaque investors such as hedge or investment funds that do not have the obligation to disclose their portfolios.[13] The majority of Chilean bonds are registered with the SEC so that they can be sold to qualified investors. Of these, insurance companies and financial advisors hold the largest share of the issuance.[14] A portion equivalent to about 5% of Chilean bonds issued abroad is held by Chilean residents.

[13] In terms of the characteristics of the investment decisions of the different types of funds, see IMF (2014), Chapter 2.

[14] On a related work, Ulloa et al (2015) analyse the investor base of the variable income portion of portfolio inflows using a proprietary database of the Central Bank of Chile. Mutual funds, indexed funds and sovereign funds have gained share. Interestingly, indexed funds' flows are significantly determined by long-term rate differentials, while mutual funds are not.

Outstanding number of bonds, by year of issuance, type of issuer and credit rating*

(number) Graph 7



* Includes 102 outstanding bond issues as of Q3 2014, issued since 1997 in amounts of $100 million or more.

Source: Bloomberg.

With this information we are able to draw some preliminary conclusions regarding the composition of US holders of currently outstanding Chilean bonds. We are also able to analyse the change in the composition of holders since the bonds were issued. The first interesting feature that stands out is that a greater proportion of holders can be identified for bonds issued in the early and mid-2000s (holders for approximately 40% of the amount issued can be identified), whereas post-crisis that proportion falls to just under 30% for the 2011–12 cohort, and 20% for bonds issued in 2014 (Graph 8, panels A and B). We argue that this could be preliminary evidence for a shrinkage in demand on the part of regulated investors in the last few years, while the participation of hedge funds (with no obligation to disclose their portfolios) may have increased in secondary markets.

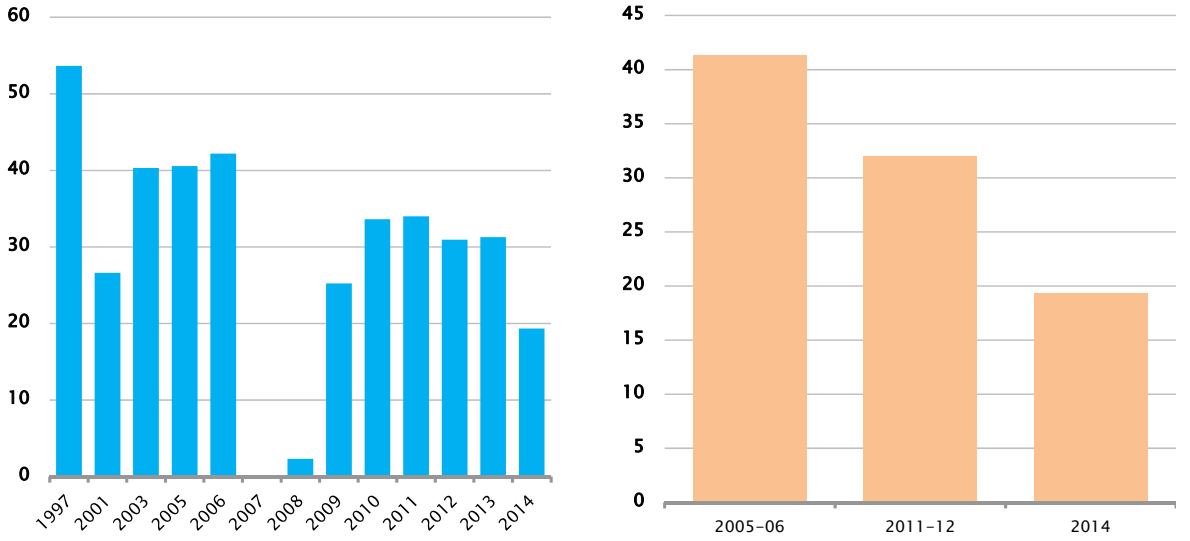
A second observation follows from analysing the time pattern of holdings since the outstanding bonds were issued. There is a clear and significant fall in the share of bonds held by regulated investors – from almost 45% in mid-2008 to about 35% thereafter. The yellow line in Graph 9 shows the share of bonds held by this type of investor at each point in time, while the other lines show the same path for bonds issued at different dates. As noted above, on average, the proportion of bonds held by identifiable investors has tended to fall. At the same time, bonds issued in the last few years have a much lower proportion of identifiable holders. The share represented by bonds issued in 2014, which accounts for 26% of the outstanding stock, makes it clear that the last issues have been acquired mainly by investors outside the purview of the SEC.

Finally, there is an important difference in the historical pattern once we divide the sample into high credit quality and low credit quality issuers, according to the Standard and Poor's credit rating scale. Bonds issued by BBB+ or higher-rated firms have experienced a much sharper and more uniform decrease in holdings by identifiable investors, while a flat pattern is observed for high yielders. In fact, as of the third quarter of 2014, both types of security (high- and low-rated) have an

observed proportion of identifiable investors of almost 35%, which is the same as for low-rated issuers before the crisis, as opposed to almost 50% in the case of highly rated issuers. This might reflect a stronger demand for high credit quality bonds by unregulated investors (Graph 10).

Share of outstanding debt (Q3 2014) held by SEC reporters, by date of issuance*

(Percentage) Graph 8

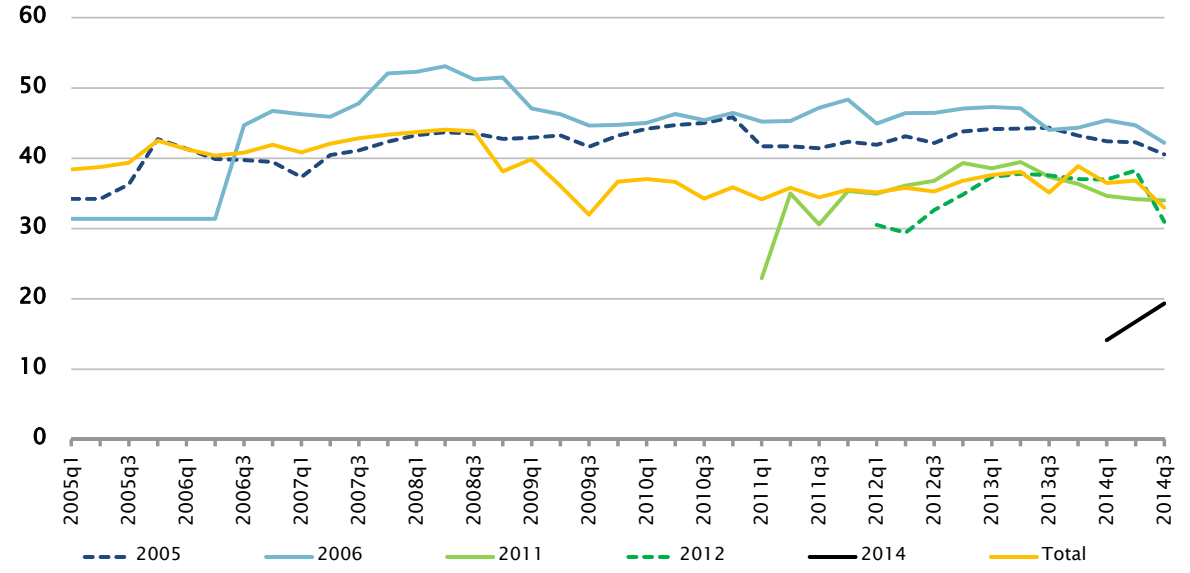


* Includes 102 outstanding bonds as of Q3 2014, issued since 1997 in the amount of $100 million or more.

Source: Bloomberg.

Share of outstanding bonds held by SEC reporters, by cohort*

(percent) Graph 9



* Historic share of issuance held by identifiable investors for a subsample of 55 bonds, with terms of 10 years or longer.

Source: Bloomberg.

Share of outstanding bonds held by SEC reporters, by S&P rating*

(percent) Graph 10

* Historic share of issuance held by identifiable investors for a subsample of 55 bonds, with terms of 10 years or longer.

Source: Bloomberg.

6. Final remarks and policy implications

The term premium component of long-term rates plays an important role in explaining the high co-movement of yields across countries and also the high volatility in yields. The question of what determines the high (and increasing) volatility in term premia is critical to understanding how financial markets work, the power of monetary policy, and its links to financial stability. In this paper, we show some evidence for Chile and other Latin American countries that, first, the high co-movement in longer-term rates arises mainly from the high correlation of term premia. Although this correlation is high over the long term, it varies significantly over time. Part of this fluctuation might be related to the part that foreign investors play in domestic bond markets. Some evidence suggests that a very high presence of foreigners might generate a much stronger linkage in term premia over short periods.

A second conclusion is that a shift seems to have taken place in the profile of holders of bonds issued abroad by Chilean financial and non-financial firms. In particular, we observe that hedge funds and more opaque investment funds have increased their presence in these markets, relative to SEC-reporting investment funds and banks. This phenomenon has been documented as a general trend in the last few years, and has arguably affected the volatility of term premia. The investment strategies of these more lightly regulated players might translate into a much higher co-movement in flows into and out of bond markets, and hence a more volatile term premium. The evidence suggests that Chile is no exception to

this tendency, as we observe a similar shift in the profile of bond holders in foreign markets, although there is still a large share in the hands of insurance companies, which are usually buy-and-hold investors. A potential challenge might arise from the impact on longer-term rates US monetary policy normalisation, and in the medium run regarding the volatility of the yield curve.

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Changes in Colombian financial markets over the past decade

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Abstract

This note describes some of the most important changes that have occurred in the Colombian financial system over the past decade. It begins with an assessment of the growth of shadow banking, together with an analysis of the main risks that have emerged in the shadow banking sector and a description of recent regulation aimed at addressing those risks. Following that, salient changes in the balance sheet structure of the traditional banking system are described, together with the risk implications for banks. Then, the paper analyses the issuance of domestic and foreign bonds by Colombian corporations. Finally, the paper examines the way foreign capital inflows feed into local bank deposits in order to assess the relevance for Colombia of the risks highlighted by Powell (2014).

Keywords: financial system, shadow banking, bonds issuance, corporate debt

JEL classification: G20, G21, G28, G30

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Introduction

This note describes some of the most important changes in the Colombian financial system over the last decade. It begins with an assessment of the growth of shadow banking, together with an analysis of the main risks that have emerged in the shadow banking sector and a description of recent regulation aimed at addressing those risks. Following that, salient changes in the balance sheet structure of the traditional banking system are described, together with the risk implications for banks. Then, the paper analyses the issuance of domestic and foreign bonds by Colombian corporations. Finally, the paper examines the way foreign capital inflows feed into local bank deposits in order to assess the relevance for Colombia of the risks highlighted by Powell (2014).

Shadow banking in Colombia

In contrast to what has happened in some other emerging market economies (EMEs), shadow banking (SB) in Colombia has not grown faster than the traditional financial sector. However, it plays an important role with regard to bank funding. The most relevant systemic risks stemming from SB thus relate to maturity transformation and liquidity. Recent regulation has partially addressed those risks.

Structure and growth of SB

By the end of 2013, assets in the SB sector amounted to USD 31 billion, equivalent to 14% of traditional financial sector assets[2] and 8.5% of GDP.[3] Since 2001, the growth in SB assets has been lower than that of the traditional financial system (Table 1). Money market funds (MMFs) represent most of the activities conducted by SB entities in Colombia (65% of total assets). MMF holdings grew by 50% between 2010 and 2013 (Graphs 1 and 2).

The activities of non-financial cooperatives have also grown fast. Such intermediaries borrow from and lend exclusively to their stakeholders. The supervision (and part of the regulation) of those entities is separate from that of traditional financial intermediaries. They are not supervised by the Financial Superintendence but rather by the Economic Solidarity Superintendence.

[2] The traditional financial system comprises credit institutions (commercial banks, financial corporations, finance companies and financial cooperatives).

[3] These values use the definition of SB by activity. The figures resulting from a definition by entities (FSB broad measure) are slightly higher. See Financial Stability Board, *Report on Shadow Banking in the Americas,* Regional Consultative Group for the Americas, August 2014.

Table 1

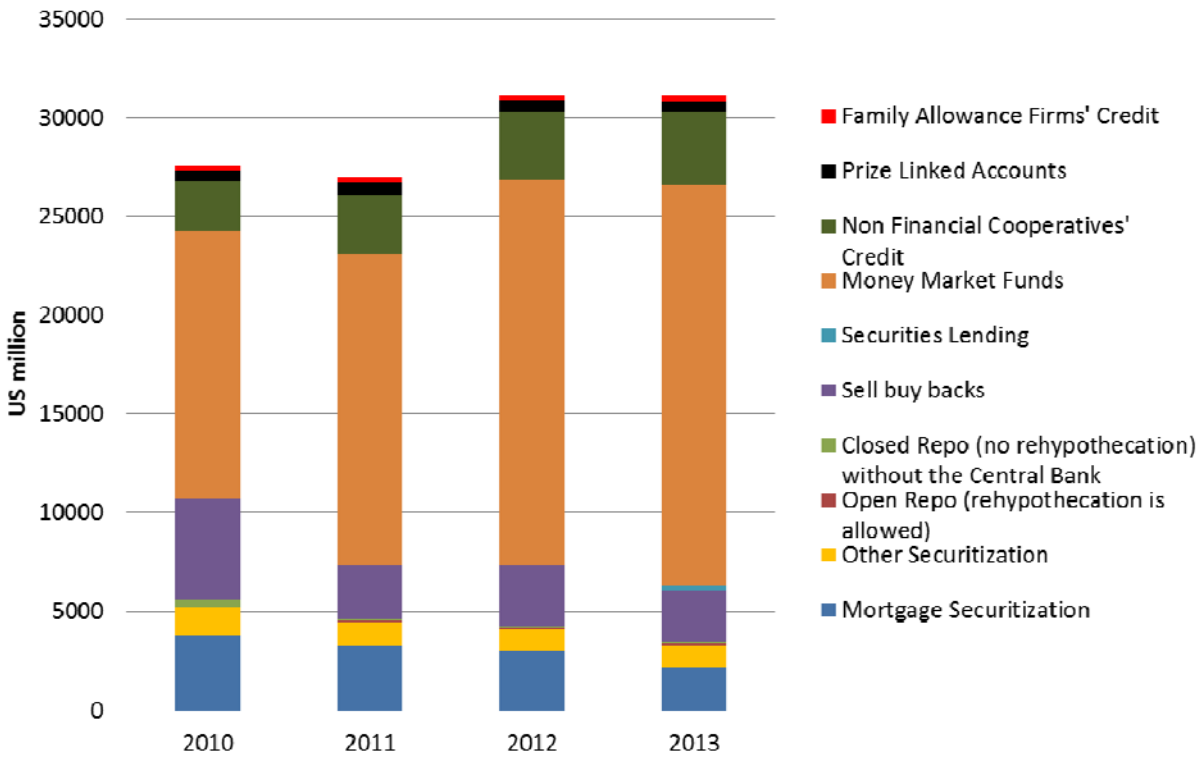
Year	SB assets (by activity) / CE assets	SB assets (by entity*) / CE assets	CE Growth	SB (by activity) Growth	SB (by entity) Growth
2010	20%	19%	16%		
2011	16%	19%	20%	–2%	21%
2012	16%	19%	14%	15%	12%
2013	14%	17%	14%	0%	5%

Note: CE- Credit Establishments

*Follows Financial Stability broad measurement

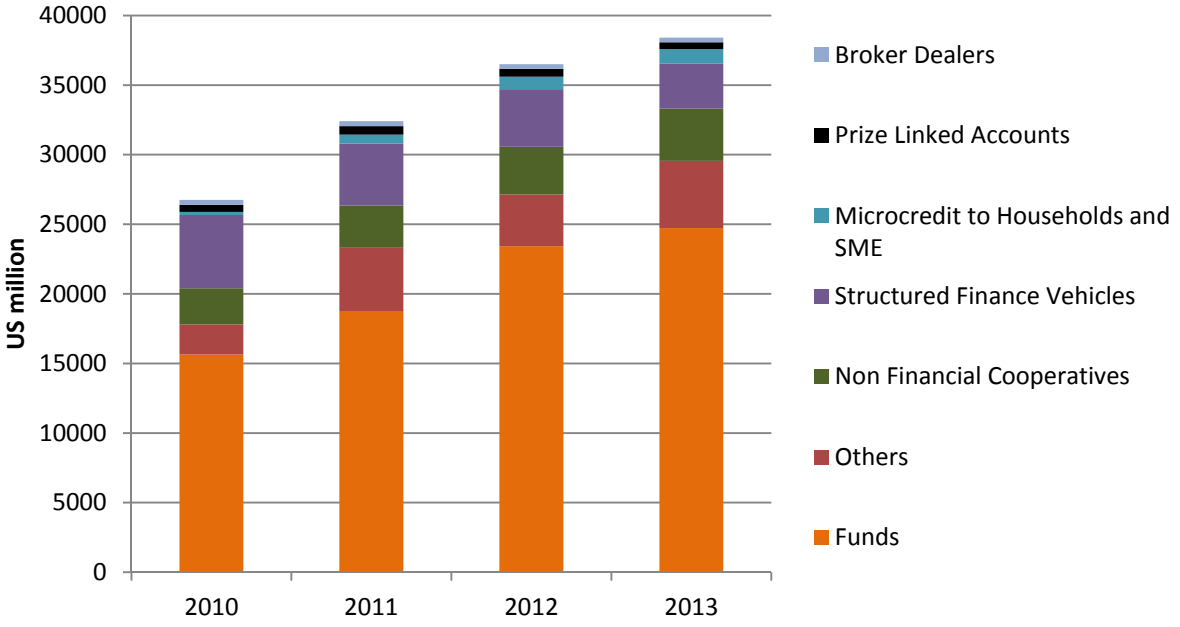
Source: Financial Superintendence, Titularizadora Colombiana, Confecoop. Authors' calculations.

Shadow Banking in Colombia (by activity) Graph 1



Source: Financial Superintendence, Titularizadora Colombiana, Confecoop. Authors' calculations.

Shadow Banking in Colombia (FSB broad measurement) Graph 2



Source: Financial Superintendence, Titularizadora Colombiana, Confecoop. Authors' calculations.

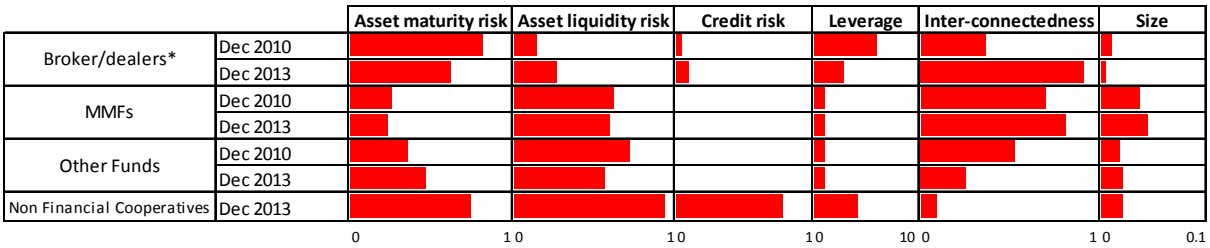
Main risks incurred by SB in Colombia

Following the risk categories proposed by the International Monetary Fund (IMF)´s Global Financial Stability Report of October 2014, it may be concluded that MMFs concentrate the most important systemic risks, given their size and connection to the traditional financial system (Graph 3). In 2013, their total assets were equivalent to 4.6% of GDP, while their assets and liabilities with credit institutions accounted for 80% of their total assets. Their holdings of bank liabilities amounted to 8% of bank deposits in the same year (Graph 4). Given the nature of MMFs, their main risks relate to maturity transformation and liquidity. The share of illiquid assets in the total assets of MMFs is close to 60%, far higher than the same figure for US MMFs (40%).

Non-financial cooperatives also involve risks that are non-negligible. The assets of such entities, which comprise mostly loans, represented 2.1% of GDP in 2013. Hence, non-liquid assets and assets with maturities longer than one year amounted to 95% and 75%, respectively, of their total assets. Non-financial cooperatives do not have access to central bank open market operations or lender of last resort (LOLR) facilities, although their liabilities are partially guaranteed by a special deposit insurance fund.[4]

[4] The coverage of this special deposit insurance fund is lower than that of credit institutions. The special deposit insurance fund is also distinct from the agency in charge of deposit insurance for most other credit institutions.

Graph 3

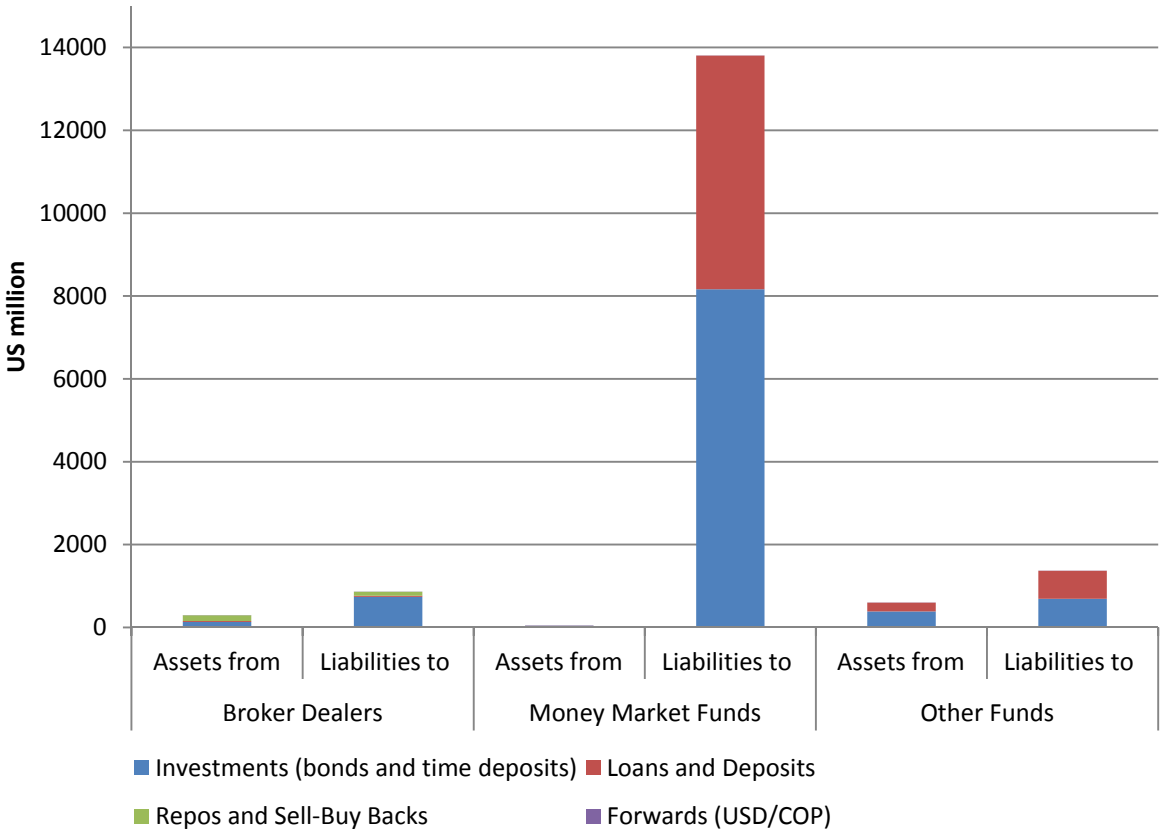


Note: calculations for securitization are not available for Titularizadora Colombiana. This entity specializes in securitizing mortgage loans in Colombia, and accounted for 62% of securitization in the country in 2013. * En las mediciones del SB por entidad generalmente se incluyen a las sociedades comisionistas de bolsa.
Asset maturity risk = (activos a largo plazo / activo total); largo plazo = vencimiento mayor a 1 año; Asset liquidity risk = 1- (activos liquidos / activos totales); arctivos liquidos = disponible + inversiones en TES + inversiones en acciones; Credit risk = (cartera / activos); Leverage = (activo/patrimonio); Inter-connectedness = (Activos + pasivos en EC)/Activo Total; Size = (activos del sector / PIB);
MMFs : FIC abiertas con concetración menor al 10 % en acciones
Other Funds : Fic cerradas, escalonadas y abiertas con concetración en acciones mayor al 10%

Source: Financial Superintendence, entities' balance sheets, Superintendence of Economic Solidarity. Authors' calculations.
Maturity risk=long-term assets to total assets; Liquidity risk=1 minus liquid assets (cash, public bonds, equities) to total assets; Credit risk=loans to assets; Leverage: assets to equity; Interconnectedness= assets from credit establishments (CE) plus liabilities to CE to total assets; Size=assets to GDP

Credit establishments' assets and liabilities with selected SB sub-groups

Graph 4

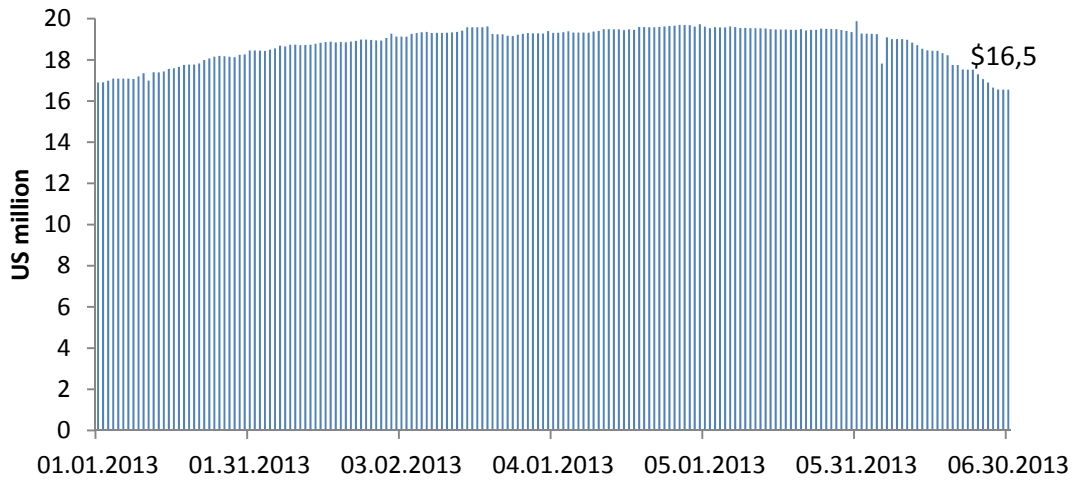


Source: Financial Superintendence, Banco de la República. Authors' calculations.

Recent regulation of shadow banking

Recent regulation of some SB activities and entities has been developed in the aftermath of two shocks that revealed fragilities in the sector. The first shock was the bankruptcy of the largest broker-dealer in Colombia, Interbolsa, in November 2012. Under the brokerage contract, this entity funded the purchase of a large number of shares in a non-financial corporation through repos. When the shares became overvalued, the operation became excessively risky, as the broker-dealer had to meet its clients' liabilities. Consequently, banks cut their funding to Interbolsa and the latter could no longer meet its obligations. The second shock occurred at the time of the "taper tantrum" and involved MMFs. The fall in local bond prices unleashed a sell-off that drastically reduced the valuation of the funds. As a result, there were large withdrawals that risked turning into fire-sales and a run on MMFs (Graphs 5 and 6).

Daily Evolution of Collective Investment Funds Portfolio* Graph 5



Note:* Daily average exchange rate for 2013 applied: $ 1869 COP/USD

Source: Financial Superintendence

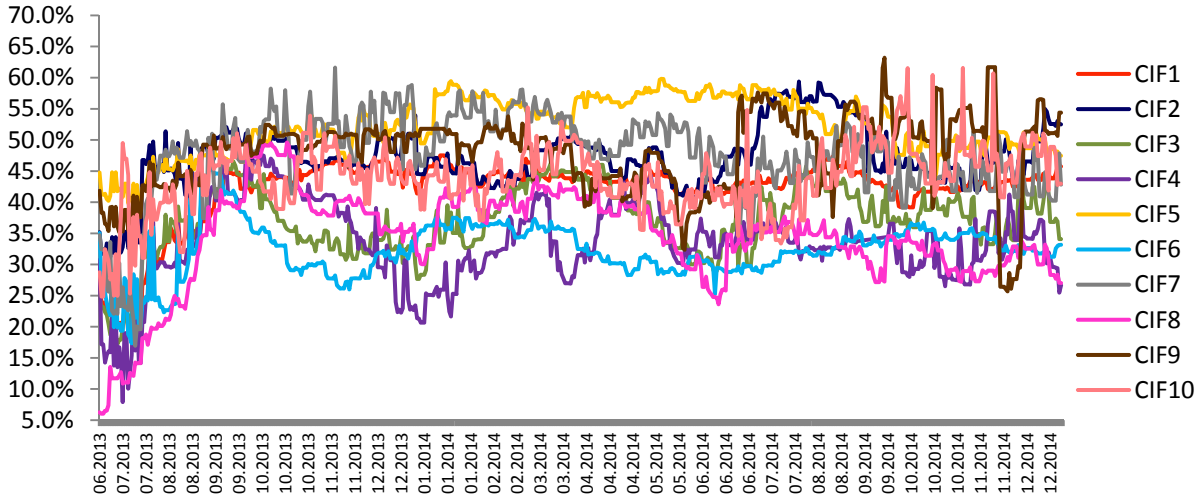
Following those stress episodes, new regulation was enacted to deal with vulnerabilities in the repo market and with the liquidity risk of broker-dealers and money market funds. Regarding REPO markets, first, the set of assets allowed as collateral was (more?) restrictively defined.[5] Second, rules that had been issued previously by the Colombian Stock Exchange (BVC) were included in a government decree, as a public regulation. Those rules set limits on transactions conducted on behalf of clients.[6] In addition, exposures to transactions by an individual and to a single asset were restricted to 30% and 100% of the broker-dealer´s equity,

[5] This set includes cash, public bonds and liquid stocks (as defined by the Colombian Stock Exchange (BVC)).

[6] Such transactions cannot be higher than 14 times the broker-dealer´s equity, or seven times its equity if they involve stocks.

respectively. Furthermore, an aggregate limit on the level of outstanding repos on a particular stock was established at 25% of the floating value of the stock. In a related area, haircuts were established as mandatory for sell/buy-backs to cover the market risk of the underlying asset.

(Cash + Colombian Government Bonds*) / Assets 10 Largest Open-ended Collective Investment Funds (CIF) Graph 6



Note: * Applying the Central Bank haircut; ** On 25 december 2014, the share of the 10 largest open-ended CIF in the total portfolio of open-ended CIF amounted to 48,9%; *** It does not include ETF, in particular the Ishares COLCAP (third largest CIF by assets)

Source: Financial Superintendence

New regulation was also enacted to deal with the liquidity risk of broker-dealers and MMFs. With respect to the liquidity risk of broker-dealers, since September 2014 these intermediaries must comply with a liquidity indicator that is similar to the Basel III liquidity coverage ratio (LCR). The indicator takes into account the risk that broker-dealers assume under their brokerage contracts by including 5% of their clients' gross positions in the LCR. Broker-dealers have to comply with a liquidity indicator for one and seven day periods. With respect to MMFs, new regulation that follows measures suggested by the International Organization of Securities Commissions (IOSCO) has been submitted for comments by the industry. First, all collective investment schemes that present the characteristics of a MMF or that are marketed to investors as having similar investment objectives would have to comply with equivalent requirements. Second, MMFs would be required to have a minimum of 5% of the market value of the fund in cash and 25% in liquid assets.[7] In addition, all open-ended funds without fixed redemption periods (including MMFs) would have to hold a minimum amount of liquid assets sufficient to cover the highest one-day redemptions experienced historically (and could not be lower than 10% of the value of the fund).

The ex ante liquidity regulation of the aforementioned SB entities completes the scheme to deal with systemic liquidity issues. Such entities have had access to quasi-

[7] These include cash, public sector bonds, equities eligible as warranty in repo operations and foreign government bonds with an investment grade.

LOLR facilities at the central bank in the form of intra-day repos that may be converted into overnight funding. Even though such funding carries penalty rates, moral hazard problems remain and are dealt with through ex ante regulation.

Moreover, the measures described above are in accordance with the recommendation of the IMF in its Global Financial Stability Report of October 2014 regarding the convenience of "integrating the entity and activity dimensions of shadow banking regulation".[8]

Changes in the structure of the banking system between 2005 and 2014

The changes that have occurred in the structure of assets and liabilities of the Colombian banking system may have affected the magnitude of the risks it confronts. Since 2005, there has been a shift in the composition of assets away from securities (mostly government bonds) and into loans (especially consumer and commercial credit, Graphs 7 and 8). Household bank indebtedness has evolved from mainly mortgages at the beginning of the current century to predominantly consumer loans today. This represents in part a fallout from the financial crisis that occurred at the end of the 1990s, which involved the bursting of a real estate bubble and a collapse in mortgage credit. As a result of that crisis, banks invested heavily in local government bonds at the beginning of the 2000s. However, after 2005 banks shifted the composition of their portfolios, trading market risk for credit risk.

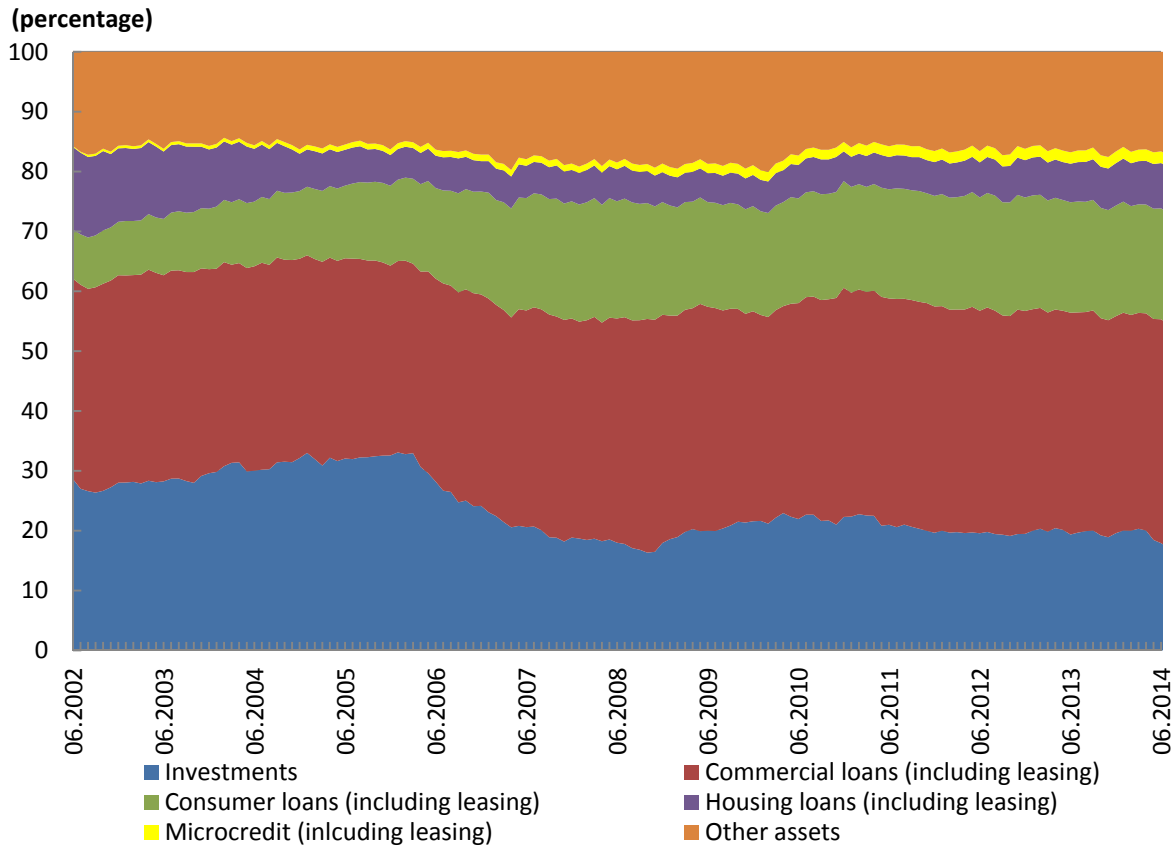
On the liability side, there has been an increase in the share of deposits in the hands of non-financial corporations (NFCs), at the expense of deposits held by households (Graph 9). The increase in the share of corporate deposits has been particularly pronounced for term deposits (CDs, Graph 10). This may have increased the concentration of deposits and, thereby, may have had consequences for the liquidity risks faced by banks. By the same token, it may have enhanced the discipline exerted by corporate depositors on banks given that non-financial firms are better informed and qualify for proportionally less deposit insurance.[9]

The breakdown of bank loans by interest rate type (fixed versus variable) shows a stable pattern since 2005, with the exception of mortgage credit. Unlike consumer loans and micro-loans, commercial loans are mostly variable rate (Table 2). Mortgage loans were almost entirely inflation-linked in 2005. Currently, however, 2/3 of these loans are fixed rate. This reflects the achievement of a low and stable rate of inflation in Colombia. It is hard to ascertain how interest rate risk has changed in the domestic banking system since 2005. While liabilities have remained concentrated in sight and short-term deposits, the share of fixed rate assets, including large medium-term government bond holdings, has been reduced in favour of variable rate commercial loans and fixed rate consumer loans. That said, the direction of the change in the duration of assets is uncertain, owing to insufficient data.

[8] IMF, "Shadow banking around the globe: how large, and how risky?", Global Financial Stability Report, October 2014, Chapter 2.

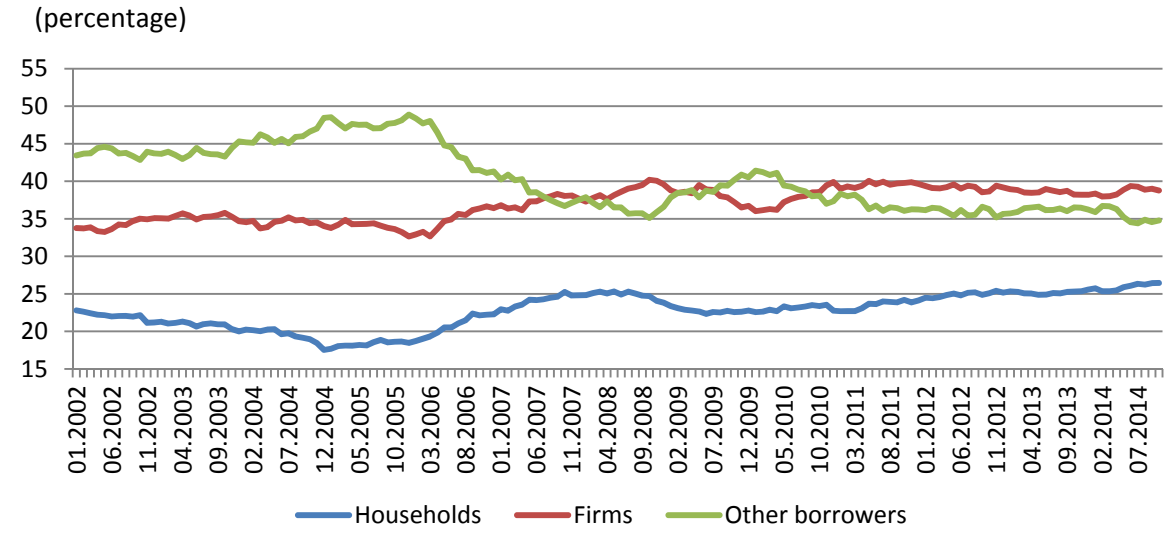
[9] Bank deposits include MMFs holdings of bank liabilities. If so, the figures reported in this note overestimate the exposure of banks to corporate deposits. However, the outcome of our analysis concerning results on deposit concentration and liquidity risk continue to hold.

Credit establishments' assets Graph 7



Source: Financial Superintendence

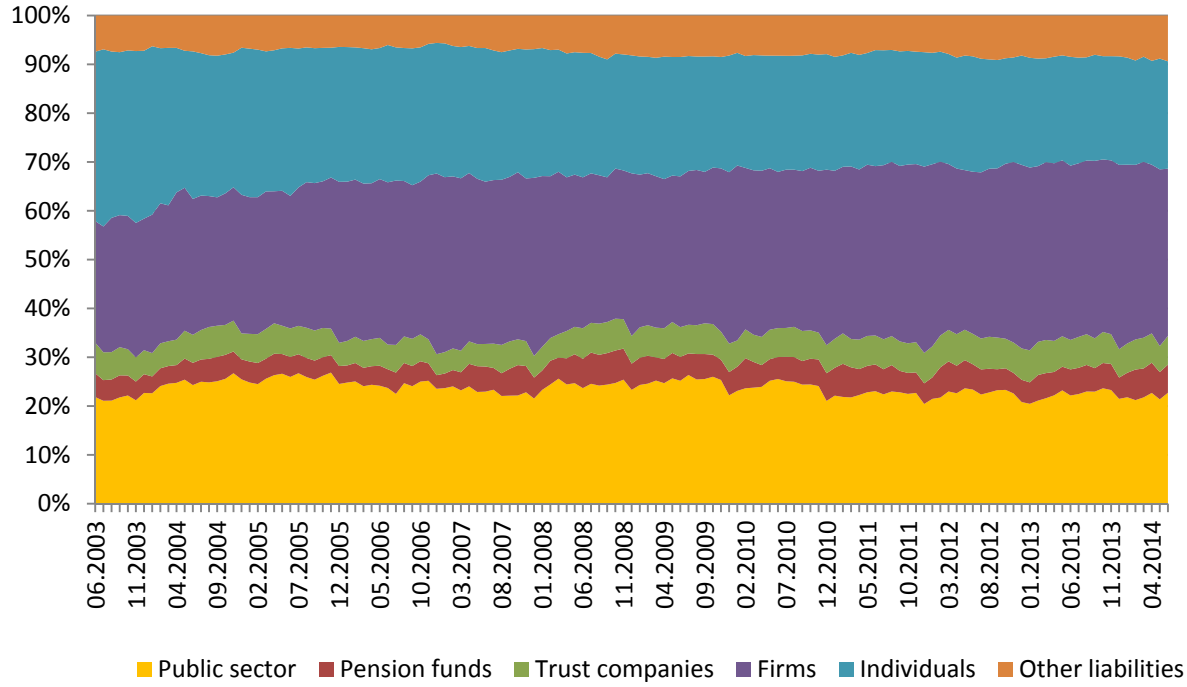
Exposure of credit establishments to Graph 8



Source: Financial Superintendence

Credit establishments' liabilities

Graph 9

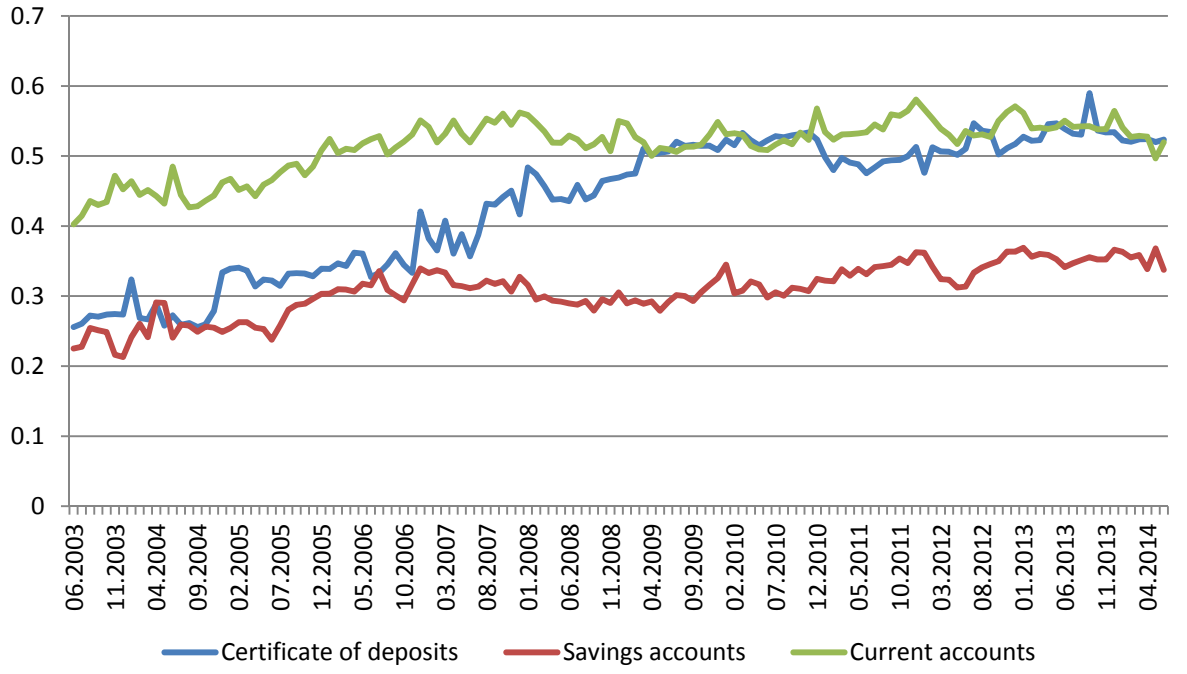


Note: The share of trust companies might be underestimated because mutual funds may be included in the firms' share and not in trust companies. As of December 2013, the share of mutual funds in the liabilities of credit establishments was 14.3%.

Source: Financial Superintendence

Firms' share in total deposits (by type)

Graph 10



Source: Financial Superintendence

Credit Establishments (%)

Table 2

	Commercial		Consumer		Microcredit		Housing	
	Fixed Rate	Variable Rate	Fixed Rate	Variable Rate	Fixed Rate	Variable Rate	Fixed Rate	Inflation Linked
Dec-05	42.45	57.55	81.44	18.56	77.46	22.54	6.99	93.01
Jun-09	57.37	42.63	85.48	14.52	85.56	14.44	49.06	50.94
Jun-11	16.03	83.97	86.37	13.63	84.42	15.58	63.06	36.94
Dec-11	18.05	81.95	85.78	14.22	86.22	13.78	66.36	33.64

Source: Financial Superintendence

The currency composition of assets and liabilities of Colombian bank has remained practically unchanged since 2005 (Table 3), with the vast majority of assets and liabilities denominated in local currency. Currency mismatches are very small or non-existent due partly to regulations imposed by the central bank. In particular, banks must match foreign currency funding with foreign-denominated loans or derivatives contracts. Mismatches may also have been contained by an awareness on the part of economic agents of the volatility implicit in the flexible exchange regime.

Table 3

Date	Local currency assets	Foreign currency assets	Local currency liabilities	Foreign currency liabilities
Jun-05	96.2%	3.8%	96.4%	3.6%
Dec-05	97.3%	2.7%	96.9%	3.1%
Jun-06	98.3%	1.7%	98.1%	1.9%
Dec-06	98.3%	1.7%	99.1%	0.9%
Jun-07	98.2%	1.8%	98.2%	1.8%
Dec-07	97.9%	2.1%	98.7%	1.3%
Jun-08	97.7%	2.3%	98.8%	1.2%
Dec-08	97.1%	2.9%	98.6%	1.4%
Jun-09	97.3%	2.7%	99.2%	0.8%
Dec-09	98.0%	2.0%	99.2%	0.8%
Jun-10	98.5%	1.5%	99.2%	0.8%
Dec-10	97.7%	2.3%	97.6%	2.4%
Jun-11	96.9%	3.1%	97.9%	2.1%
Dec-11	96.5%	3.5%	97.2%	2.8%
Jun-12	96.9%	3.1%	98.6%	1.4%
Dec-12	97.4%	2.6%	98.4%	1.6%
Jun-13	97.4%	2.6%	97.6%	2.4%
Dec-13	97.8%	2.2%	98.0%	2.0%
Jun-14	97.9%	2.1%	98.3%	1.7%

Note: Calculations do not include other assets.
Source: Financial Superintendence. Banco República's calculations.

Commercial foreign loans have represented between 66% and 90% of foreign currency assets of Colombian banks since 2005 (Table 4). This reflects the fact that most of the foreign currency activity conducted by Colombian financial institutions consists of traditional loan intermediation. Foreign currency loans fell in 2009 (Graph 11), when international trade financing shrank in the midst of the global financial crisis. Such loans recovered rapidly afterwards, along with total bank credit in Colombia. Holdings of foreign investments jumped between 2010 and 2013, following the acquisition by Colombian financial institutions of foreign banks, mainly in Central America. Regarding the composition of foreign currency liabilities, bond financing increased markedly after 2008, mostly related to the funding of the aforementioned acquisitions.

The evolution of foreign assets and liabilities of Colombian banks confront regulators and supervisors with new challenges. To begin with, the currency regulation established by the central bank might need to be reviewed in the light of the increased exposure of Colombian intermediaries abroad. More specifically, the equity participation of Colombian banks in foreign banks may be denominated in a currency that is different from the currency of funding used to acquire the shares.

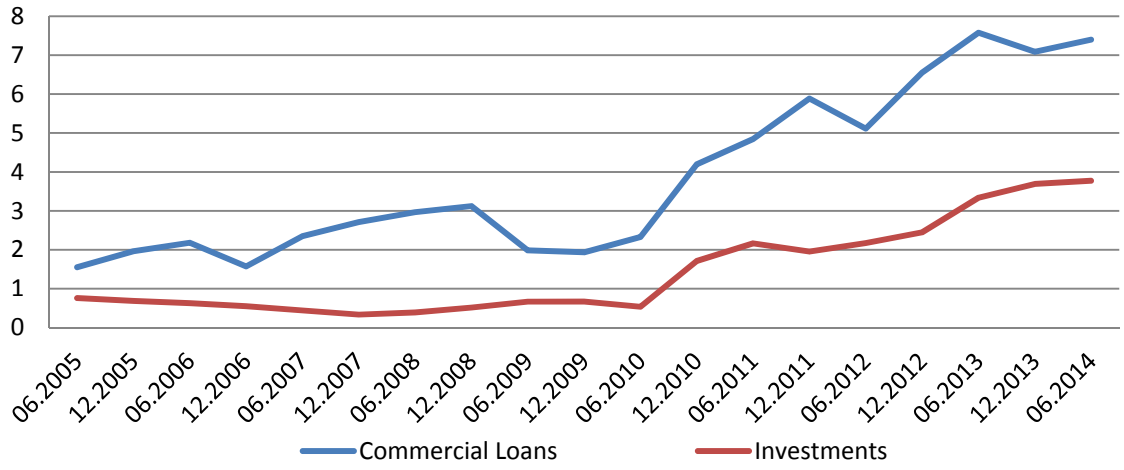
Table 4

Date	Share of foreign currency commercial loans in total foreign currency assets	Share of foreign currency investments in total foreign currency assets	Share of foreign currency bank loans in total foreign currency liabilities	Share of foreign currency bonds in total foreign currency liabilities
Jun-05	67.8%	31.9%	99.7%	0.0%
Dec-05	74.5%	25.1%	99.4%	0.0%
Jun-06	67.4%	31.7%	99.0%	0.0%
Dec-06	43.6%	55.6%	97.6%	0.0%
Jun-07	54.8%	44.5%	86.9%	12.1%
Dec-07	51.3%	48.0%	83.3%	15.3%
Jun-08	47.3%	52.1%	83.8%	14.9%
Dec-08	37.2%	62.2%	84.8%	14.4%
Jun-09	25.0%	74.5%	75.2%	23.3%
Dec-09	30.6%	68.7%	76.4%	20.3%
Jun-10	43.7%	55.4%	78.9%	18.0%
Dec-10	48.6%	50.7%	86.7%	12.7%
Jun-11	34.9%	64.6%	77.4%	22.1%
Dec-11	37.0%	62.5%	74.6%	25.0%
Jun-12	32.2%	67.3%	60.0%	39.5%
Dec-12	43.3%	56.1%	49.5%	50.1%
Jun-13	53.6%	45.6%	51.1%	48.5%
Dec-13	50.6%	48.5%	53.4%	46.2%
Jun-14	52.2%	46.9%	52.2%	47.5%

Source: Financial Superintendence. Banco República's calculations.

Foreign currency commercial loans and investments of credit establishments

(billions of dollars) Graph 11



Source: Financial Superintendence

So far, the central bank has requested information on the currency denomination of all assets and liabilities of banks in Colombia and overseas. This information is currently being refined and interpreted. No new regulation has been imposed yet. Similar concerns have arisen regarding the foreign exchange (FX) liquidity risk of financial conglomerates, leading to a request for detailed information in this respect.[10] More generally, the expansion of Colombian banks abroad requires a careful examination of the differences in financial regulation and safety nets across host countries.

With respect to collateral management, an important regulatory change was introduced in 2013 when the Colombian congress passed Law 1676, which introduced the concept of "mobiliary guarantees" (ie transactions under which an obligation is collateralised with the movable property of the guarantor) with the aim of promoting access to credit to small and medium-sized enterprises.[11] The law mandates the registration of guarantees in a central system privately run by Colombia's Chamber of Commerce and accessible through the internet. In addition, the procedure for the execution of guarantees was simplified with the purpose of reducing costs and processing time. There are signs that this reform is yielding positive results. After the introduction of the new legislation, the value of loans so covered has increased markedly (Table 5).

Finally, the Colombian banking system remains predominantly procyclical. A study by Hamann et al. (2013) found evidence in this regard. They also found heterogeneity in the way banks manage their balance sheet. Moreover, foreign banks exhibit higher leverage and higher non-core-to-core liability ratios than local banks. Foreign banks also display a greater degree of procyclicality.

[10] An LCR has been calculated by currency for financial conglomerates since March 2014.

[11] The assets subject to mobiliary guarantee agreements include tangible and intangible assets, derivatives assets, current assets and future property on which the guarantor obtains rights after an acquisition.

Table 5

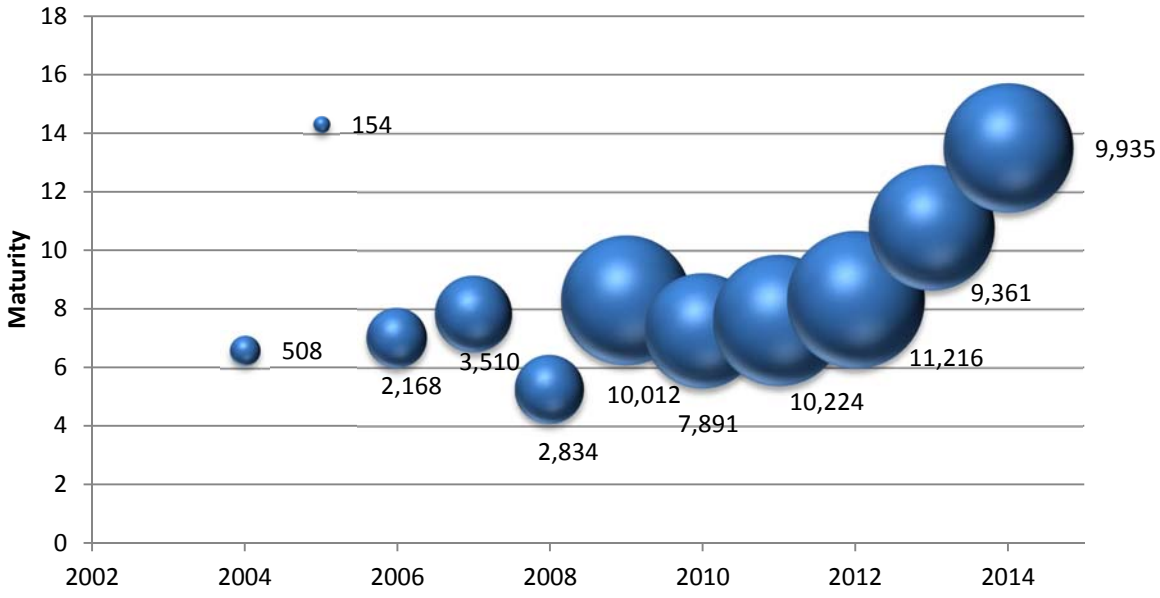
	Before Law 1676 of 2013	After the implementation of Law 1676 of 2013 (February 20th of 2014)	Total
Number of registered credit operations	812622	137357	949979
Amount (billions of dollars)	43.3	23.7	66.9
Average amount (thousands of dollars)	53.2	172.1	70.4

Source: Registro Garantías Mobiliarias- Confecámaras

Changes in the structure of Colombian corporate bond issuance between 2008 and 2014

Over the past six years, there has been a remarkable increase in bond issuance by Colombian corporations, even though bonds represent only 8% of the total financial liabilities of Colombian NFCs. Graph 12 shows that the size and maturity of the bonds issued domestically and externally by Colombian companies rose significantly after 2008, although the number of issuers remains low and issuance is limited to highly rated borrowers (Graphs 13 and 14).[12]

Corporate Debt Issuance (USD million) Graph 12



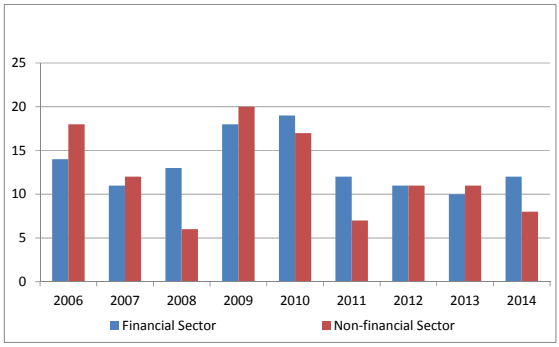
Source:Bolsa de Valores de Colombia (BVC) – Colombia' Stock Exchange, Bloomberg, own calculations

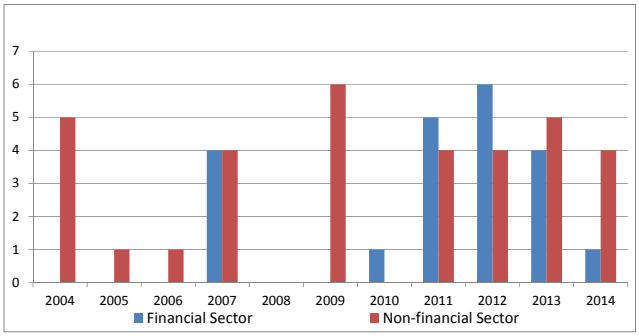
[12] Colombia's sovereign debt was downgraded to a speculative level (BB+) on 21 September 1999 and was further downgraded on 24 May 2000 (to BB). It was upgraded on 5 March 2007 (to BB+) by Standard and Poor's (S&P) and to investment grade (BBB–) on 16 March 2011. On 24 April 2013, it received a rating of BBB from S&P. Other agencies caught up later.

Number of Colombian corporate debt issuers in the local market

Number of Colombian corporate debt issuers in the external market

Graph 13



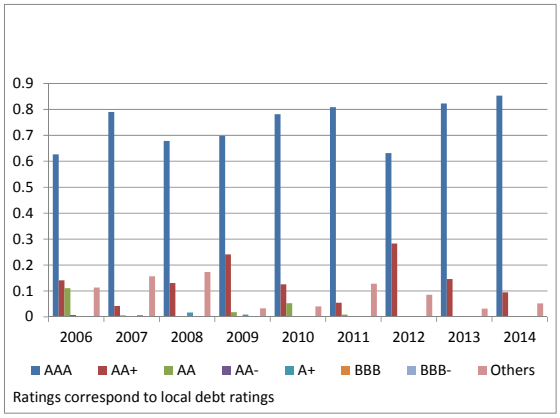


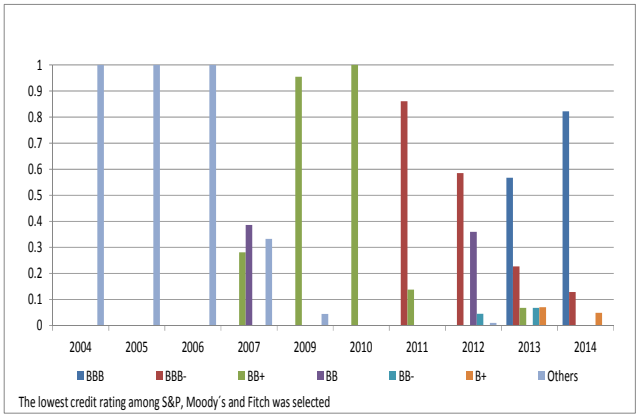
Source:Bolsa de Valores de Colombia (BVC) – Colombia' Stock Exchange, Bloomberg, own calculations

Credit rating of private sector local issuance of debt securities

External Corporate Debt Securities Issued by Credit Rating

Graph 14





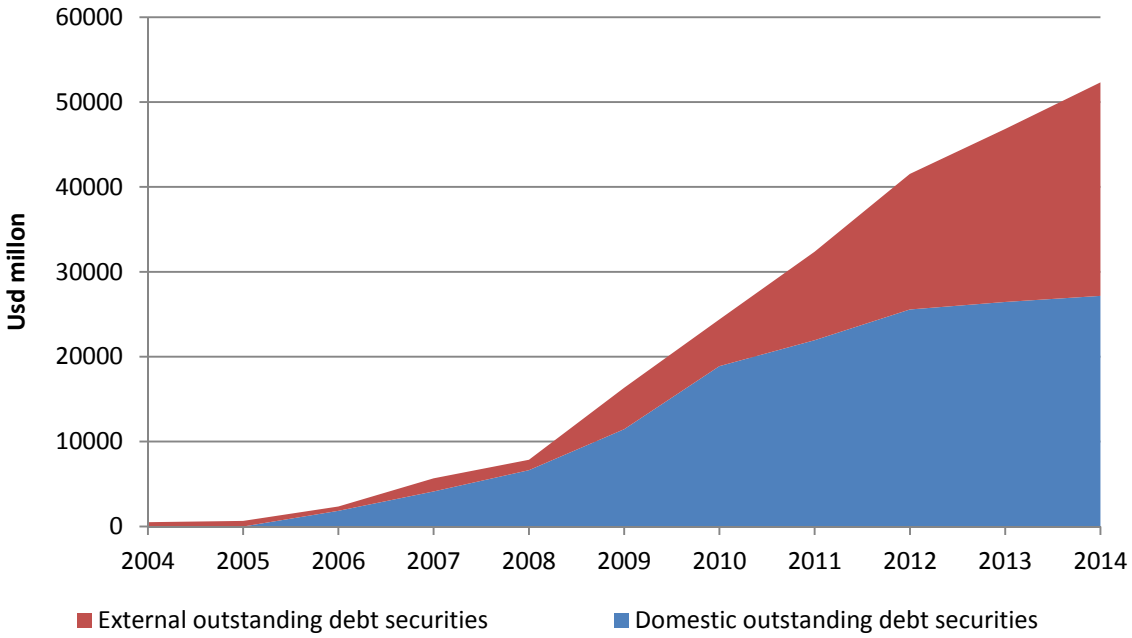
Source:Bolsa de Valores de Colombia (BVC) – Colombia' Stock Exchange, Bloomberg, own calculations

Most of the bond issuance has taken place in the Colombian domestic market (Graph 15), where both financial and non-financial firms have increased their bond liabilities (Graph 16). Bond issuance abroad has been carried out mostly by financial corporations (Graph 17). The entire domestic bond supply is denominated in local currency, while most external bonds are US dollar-denominated. Only a small fraction of corporate bonds sold in foreign markets is denominated in Colombian pesos (Graph 18).

Since 2006, most bonds sold abroad have been issued at fixed interest rates. In contrast, domestic bonds have generally been issued at variable rates, mostly linked to the consumer price index (CPI, Graph 19). The increase in the maturity of corporate issuance described above is common to both domestically and externally issued bonds, although it is more pronounced for the latter (Graph 20). The projected aggregate amortisation of external bonds shows peaks in 2019 and 2021–22 (Graph 21). Whereas in 2019 the bulk of amortisation corresponds to NFCs, for the 2021–22 period most debt repayments are due from financial firms.

Outstanding Corporate Debt securities by market

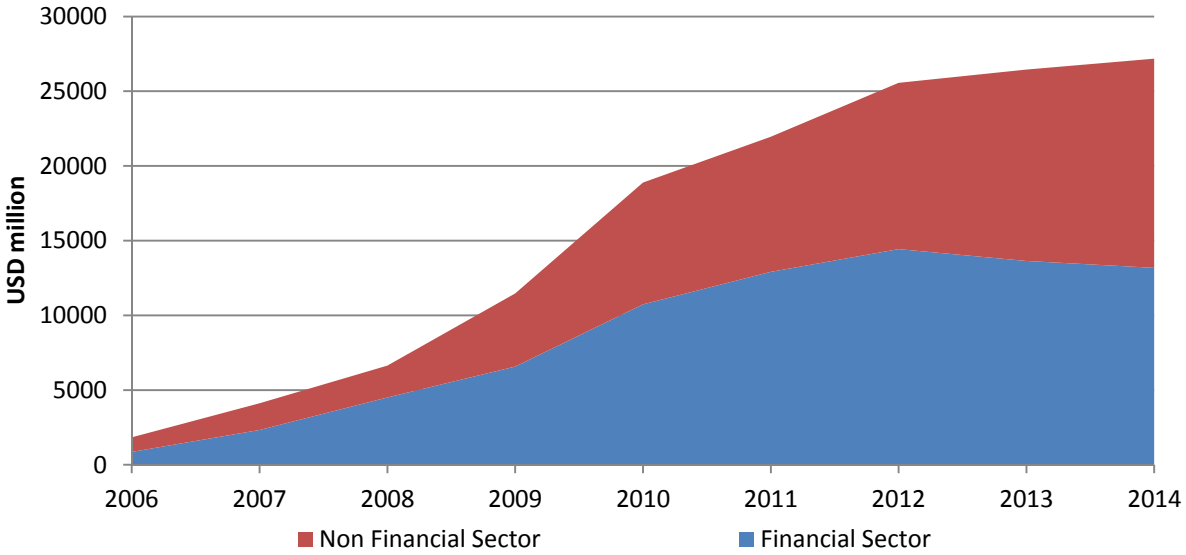
Graph 15



Source: Bolsa de Valores de Colombia (BVC) – Colombia' Stock Exchange, Bloomberg, own calculations

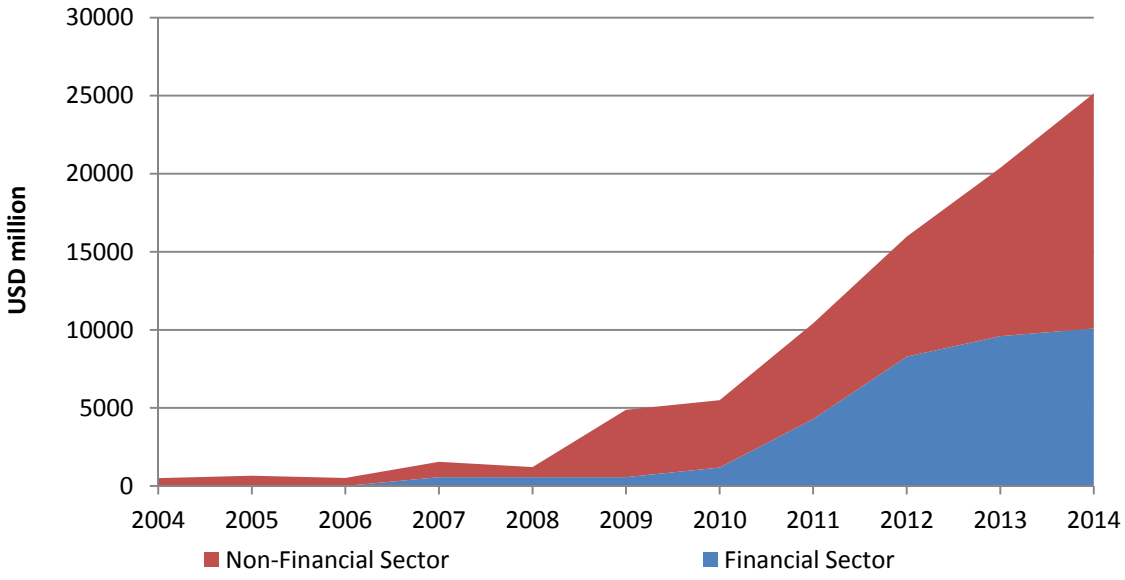
Domestic outstanding debt securities – private sector

Graph 16



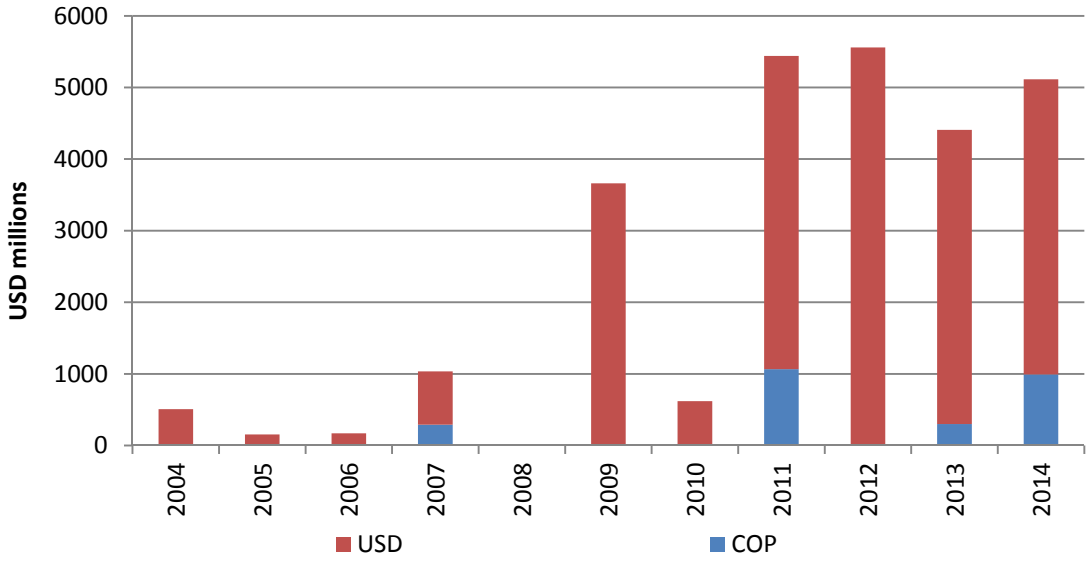
Source: Bolsa de Valores de Colombia (BVC) – Colombia' Stock Exchange, Bloomberg, own calculations

External outstanding debt securities - private sector Graph 17



Source: Bloomberg, own calculations

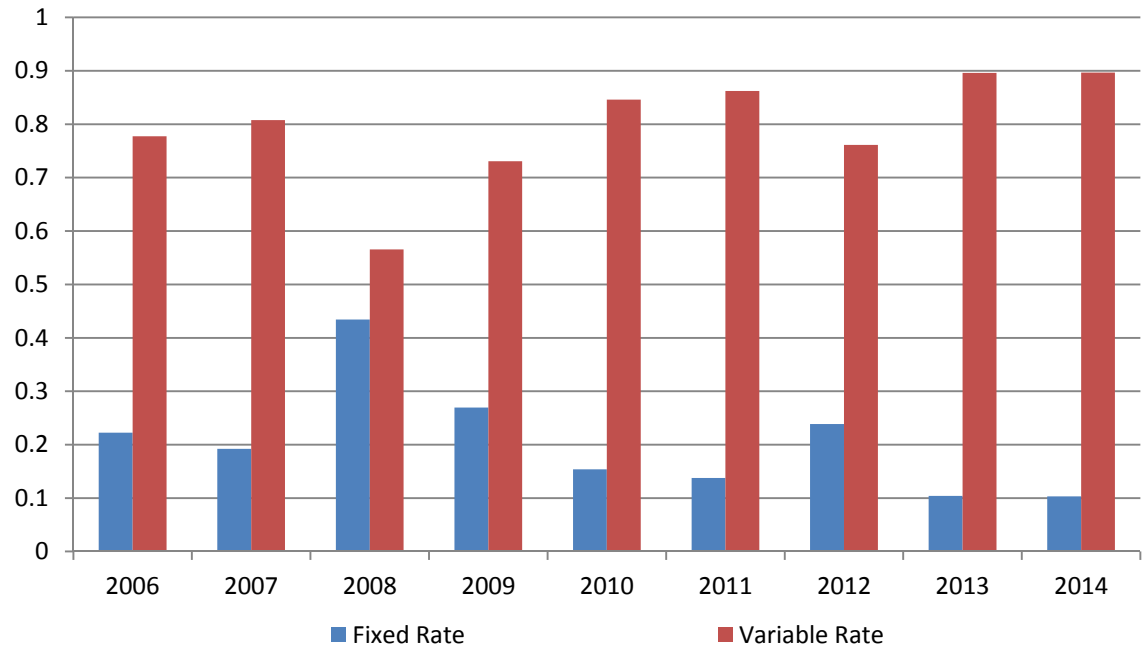
External Corporate Debt Securities Issued by Currency Graph 18



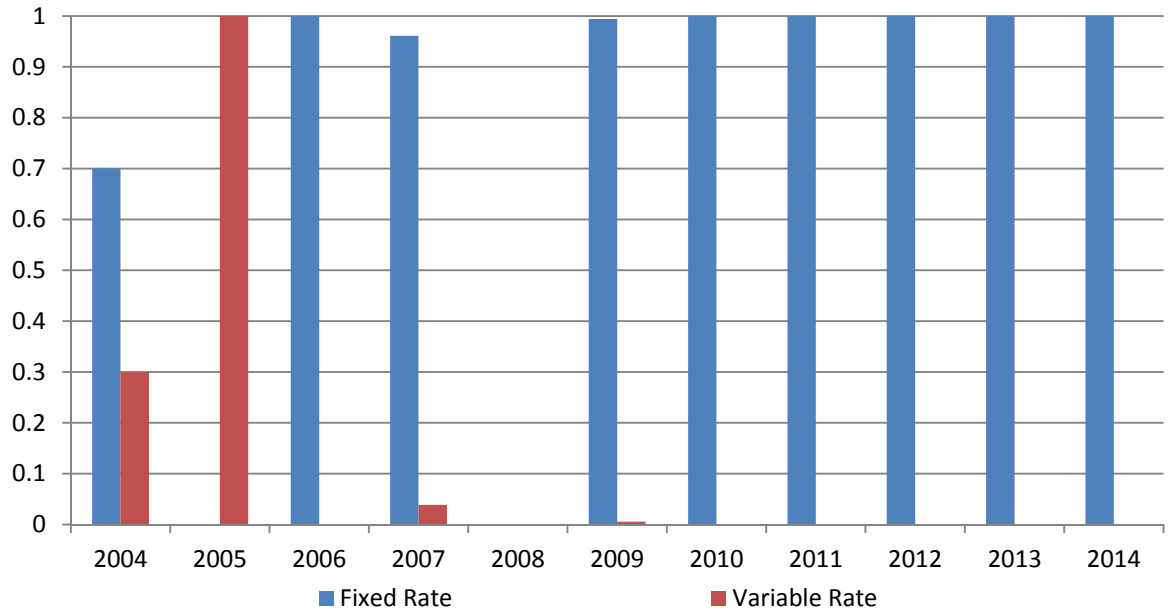
Source: Bloomberg, own calculations

Domestic Corporate Debt securities Issued

Graph 19



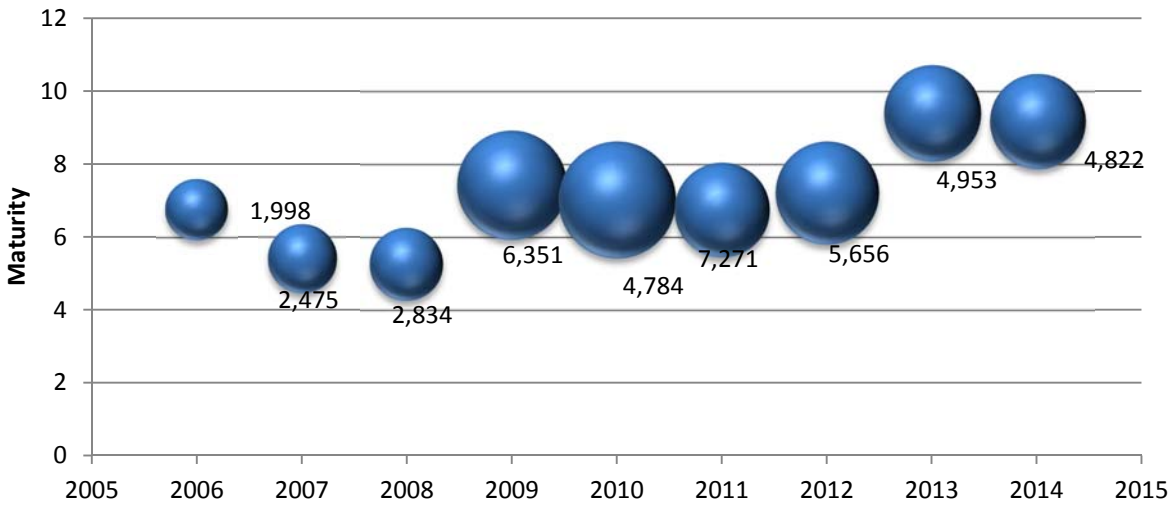
External debt securities issued – private sector



Source: Bolsa de Valores de Colombia (BVC) – Colombia' Stock Exchange, Bloomberg, own calculations

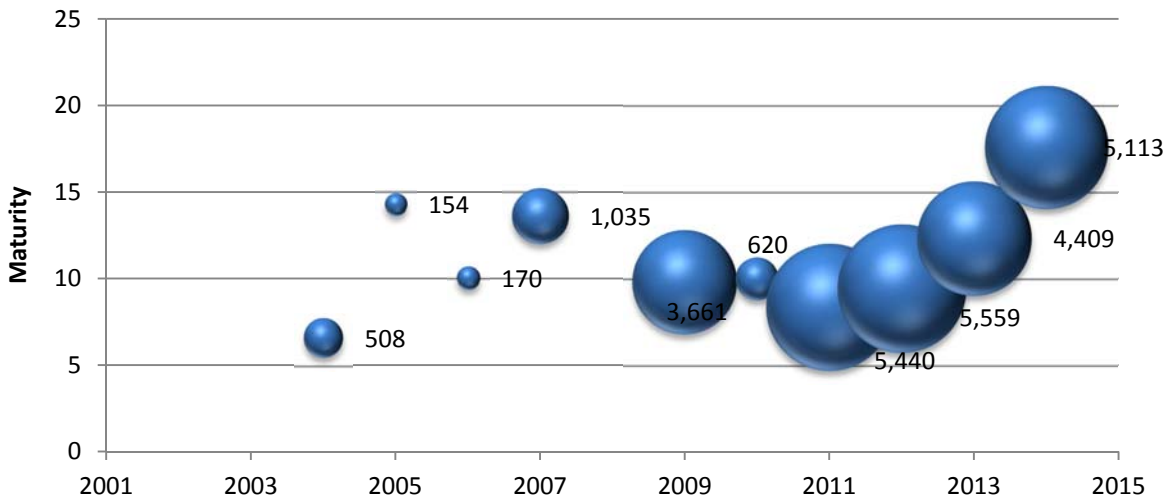
Domestic Corporate Debt Issuance

(USD million) Graph 20



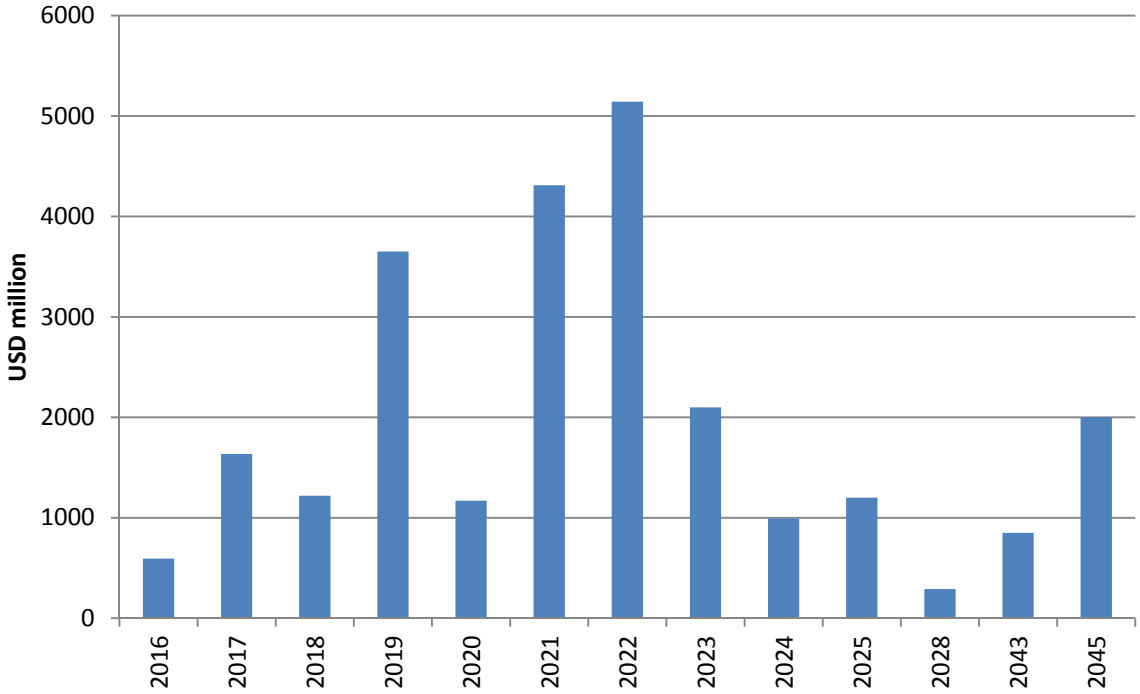
External Corporate Debt Issuance

(USD million)



Source:Bolsa de Valores de Colombia (BVC) – Colombia' Stock Exchange, Bloomberg, own calculations

Projected redemptions on External Corporate Debt Graph 21



Source: Bloomberg, own calculations

Changes in the uses and sources of funds of Colombian NFCs between 2008 and 2013

A potential source of vulnerability in EMEs has been the increased foreign indebtedness of NFCs after the global financial crisis (Powell (2014)). It has been argued that part of the foreign funding may have been channelled to the local financial system in the form of corporate deposits. As a result, risk may have built up in several dimensions. First, the new local bank deposits that have been fed by external issuance might be seen as "non-core" liabilities of banks, in the sense that they are not a stable source of funding. Ensuing expansions in credit supply and risk taking may weaken the banks' balance sheets.[13] Second, after a sudden stop of foreign lending, firms may withdraw their deposits. This may have implied higher liquidity risk for local banks and the possibility of diminished credit supply, as well as the activation of a negative cycle of the financial accelerator.

[13] Interestingly, in this case the expansion of non-core liabilities may have caused riskier lending, in contrast to the traditional risk- taking channel for which the causality runs in the opposite direction.

Figure 1 reproduces a diagram from Powell (2014), which illustrates the financial flows taking place between foreign and local financial and non-financial agents in selected Latin American countries.[14] The corresponding flows for Colombia are also included (red numbers). Whereas the GDP of Colombia represents about 9% of the aggregate GDP of the selected countries, the financial flows accounted for by the country amount to only 5% of the aggregate flows of the group, indicating that the above-mentioned risks might be less relevant. International loans to Colombian NFCs are an exception to this pattern, representing 25% of the group's aggregate flows.

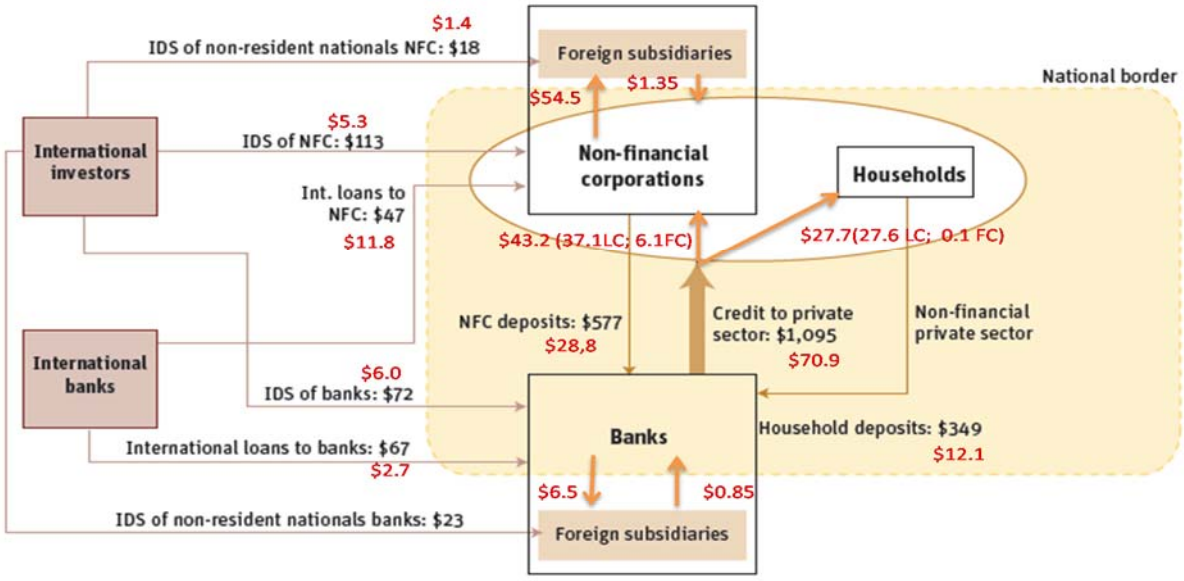
Moreover, the following features may be observed from Figure 1:

- Lending from foreign subsidiaries to Colombian banks and NFCs is small relative to other sources of funding.
- In contrast to the other countries in the group, the most important source of external funding for Colombian NFCs comes from international banks rather than from international investors. The opposite happens in the case of Colombian banks. This may be due to the relatively small size of NFCs in Colombia, which makes them more reliant on bank credit than their counterparts in other countries.
- Foreign direct investment (FDI) is an important use of funds for Colombian banks and NFCs. A non-negligible part of the foreign funding has been invested in external assets.

In sum, it seems that corporate deposits in local banks financed through foreign sources are not as important in Colombia as they might be elsewhere. Table 6 shows the change between 2008 and 2013 in the main assets and liabilities of a group of Colombian NFCs, which accounted for 51% of total non-financial private currency mismatches in 2013. Foreign financing, which includes FDI, bond issuance and bank loans, is one of the most important sources of funds. The main uses of funds are fixed assets and other assets, with bank deposits being a minor one.

[14] Brazil, Chile, Colombia and Mexico.

Figure 1



Explaining the growth in credit change in stocks of credit, deposits and international debt (2008-2013) in LAC-4 (Brazil, Chile, Colombia and México) (Bn USD).
Source: Powell (2014) IADB. The estimated contribution of Colombia is presented in red (Central Bank's calculations).

LC: local currency. FC: foreign currency

Note: Data on corporate local bank deposits might be overestimated, since they may include MMF holdings of bank liabilities.

Firms' balance Sheets

Table 6

(USD million)	2008	2013	2013-2008
Deposits **(1)+(3)-(2)**	314	1019	705
(1) Liabilities (a)+(b)+(c)	**11622**	**24973**	**13351**
(a) Financing in COP	2152	2738	586
(b) Financing in USD	4629	13735	9105
(c) Other liabilities	4840	8500	3660
(2) Assets (d)+(f)+(g)	**23805**	**45045**	**21240**
(d) Fixed assets 1/	9443	16635	7193
(f) Other assets	12237	24301	12064
(g) Foreign assets (i)+(ii)	2125	4109	1984
(i) Financial assets	1820	2405	585
(ii) Colombian direct investment abroad	305	1703	1398
(3) Net worth	**12497**	**21091**	**8595**

Source: Supersociedades, Superfinanciera, Aerocivil and Public services superintendence
1/: for balances that do not make this variable explicit, it was constructed as property, plant and equipment.

Conclusions

This note presented some features and changes of the Colombian financial system in the last decade. Shadow Banking grew fast along the traditional banking sector since 2008. Its main component is MMF. Hence important risks associated with Shadow Banking in Colombia are maturity transformation and liquidity. Recent regulation has been enacted or studied to deal with such risks.

The main changes in traditional banking over the last decade are related to the sector's foreign expansion, especially in Central America, and to its growing reliance on domestic corporate deposits. These changes require a reassessment and monitoring of currency mismatches as well as FX and local liquidity risks.

Corporate bond issuance has increased since 2008, both domestically and externally. However, bonds remain a minor source of funding for private financial and non-financial firms. The projected amortisations of external bonds peaks in 2019 and 2021–22.

Finally, although external funding for non-financial corporations has been large since 2008, the funds raised have been used to finance fixed and other assets. Corporate deposits in local banks have not been a major channel through which such resources have been allocated.

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Changes in the Czech Republic's financial intermediation during the last decade

Vladimír Tomšík[1]

Abstract

This note outlines the development of the Czech Republic's financial sector over the last 25 years. Despite significant changes in their ownership and the banking crisis in 1990s, the banks have kept their dominant position while the capital market still plays only a minor role. One explanation is that non-financial corporations often use intragroup financing directly from their parent companies abroad, and thus have no incentive to search for market-based funding. Nevertheless, Czech corporations have been pursuing the global search for yield recently by issuing bonds to raise cheap funds. This trend applies only to a small set of large firms and the associated credit risk is borne mainly by non-residents. The banks have responded to the resulting fall in demand for their credit by lowering lending interest rates and interest margins. As a result, the risk of a gradual softening of credit standards has emerged.

Keywords: Czech Republic, financial intermediation, bond market

JEL classification: G21, E51

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Introduction

The Czech financial system has long been dominated by banks. While the depth of financial intermediation – as measured by the total assets of the financial sector as a percentage of GDP – has steadily increased, reaching 150% in 2014, the share of banks in the financial sector remains stable at around 75%. Insurance companies have a share of about 7%, followed by non-bank lenders and pension companies each with 5%. The financial system has seen no major changes in structure over the last 10 years. The capital market has long played only a small role in funding the private sector, although the share of bonds in external financing of the corporate sector has increased slightly in recent years.

Structural changes in the banking sector and credit provision

The banking sector has experienced substantial volatility over the last 25 years.[2] During the first half of the 1990s, in the initial phase of the Czech Republic's economic transition, the country's banking sector operated with a relatively high credit-to-GDP ratio and with loan portfolios concentrated almost exclusively in the corporate sector. Nearly 90% of loans in credit portfolios were extended to this sector. The share of households in the overall credit system stayed below 10% throughout the 1990s. The deep banking crisis of 1997–99 changed the banking sector dramatically, however. The sector went through noticeable downsizing and deleveraging as a significant amount of credit was written off banks' books. Decisive restructuring and (re)privatisation of banks followed, paving the way to the current structure in which the sector is controlled almost exclusively by foreign banking groups.

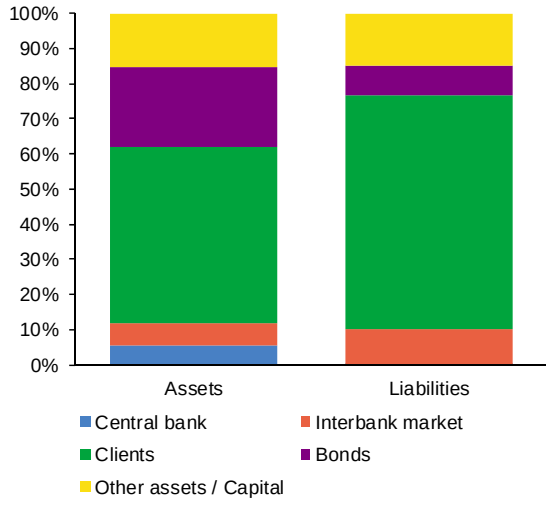
By the end of 2001, the banking sector had been restructured, and credit growth followed. Banks started to lend to households, which before the crisis had been largely ignored by the semi-state banks. This trend has been reinforced since 2008. The banking sector remains quite conservative, with client loans and client deposits dominating the assets and liabilities of banks (Graph 1). Credit growth has been driven mainly by housing loans, while bank consumer loans have stagnated (Graph 2).

While the majority of loans to the private sector come from local banks, non-bank financial intermediaries (such as other companies engaged in lending and leasing companies) also play a role. Around 2005 they accounted for almost 20% of loans to non-financial corporations (NFCs) and loans to households (Graphs 3 and 4). However, increasing competition from banks and tax changes (which have made leasing financing less favourable) have contributed to a decline in the relevance of these institutions. In particular, the rise of mortgage financing has caused their market share to dive. Like banks, non-bank lenders are facing declining demand for consumer credit.

[2] See J Frait, A Gersl and J Seidler, "Credit growth and financial stability in the Czech Republic", *World Bank Policy Research Working Paper*, no 5771, August 2011.

Bank assets and liabilities structure

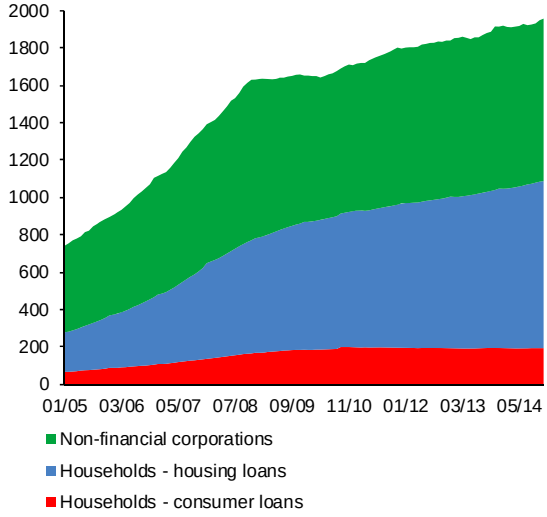
% of total assets; 31 October 2014 Graph 1



Source: CNB.

Sector structure of bank credit

CZK bn Graph 2

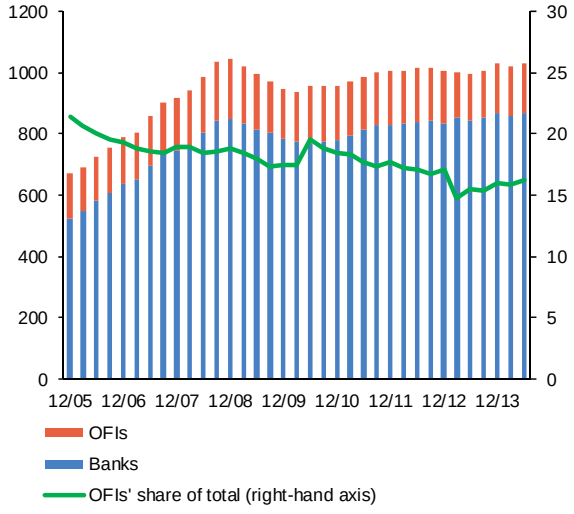


Source: CNB.

Direct cross-border credit to NFCs also plays a significant role in the Czech Republic. Due to the large share of foreign ownership in the corporate sector resulting from past foreign direct investment, corporations often use intragroup financing directly from their parent companies abroad. An analysis of broadly defined credit taken on by NFCs reveals that less than half of the credit comes from domestic financial institutions. A larger proportion comes from non-residents, which include both parent NFCs abroad and foreign banks providing direct cross-border loans (Graph 5).

Loans to NFCs: OFIs vs. banks

CZK bn, % Graph 3

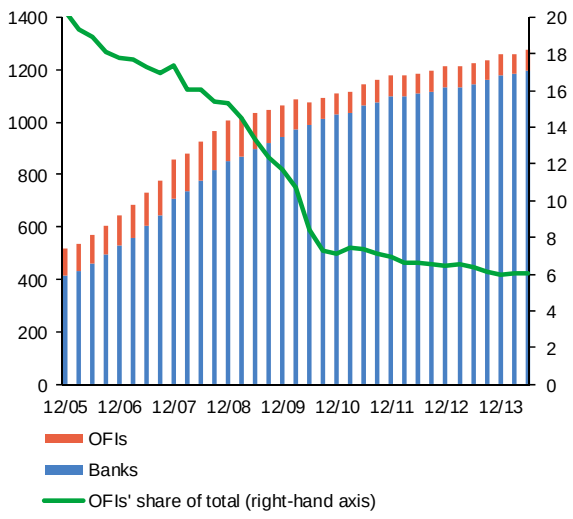


Source: CNB.

Note: NFCs – non-financial corporations, OFIs – other financial intermediaries.

Loans to households: OFIs vs. banks

CZK bn, % Graph 4



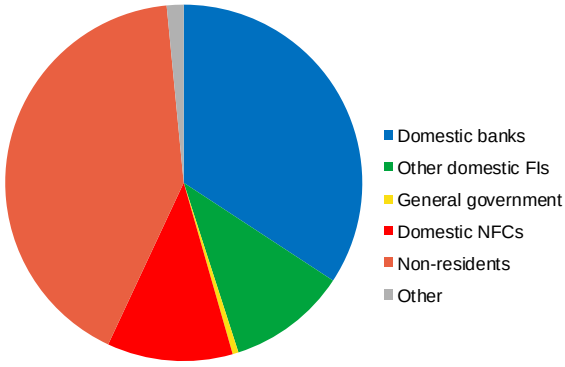
Source: CNB.

Like their counterparts in many other advanced countries, Czech NFCs have increasingly been raising funds by issuing corporate bonds in recent years (Graph 6). However, this trend only applies to a small set of large firms – bonds issued by the 10 largest issuers account for around 90% of the total issued by the sector as a whole. The bonds issued by Czech NFCs usually have maturities of longer than one year and are mostly placed abroad. The credit risk associated with Czech corporate bonds therefore has only a marginal impact on the Czech financial sector and is borne mainly by non-residents. Bonds account for around 20% of total NFC funding, so that bank loans still dominate. Some bond issues are denominated in foreign currencies, but the overall foreign currency indebtedness of NFCs does not represent a major risk to financial stability.

Credit to NFCs by creditor

%

Graph 5

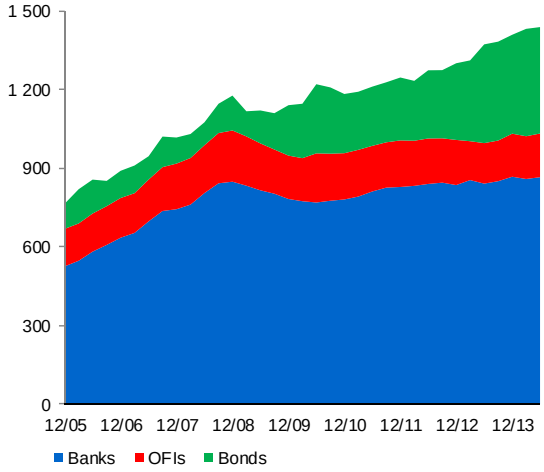


Source: CNB.

Structure of funding of NFCs

CZK bn

Graph 6



Source: CNB.

Foreign ownership and the post-crisis environment

The banking system in the Czech Republic is almost completely controlled by subsidiaries of foreign banks, usually from other EU countries. The role of foreign bank branches has always been rather limited. The role of government-owned financial institutions is also very low. The direct share of foreign banks in total assets is roughly 80% but, as some banks (mainly specialised building savings societies) are owned by other banks that are domiciled in the Czech Republic but have foreign owners, the share of the banking sector under (direct and indirect) foreign control is in fact more like 95% (the sector is mostly under the control of banking groups headquartered in Austria, Belgium, France and Italy). Despite the foreign ownership, the business of banks is predominantly domestic in terms of currency structure and sources of funding. Loans to households are extended almost exclusively in Czech koruna. Owing to the export orientation of the NFC sector, the share of foreign currency loans is higher, but still below 20%. In addition, banks generally fund their operations with local client deposits, which are rising steadily over time. The ratio of household bank deposits to NFC bank deposits is fairly constant over time (hovering between 2 1/2 and 3 to 1). These structural characteristics provide strong

protection against external shocks and have helped to limit the consequences of the pre-crisis credit boom and the impacts of the global crisis on domestic financial institutions.

However, the above information about the structure of the financial system in the Czech Republic and its evolution over the last decade should not be interpreted as meaning that the Czech economy is insensitive to global developments. Global conditions in the pre-crisis years (high economic activity in an environment of excess liquidity) and in the period that followed (strong disinflationary pressures and low interest rates), coupled with developments in the banking sector and banking sector regulation in the EU, have in recent years been affecting monetary/credit conditions in the Czech economy and thus also the monetary policy transmission mechanism. Weak economic growth in the EU, the financial tensions in the euro area and the monetary policies of key central banks have helped to undercut demand for bank credit amid strong liquidity. In a climate of increased competition, banks have responded by lowering their lending interest rates and interest margins. At the same time, these factors are generating a risk of a gradual softening of credit standards. Banks are also increasingly investing their surplus liquidity in government bonds (Graph 7). Domestic currency issuance again predominates in the case of Czech government debt (FX issuance stands at around 20%) and the majority creditors are Czech financial institutions (non-residents account for roughly 25%). The proportion of floating rate debt has risen sharply since 2007 and is now close to one quarter at maturities of from one to five years. A large majority of the floating rate debt is koruna-denominated. Government debt has thus become more sensitive to sudden shifts in the koruna yield curve. However, volatility on the global bond market should not have a strong effect on the local bond market.

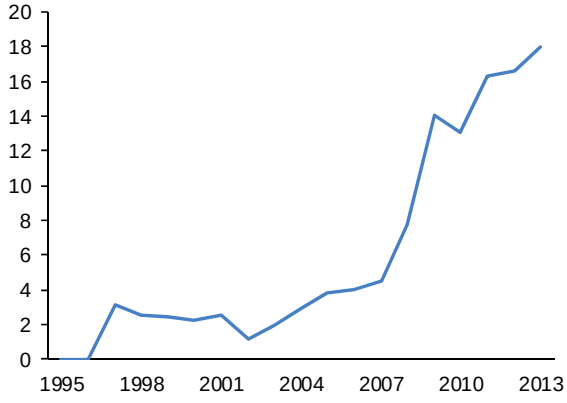
Government bonds in banks' balance sheets

% of total assets — Graph 7

Source: CNB.

Share of government debt with floating rate

% — Graph 8



Source: CNB.

Summary

The relative importance of banks and debt markets in the Czech economy has not changed significantly over the last decade. All we have seen is a slight increase in the importance of bonds in the funding of non-financial corporations. Structural factors (such as sufficient local funds, predominantly local currency funding, low significance of foreign bank branches) also ensure that the local banking sector continues to play an important role in the transmission of domestic monetary policy. Meanwhile, considerable scope still exists for domestic monetary policy autonomy, although the sensitivity of the economy to global monetary and financial conditions has naturally increased in recent years. The robustness of the domestic financial sector means that macroprudential policy can be focused on preventing the accumulation of potential systemic risks, not on coping with existing risks and imbalances. That said, the influence of macroprudential considerations on the monetary policy transmission mechanism has been limited so far, being a complement to, rather than a substitute for, interest rate policies. A potential tightening of the global funding conditions could have a direct, if not strong, impact on the balance sheets of several large non-financial corporations. For banks, most non-bank corporations and for government finance, however, the impact would be indirect and generally moderate.

The rise of Hong Kong's corporate bond market: drivers and implications

Prepared by David Leung, Ceara Hui, Tom Fong and Alfred Wong[1]

Abstract

The growth of Hong Kong SAR's corporate bond market has accelerated considerably since the global financial crisis, suggesting that local corporations increasingly regard market-based financing as a workable alternative to bank-based funding. The acceleration was driven by both cyclical and structural factors such as unconventional monetary accommodation by major central banks and market promotion initiatives by the Hong Kong government. From the perspective of financial stability and longer-term financial development, the rapid growth of the bond market has mixed implications. On the positive side, it complements bank-based financing, providing the economy with an additional channel of financial intermediation. However, policymakers need to be vigilant about the potential risks to financial stability as the corporate sector may have become more vulnerable to shocks as a result of increased leverage.

Keywords: Corporate bond market, Hong Kong SAR, financial intermediation, corporate leverage, bank-based financing, market-based financing

JEL classification: G12, G21, G30, E50

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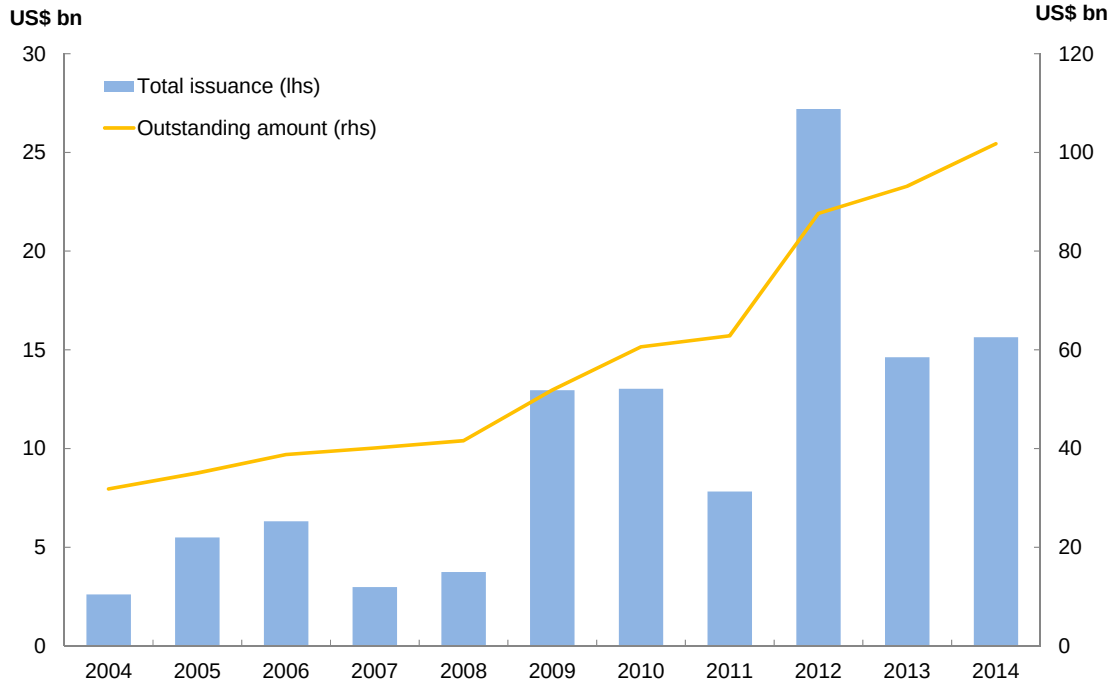
1. Background

The bond market has played an increasingly prominent role in financial intermediation in Hong Kong SAR in recent years.[2] While bank lending still accounted for 77% of the total borrowing of non-financial corporations at the end of 2014, the growth of the corporate bond market has accelerated considerably. Prior to the global financial crisis, the outstanding amount of corporate bonds grew at an average annual rate of around 5%, which was broadly in line with Hong Kong's nominal GDP growth. Following the crisis, outstanding corporate bonds posted a significantly faster growth of 17% per annum on average, far outpacing economic growth. As a result, the total amount of outstanding corporate bonds rose to US$101.8 billion at the end of 2014, more than double the US$38.8 billion outstanding at the end of 2006 (Graph 1).

Outstanding amounts and annual issuance of Hong Kong non-financial corporate bonds

Graph 1



Note: Outstanding amounts are estimated from issuance data for debt securities on the assumption that all debt securities mature on their original maturity dates.

Source: HKMA staff estimates based on data from Dealogic.

[2] In this paper, corporations refer to non-financial corporations and corporate bonds are their debt securities regardless of currency denomination, with original tenors of 12 months or more. Whether a bond is classified as a Hong Kong bond depends on the deal nationality, which is based on the nationality of the issuer parent if there is a credit support or guarantee for the issuing subsidiary. For deals without that support or guarantee, the deal nationality refers to the nationality of the issuing subsidiary. Based on data collated by Dealogic, as of the end of 2014, the outstanding amount of corporate bonds in Hong Kong stood at US$101.8 billion, of which 14%, 65% and 22% are denominated in HKD, USD and other currencies respectively.

From the perspective of financial development, the rise of the Hong Kong corporate bond market should be welcomed since it opens up an alternative financing channel for local corporations, which were traditionally dependent on bank loans as the primary source of borrowing. The financial crisis which beset many Asian economies in 1997–98 showed that the lack of a well developed bond market can be a source of financial system fragility. However, there are concerns that market-based intermediation can also allow global monetary and financial shocks to be transmitted into domestic borrowing costs more easily and frequently, given that international capital markets are now highly interconnected. The wider availability of bond financing has also raised the question whether corporations might be encouraged to take on more debt, thus making them more vulnerable to negative shocks. Against this backdrop, we take a closer look at the recent developments in the Hong Kong corporate bond market, with a focus on the driving forces behind its rapid growth as well as the implications for financial stability.

2. Recent developments in Hong Kong's corporate bond market

The rapid growth of Hong Kong's corporate bond market is obvious in the average annual bond issuance by corporations, which almost quadrupled from around US$4 billion before the crisis to US$15 billion following the crisis (Graph 1). In addition to the volume of issuance, two trends suggest that bond financing has become more widespread than before.

- *First-time bond issuers*: After the crisis, more corporations have begun to turn to the bond market for funding. As shown in Graph 2, annual bond issuance by first-time issuers amounted to an average of US$2.0 billion registered in 2009–14, or a 37.6% increase from the US$1.4 billion in 2004–08, suggesting that the growth in bond issuance is driven by both newcomers as well as increased issuance by incumbent bond issuers. The number of first-time bond issuers also shows a similar upward trend.
- *Credit rating distribution*: After the crisis, bond issuers are less confined to corporates with top credit ratings, as corporations with lower credit ratings are now able to gain access to the bond market. As measured by Standard & Poor's, issuers' credit ratings ranged from A+ to BBB– in 2014, compared with a relatively tight range of AA to A– back in 2006. As a consequence, the credit ratings of newly issued corporate bonds had a higher standard deviation after the crisis (Graph 3).

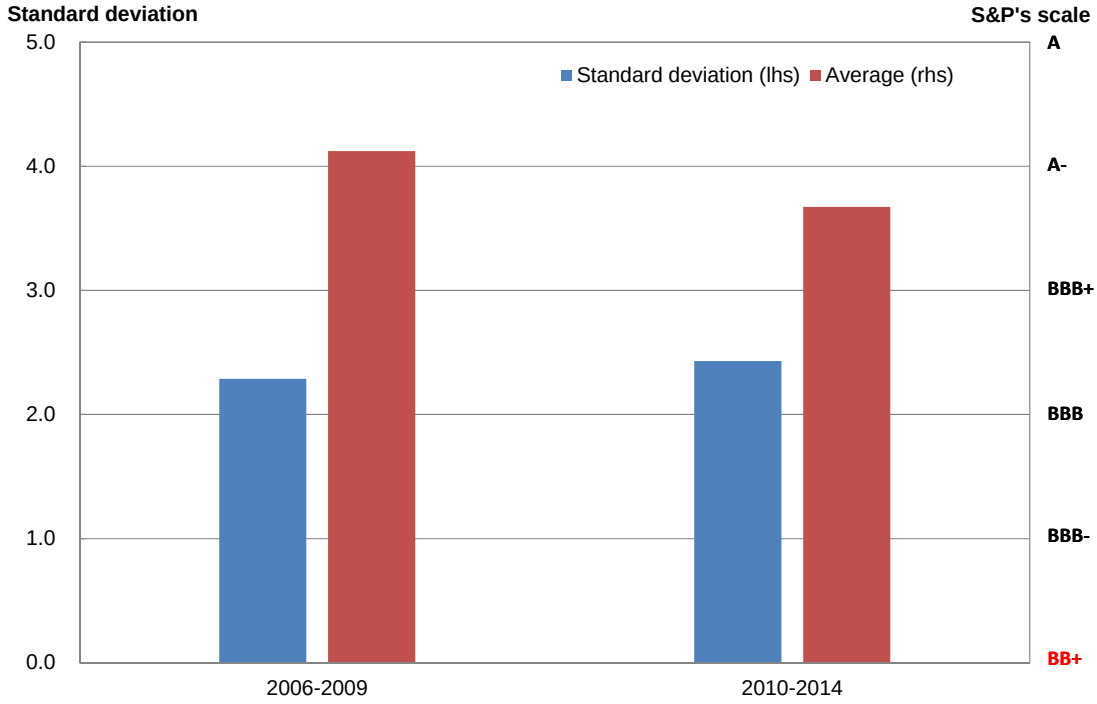
First-time issuers of corporate bonds in Hong Kong

Graph 2

Source: HKMA staff estimates based on data from Dealogic.

Credit ratings of Hong Kong corporate bond issuance

Graph 3



Note: One standard deviation represents one notch difference in credit rating.

Source: HKMA staff estimates based on data from Dealogic.

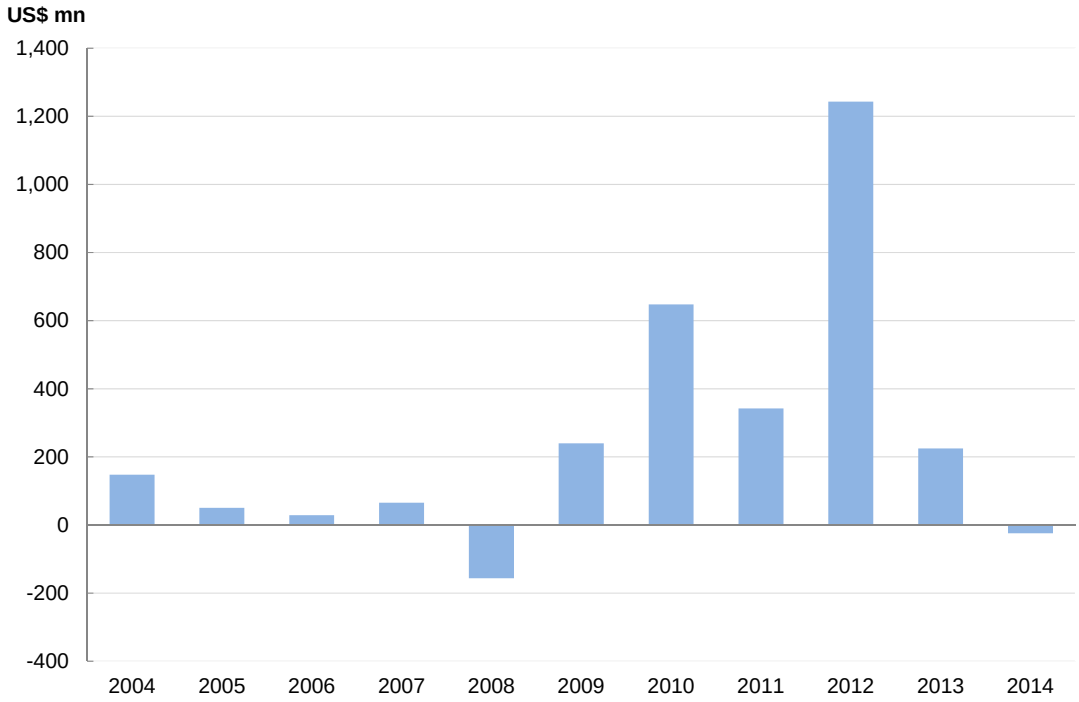
3. Driving forces for the Hong Kong corporate bond market

The surge in corporate bond issuance reflects a rather long list of driving forces that can be classified as either cyclical or structural factors:

Cyclical factors

Unconventional monetary stimulus from major central banks in the aftermath of the US subprime and European debt crises has flooded the market with liquidity, pushing interest rates to historical lows. As a result, there has been a tendency for bond investors to turn to the corporate bond market, particularly those in emerging market economies with relatively solid fundamentals. As a proxy indicator of this search-for-yield phenomenon, annual global net inflows into Hong Kong's bond mutual funds amounted to US$487 million on average during 2010–14, representing an almost sevenfold jump from US$73 million during 2004–07, according to data collected by EPFR Global (Graph 4). As a result of these massive fund inflows, corporate bond yields declined, which in turn allowed corporations to raise funds at lower costs than before the crisis.[3] It is noteworthy that the rapid

Global net inflows into Hong Kong's bond mutual funds — Graph 4



Source: EPFR Global.

[3] As a proxy indicator, the yields of Hong Kong's corporate bonds denominated in US dollars averaged 3.64% in 2014, compared to 5.75% in 2007, according to HSBC Asian Bond Index data.

growth of corporate bonds has in recent years been dominated, to a significant extent, by fixed rate and perpetual bond issuance, indicating that corporations opted for bond financing so as to lock in lower funding costs at prevailing market interest rates.

Structural factors

Two sets of structural factors are crucial for the growth of the corporate bond market. The first one is related to the initiatives by the Hong Kong government to promote the market. In his 2009–10 budget speech, the Financial Secretary announced his intention to promote further and sustainable development of the bond market in Hong Kong through the Hong Kong Government Bond (HKGB) Programme. Since the first issuance of HKGB in September 2009, the local government bond market has expanded rapidly (Graph 5). By boosting the supply of government bonds, the programme helped improve market liquidity and expand the investor base, which in turn provided a favourable environment for corporations to tap the local bond market. In December 2014, two additional measures were announced to further promote market development. First, the tenors of bonds issued under the Exchange Fund Bills and Notes Programme and the HKGB Programme were streamlined to minimise overlaps in longer tenors so that a single benchmark yield curve can be established. Second, a discount facility for HKGB was introduced to provide greater flexibility for banks to manage liquidity, an important characteristic that is likely to boost demand.[4] Alongside government initiatives, the increasingly popular medium-term note (MTN) programme has encouraged the corporate sector to use standardised documentation for bond issues. By streamlining issuance procedures, corporations have more flexibility to issue bonds when the market timing is favourable. On the investor side, the MTN programme also makes it more convenient for private bankers to approach corporate issuers through "reverse enquiry".[5]

The second set of factors is related to regulation that lowers the appetite of banks for exposure to loans with relatively long tenors. The decline in long-term bank credit was exacerbated by the deleveraging undertaken by European banks during the European sovereign debt crisis. In fact, there are signs that the average tenor of Hong Kong's syndicated loans has been on the decline since the global financial crisis (Graph 6). For instance, the average tenor of syndicated loans in Hong Kong shortened to 3.8 years in 2014 from 4.7 years in 2008. Tight credit conditions in this market segment have sharply pushed up the long-term costs of bank lending.[6] As a result, the loan market has become a less accessible and appealing financing channel, inducing corporations to tap the bond market for their long-term funding needs.

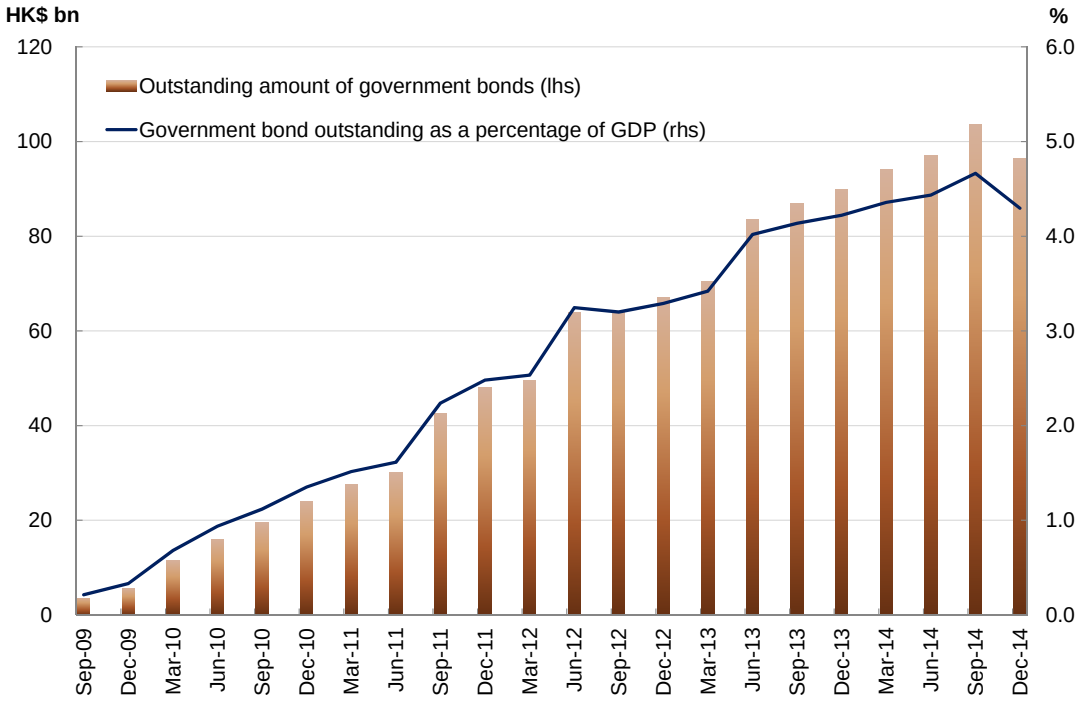
[4] For details, see HKMA Press Release "Streamlining Issuance of Exchange Fund Notes and Government Bonds and Introduction of Discount Facility for Government Bonds", 8 December 2014.

[5] Reverse enquiry is a common practice whereby investors approach and ask the corporations-of-interest to issue bonds specifically for them, instead of passively waiting for public tenders.

[6] For instance, in the Hong Kong syndicated loan market, loan costs jumped to 185 basis points above the reference rate in the second half of 2014 from 122 basis points in the same period of 2008.

Outstanding amount of Hong Kong government bonds

Graph 5

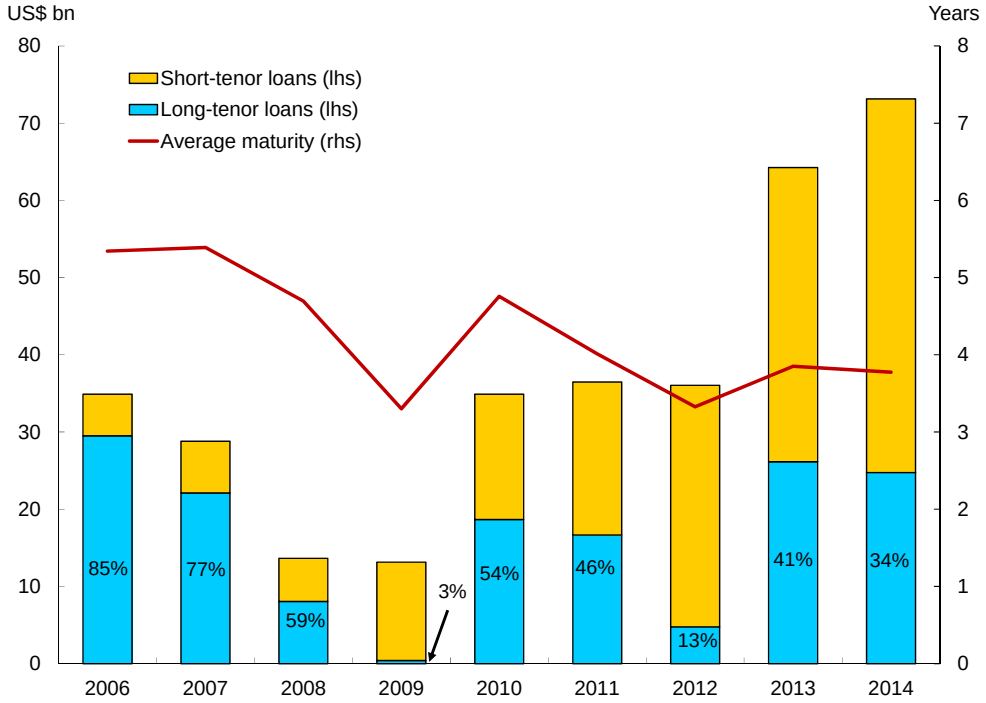


Note: Only HKD bonds issued under the Government Bond Programme are included in the calculation.

Sources: Census and Statistics Department of Hong Kong; *HKMA Monthly Statistical Bulletin*.

Hong Kong syndicated loan origination and average tenor

Graph 6



Note: Short-tenor loans refer to syndicated loans with maturity of less than five years. Long-tenor loans refer to those with maturity equal to or longer than five years.

Source: HKMA staff estimates based on data from Bloomberg.

4. Implications of the rapid growth of corporate bond market

The rapid growth of the corporate bond market has mixed implications for financial stability and longer-term financial development. In general, there are three major issues that policymakers and market participants need to consider, namely, availability of corporate financing, vulnerability of corporate financing to shocks, and concerns about excessive corporate leverage.[7]

4.1. Availability of corporate financing

With the rapid expansion of its corporate bond market, Hong Kong has seen some success in developing an alternative financing channel for the corporate sector, which has traditionally relied too much on bank lending as compared with advanced economies. This development should be welcomed for three reasons. First, since commercial banks tend to rely heavily on short-term deposits, interbank borrowing or issuance of money market instruments for their funding, banks are inherently constrained in their capacity to provide long-term credits, given their need to manage maturity mismatch. A well developed corporate bond market could therefore fill this niche and offset the natural limitations of bank lending. This is especially true for many institutional investors with long investment horizons (such as pension funds, endowment funds and insurance companies) as they would be a natural match for corporates with long-term borrowing needs. Second, multiple financial intermediation channels provide corporations with more diversified funding sources. To the extent that negative shocks to the banking sector and the bond market are not perfectly correlated, there is room for corporates to be additionally safeguarded against credit crunches during times of distress. Third, as bond investors are predominantly institutional investors that are highly international in terms of their portfolio allocation strategies, local corporations are in a better position to tap international funding sources, making their borrowing terms less restricted to domestic funding conditions. Such gains are analogous to the gains from the international trade of goods and services.

4.2. Vulnerability to shocks

As the pricing of corporate bonds are usually based on major government bond yields (notably the US Treasury yields), the increased use of bond financing could make corporate borrowing costs more sensitive to global monetary and financial conditions. Since the first hint from the US Federal Reserve on the tapering of its quantitative easing program in May 2013, financial markets have shifted their focus to the potential impact of an ultimate rebound of interest rates on the economy. The Hong Kong Monetary Authority (HKMA) has conducted empirical research (see

[7] To guard against and mitigate spillovers from global shocks, the Hong Kong SAR authorities have introduced various types of macroprudential measures targeting credit growth and the property market. Research suggests that these measures have helped safeguard financial stability and have influenced loan growth, interest costs, property market transactions and speculative activity. For details, see HKMA (2013b).

Annex for details) on the impact of US monetary normalisation on the sovereign bond yields of 11 economies in the Asia-Pacific region. The study finds that the potential impact could be significant, especially if the process should turn out to be more disorderly than expected.[8] This finding is important because an increase in sovereign bond yields could easily translate into higher borrowing costs for the entire economy. In particular, it was found that in the May–September 2013 episode, the actual increases of sovereign yields registered were greater than the mean estimates based on the model for most economies in the Asia-Pacific region, suggesting that markets might have over-reacted to adverse shocks. Nonetheless, the associated tail risks could be even greater as the estimates at the 90th and 95th percentiles are many times higher than the actual increases or mean estimates. Taking Hong Kong as an example, the actual increase in the sovereign bond yield was 1.2% during the episode, while the estimated increase at the mean and 95th percentile are 0.9% and 3.1% respectively.

4.3. Concerns about corporate leverage

There have been concerns that enhanced availability of corporate funding through the bond market might result in a further increase in corporate leverage, hence threatening economic and financial stability. Graph 7 shows that as corporations increased their borrowing from banks and in the bond market, the leverage ratio of the corporate sector as a whole (measured by the ratio of total assets to shareholders' funds) has been on the rise while corporate debt-servicing capability as measured by the interest coverage ratio (defined as the ratio of earnings before interest and taxes to interest expenses) is on the decline.

Nonetheless, the issue of possible over-indebtedness of the corporate sector must be examined in a wider context. Based on the statistics compiled by the IMF in a recent study, unlike in many other Asian countries, a considerable amount of corporate debt in Hong Kong is owned by corporations with relatively low levels of leverage (Graph 8). In addition, Hong Kong has only a small share of corporate debt linked to corporations with a low interest coverage ratio (Graph 9). This is attributable to the fact that the post-crisis development has opened up funding channels for corporations that were unable or less able to borrow in the past.

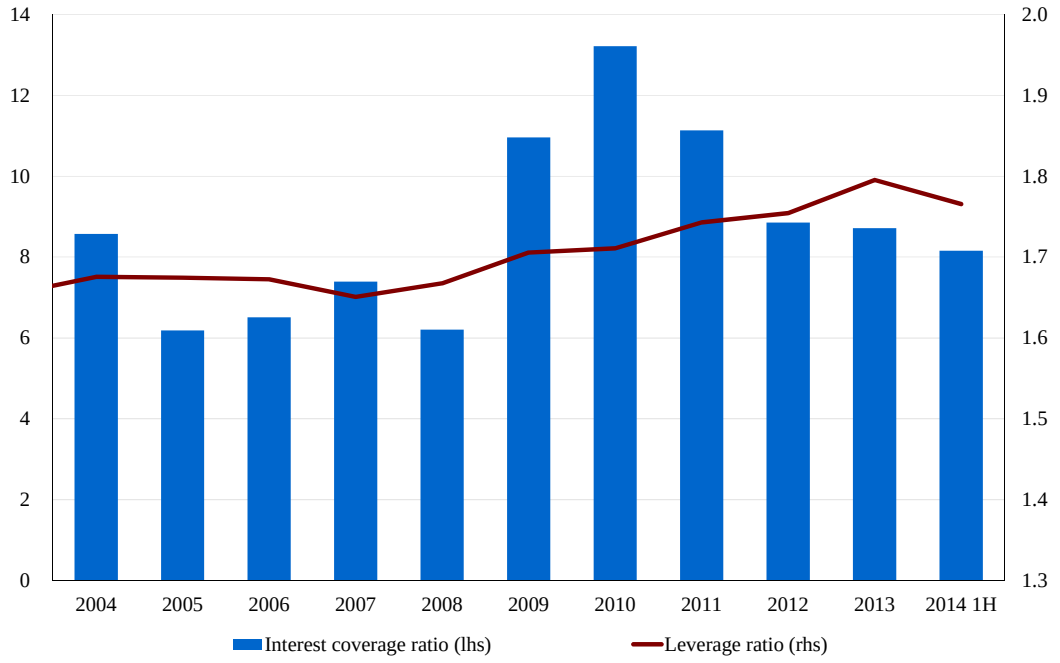
Finally, the structure of corporate debt in terms of sectoral composition is very important from a macroeconomic perspective. The risk is higher if the lending is concentrated in a certain economic sector, and *vice versa*. The Herfindahl-Hirschman index (HHI) is employed to track the concentration risk.[9] As can be seen, the HHI has risen in recent years, as larger corporations such as property developers found it more cost-efficient to raise funds in the bond market (Graph 10). From the

[8] Empirical studies also found significant evidence suggesting that local sovereign bond yields in emerging economies have moved much more closely with the US Treasury bond yield after 2005. For details, see Turner (2013).

[9] The HHI is a statistical measurement of concentration. It is defined as the sum of the squares of the shares of individual sectors. As such, the index ranges between 0 and 1, with a higher reading of the index meaning a higher degree of concentration.

Leverage ratio and interest coverage ratio of listed non-financial corporations in Hong Kong

Graph 7

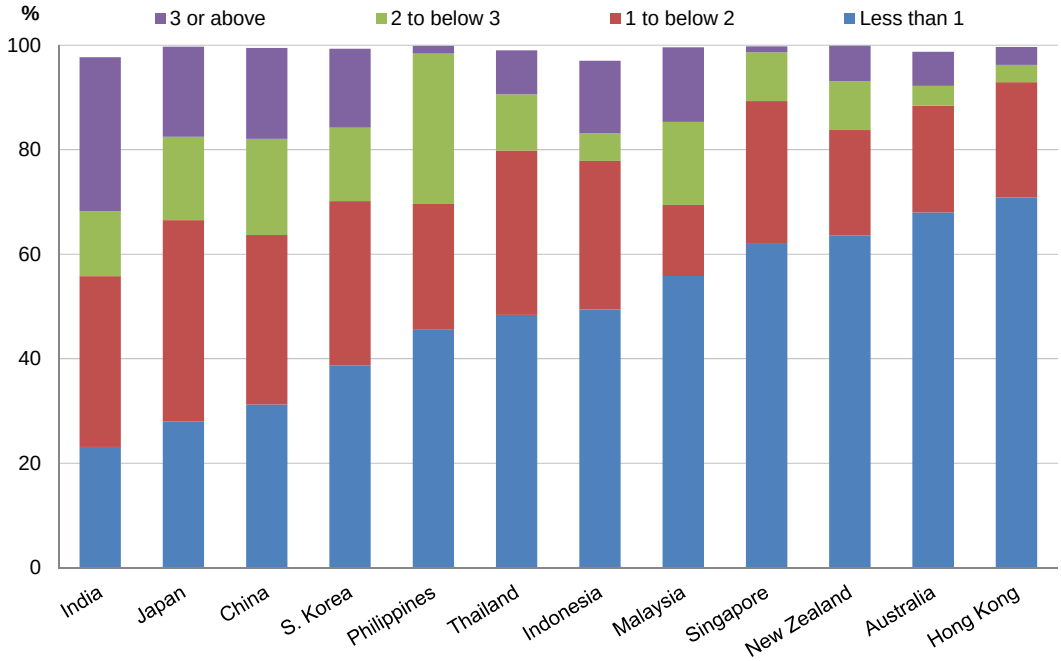


Note: The leverage ratio is defined as the ratio of total assets to shareholders' funds. A higher value indicates higher leverage. Interest coverage ratio is defined as the ratio of earnings before interest and taxes to interest expenses.

Source: HKMA staff estimates based on data from Bloomberg.

Share of corporate debt by leverage ratio

Graph 8

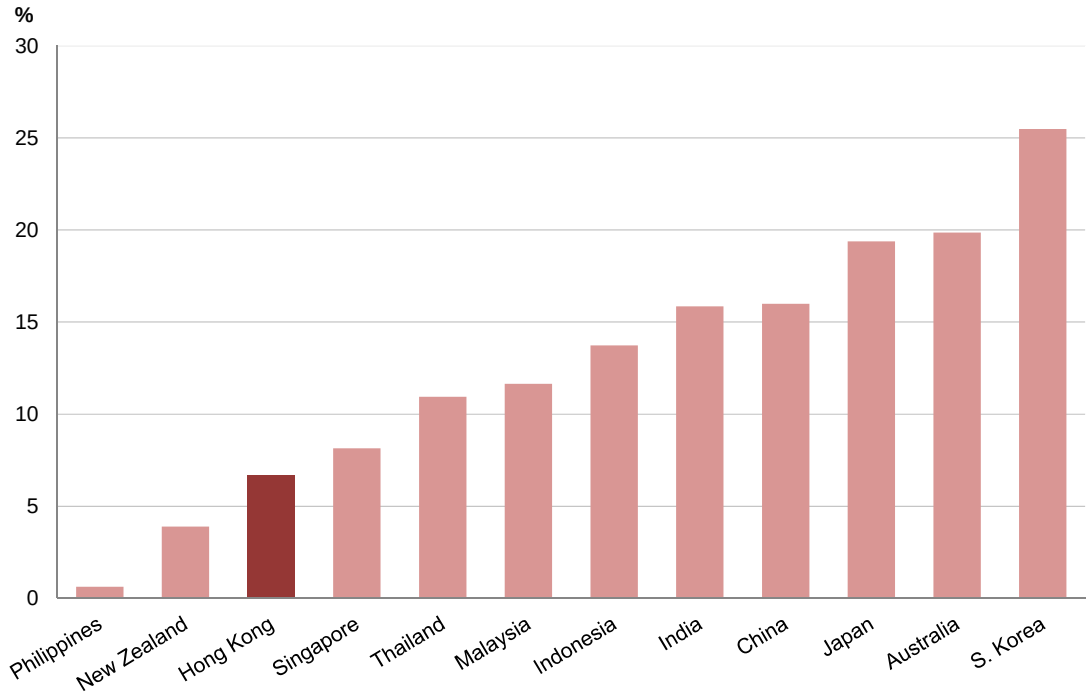


Note: The leverage ratio in this graph is defined as the ratio of total debt to common equity and therefore is not strictly comparable with the leverage ratio reported in Graph 7.

Source: IMF, *Regional Economic Outlook*.

Share of corporate debt owed by firms with interest coverage ratio of less than one

Graph 9

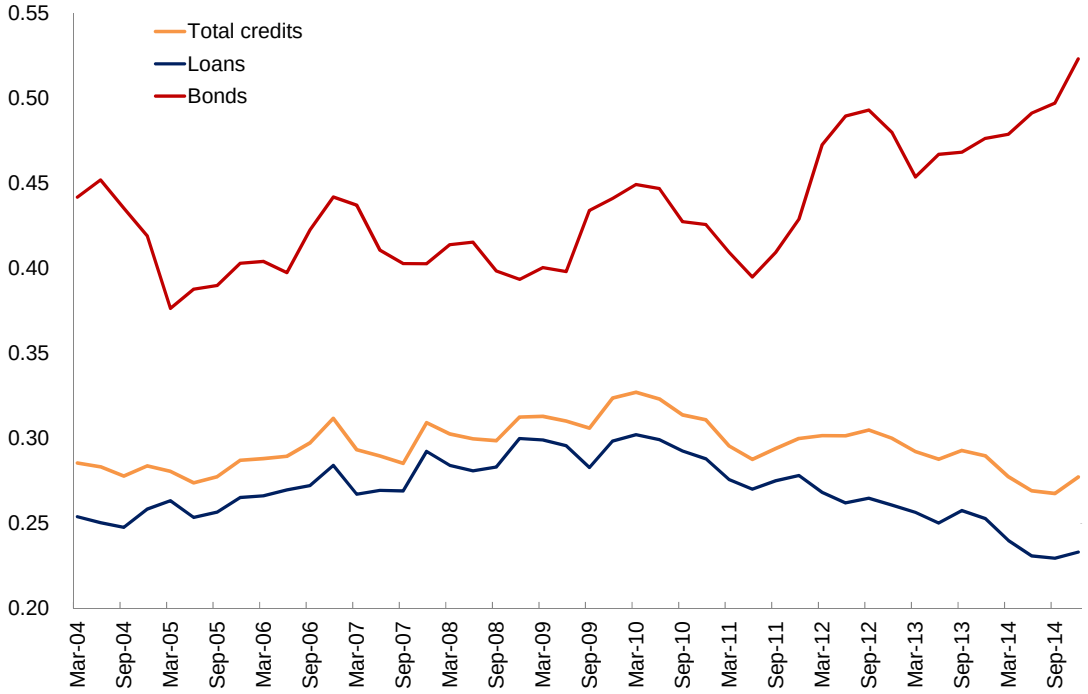


Source: IMF, *Regional Economic Outlook*.

perspective of an investor investing solely in Hong Kong corporate bonds, the risk is certainly higher. However, as bond investors tend to be highly international in terms of their portfolio holdings, the risk can be diversified away by investing in bonds from other economies. Meanwhile, from the perspective of the banking sector, as property developers shifted to the bond market for financing, banks were able to release funds for lending to corporations in other sectors. Indeed, bank loans to various industries, other than information technology and building, construction and property development, have accelerated since the global financial crisis (Graph 11). As a result, the HHI for bank loans has come down significantly (Graph 10). Given that loans to corporations account for a significant share of total domestic lending in Hong Kong, the banking sector is now subject to a smaller concentration risk. From the macro angle, the HHI for total corporate credit, ie bond financing and bank financing combined, has also trended lower from 2010 onwards.

The HHI for outstanding corporate bonds, bank loans and total credits to non-financial corporations in Hong Kong

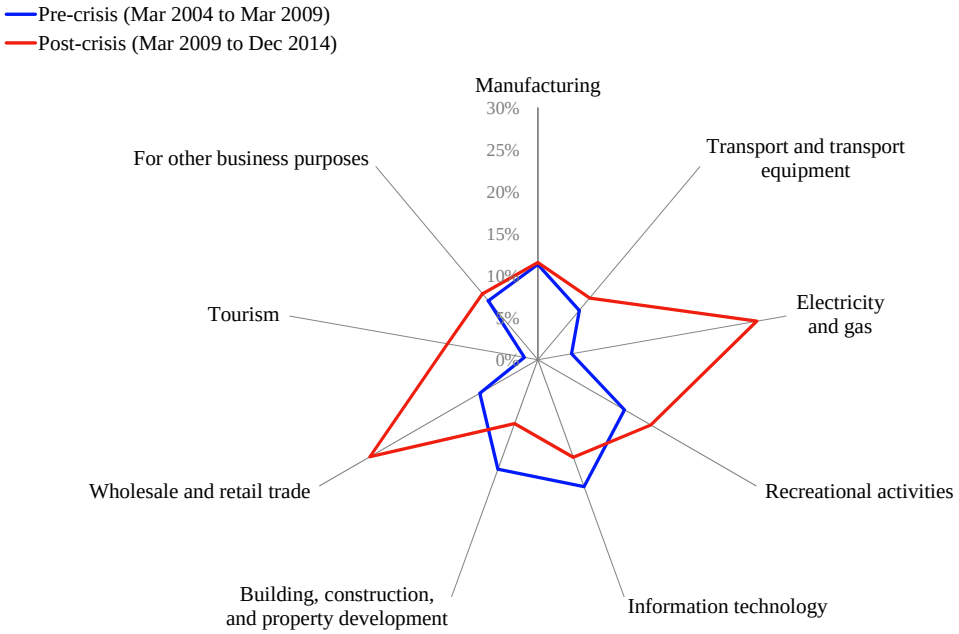
Graph 10



Sources: *HKMA Monthly Statistical Bulletin* and HKMA staff calculations; Dealogic.

Annual loan growth by industry

Graph 11



Source: HKMA Monthly Statistical Bulletin.

5. Conclusion

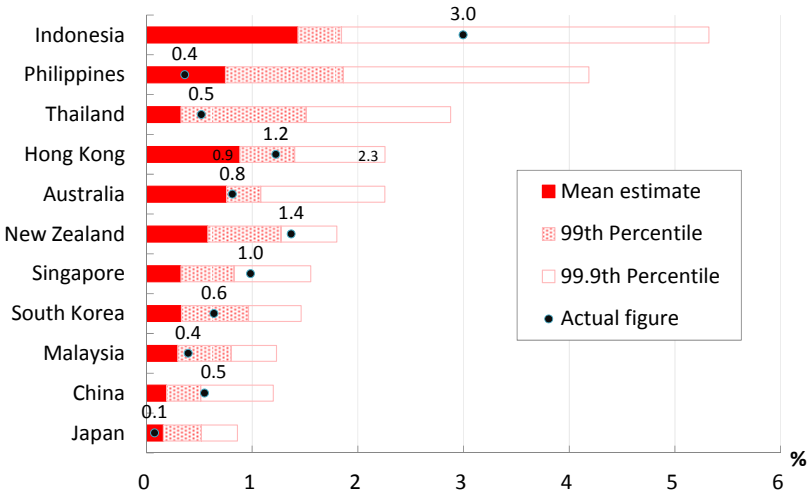
In summary, the rise of the corporate bond market has mixed implications for policymakers. On the one hand, the availability of an additional financing channel, over the long term, reduces the traditional over-reliance on bank lending and enables corporations to further diversify their funding sources. However, the challenge is that the rapid growth of the market has added fuel to the rise in total credit growth in an extraordinary monetary environment, which is often a precursor to financial crisis. While key indicators suggest that the financial burden of the debt is now distributed more evenly and bank credit (as well as overall credit) to the corporate sector has become more diversified, the potential risks associated with the increased leverage can never be downplayed. Particularly, the corporate sector is expected to face a higher interest burden in view of the eventual normalisation of interest rates by the US Federal Reserve, a process that is widely expected to begin in the coming months. Therefore, any impact of such changes in market conditions on corporate leverage merits close monitoring.

Annex: How might sovereign bond yields in Asia-Pacific react to US monetary normalisation under turbulent market conditions?[10]

The HKMA has conducted a study on the potential impact of US monetary normalisation on the sovereign bond yields of 11 Asia-Pacific economies.[11] The study employs a quantile vector autoregressive model with principal component analysis in the assessment of the tail risk of sovereign debt in the region, which may not be detectable using traditional OLS-based analysis. The model is used to compute short-run changes in the sovereign bond yield of each of the economies based on the scenario seen between May and September 2013 during which the increase in the 10-year US Treasury yield was 94 basis points. Different quantiles can be considered as representing different levels of market distress: the higher the quantile, the greater is the distress.

Graph A1 shows the short-run response in the sovereign bond yields in Asia-Pacific estimated at the mean and various quantiles along with their corresponding actual increases, with the economies ranked according to the size of their response at the 95th percentile.

Estimated short-run changes in local sovereign bond yields based on the scenario seen between May 2013 and September 2013 * Graph A1



* During this period the US Treasury bond yield rose by 94 bps.

Source: HKMA staff calculation

Two salient points of the findings are noteworthy. First of all, it is apparent that the actual increases registered in the episode are mostly greater than the mean

[10] For details, see HKMA (2014).

[11] The economies are Australia, China, Hong Kong SAR, Indonesia, Japan, Malaysia, New Zealand, the Philippines, Singapore, Korea and Thailand.

estimates. This reflects the knee-jerk reaction of international investors in running for the exit in response to the news of tapering, given that these economies had received significant capital inflows after several rounds of quantitative easing by the US Federal Reserve. Second, by comparing the actual increases and the estimates at the various quantiles, the findings highlight the importance of assessing the potential tail risk. The estimates at the 90th and 95th percentiles are many times larger than the actual increases or mean estimates, suggesting that the volatility and turbulence of financial markets in times of extreme adversity can be even more disruptive than imagined.

In sum, the empirical evidence supports that the US Treasury bond yield can have a significant influence on sovereign bond yields in Asia-Pacific, one of many channels by which US monetary normalisation could affect the region's economies. This would be especially the case if the process should turn out to be more disorderly than expected.

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Interaction between monetary and macroprudential policies in practice – a Hungarian example

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Abstract

As the financial crisis showed, price stability in itself cannot ensure macroeconomic stability and financial stability issues cannot be separated from monetary policy considerations. This paper presents the changes in the relationship between monetary policy and financial stability in Hungary following the outbreak of the financial crisis and its consequences. An important source of the Hungarian economy's vulnerability was the mismatching of maturities and foreign currency positions, arising primarily from foreign currency lending. We describe how a liquidity-based macroprudential instrument (the Foreign Exchange Funding Adequacy Ratio or FFAR) has been used to reduce these risks, thereby strengthening domestic financial resilience. We conclude that the improving maturity structure of foreign funds is expected to mitigate risks arising from the drying up of foreign liquidity and the consequent intensification of exchange rate volatility. As regards the relation between the Hungarian monetary and macroprudential policy, it can be stated that this regulation may provide more room for manoeuvre for monetary policy to focus on its primary objective, namely price stability. At the same time it should be borne in mind that upon the occurrence of certain financial stability risks, falling beyond the MNB's macroprudential competence, monetary policy may still need to react to financial conditions and contribute to the achievement of the financial stability.

Keywords: macroprudential policy, monetary policy, financial stability, policy coordination, foreign currency lending, foreign exchange liquidity mismatch

JEL classification: E58, E61, G28, F34

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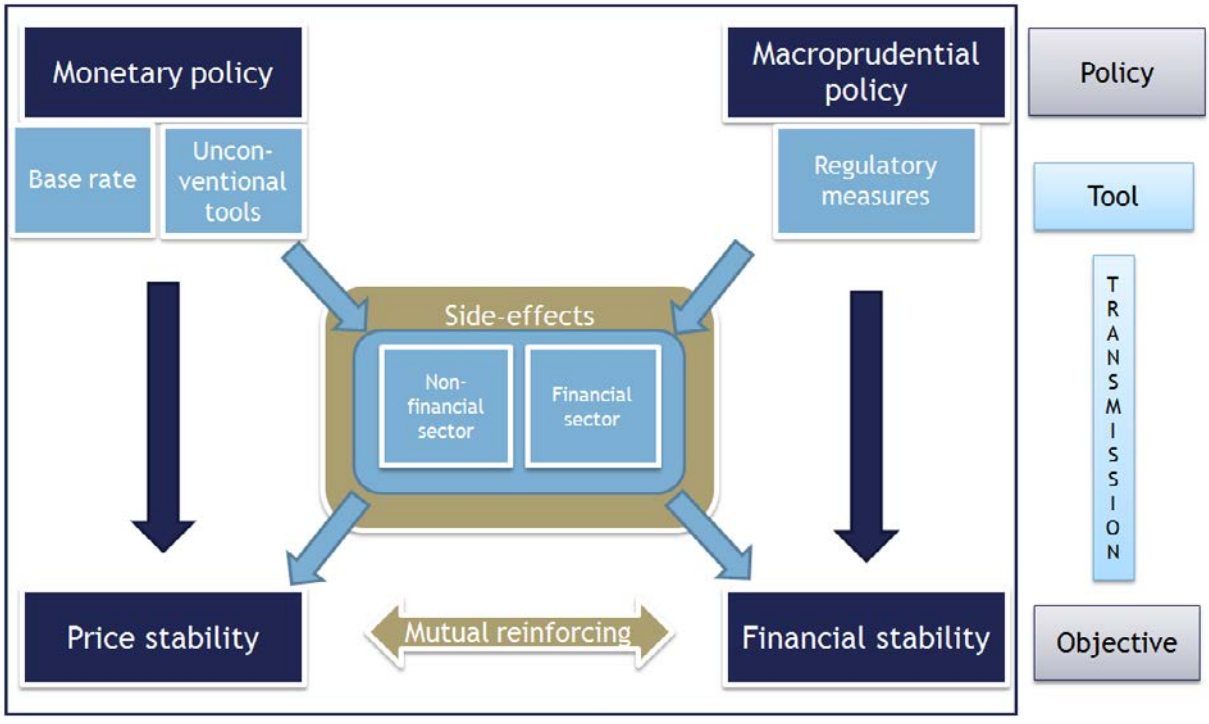
1. Introduction: Link between monetary and macroprudential policies – the new policy framework

Pre-crisis, the primary objective for Hungary's monetary policy was price stability. This strategy was supported both by the academic consensus and the policymakers, which created a relatively stable macroeconomic environment during the period of Great Moderation, and appeared to be the most capable of stabilising the economy and the financial system. However, the financial crisis highlighted the fact that the price stability alone cannot ensure macroeconomic stability, given that financial imbalances built up under a low inflationary and stable economic environment. Although the relationship between monetary policy and financial stability is still debated (see eg the classification by Smets (2013)), in the light of the experiences of the crisis the opinion that monetary policy and financial stability issues cannot be separated is now increasingly widespread (Billi-Vredin (2014)), as is the view that financial stability must be taken into account as an additional goal during the creation of macroeconomic stability. (IMF (2013a)). In this spirit, an increasing number of policymakers and economists emphasise that financial stability is an important part of monetary policy.[2] On the other hand, the management of financial stability problems is the primary responsibility of macroprudential policy rather than of monetary policy.

Objectives and interactions of monetary policy and macroprudential policy

Graph 1



Source: based on Lautenschläger (2014).

[2] Dudley (2013), Yellen (2014).

Parallel with the development of the macroprudential framework there is an increased focus on the link between macroprudential and monetary policies. According to the post-crisis consensus, price stability has remained the primary objective of monetary policy, while financial stability continues to be the primary objective of macroprudential policy. On the other hand, unintended impacts on the goal of the other policy do arise in the course of formulating both policies (see Graph 1); these interactions may improve or reduce the efficiency of the individual policies in the course of achieving their objectives, which necessitates coordination between the two policy areas (IMF (2013a)). In accordance with this, Shakir and Tong (2014) also emphasise that the interaction of these transmission channels is rather complex; still, the various policies must take account of the primary goals and probable effects of the other policy.

The purpose of this paper is to examine the relationship between monetary and financial stability in the light of experience with a special Hungarian macroprudential tool, the Foreign Exchange Funding Adequacy Ratio (FFAR). Section 2 of the paper outlines how the interrelation between monetary policy and financial stability has changed in Hungary since the outbreak of the financial crisis. Section 3 describes the interactions and transmission channels through which the individual policies may impact the goals of the other policy; in this connection, it also discusses the cases when monetary policy may need to consider financial stability issues. In this light, Section 4 describes the background for the FFAR's introduction, the adjustment triggered by the regulation and its economic policy consequences. The last section summarises the experience gained so far, also commenting on how the FFAR's revision can influences the room for manoeuvre of monetary policy.

2. Development of the MNB's relationship to the macroprudential policy in Hungary

2.1 Monetary policy and financial stability before and after the outbreak of the crisis

Before the crisis, Magyar Nemzeti Bank (MNB) took the same view as the international consensus, according to which monetary policy did not need to react to financial stability risks and could simply concentrate on the management of the problems arising after any bubble burst. ("do not lean, just clean" or "mop up" strategy).Thus, even though the MNB identified signs that certain threats to financial stability (eg foreign currency lending) were accumulating, it had neither the authority nor the tools to prevent the build-up of these imbalances. The financial crisis has considerably modified the domestic monetary policy strategy. Post-crisis, the MNB has faced a dilemma: while the real economy and the inflation outlooks pointed to the direction monetary policy easing, the resultant weakening of the exchange rate would have jeopardised financial stability to an extent that monetary policy would not be able to ignore.[3]

[3] In this extraordinary situation, the central bank had to increase the base rate by 300 basis points at the end of 2008 in order to preserve the stability of the financial intermediary system and to curb capital outflows.

This was attributable, on the one hand, to the fact that pre-crisis years households had accumulated significant foreign currency debts, but the associated financial stability risks became obvious only after the outbreak of the crisis. Then, in the stressed financial environment characterised by liquidity shortage, the further depreciation of the exchange rate, coupled with base rate cut, would have had an unfavourable impact on the households with foreign currency loans and – through the increased risk of default – on the banking sector and financial stability. Meanwhile, high outstanding external debt and public debt, significantly increased the vulnerability of the Hungarian economy.

Following the outbreak of the crisis, these vulnerability risks materialised, with a significant impact on the banking system. The banks showed significant vulnerability on both the assets and the liabilities side, primarily due to the unsecured foreign currency loans extended to the households. On the liabilities side, due to the increased risk aversion of international investors, the required foreign currency liquidity could be acquired from the money market only at a higher cost and on shorter maturities than before. At the same time, the assets side was hit by the weakening of the forint exchange rate, as loan repayment instalments, expressed in forints, increased dramatically, leading to an unexpected surge in credit risk and to the escalation of solvency risks at a systemic level (see Section 4).

2.2 Evolution of the Hungarian macroprudential institutional system

Both the international and the domestic experiences related to the financial crisis showed that more stringent regulation and oversight were required to prevent the build-up of the financial imbalances and to mitigate their consequences.[4] In order to manage the systemic risks properly a number of European countries have revised their oversight structure in the wake of the European Systemic Risk Board's recommendations. A number of different solutions were applied: in countries where the microprudential authority was integrated into the central bank, it was typically the central bank that took responsibility for macroprudential policymaking (eg Belgium, the Czech Republic, Ireland and the United Kingdom). In a number of cases an inter-institutional financial stability committee was set up, with representatives delegated by the supervisory authority, the government and the central bank (eg France, Sweden). In the third version, connections between the individual authorities were strengthened without changing the institutional structure (eg Norway, Switzerland) (Nier at al (2011)). The few existing empirical studies[5] that have analysed the efficiency of the different solutions find the first configuration to be the most suitable and it is also clear that, on the broader international horizon, more countries have opted for this solution.

In accordance with the European processes, Hungary also strengthened its supervisory framework in late 2013. The microprudential supervisory authority (HFSA) was closed and its duties transferred to the MNB, so that the central bank, reinforced with supervisory functions, became the authority responsible for the stability of the financial system as a whole and for the safer operation of individual financial institutions.

[4] On the importance of oversight based on a macroprudential foundation, see eg Weidmann (2011).

[5] Eg Goodhart and Schoenmark (1995), Merrouche and Nier (2010).

Additionally, the Hungarian central bank was vested with macroprudential powers that are far-reaching by international standards. Its new responsibilities included the formulation of macroprudential policy in a framework that is designed to contribute to the resilience of the financial system while supporting economic growth (Fáykiss and Szombati (2014)) The central bank was also vested with a number of new regulatory tools, covering four areas: limiting excessive credit outflows, the mitigation of risks stemming from procyclical banking system behaviour, the management of structural risks and the mitigation of systemic liquidity risks.[6] The integration of the supervisory functions in the central bank also contributes to considering the interaction between monetary policy and macroprudential policy upon decision making[7]. Nevertheless, the MNB's key objective is still to achievemaintain price stability, and financial stability must be supported without jeopardising this objective.[8]

The MNB's new decision-making regime has been also formulated in accordance with these objectives. The Monetary Council remains the primary decision-making body, being responsible first of all for monetary policy by setting the base rate; the other decision-making body is the Financial Stability Council, which is responsible for macro- and microprudential supervisory issues, resolution tools and the reorganisation. On the other hand, the priority of the price stability objective is ensured by the facts that the Financial Stability Council operates within the strategic framework determined by the Monetary Council, and that the two decision-making bodies have a number of members in common.[9]

3. Importance of the coordination between monetary and macroprudential policies

3.1 The primary monetary policy instrument , i.e. the channels of transmission between the base rate and financial stability

The primary monetary policy instrument, ie the base rate, influences financial stability through a number of channels on which research is still under way (IMF (2012)). Below, we outline the most frequently identified channels that are deemed to be the most relevant to Hungary's case.

[6] On the elements of the available tools, see Fáykiss and Szombati (2013). Harmonisation with EU legislation was completed by Act CCXXXVII of 2013, and the details of the tool's introduction are now being elaborated.

[7] It should be noted that the body responsible for the prevailing financial regulation – in the case of Hungary the Ministry of National Economy (NGM) – is also involved in the development of the national macroprudential policy. Coordination with the ministry is supported by inviting a high-ranking NGM official to discussions of macroprudential relevance on the Financial Stability Council's agenda.

[8] The Central Bank Act states that "The primary objective of the MNB is to achieve and maintain price stability. Without prejudice to its primary objective, the MNB shall support the maintenance of the stability of the financial intermediary system and the increase of its resilience, the sustainable contribution thereof to the economic growth, as well as the economic policy of the Government using the instruments at its disposal."

[9] The Monetary Council is a body comprising of a minimum five and a maximum of nine members, while the Financial Stability Council has at least three and a maximum of 10 members. At present the common members of the two bodies are the Governor of the MNB and the three Vice-Presidents.

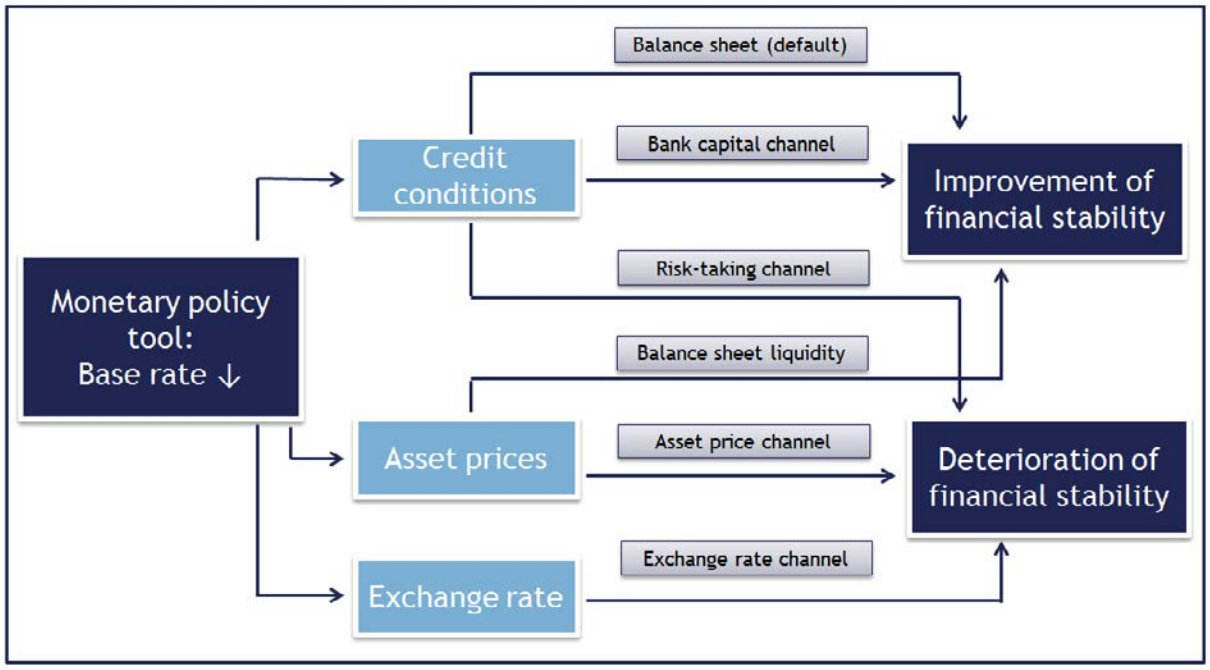
- **Balance sheet or default channel.**[10] Monetary policy influences lending conditions by decreasing the base rate, reducing the interest burden of debtors with variable interest rate loans, thereby reducing the probability of default and improving their willingness to repay the loan, ie it has a positive impact on financial stability. (Allen and Gale (2000); Illing (2007); Goodhart et al (2009)).
- **Bank capital channel.**[11] In this channel, a reduced interest rate increases the spread between the deposit and the loan interest rates, as the change in the base rate typically has a greater influence on the interest rates applied to (shorter-term) deposits than on that of (longer-term) loans.[12] As a result, the spread increases, the yield curve steepens, thereby improving bank profitability and reducing financial stability risks (BoE (2013)).
- **Risk-taking channel.** Lower interest rates encourage banks to expand their balance sheets and debts, as well as to ease credit conditions for borrowers (Borio and Zhu (2008)). Additionally, the low interest rate environment may change investor risk perceptions, so that they are encouraged to take on more risk in the search for higher yields. Hence, monetary easing may increase financial stability risks through the risk-taking channel.
- **Balance sheet liquidity channel.** Lower interest rates increase – through the asset price channel of monetary policy – the value of securities acceptable as collateral, which eases access to liquidity for banks and improves external financing opportunities. As a result, the increased lending capacity, profitability and resilience of banks have a positive impact on financial stability (BoE (2013)).
- **Asset price channel.** Higher asset prices, due to low interest rates through the financial accelerator impact – may encourage economic agents to increase their indebtedness, which may lead a continued rise in asset prices, thereby intensifying the financial cycle, which may eventually lead to a bubble. (Bernanke and Gertler (1989)). In this channel, monetary easing may increase financial stability risks.
- **Exchange rate channel.** In a small open economy, the monetary policy stance has an impact on the exchange rate and capital flows. In this case, a rate increase may cause the exchange rate to strengthen and increase capital inflows, leading to a credit expansion, and possibly to increased foreign currency lending. All these factors may generate an overheated economy and increase financial stability risks. Reducing interest rates, on the other hand, could cause depreciation of the exchange rate to fall, posing financial stability risks in the case of significant FX exposure in the economy.

[10] BoE (2013) defines this channel, or similar mechanisms, as the demand channel.

[11] IMF (2013a) refers to this channel as the risk-shifting channel.

[12] On the other hand, it should be also noted that when the base rate is close to the zero lower bound, deposit rates cannot be reduced any further. Thus, the spread increase resulting from the interest rate cut may stop or even shrink (endowment effect).

Interactions between monetary policy and the financial stability Graph 2



Source: MNB.

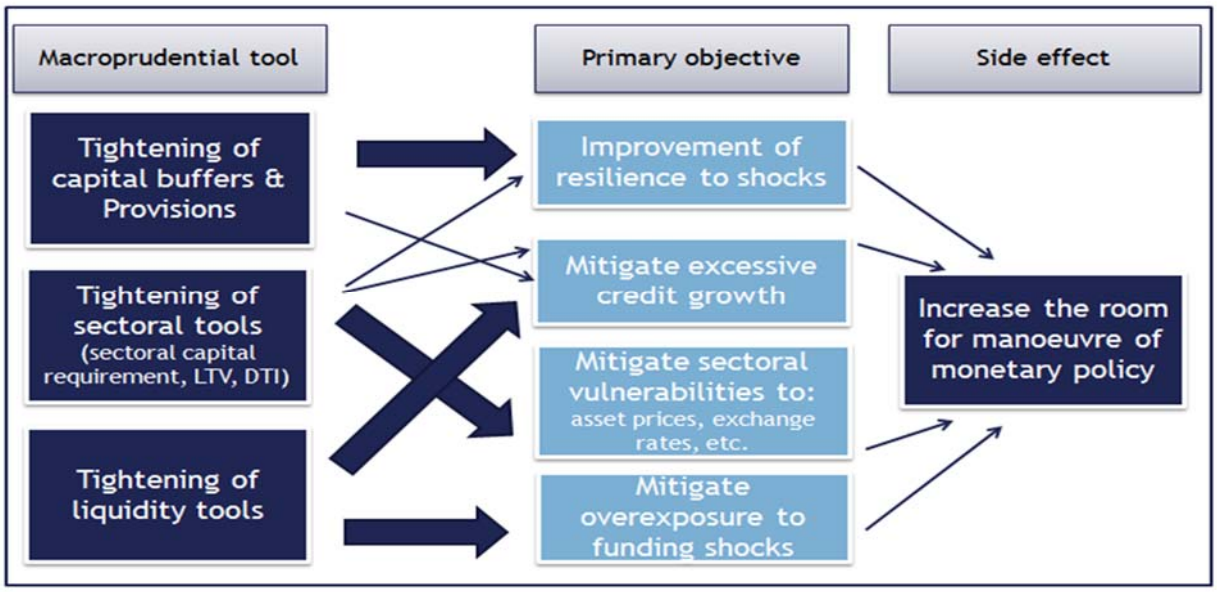
It is clear from the above that a reduction in the base rate improves financial stability through certain channels, while other channels may impact it negatively (see Graph 2). The strength of the individual channels depends on a number of factors such as the state of the financial cycle, the financial structure or the openness of the economy.

3.2 Channels of transmission between macroprudential tools and price stability

In this section, we describe the primary financial stability objective of the most important Hungarian macroprudential instruments, and the way they may indirectly affect the inflationary and real economic processes, such as room for manoeuvre in monetary policy. In this connection, Graph 3 presents the financial stability risks mitigated by the tightening of certain tools, and the way they may thereby create additional room for manoeuvre in monetary policy.

Purpose of macroprudential tools and their impact on the room for monetary policy manoeuvre

Graph 3



Source: Based on IMF, (2013c).

The primary objective when **tightening capital buffers** is to increase the resilience of the banking system. In practice, the tightening of the capital buffer in run-up periods may reduce lending and economic activity via the tightening of lending conditions. However, experience shows that this impact is limited. On the other hand, the effect may be more significant in less favourable periods, when the previously accumulated capital buffers help to maintain the credit supply at its former level – or at least mitigate its decline. Accordingly, when tighter lending conditions have a negative impact on the economic activity during a downturn, sufficient capital buffers may support the effectiveness of an expansionary monetary policy and help policymakers to avoid hitting the ZLB. (IMF (2012),

The purpose of **tools for preventing excessive credit** build-ups (eg loan-to-value (LTV), debt-to-income (DTI), payment-to-income limits (PTI)) is to moderate the financial accelerator effect during the recovery, as well as the probability of overheated lending dynamics and property prices, and excessive household indebtedness. By reducing aggregate demand, these tools also have implications for monetary policy. Thus, while the LTV and DTI regulations reduce the impact of the financial accelerator during the recovery, they also allow monetary policy to be loosened. Additionally, the application of the LTV and DTI regulations after the outbreak of a financial crisis reduces lending and real economy losses by mitigating the impact of the financial shocks on domestic investments and consumer spending. On the other hand, the relatively moderate downturn reduces the need to loosen monetary policy unduly and thus makes it less likely that the zero lower bound will be reached (IMF (2012),

Liquidity ratio requirements become relevant, because banks – particularly in small open economies – finance their loans typically from short-term funds, often

denominated in foreign currency, which generates maturity and currency mismatches in bank balance sheets.[13] Thus, liquidity ratio requirements can be applied to mitigate risks related to excessive dependence on short-term funding. Such restrictions can reduce not only the maturity and currency mismatches, but also credit growth in general (IMF 2013d)). This tool may affect monetary policy through several factors, particularly by reducing the exchange rate volatility generated by a financial shock. This may reduce the relevance of the financial stability considerations and increase the focus on price stability for monetary policy of a small, open economy. (IMF (2012)).

3.3 Changed relation of monetary and macroprudential policies

As noted in Subsection 3.1, when focusing on its primary objective, ie on price stability, monetary policy may have both a positive and a negative impact on financial stability. If the negative side effects prove to be stronger, the resulting financial instability can endanger the entire economy, including price stability. In this case, properly selected macroprudential tools, applied ex ante, may be able to mitigate these risks, which may give additional room for manoeuvre for monetary policy (IMF (2013a)).

Looking at this from the other side, the active macroprudential policy mitigates the financial stability risks, and a number of analyses pointed out that the macroprudential tools may be efficient in the identification and management of certain sectoral or even systemic risks. Thus, a properly designed macroprudential framework and toolset may make it possible – in addition to fulfilling its primary objective, ie the maintenance of financial stability –for monetary policy to focus on its primary objective, ie price stability (IMF (2012)). At the same time, risks that cannot be managed by macroprudential tools may also arise, or there could be cases when macroprudential tools prove to be ineffective in stopping the build-up of an imbalance. If so,[14] monetary policy may also need to take into account the prevailing financial conditions.

Additionally, the financial crisis also drew the attention to the fact that, in addition to the business cycle, financial cycles should also be taken into account when integrating macroeconomic stability goals into the formulation of monetary policy. Whether monetary and macroprudential policy help or hinder each other in efforts to achieve price stability or financial stability objectives depends on the interrelationship between the business and financial cycles.[15] The analysis of the

[13] As a result of this some countries (eg Korea, New Zealand) applied macroprudential measures to mitigate these risks, and the Basel Committee on Banking Supervision also introduced similar tools (eg the NFSR).

[14] There are certain factors that may limit the effectiveness of macroprudential policy. One of these is when it is difficult to identify the financial imbalances, and hence to ascertain what type of tools should be developed, or to make a decision on whether it is time for tightening or easing. A further challenge, for the calibration of such tools, is that we have limited knowledge of their quantitative impact, which could lead – at least initially – to policy errors (IMF (2013b)). So-called regulatory arbitrage represents a further risk, according to which the stricter a regulation is, the stronger the incentive will be to find alternative solutions (eg via the shadow banking system) (Borio (2014a)). In addition political economy constraints may work against the application of appropriate macroprudential tools.

[15] Although there is still no consensus on the definition of financial cycle, it is agreed that it has a number of features that monetary policy cannot afford to ignore (see BIS (2014, Chapter IV)).

simultaneous development of the two cycles is important, because it was proved that an economic policy that ignores the financial cycles has a price: namely the build-up of financial imbalances, the debt overhang of the enterprises and the households or the overleveraged financial system may lead to the substantial deterioration of the macroeconomic and financial conditions. The phenomenon of an "unfinished recession" highlights the fact that a monetary policy which fails to take into account the medium-term financial cycle, and thus supports the further leveraging of the economy in boom times, may avoid a recession in the short run, but it runs the risk of generating an even deeper recession after the bubble bursts (Drehmann et al (2012)).

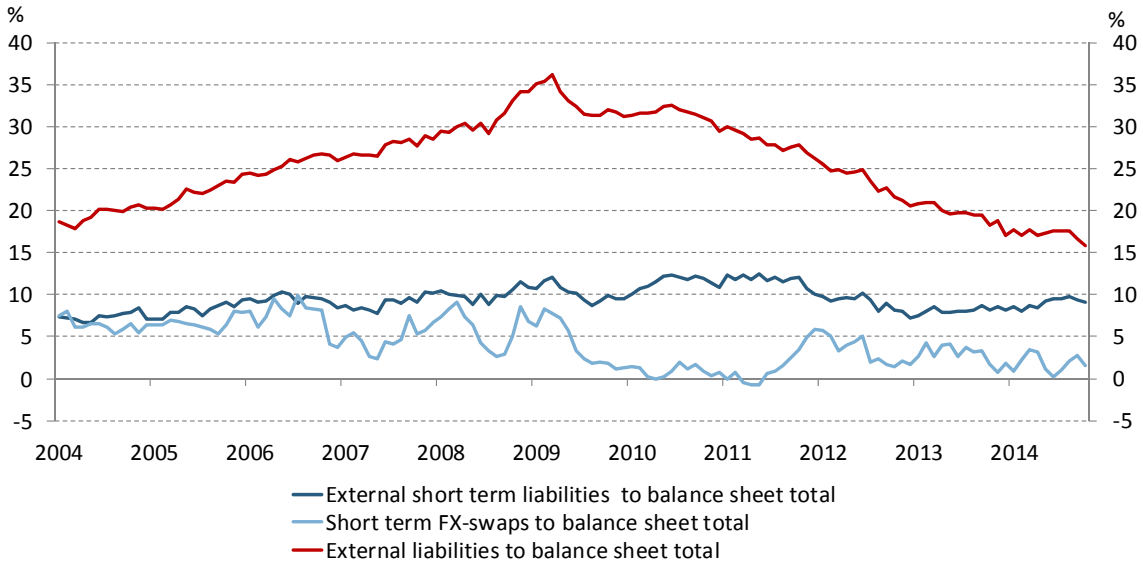
Taken together, it can be stated that the two policies in most cases support or supplement each other, and that there is only a relatively small probability that situations may arise where the objectives of the two policies expressly conflict with each other. Even in the case of coordinated and effective interventions, it may happen that monetary policy needs to react to the financial conditions and play a part in achieving the financial stability ("Last line of defence" theory; IMF (2013b); Carney (2014); Yellen (2014).

4. A specific national tool: the foreign exchange funding adequacy ratio

4.1 Factors underlying the implementation of the FFAR regulation

By 2007, significant liquidity risks had built up in the Hungarian banking system. One of the more acute problems was the growing maturity mismatch in bank balance sheets. Long-term assets were dominant, with those of one- to five-year maturity and of over five-year maturity accounting for 25% and 30%, respectively. The ratio of short-term loans (maturity up to one year) had fallen by about 15 percentage points compared with 2002. At the same time, the Hungarian banking system was increasingly dependent on external liabilities (see Graph 4) – the ratio of external liabilities within the balance sheet increased to some 30–35% on the eve of the crisis, from 20% in 2004. Of this, a major part, ie about 30–40%, was short-term. Adding to a dangerously large external financing requirement, the high degree of maturity mismatching resulted in a significant vulnerability.

External debt of the Hungarian banking system (2004–14) Graph 4



Source: MNB

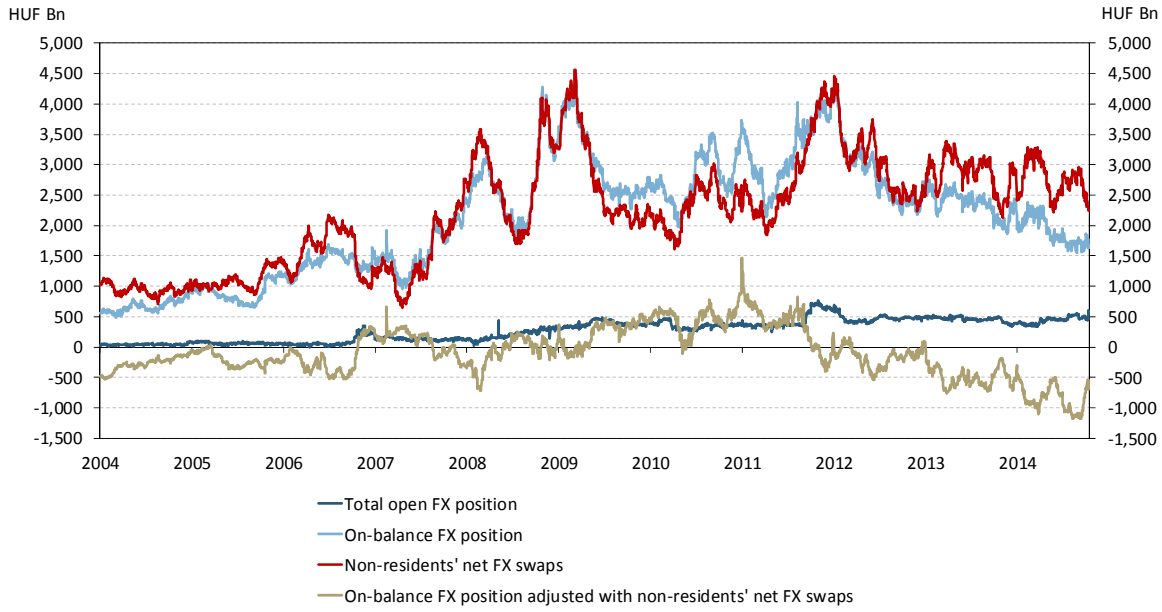
The maturity mismatch within the banks' foreign currency position also contributed considerably to this vulnerability. By the end of 2008, soaring foreign currency lending lifted the ratio of household foreign currency loans within outstanding borrowing to almost 80%.[16] The banks – despite the increasing role of short-term external resources – financed the larger part of their foreign currency lending from forint funds, using foreign exchange swap transactions to close the resulting foreign currency positions on their balance sheets (see Graph 5). Domestic credit institutions therefore became increasingly dependent on the foreign exchange swap market[17] (Mák and Páles (2010)). Banks were exposed to a number of liquidity risk factors (eg margin call impact, rollover risk due to the shortening of the maturity), given that the average residual maturity of the gross outstanding swap contracts between 2005 and 2007 amounted to a mere six months.[18]

[16] The foreign exchange liberalisation entered into force in Hungary in 2001.

[17] The development of the scheme was supported by several factors, eg the banks could manage open positions by using their forint liquidity and due to the increasing borrowing requirement of the Hungarian government, the demand side of the FX swap market was expanded.

[18] For more details, see Páles, Kuti and Csávás (2011)).

Open foreign currency position of the Hungarian banking system (2004–14) Graph 5



Source: MNB.

These external liabilities have represented an outstanding systemic risk in the Hungarian banking system for years. MNB issued several warnings[19] to the effect that the continuous and significant foreign currency fund and rollover requirements on the foreign currency loan portfolio, coupled with excessive maturity mismatch and the related liquidity risks, could become drastically more difficult to satisfy with any withdrawal of funding from the parent banks or the international money markets. However, prior to October 2013, the central bank had no mandate to intervene. Indeed, state intervention against the potential risks inherent in Hungarian financing practices did not appear on the agenda until liquidity abruptly dried up after the onset of the crisis.

In 2010–11, as the European sovereign debt crisis set in, investors' risk appetite once again declined, and Western European parent banks were forced to cut back on funding for their eastern European subsidiaries. The withdrawal of funds from the Hungarian banking system was more intense than in the region as a whole. However, foreign currency-denominated assets could not be cut back as quickly as the funding, and thus the banking system continued to rely heavily on external liabilities. The prevailing maturity and liquidity risks can be gauged from the fact that since the long-term funds became expensive compared to the short-term funds, the ratio of the liabilities with residual maturity of less than 12 months to total foreign liabilities rose to almost 56% by the end of 2010, from 49% at the start of the year (MNB (2010); MNB (2011)).

The impact of the European crisis was also felt in the foreign exchange swap market, where interest margins started to rise from mid-2010 as increasing funding

[19] See eg Balás and Móré (2007).

costs forced banks to switch to shorter-maturity swaps.[20] Within the total portfolio, the ratio of foreign exchange swaps maturing within one year fluctuated at around 50–60% in 2010–11 at the banking system level. Meanwhile, the average residual maturity of the accumulated outstanding swap contracts has tended to converge with the average maturity of the direct foreign currency liabilities, although, at 1.5 to 2 years, it has typically remained shorter than that of the direct liabilities. The value of the net foreign exchange swap portfolio started to rise once again from mid-2010 and continued to do so up to January 2012 (MNB (2010); MNB (2011)). Such a high swap exposure in the Hungarian banking system has not been typical since the stress period that followed the bankruptcy of Lehman, and looking ahead the further growth thereof could be expected.

Despite the experience of the crisis, domestic banks failed to adjust their maturity mismatches to the extent that systemic risk considerations would have suggested. One possible reason was that the credit institutions hoped for a bailout by the central bank in its lender of last resort role. From the outbreak of the crisis, the MNB sought to fend off disruptions to the swap market, with its enormous importance for the Hungarian banking system, and to supply credit institutions with foreign currency. The resulting increase in its foreign exchange reserve holding requirement generated severe costs for the central bank. In effect, the MNB's foreign exchange swap instruments,[21] which had been in place since the end of 2008, represented a financial safety net for the Hungarian banks could avail themselves of upon the exhaustion of the market opportunities or extreme rise in prices. But this foreign currency supply activity had to be designed in a way that did not jeopardise the central bank's foreign exchange reserve requirements. In the light of the foregoing the recurring systemic risk signals indicated that a preventive financial stability instrument was urgently needed.

4.2 Overview of the FFAR regulation

Although with its measures MNB was able to manage the liquidity risks arising from the currency and maturity mismatch to some extent. The condition of the Hungarian banking system after the second phase of the crisis necessitated a targeted intervention. On the MNB's initiative, the government intervened at a macroprudential level in 2011, since at that time the MNB did not yet have the required authority. By Government Decree 366/2011, restrictions were placed on the maturity matching of credit institutions' foreign currency positions. The Foreign Exchange Funding Ratio (FFAR) introduced by the decree entered into force in July

[20] The shortening was triggered, on the one hand, by the deteriorating national profitability. In addition to the permanently higher premium of the long-term swap financing compared to that of the short one, the higher premiums of the direct longer-term liabilities after the crisis also contributed to the process. Additionally, the shortening of maturities could be also attributed to the fact that the foreign parent banks of the domestic subsidiaries, playing a key role in the Hungarian banking system, substituted the withdrawal of the direct liabilities by mediating swap financing to their subsidiaries with maturities shorter than the average of the period.

[21] According to international experience, the relationship between the central bank's swap lines and its foreign exchange reserves is strong, ie in the case of the emerging countries, swap lines act only as a limited substitute for the proper amount of reserves (see Auer and Kraenzlin (2009), Obstfeld et al (2009), Aizenman et al (2010), Landau (2013)). ECB, as the partner of MNB, makes a considerable contribution with its support provided for the generation of the required funds; the borrowing facility in the form of repo operations provided euro liquidity up to a limit of EUR 5 billion.

2012. The basic concept of the FFAR is similar to that of the Net Stable Funding Ratio or NSFR proposed by the BCBS, although in detail it is a considerably different regulatory instrument with a structure set up for the specific purpose of mitigating institutional and systemic liquidity risks. The FFAR is calculated as the quotient of the weighted sum of the stable foreign currency liabilities and the weighted sum of the banks' long-term foreign currency-denominated assets. The regulation specifies that the ratio calculated for each individual credit institution must equal or exceed 0.65 at all times. Through FFAR the regulator has set the mitigation of the individual and systemic liquidity risks and the decrease of the national economy's vulnerability as primary objectives.[22]

The method of calculation is as follows:

$$FFAR = \frac{\text{Available amount of stable foreign currency liabilities } + \text{ stock of long term net FX swap position}}{\text{Required amount of stable foreign currency funding}}$$

4.3 Result of the FFAR regulation

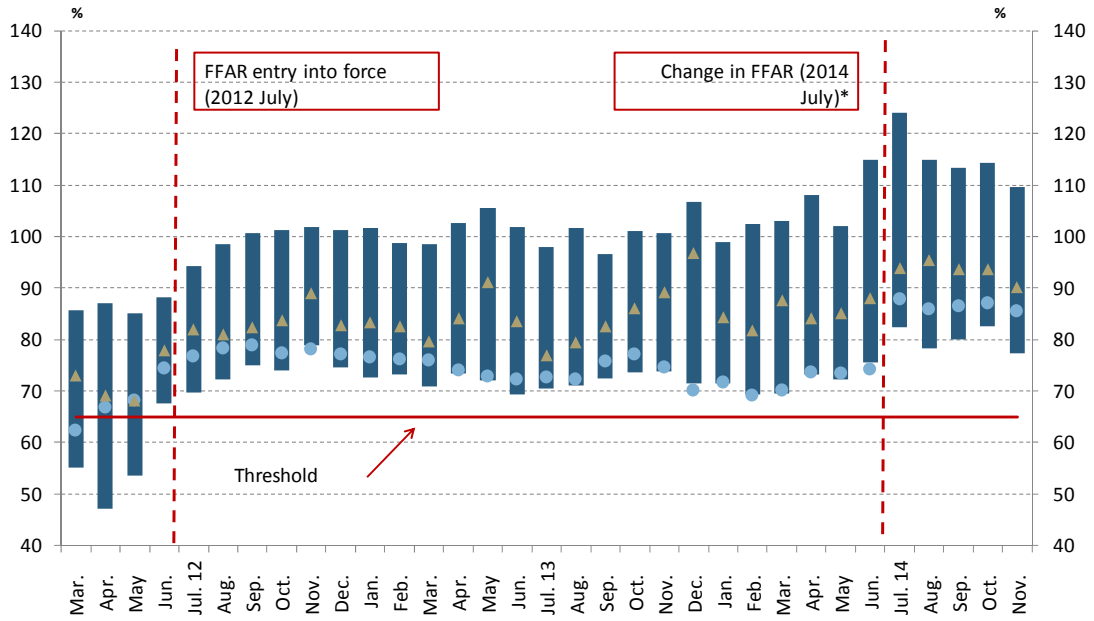
The extreme swap market price fluctuations experienced during 2010–11 have not reoccurred with a similar intensity. Nevertheless, the FFAR regulation has played an important role in the design of the financing maturity structure as the high volumes of foreign currency loan portfolios are slowly phased out.

By July 2012, when the FFAR regulation came into effect, almost all the banks had implemented the required adjustments, resulting in a 10 percentage point improvement in their adequacy within two months (see Graph 6). During this initial adjustment period, the banks took action primarily on the liabilities side. The regulation managed to stabilise the average maturity of the foreign currency liabilities at a higher level, as well as to increase the average maturity of the foreign outstanding swap contracts. The outflow rate of foreign liabilities also decreased by 2013 (but it still remained above the regional average). On the other hand, the withdrawal of funds still slightly exceeded the downsizing rate of the foreign currency assets in 2013, while part of the foreign currency liquidity shortage was funded through a slight increase in foreign exchange swap holdings.

[22] At this time the FFAR could be deemed unique in the international scene; however, based on the Hungarian experience, Iceland also started to develop a similar instrument in 2014.

FFAR of the banking system since its implementation

Graph 6



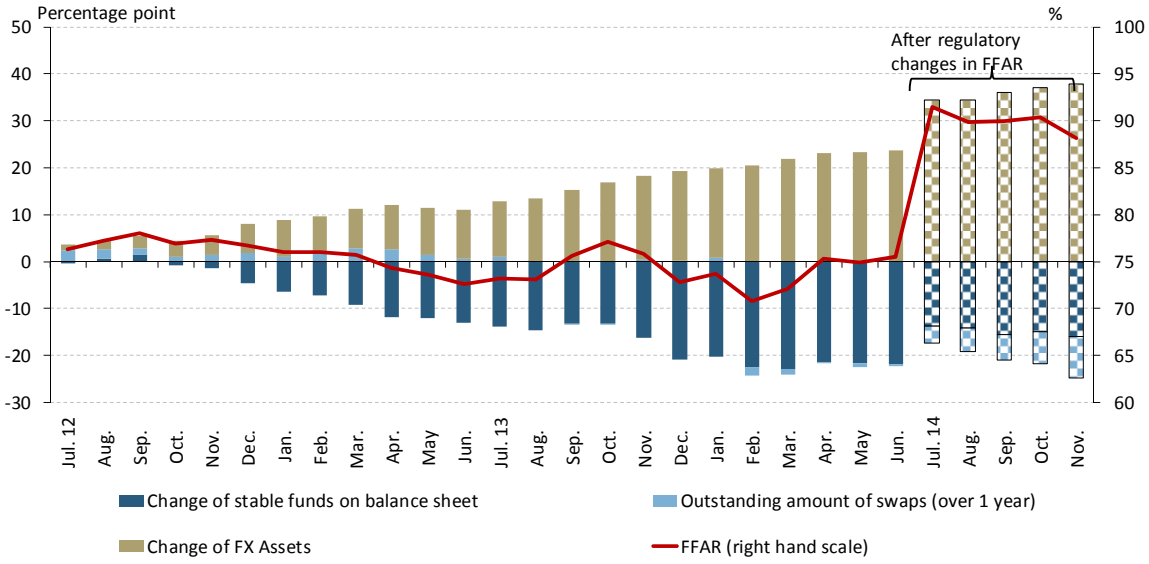
Note: the columns indicate interquartile values (among the banks and branches), the blue dot shows the average of the large banks FFAR, while the yellow diamond shows the median of the FFAR of all participants in the banking system.

* : See the details of the changes of the regulation below, at the end of the section.

Source: MNB.

The two most important components of the individual bank's adjustment patterns included the foreign currency deposits and liabilities with residual maturity of at least one year or longer, fully considered within the large banks' available stable foreign currency liabilities and the net foreign currency swap contracts against forint with residual maturity of over one year. On the assets side, the regulation did not have the effect of restricting corporate foreign currency lending activity at the banking system level. But, between 2010 and 2015, new lending did not significantly increase the household foreign currency loan portfolio owing to various other regulatory limits.

The banking system's foreign exchange funding adequacy ratio Graph 7



Note: The exchange rate- adjusted cumulative monthly difference of the item groups'' values were illustrated at each point of time as a percentage of the value of the stable funds available in June 2012 (for various items of stable funds and swaps at latter specified dates) and of the stock of FX assets requiring stable funding in June 2012 (for FX assets at latter specified dates).

Source: MNB

The FFAR rule proved to be successful in terms of stopping the deterioration of the maturity mismatch, although it could not stop the shortening maturity trend of external liabilities. This is also confirmed by, in addition to the withdrawal of funds resulting from the balance sheet adjustment processes of the foreign groups (while the parent banks take an increasing role in the cheaper mediation of the foreign currency liquidity), the other procedures described above. As a result of the FFAR, therefore, maturity mismatches have materially decreased at the level of several individual banks falling under the regulation, but the regulation was not able to sustain an ongoing improvement in the banking system as a whole after the initial compliance with the restriction on foreign currency position maturity mismatching. As the introduction of the FFAR thus only partially addressed the funding structure and market risk problems, the central bank decided to revise the indicator's content with the aim of instigating an active restructuring of the maturity structure.

In July 2014, the MNB therefore issued a decree calling for a half-yearly 5 percentage point increase in the FFAR.[23] As a first step, the expected minimum level was raised to 75%, with half-yearly increases of 5 percentage points thereafter until the FFAR reaches 100% in 2017. At the same time, the indicator's calculation

[23] From 2013, the MNB was authorised to determine rules related to the foreign currency position and maturity match in order to reduce systemic liquidity risks. The revised rule was issued as the MNB's Decree No 14/2014. (V 19) on the regulation of the credit institutions' foreign currency position maturity match, and on the amendment of the MNB Decree No 43/2013 (XII.29) on the obligations of money and credit market institutions to report data to the central bank.

method was changed in several material points and, as a result of this change, the banking system level value of the indicator significantly improved, from around to 75% to almost 90%. In addition, the FFAR was extended to cover foreign bank branches as well, since they held almost their total external liability portfolio as short-term debt (about one-third of the banking system's total short-term liabilities). This, once again, may help to reduce the level of foreign currency reserves held and help promote a balanced market free from regulatory arbitrage. The new calculation method for the FFAR regulation comes even closer to the NSFR.

4.4 The connection between the FFAR regulation and domestic monetary policy

The primary aim of the FFAR was to reduce an important source of the Hungarian economy's vulnerability, namely that long-term foreign currency mortgage loans were typically funded by short-term foreign swaps, and this aim should be borne in mind when discussing the relationship between the FFAR and interest rate policy. The negative impact of this general market situation could be felt to a lesser extent in periods that were free from stresses; however right after the outbreak of the crisis and also in the second phase thereof, in the wake of the renewed money market tensions from 2011 onwards, it could not be ignored when making monetary policy decisions. The primary objective of the government decree on the foreign exchange funding adequacy ratio, effective since July 2012, was to manage this systemic risk directly.

Since the start of the crisis, Hungarian monetary policy has been subject to some macroeconomic factors that have simultaneously pointed at both easing and tightening. A turning point in domestic monetary policy came in July 2012: when the strengthening of the international willingness to take risks (e.g. those that may be attributable to the loose monetary policy of the developed-country central banks), coupled with an increasing number of country-specific factors (eg a favourable inflation outlook, improving financing capacity, a fall in the government deficit) made it possible to start and then continue the easing cycle. Although the implementation of the MNB's two-year easing cycle was facilitated primarily by these favourable factors, the FFAR regulation may have also increased the room for manoeuvre of monetary policy by relieving the banking system's vulnerability to a possible exchange rate shock. Thus the role of the financial stability risks, which could manifest themselves primarily through the exchange rate channel, could decrease in the formulation of monetary policy. This may have also contributed to the fact that the price stability objective could be enforced more strongly than before in the management of monetary policy. An additional potential external impact of the introduction of the foreign exchange funding adequacy ratio, and particularly the tightening thereof in 2014, is that with the phase out of the banking system's short-term external debt from the balance sheets it could contribute to the gradual reduction of the central bank reserve requirements and thereby to that of the reserve costs.

5. Conclusions

The primary objective of the FFAR regulation was to reduce an important source of the Hungarian economy's vulnerability – namely the maturity and the foreign currency mismatch present in the banking system, related primarily to the former foreign currency lending – and simultaneously to improve the resilience of the

domestic financial system. During the two years that followed its introduction, this macroprudential tool successfully stopped the deterioration of the maturity mismatch. In addition, following the changes made to the regulation in 2014,made by the MNB it may help to further reduce the liquidity risk within the Hungarian banking system.

As regards the relationship between Hungarian monetary and macroprudential policy, the FFAR is expected to provide more room for manoeuvre for monetary policy by increasing the stability of the financial system. When focusing on its primary objective, namely on achieving and maintaining price stability. Additionally, the FFAR should reduce the banking system's vulnerability to exchange rate shocks over time, which should mean that financial stability risks, manifesting themselves primarily through the exchange rate channel, can play a less prominent role in the formulation of monetary policy. Presumably in the future this may contribute to the enforcement of the price stability objective more strongly than before. At the same time it should be borne in mind that upon the occurrence of financial stability risks, falling beyond the MNB's macroprudential powers, monetary policy may still need to react to the financial conditions and participate in the achievement of the financial stability.

An additional feature of the FFAR regulation is that it is based on the concept of the NSFR indicator recommended by the BCBS. In this way, it conforms with international regulatory trends and will facilitate the adjustment of the Hungarian banking system to future EU requirements. Finally, the experience of introducing the FFAR could prove useful for small open economies similar to Hungary's that need to deal with systemic problems arising from foreign currency and maturity mismatching, and the related risks.

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Indonesia: Changing patterns of financial intermediation and their implications for central bank policy

Perry Warjiyo[1]

Abstract

As a bank-based economy, global factors affect financial intermediation and monetary transmission in Indonesia mainly through financial markets. Foreign portfolio flows to Indonesia are mostly in the form of government bonds and corporate equities, and thus directly influence the movements of the exchange rate, bond yields and equity prices. Liquidity from these portfolio flows also affect interest rate setting and bank lending. Problems in the monetary transmission mechanism arise from the shallowness of domestic financial markets, often causing excessive volatility of financial asset prices in times of stress. As such, a monetary policy that relied solely on interest rates would not be effective. We find that a policy mix of interest rates complemented by flexible exchange rate and macroprudential measures directed toward mitigating excessive lending in certain sectors and external vulnerabilities is more effective in achieving monetary and financial stability.

Keywords: Global capital flows, financial intermediation, central bank policy

JEL classification: F32, G1, E5

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1. Introduction

Global factors may alter a country's monetary transmission through a number of channels: interest rate, exchange rate, asset prices, bank deposit and lending, debt issuance, as well as risk-taking behaviour. Since the 2008 global crisis and subsequent quantitative easing by advanced countries, global financial markets have been swamped with unprecedented liquidity. Up to the eve of the Greek crisis in October 2011, this global excess liquidity and near-zero interest rates in the advanced countries induced large capital inflows into the emerging market economies (EMEs). These were then transmitted into exchange rate appreciations, declining interest rates and credit expansion in the EMEs. In many cases, the influx of global excess liquidity during this period helped to contain inflation and to stimulate economic growth in the EMEs.

Risks and volatility in the global financial market have increased since the Greek crisis in October 2011, and they have subsequently intensified since the Fed's May 2013 announcement on monetary policy normalisation. Capital flows then became volatile into and from EMEs, driven by risk-on and risk-off sentiment in global financial markets. Heightened risks to monetary and financial stability posed various challenges for central bank policy in EMEs as the volatility of exchange rate and asset prices increased and the domestic banking system came under pressure from liquidity strains caused by capital flow reversals.

How far these global factors affect financial intermediation, monetary transmission, and then macroeconomic and financial stability in the EMEs depends on each country's macroeconomic condition and the depth of its financial system. For Indonesia, as a bank-based economy with relatively shallow financial markets, monetary transmission of these global factors to domestic financial markets and the economy has not always been smooth. Indeed, global factors have often posed risks to domestic monetary and financial stability. The challenges have become even more complex since the Fed's path towards normalisation began in mid-2013, as they coincided with the domestic problem of inflation pressure from an increase in domestic fuel prices and a widening current account deficit due to the decline in commodity prices, together with booms in lending and house prices.

This paper discusses how global capital flows have influenced financial intermediation and monetary transmission in Indonesia and explains the central bank's efforts to mitigate the resulting impact on monetary and financial stability. First, a brief review of macroeconomic conditions in Indonesia since the 2008 global crisis will be given to set the stage. Second, the role of banks in financial intermediation is outlined, followed by a discussion in the third section on how global capital flows have been channelled into the financial markets, including foreign holdings of government bonds and offshore borrowing by corporates. The final section discusses Bank Indonesia's monetary and macroprudential policy mix in response to these global factors.

2. Macroeconomic context

Indonesia has successfully weathered the global financial crisis. GDP growth was 4.6% in 2009 on strong domestic private consumption, making Indonesia one of the

few countries that did not go into recession at that time (Table 1). GDP growth subsequently accelerated, peaking at 6.5% in 2011, buoyed by the commodity boom. Inflation remained under control, falling from 11.1% in 2008 to a low of 3.8% in 2011. The pass-through of high global commodity prices to the domestic inflation was dampened by the appreciation of the exchange rate.

An influx of capital flows had a positive effect on the Indonesian financial system and economy during this period. Capital account surpluses continued to increase, both in terms of foreign direct investment (FDI) and portfolio inflows, driven by higher returns and confidence in Indonesia's economic fundamentals. Combined with the current account surplus from the global commodity boom, the balance of payments enjoyed large surpluses and foreign exchange reserves expanded from a low of $66.1 billion in 2009 to $112.8 billion in 2012. These positive global spillovers induced exchange rate appreciation, and also flushed liquidity into the domestic financial system, pushing down interest rates and boosting bank lending to the economy.

Conditions have become more challenging since the Greek crisis in October 2011 and the "taper tantrum" of May 2013. Capital outflows from government bond holdings reached US$6.5 billion during the third and fourth quarters of 2011 following the Greek crisis and US$4.1 billion during May–June 2013 following the taper tantrum. The exchange rate has fallen by about 42.7% from IDR 9,115 per US dollar in December, 2011 to about IDR 13,000 at present. The challenges now became more complex as these global shocks have coincided with the domestic problems of higher inflation pressures from the increase in domestic fuel prices, the widening current account deficit due to the decline in commodity prices, and the booms in the housing market and associated lending.

Following measures to stabilise the economy through monetary tightening and fiscal consolidation, market confidence was restored in early 2014, leading to a jump in portfolio inflows to $23.4 billion in 2014 from $12.1 billion in 2013. Meanwhile, the credit default swap (CDS) spread narrowed from 240 bps in mid-2013 to 134 bps at present. Inflation has fallen from 8.4% following fuel price increases in July 2013 and November 2014 to 6.4% at present. We forecast inflation to further decline to its targeted range of 4%±1% in 2015 and 2016 following subsidy reforms and on lower oil prices. The current account deficit declined from 3.3% of GDP in 2013 to 3.0% in 2014, and we forecast that it will stabilise at 2.5–3% of GDP in 2015 and 2016. GDP growth moderated from 5.8% in 2013 to 5.0% in 2014, but we forecast it will rebound to 5.6% in 2015 and to 5.8% in 2016 following fiscal and structural reforms undertaken by the new government.

3. Role of banks

Indonesia is still a bank-based economy, even as efforts to deepen the financial markets are under way. Banking institutions are the major financial intermediaries in the country, while non-banks and capital markets provide only secondary sources of financing. Bank lending's share of total financing actually increased from 91.1% in 2009 to 92.2% in 2014. Corporate issuance of stocks and bonds has increased in recent years, but the share of capital markets financing is still small (at about 7.2% of total) compared with bank lending. Non-bank financial institutions (NBFIs)

provide only a small portion of financing in terms of leasing and other consumer finance.

The question is how bank financial intermediation in Indonesia has changed in the wake of quantitative easing by advanced countries since the 2008 global crisis. Apart from FDI, most capital inflows to Indonesia are in the form of foreign portfolio investments and other investments (Table 2). FDI inflows are stable and continue to accelerate. Volatility mostly relates to the portfolio inflows, which are often subject to capital reversals especially during global financial turbulence such as the Greek crisis and the taper tantrum. Indonesia's capital account surplus amounted to US$26.5 billion in 2010, but it then declined sharply to US$13.6 billion in 2011 due to capital reversals following the Greek crisis. The Fed taper tantrum in mid-2013 reduced the capital account surplus from US$24.9 billion in 2012 to US$21.9 billion in 2013, but the surplus quickly rebounded to a record high of US$43.5 billion in 2014 following the success of stabilisation policy responses by Bank Indonesia and the government.

The funds from these capital inflows are channelled mostly through the banking system. The natural question is how they influence bank financial intermediation and monetary policy transmission. In the case of Indonesia, foreign capital inflows increased bank deposits, which grew by 20.5% and 18.7% in 2010 and 2011, respectively (Table 3). But deposit growth then slowed to about 13% in 2013 and 2014 due to increased competition and the domestic economy slowdown. Likewise, the deposit interest rate declined from 6.7% in 2010 to 5.6% in 2012 but it recovered to 8.2% in 2014 with the tightening of domestic monetary policy. By type of depositor, there was a slight increase in corporate deposits from 26.1% in 2010 to 30.6% in 2013 but in general this does not reflect a major shift from household deposits, which account for an average 60% of total bank deposits. Likewise, most bank deposits are in domestic currency and with a maturity of less than one month.

Liquidity injection from capital inflows also increased bank lending capacity, at a time of domestic economic expansion driven by strong consumption and high commodity prices. Bank lending grew by an average of 23% per annum during 2010–13, but then fell back to 12% in 2014 in the wake of domestic monetary tightening (Table 4). Credit expansion also increased its share to total bank financing from 80.2% in 2009 to 88.5% in 2013. Funding for this credit expansion came not only come from an increase in bank deposits (partly due to foreign inflows), but also from a shift in bank asset composition away from securities holdings (mostly in the form of government bonds and deposits with the central bank) from 17.0% in 2009 to 9.2% in 2013 as foreign investors bought these securities. By composition, there has been slight shift from consumption and working capital lending to investment loans, which now account for 28.5%, 47.4% and 24.1% of total assets, respectively. Likewise, there was only a slight shift from household lending to corporate loans, which now account for 46.7% and 45.1% of assets, respectively. By currency, most bank lending is in the domestic currency, accounting for about 85% of total bank lending.

How have international banks' business models evolved since the 2008 financial crisis? Does the nature of these business models influence the supply of credit during periods of adverse external shocks? In Indonesia, international banks (subsidiaries and branches of foreign banks) have not changed their business plans, models, or credit policy following changes in the business models of their parents or head offices. The same is true for joint venture banks. The shares of credit extension

by foreign and joint venture banks have been steady at about 11.5%. Foreign banks have continued to expand credit to their growing number of retail customers, adapting their traditional business models to the Indonesian context. Such banks continue to be more reliant on consumer banking, including efforts to increase their wealth management business, than on the corporate segment.

4. Role of debt securities

For Indonesia, as a bank-based economy, foreign capital inflows have been channelled mainly through financial markets and external debt. In the financial markets, foreign investors invest their portfolios mainly in government bonds and corporate equity. This reflects the high yields and relatively low risk of government bonds, plus the liquidity of government bonds and corporate equity, which are actively traded in the secondary market. Foreign investors now hold almost 40% of government bonds, up from 29% in 2010. Foreign investors also account for 64% of corporate equity holdings at present compared with 59.8% in 2010. The volume of corporate bonds outstanding in the markets has only recently started to increase, which is attributable to low interest rates and persistent low volatility in global financial markets.

The Indonesian government started issuing bonds in 1998 as a part of a bank recapitalisation following the 1997 Asia crisis. Since then, government bonds have been regularly issued for refinancing purposes as well as for deficit financing, even though by law the fiscal deficit should be kept below 2.5% of GDP. For example, under the 2015 budget with fiscal deficit of 1.9% of GDP, the government is planning to issue bonds worth about US$36 billion (equivalent), of which about US$24 billion will finance the budget and US$11 billion will refinance maturing bonds. Of this amount, about 77% will be issued in the form of domestic currency bonds while the remaining 23% will be international bonds. The government of Indonesia maintains a prudent debt management policy, as indicated by relatively low total government debt at about 24% of GDP.

Domestic currency-denominated government bonds now amount to about IDR 1,246 trillion, having increased at an average 16.39% per annum since 2010. About 89.5% was issued at fixed rates and 10.5% at variable rates. By investment type, about 10% of government bonds are traded, 60% are available for sale, and 30% are held to maturity. Government bonds are actively traded in the secondary market with a total amount of IDR 2,706 trillion in 2014, up from IDR 1,377 trillion in 2010. Domestic investors hold about 63% of government bonds, of which 48% is held by banks, 19% by insurance firms, 5% by the central bank, and only a small amount by the public.

Foreign investors held about 37% of government bonds at end-2014, up from 29% in 2010. The majority of foreign holders are financial institutions and central banks with a long-term investment view, and thus provide stable portfolio inflows to Indonesia. The share of foreign investors bottomed out at 25% during the heavy selling pressure after the Greek crisis. Short-term investors, especially hedge funds, are generally sensitive to any global or domestic news that might have a negative impact on expected returns, and thus exhibit more volatile portfolio flows.

Apart from increasing foreign holdings on government bonds, corporate offshore borrowing has significantly over the past five years. This is due, first, to the fact that corporates are free to resort to offshore financing, while banks are subject to central bank approval for any offshore borrowing. Second, corporate financing needs have expanded beyond the lending capacity of domestic banks in the wake of the commodity boom since the 2008 global crisis. And, third, borrowing costs in overseas markets are lower than in the domestic market, especially since lending rates increased following the central bank's monetary tightening in mid-2013.

Total private sector offshore borrowing stood at US$162.8 billion in December 2014, almost double the US$83.8 billion outstanding at end-2010. This is in contrast with public external debt, which only slightly increased from US$118.6 billion in 2010 to US$129.7 billion at end-2014. The majority of private external debt was raised by non-financial corporates, which accounted for US$121.2 billion (around 75% of total private external debt) at end-2014. One concern is that these corporate external debts have been increasing relatively fast, at an average of 21% per annum over the past four years. As a consequence, the total debt service ratio (DSR) increased from 20.7% to 46.2% during the same period, at a time when export performance has been hit by weakening external demand and falling commodity prices.

At the corporate level, there has been a growing need to strengthen risk mitigation. Regarding maturity profile, most corporate external debt was actually long-term (around 73%) at original maturity. Most of this is in the form of loan agreements or medium-term debt securities. The issue is rather utilisation, ie that much of this external financing is for long-term projects, raising the concern of maturity mismatching. Of even greater concern is that almost half of corporate external debt is unhedged and thus exposed to currency risk. This raises a potential macroeconomic stability issue that needs to be addressed and mitigated.

5. Implications for monetary policy

The preceding sections lead to the following conclusions on how global factors affect financial intermediation and monetary transmission in Indonesia. First, as a bank-based economy, the quantitative easing and subsequent normalisation of monetary policies in the advanced countries have been transmitted through financial markets, especially in the form of foreign portfolio flows into government bonds and corporate equities. Subsequently, global excess liquidity and low interest rates have also encouraged an increase in corporate offshore borrowing. As such, global factors have affected financial intermediation in the Indonesian economy mainly through additional financing for the budget as well as for corporate investment activities. To some extent, capital inflows have also supplied extra liquidity to the domestic banks, thus helping them to extend credit to the economy. That said, financial intermediation in the banking sector is driven mainly by domestic factors.

Second, the impact of global factors on the monetary transmission mechanism has been felt mostly in the volatility of exchange rate and financial asset prices. Volatility has been on the increase since the Greek crisis towards the end of 2011 and the taper tantrum in May 2013, which have increased the risk of capital flow reversals. Exchange rate volatility has a direct impact on inflation, current account

deficit, economic growth and financial stability. The effects of volatility on financial asset prices, especially government bond yields and corporate stock prices, are more contained in the financial markets, but have implications for financial stability. Likewise, the liquidity effects of global factors on domestic liquidity have been felt mainly in the banking sector, where they have helped to provide a small degree of additional financing for the economy.

Third, the shallowness of domestic financial markets has often had the effect of accentuating the impact of these global factors on exchange rate and asset price volatility. The timing and magnitude of these effects have become more difficult to predict, particularly during periods of heavy pressure on portfolio flows. In thin markets, irrational market behaviour can easily lead to excessive volatility of exchange rates and financial asset prices.

Confronted with these challenges, we have concluded that a reliance solely on interest rates would not be effective as a means of maintaining macroeconomic and financial system stability. In this light, the monetary and macroprudential policy mix adopted by Bank Indonesia to strengthen the effectiveness of monetary transmission consists of the following elements. First, as Indonesia is an inflation targeting country, the policy rate is geared toward achieving the inflation target. As such, to contain inflation pressures from the increase in fuel prices, the policy rate was raised by 175 bps to 7.5% in June 2013 and again by 25 bps to 7.75% in November 2014. The policy rate was lowered by 25 bps to 7.5% in February 2015 as inflation was forecast to decline to the targeted range of 4%±1% in 2015 and 2016 following subsidy reforms and falling oil prices. We believe that the current policy rate is appropriate in the light of a number of risk factors, including global ones.

Second, since June 2013, we have adopted a more flexible exchange rate to help the adjustment process for the current account deficit as well as to absorb external shocks from global financial markets. The rupiah depreciated by about 26% in 2013 in the context of a current account deficit of 4.4% in Q2 2013 and 3.2% for 2013 as a whole. After the success of the stabilisation measures taken by Bank Indonesia and the government, the rupiah stabilised at about IDR 12,200 per US dollar in 2014 as the current account deficit narrowed to 3% of GDP. We expect the current account deficit to stabilise at a more sustainable level of about 2.5–3% of GDP in 2015 and 2016.

Third, to reinforce the transmission of interest rates to the lending channel, we have adopted as a macroprudential measure a maximum loan-to-value ratio of 70% for the first mortgage and declining by 5% each for the second mortgage and so on in order to dampen excessive property lending. While overall bank lending growth fell from 23% in 2013 to 12% in 2014, property lending growth declined from 45% to 14% and property price growth also eased from 15% to 8% during the same period.

Fourth, we have strengthened risk mitigation on non-bank corporate external borrowing. When bank lending was curbed through increases in the policy rate and macroprudential measures, non-financial corporates resorted to overseas financing. This trend was also supported by global excess liquidity and low interest rates. As stated earlier, the problem is that most of this external borrowing is unhedged. Leverage is also increasing as offshore financing becomes easier to access. To mitigate the risks inherent in this corporate offshore borrowing, Bank Indonesia recently issued a regulation requiring currency hedging for a minimum 20% of corporate net debt falling due within six months. A minimum rating has also been

specified for corporates that plan to access offshore borrowing. In addition, banks and state-owned enterprises require official approval for external borrowing.

Finally, we have stepped up our efforts to deepen Indonesia's financial markets. Most securities traded in Indonesia are government bonds, while the volume of corporate equities and bonds is still relatively small. The term structure of interest rates is also truncated, extending no further than three years. Over the past two years, we have successfully introduced interbank repo and interbank swap markets to strengthen the market mechanism for interest rate and exchange rate setting as well as to enhance the term structure and liquidity management of banks and non-bank financial institutions. We are also in the process of introducing additional products in the financial markets, ranging from negotiable certificates of deposit, promissory notes and medium-term notes, as well as infrastructure bonds.

Indonesia: Selected macroeconomic indicators, 2009–14 Table 1

	2009	2010	2011	2012	2013	2014
GDP growth (%)	4.63	6.22	6.49	6.26	5.78	5.02
- consumption (%)	6.2	4.14	4.51	4.77	5.23	4.82
- investment (%)	3.29	8.48	8.77	9.25	4.71	4.12
- exports (%)	-9.69	15.27	13.65	2	5.3	1.02
- imports (%)	-14.98	17.34	13.34	6.66	1.21	2.19
CPI inflation (%)	2.78	6.96	3.79	4.3	8.38	8.36
- core inflation (%)	4.28	4.28	4.34	4.4	4.98	4.93
- volatile food prices (%)	3.95	17.74	3.37	5.68	11.02	10.88
- administered prices (%)	-3.26	5.4	2.78	2.66	2.91	17.57
Balance of payments ($ million)	12,506	30,343	11,857	215	-7,325	15,249
- current account ($ million)	10,628	5,144	1,685	-24,418	-29,115	-26,233
- % of GDP	2	0.72	0.2	-2,80	-3,20	-3
- capital account ($ million)	4,852	26,526	13,636	24,909	22,010	43,586
Exchange rate (IDR/$)	9,447	9,036	9,113	9,715	12,250	12,135
- % change	14.16	4,35	-0.85	-6.61	-26.09	0.94
FX reserves ($ million)	66,165	96,207	110,123	112,781	99,387	111,862
- import months (cif)	8.59	8.93	9.34	9.62	9.01	6.6

Indonesia: Capital Account, 2009–14

Table 2

	2009	2010	2011	2012	2013	2014
Capital account ($ million)	4,852	26,526	13,636	24,909	22,010	43,586
- foreign direct investment	2,628	11,106	11,528	13,716	12,295	15,266
- portfolio investment	10,336	13,202	3,806	9,206	10,875	25,802
- Other investment	-8,208	2,262	-1,801	1,922	-871	2,705

Indonesia: Bank deposits, 2009–14

Table 3

	2009	2010	2011	2012	2013	2014
Bank deposit (Rp trillion)	1,913.6	2,304.9	2,736.4	3,163.5	3,578.2	3,929.0
a. Annual growth (%)	13.8	20.5	18.7	15.6	13.1	13.4
b. Interest rate (1 month, %)	6.9	6.7	6.4	5.6	7.3	8.2
By type of deposits (% share)						
a. Demand deposit	21.3	21.9	22.1	22.5	22.3	22.2
b. Saving deposit	31.9	32.0	33.1	34.3	34.2	31.3
c. Time deposit	42.8	46.1	44.8	43.2	43.6	46.5
By maturity (% share)						
a. Less than 1 month	72.4	74.0	74.5	72.7	74.0	71.4
b. 3 month	7.1	14.3	12.0	11.6	10.2	12.6
c. 6 month and above	20.4	11.7	13.5	15.7	15.8	16.0
By currency (% share)						
a. Rupiah	84.3	85.5	86.4	85.7	83.0	84.2
b. Foreign currencies	15.7	14.5	13.6	14.3	17.0	15.8
By type of banks (% share)						
a. State owned bank	37.4	37.2	35.8	35.6	35.5	35.7
b. Private national bank	43.1	44.9	46.0	46.1	46.7	45.6
c. Foreign & joint venture bank	10.5	8.9	8.4	8.3	8.6	7.6
By type of depositors (% share)						
a. Household	62.9	62.0	60.3	59.3	58.9	57.7
b. Corporate	26.2	26.1	27.6	28.5	30.6	28.8
c. Government and SOEs	5.6	6.3	5.8	6.0	5.5	5.5

Indonesia: Bank financing and loans, 2009–14 Table 4

	2009	2010	2011	2012	2013	2014
Total Bank Financing (Rp trillion)	1,788.8	2,084.0	2,553.9	3,087.1	3,722.4	3,825.7
a. Bank loans (% share)	80.2	84.2	86.1	87.7	88.5	86.1
b. Securities (% share)	17.0	13.2	11.5	10.0	9.2	10.9
c. Others (% share)	2.8	2.6	2.4	2.3	2.4	3.1
Bank loans (Rp trillion)	1,446.8	1,783.6	2,223.7	2,738.1	3,324.5	3,626.8
a. Annual growth (%)	10.1	23.3	24.7	23.1	21.4	11.7
b. Interest rate (working capital, %)	13.7	12.8	12.2	11.5	12.1	12.9
By type of loans (% share)						
a. Investment	20.6	19.5	20.8	21.6	23.9	24.1
b. Working capital	48.5	49.6	48.3	48.4	47.9	47.4
c. Consumption	31.0	30.9	30.8	30.0	28.2	28.5
By currency (% share)						
a. Rupiah	86.1	85.4	84.4	85.0	83.5	84.5
b. Foreign currencies	13.9	14.6	15.6	15.0	16.5	15.5
By type of banks (% share)						
a. State owned bank	36.9	35.3	34.2	34.4	34.8	34.5
b. Private national bank	41.0	43.5	45.0	44.5	43.2	43.8
c. Foreign & joint venture bank	11.8	11.3	11.0	11.3	12.3	11.6
By type of debtors (% share)						
a. Household	48.3	49.0	50.9	49.1	46.5	46.7
b. Corporate	44.9	41.9	42.4	43.3	44.5	45.1
c. Government and SOEs	5.3	6.3	5.0	6.0	6.5	6.2

Indonesia: Government bonds by owner, 2009–14 Table 5

	2009	2010	2011	2012	2013	2014
Total government bonds (IDR trillions)	584	654	747	856	1,027	1,246
Resident (IDR trillions):	476	458	525	586	703	784
- Bank	252	210	207	218	261	287
- Insurance	73	79	93	83	130	151
- Central bank	25	25	66	84	119	130
- Mutual fund	45	51	47	43	42	46
- Pension fund	38	37	34	56	39	43
- Others	44	56	77	100	112	127
Non-resident (IDR trillions):	108	196	223	271	324	461
- Financial institutions	78	127	134	159	157	200
- Mutual funds	22	54	68	70	87	129
- Corporates	4	6	7	11	17	24
- Pension funds	1	2	3	4	9	20
- Others	3	4	5	22	48	81

Indonesia: Private external debt, 2010–14 Table 6

	2010	2011	2012	2013	2014
Total Private External Debt ($ billion)	83.79	106.73	126.25	142.57	162.84
a. Bank (% share)	17.2	17.3	18.2	17.2	19.2
b. Non-bank financial institution (% share)	4.3	5.7	6.1	5.5	6.3
c. Non-bank corporates (% share)	78.6	77.0	75.7	77.4	74.4
By currency (% share)					
a. US Dollar	86.5	86.5	87.4	89.9	90.6
b. Japanese Yen	9.1	8.5	7.0	5.0	3.8
c. Indonesian Rupiah	2.9	3.7	4.1	3.5	4.0
d. Others	1.5	1.3	1.5	1.6	1.5
By instruments (% share)					
a. Loan agreement	71.6	67.6	66.6	67.6	65.9
b. Debt securities	13.5	16.0	19.2	18.0	18.3
c. Others	14.9	16.4	14.3	14.5	15.8
By original maturity (% share)					
a. Short-term	28.0	31.8	29.2	27.6	27.0
b. Long-term	72.0	68.2	70.8	72.4	73.0

Financial intermediation and the transmission mechanism: learning from a case study on Israeli banks[1]

Emanuel Barnea, Nadine Baudot-Trajtenberg and Ziv Naor

Abstract

The emergence of institutional investors managing the long-term retirement savings of Israeli households has clearly altered the pattern of financial intermediation in the past decade. Households increasingly hold their savings through these institutions, which in turn provide a growing share of credit to large non-financial businesses. However, Israeli banks are still mainly funded by deposits, but these are less sticky than traditional retail deposits, which have shrunk from 62% to 48% of total deposits. The case study on banks' intermediation of capital points to friction in the banking sector, particularly where the recent fall in the coverage ratio implies a widening of the gap between deposit and lending rates. This does not unequivocally imply a weakening of the transmission mechanism. Indeed, the increased competition from institutional investors is refocusing banks' lending to SMEs and households, areas where the oligopolistic nature of the banking system is likely to allow them broader margins. If this is the case, then the transmission mechanism is likely to have become more efficient overall, assuming of course that the corporate bond market and direct credit lending by institutional investors appropriately price the risk involved. A more troublesome finding of the case study is that the financial crisis seems to have had a lingering effect on deposit-lending spreads, beyond the increase in risks and the coverage ratio drop, affecting all borrowers. Thus, unrelated to the transformation of the financial intermediation map, the global financial crisis seems to have weakened the transmission mechanism.

Keywords: banks, credit, financial intermediation, transmission mechanism

JEL classification: E44, E51, G18, G21, G23

[1] Bank of Israel. This work makes use of a policy memo by Barnea, Dijvre and Naor (2012) on the effects of the 2007 global financial crisis on the monetary policy transmission mechanism in Israel.

Introduction

The pattern of financial intermediation has seen significant changes in Israel during the past decades, in large part due to regulatory reforms affecting both the banking sector and long-term retirement savings rules and institutions, as well as the continued contraction of public sector debt since 1985.

The reforms affecting long-term retirement savings include the gradual elimination of pay-as-you-go pension schemes in the public sector and their replacement by defined contribution schemes (DC), the homogenisation of fiscal and investment rules and regulations between pension funds, provident funds and life insurance policies, and the expansion of the range assets that can be held by these long-term saving schemes, including foreign assets.[2] These various reforms have engendered a rapid growth of the public's assets held through these independent asset managers, most of them insurance companies, and they have reduced the share of assets held directly, such as bank deposits or direct holdings of stocks and bonds.

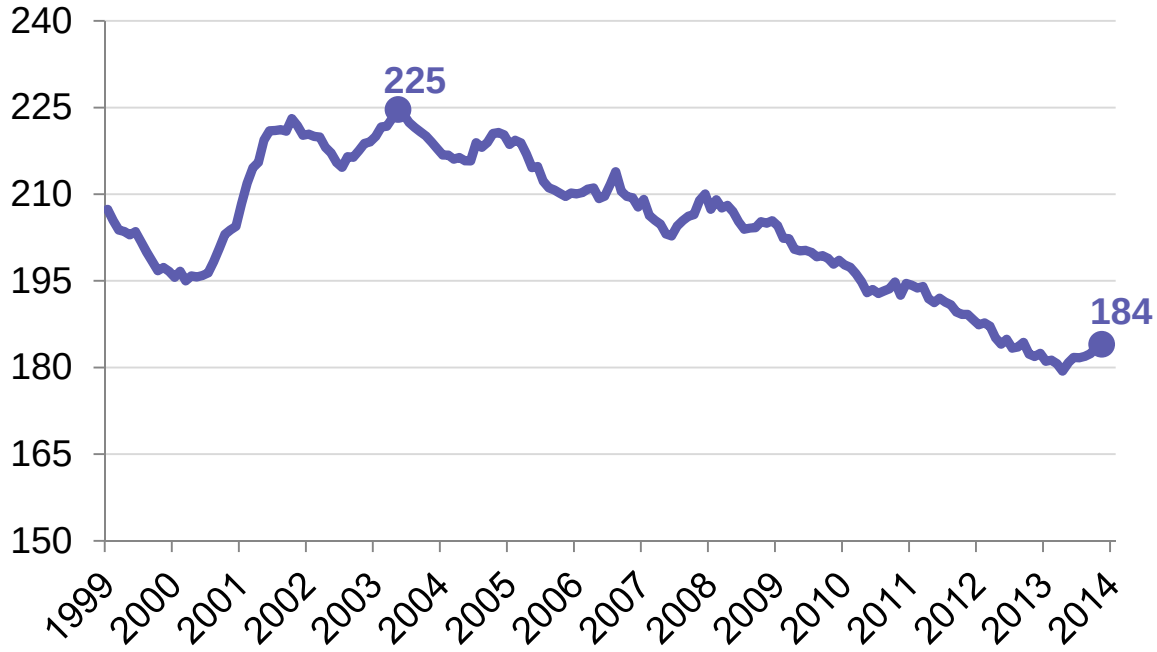
The reform that most affected the structure of the rather concentrated banking sector has been the 2005 Bachar reform, which at its core separates the financial advisory role from the asset management role of financial institutions. This has forced the banks to spin off their asset management operations, particularly their provident funds, which had been mostly held by the banks until then, and to focus on distributing those funds as well as providing financial advice to their clients. Thus starting in 2006, the financial market structure evolved from one dominated by five banking groups, to one where five large asset managers are also playing a major role in the intermediation process.

For the past 30 years, fiscal policy has remained focused on reducing the overall burden of debt, from its peak of 284% of GDP in 1985 to 68% by the end of 2014. The path has been a gradual one and not without deviations from its downward trend, particularly during times of recession such as in the deep downturn of 2000–03 and the much shorter and shallower one of the recent global financial crisis in 2009. But the trend has been maintained throughout, including during the past decade.

[2] For further details on the changes in the long-term savings market in Israel, see L Achdut and A Spibak, "The pension system in Israel after 15 years of reforms", *Policy Studies*, no 8, Van Leer Institute, 2010.

Total Debt as a % of GDP

Government and Private Non Financial Sector Figure 1



Thus, both sides of the financial intermediation have been affected: on the borrowing side, the public sector's retrenchment has left more space for business and household borrowing, and on the lending side, pension reforms have led to the rise of long-term retirement savings institutions that are competing with banks particularly in the corporate borrowing segment.

Intertwined with the change in the relative importance of these different types of borrower and lender, the intermediation process itself has undergone a different transformation, increasingly relying on the markets to allocate the funds, away from the face-to-face transactions of the traditional banking environment. The evolution of financial intermediation activity in Israel has taken place gradually over the past two decades, at a more or less accelerated pace, sometimes with substantial flows of capital in and out of the country and sometimes not. Although not quite indifferent to global developments, its metamorphosis does not appear to have been significantly influenced by the global financial crisis.[3]

It is still unclear to what extent the transmission mechanism of monetary policy has been affected by these changes. Later in this paper we introduce a case study in which we find some evidence for the existence and characterisation of the effects of the global financial crisis on the transmission mechanism in Israel. Furthermore, the emergence of new players with different tastes, horizons, constraints and expectation formations, as well as the move away from closed doors to (more)

[3] The Israeli banks went through the global financial crisis relatively unscathed and, although banking regulations have since raised the capital requirements for banks, banks in Israel do not appear to have gone through anything like the "credit crunch" that was observed elsewhere.

transparent market transactions, may well have affected the speed and the price at which new information is processed.

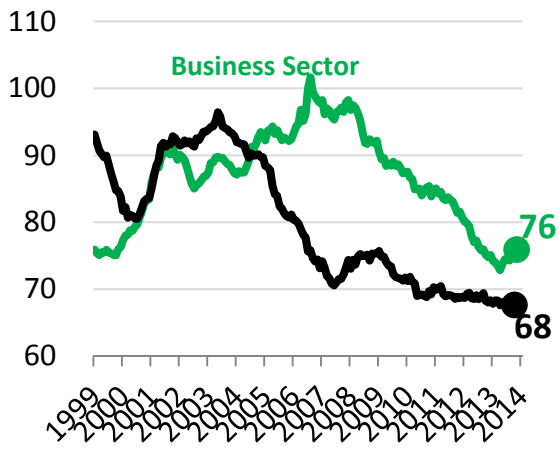
Overview of developments

A quick look at the overall amount of financial liabilities in the economy reveals that the overall level of debt as a percentage of GDP has fallen from 225% at the end of 2003 to 181% at the end of 2013, as can be seen in Graph 1. This reflects the continued contraction of public sector debt, from approximately 94% of GDP at the beginning of 2004 to about 68% in mid-2014. At the same time, business sector debt initially expanded until the first signs of the global financial crisis appeared in 2007, after which a steep reversal occurred and a downward trend set in until 2014.

Public Sector and Business Sector Debt

As a % of GDP

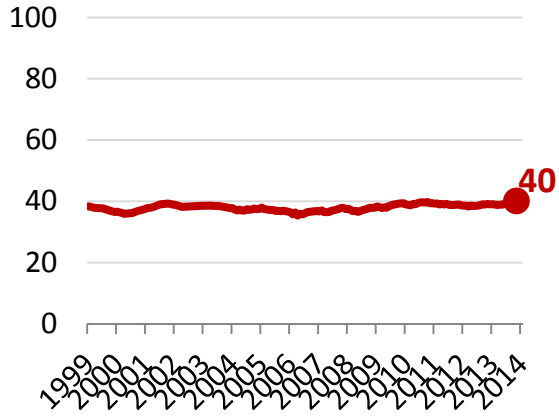
Figure 2



Household Debt

As a % of GDP

Figure 3

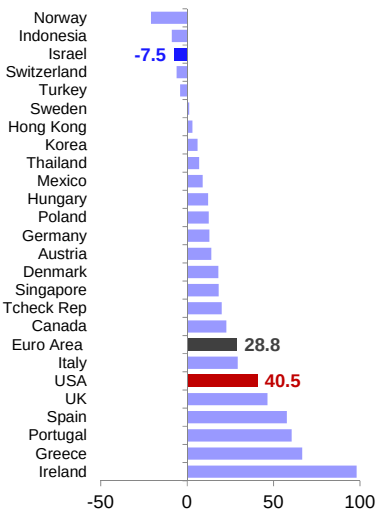


As can be seen in Graph 2, non-financial business sector debt as a percentage of GDP rose to approximately 100% by the summer of 2007, and has contracted to about 73% by August of 2014. Throughout this period, household debt remained relatively constant at about 40% of GDP, consistently comprising about two thirds mortgages and one third consumer debt.

Thus the developments of the past decade, and particularly since the global financial crisis, have been quite distinct from what most countries have seen (see Graphs 4, 5 and 6).

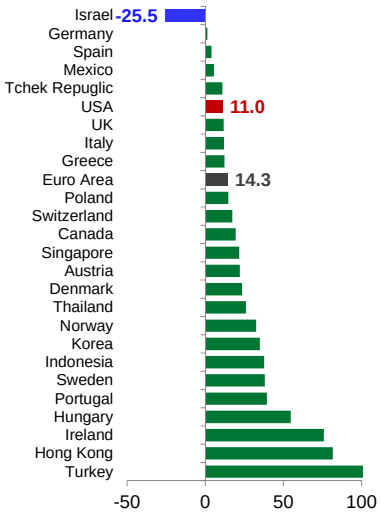
Change in Public Debt
as a % of GDP 2007-2013

Figure 4



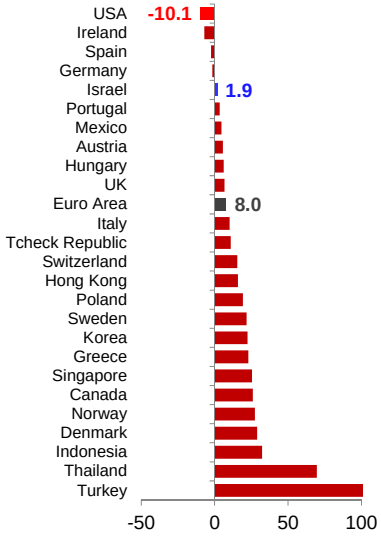
Change in Business Sector Debt
as a % of GDP 2007-2013

Figure 5



Change in Household Debt
as a % of GDP 2007-2013

Figure 6

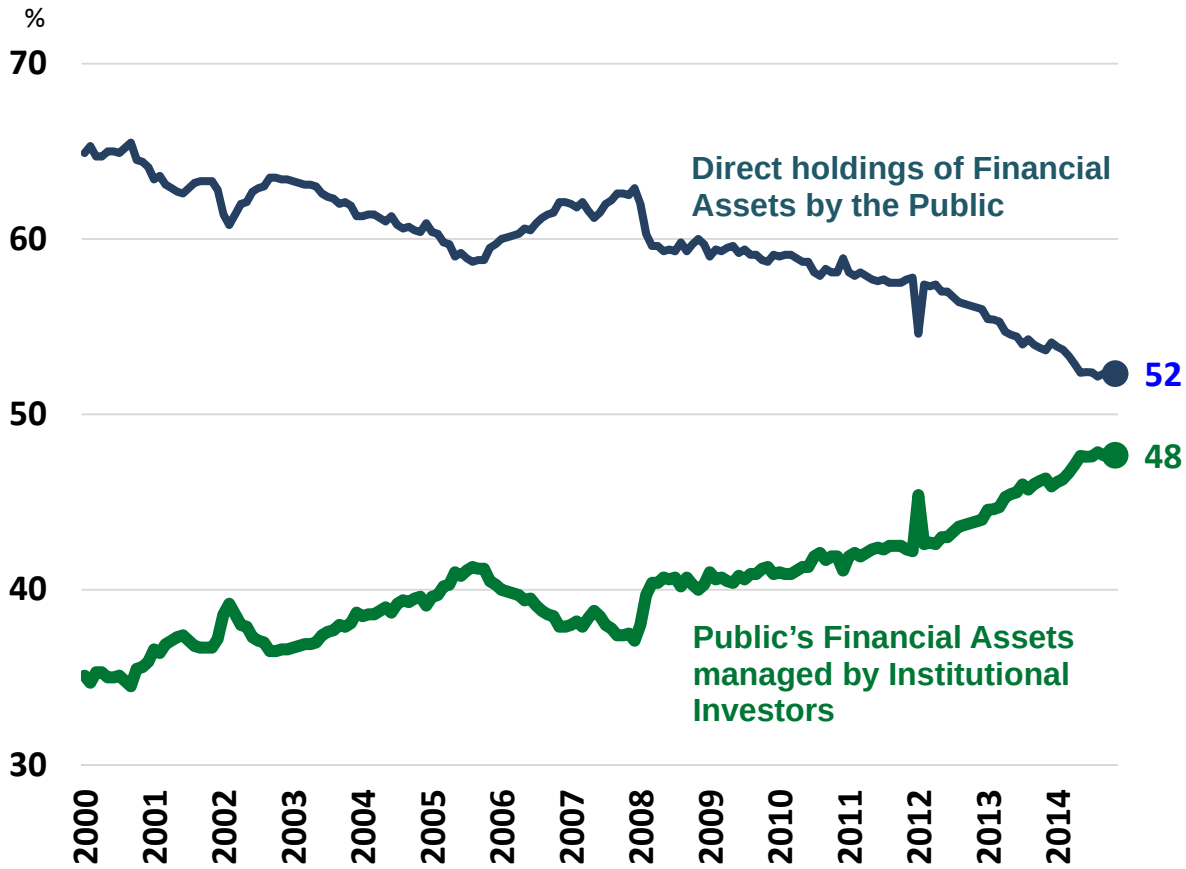


Role of banks

Following a rapid rise in the early part of the last decade, the public's financial portfolio has hovered around 275% of GDP 2007. However, pension reforms have substantially altered the recipients of the public's long-term savings which are increasingly held through institutional investors, away from direct holdings of stocks, bonds and bank deposits as can be seen in Graph 7. Bank deposits now account for 27% of the public's financial assets, down from some 40% a decade ago. The mirror image of this phenomenon is that retail deposits, which traditionally had been the main source of funding for banks, have dropped from 51% in 2004 to 44% of banks total liabilities by 2013. In addition, the share of funding raised directly through bonds has doubled in the past decade, up from 4.6% of total bank liabilities in 2004 to 9.2% in 2013. Thus, while Israeli banks are still mostly funded through deposits, these have become less "sticky" than in the past.

Composition of the Public's Financial Assets Between direct and indirect holdings

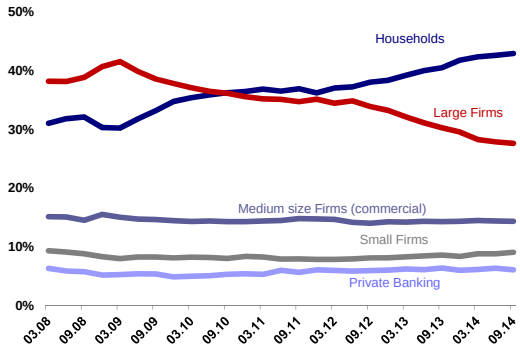
Figure 7



Looking at the asset side of banks' portfolios, a very clear trend appears, one undiminished by the global financial crisis: a continued rise of the share of credit to households, in the form of both mortgages and consumer credits, while corporate credit has gradually fallen from 38% of the total balance sheet to 27% by the third quarter of 2014, as can be seen in Graph 8.

Composition of Bank Credit by Segments 2008-2014

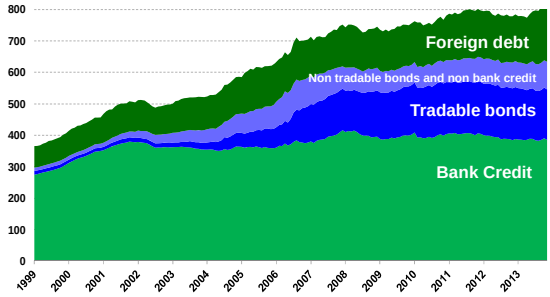
Figure 8



Sources of Credit to the Non Financial Business Sector

2000- 7/2014, billions of NIS

Figure 9



The reduction in the role of banks as providers of credit to the non-financial business sector is perhaps more easily seen when one looks at the source of funding for that sector, as seen in Graph 9. Total bank credit provided to that sector has remained flat for the past decade, while the share of tradable bonds and non-bank credit has risen steadily. Foreign funding has accounted throughout the period for about 18% of total credit to the non-financial business sector. Thus, business sector funding from banks has fallen from 75% in 2000 to slightly less than 50% by mid-2014. The new vehicles of long-term retirement savings, pensions, provident and life insurance funds have filled the gap and are the principal holders of domestic corporate bonds as well as providing direct credit to the business sector.

The trends just described gained way before the global financial crisis and have continued throughout the period. We now turn our attention to their potential impact on the transmission mechanism.

Potential impact on the transmission mechanism

The transmission mechanism of monetary policy has three main channels: first, directly through its impact on the market interest rate, second, indirectly through the impact of the interest rate on the exchange rate and, third, indirectly through its impact on the stock market and other assets making up household wealth. Note that for a small open economy like that of Israel, the second channel is likely to be the most powerful one, and there is plenty of evidence to show that the interest rate gap between Israel and the rest of the world affects the exchange rate, and that the latter impacts exports (particularly of traditional industries) as well as imports. However, the changing structure of the financial intermediation is most likely to affect the first channel, which is the question we want to investigate further.[4]

[4] Note that the wealth effect could also be affected by the way in which household savings are held. It is not clear whether households are more "aware" of their wealth if they directly hold the financial

It is relevant to decompose the first channel into steps and see how the changing structure of the intermediation process weaves into it: (i) the extent to which the central bank's interest rate affects the market interest rate; (ii) the gap between lenders' and borrowers' interest rates (the efficiency of the financial intermediation process); (iii) the risk premium required by lenders (another aspect of the efficiency of financial intermediation); and (iv) the sensitivity of investment and consumption to the interest rate, which is also affected by borrowers' access to funds.

At first sight, it is not obvious in what direction will the transmission mechanism be impacted. On the one hand, the introduction of more players in the financial intermediation arena, particularly in a market that was very concentrated and oligopolistic in nature, is likely to reduce the spread between lending and deposit rates, and the enhanced competition could also improve accessibility to financial markets. Both these effects – steps (ii) and (iv) – should strengthen the transmission mechanism by improving the efficiency of the financial intermediation process. On the other hand, asymmetric information between borrowers and lenders may be more pronounced in the arm's length transactions which characterise these new players in the financial markets. If this is the case, the lenders will likely require a higher risk premium to compensate for this asymmetric information; thus, a move away from bank lending to market-based transactions could actually widen the interest spread, so weakening the transmission mechanism.

The picture painted earlier does not point to a significantly increased accessibility to financial markets. Indeed, Graph 8 clearly shows that the share of credit to small and medium-sized borrowers has not changed, while households' debt has increased on par with GDP.[5] The focus on the transformation of intermediation has been on large borrowers, who have increasingly turned to the domestic bond market to raise funds, away from banks. What has happened to pricing, and particularly to the interest rate gap and the risk premium in that market?

From an empirical standpoint, it is not straightforward to compare pricing in the corporate bond market with that of similar bank loans. To do so we would need very granular data on both types of transactions, since they are likely to involve different types of customer and particularly of risk on borrowers, including the availability of collateral. Indeed, in the absence of securitisation (as is still the case in Israel), only the largest corporate clients are likely to be able to raise funds directly by issuing bonds. In fact, just by looking at the composition of bank loans and corporate bonds by industry, one can see that they differ substantially. At the end of 2013, the share of bank credit to industry amounted to 19% of lending to the non-financial business sector, compared to 11% only of corporate bonds issued by non-financial businesses, and the exposure to real estate and construction was even

assets, as opposed to when those are held through institutional investors. However, one could conjecture that direct holdings, and the liquidity it bestows, are likely to imply a larger wealth effect – thus pointing to a weakening of this channel following the change in the holdings of household assets during the past decade.

[5] Although note that, starting in 2011, macroprudential policies have been introduced that have made mortgages both pricier and less leveraged, without which we are likely to have seen a further rise in credit to housing.

more distinct, at 32% of banks' non-financial credit portfolio[6] versus 50% in the corporate bond market.

However, we can focus on the banking sector and try to assess how the spreads between deposit and lending appear to be set, to what extent do they incorporate the appropriate level of risk, and whether or not they appear to have been altered.

Case study: assessing the transmission mechanism in the banking sector

We assume that there exists asymmetry of information between lenders and borrowers, regarding the perceived repayment abilities of the latter, and between savers and lenders, pertaining to their exposure to risk. Thus, financial intermediation will introduce a wedge between borrower and lender interest rates, reflecting the risk premium assessment of the lenders, beyond the expected value of future losses.

The cost of banks' deposits and liquidity are influenced by the depositors' and bond holders' assessment of the banks' risk exposure, the latter depending on the asset side of the banks' balance sheet. In addition, a rise in the risk of the borrowers may lead to a reduction in the supply of credit by the banks, due to the higher risk premium needed to compensate for the extra risk.[7]

Increasing the lending rate (ex ante) and/or requiring guarantees (ex post) helps creditors to partly overcome the uncertainty pertains to the borrowers' ability to repay. To that end, creditors price the credit risk such that, in the margin, their cost of monitoring equals the cost of preventing the realisation of the risk. In this way, there emerges a wedge (an external finance premium) between the alternative use of the firm's internal finance resources and its external finance resources, leading to inefficient allocation of resources. Indeed, better borrowers, for whom the asymmetry of information problem is less severe, would probably get credit more easily and suffer less during financial crises.

This approach can be found in empirical works that validate the existence of asymmetric information in the intermediation process. Hoshi et al (1991) find that firms in Japan that had close relationships with banks, thus mitigating the asymmetry of information or reducing the cost of monitoring, had better access to bank credit. Gertler and Gilchrist (1992) as well as Oliner and Rudebusch (1996) find, respectively, that small firms in the United States, and their credit supply, suffer more (in comparison with larger firms), and that small firms' investments depend more on internal financing especially during recessions. These findings are consistent with the notion that smaller firms are more exposed to asymmetry of information and to higher monitoring costs.

Here, we will take a similar approach to set testable hypotheses regarding the existence of frictions in the monetary policy transmission mechanism through the

[6] The latter is also affected by banking regulations that limits the banks' exposure to the construction and real estate sectors and/or mobilises a higher level of bank' capital.

[7] For further discussion on credit channel see Freixas and Rochet, (2008).

credit channel, based on data from the banking sector. Again, our analysis depends on the existence of asymmetry of information in the deposit and credit markets. We will model the intermediation process as one where the deposit market is competitive, but where the credit market is monopolistic, reflecting Israel's strongly concentrated banking sector. This allows us to model non-trivial pricing strategies that include pricing of risk as are necessary to show the possible existence of frictions in the transmission mechanism.

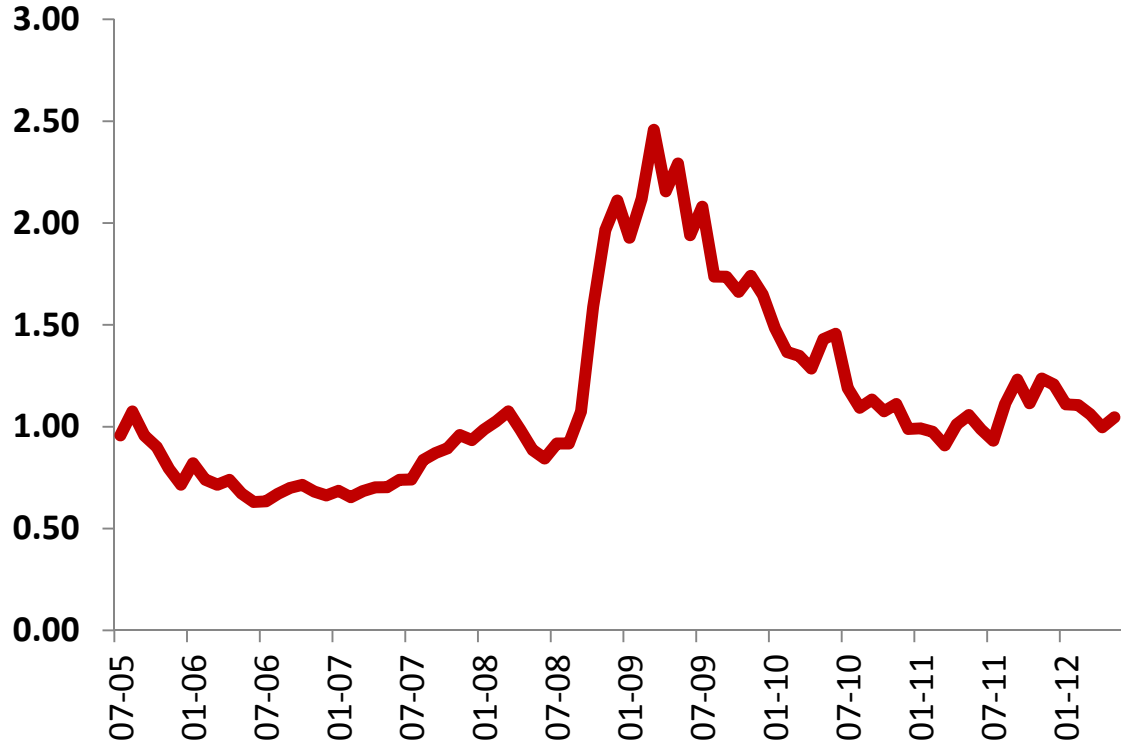
The global financial crisis offers us an experiment where we can more easily identify the frictions in the transmission mechanism, as such frictions must have been amplified during that period of high uncertainty and volatility in the markets.

Indeed, the conjecture that frictions in the transmission mechanism exist and in fact were amplified during the last global financial crisis is supported by our findings, whereby the pricing of the deposit and lending rates include an element that goes beyond the effects of the banks' exposure to risk and the credit risk itself. The main findings are the following:

1. There is no evidence for the existence of market discipline in the public supply of deposits. In fact, the effect of the banks' exposure to risk, as measured by the ratio of problem loans to total lending, is found insignificant in the regression of the deposit interest rate. At the same time, the onset of the financial crisis was clearly internalised by the bond market, whereby the spread on bank-issued bonds increased dramatically following the Lehman bankruptcy, to fall back gradually in 2009 and 2010 as can be seen in Graph 10.

Average Bond Spread of the 5 large Bank Groups

2005-2012 Figure 10

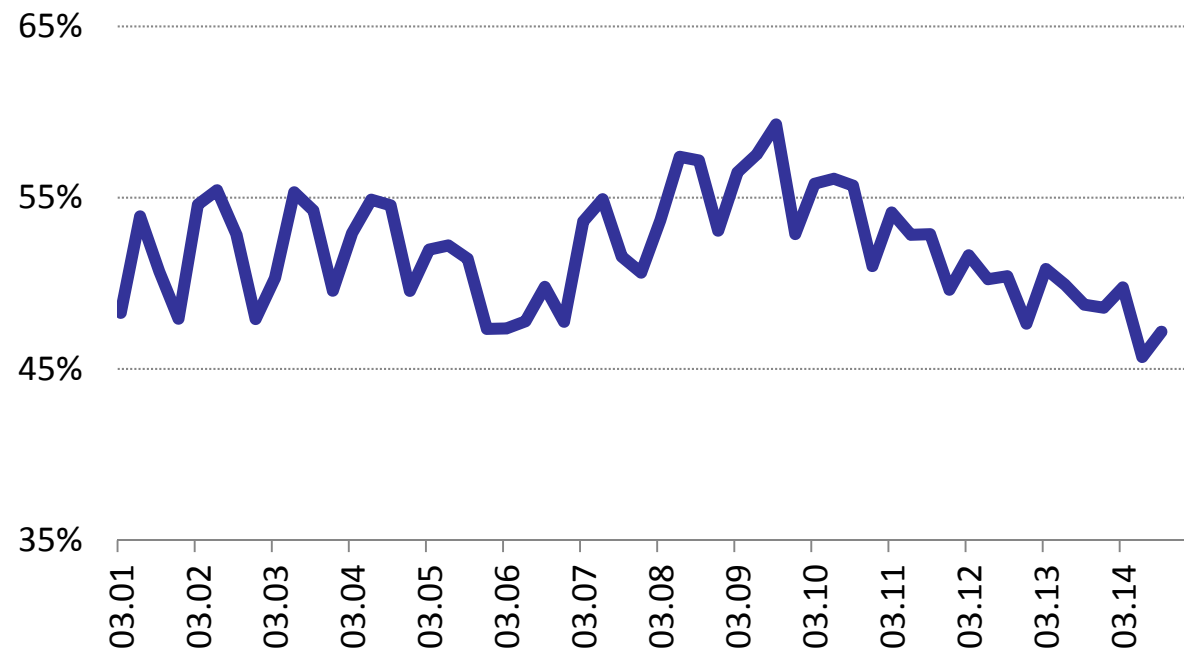


This discrepancy in response between the bond and deposit markets could indicate that a market that is dominated by risk-insensitive depositors results in a transmission mechanism that can oversupply credit to the market as well as severely misallocate credit between sectors. Alternatively, it may be that depositors assume the existence of an implicit bank deposit insurance, an assumption that may not be far-fetched in a small country with a concentrated banking sector.

2. The regression results partly support the possible existence of a trade-off between the banks' interest income and their net non-interest income, as is reflected by the coverage ratio.[8] The further from unity the banks' coverage ratio lies, the more the banks will need to earn in net interest income to compensate for their lack of efficiency in the intermediation process. In fact the data show a downward trend in the average coverage ratio of the Israeli banks, starting from 2009, and this led, in line with the aforementioned trade-off, to an increase in the lending interest rate. This suggests that the transmission mechanism through the banking system has weakened. Alternatively, it could be that the competition for large customers who have direct access to the bond market has reoriented banks into the less competitive markets of SMEs and households, where they can more easily widen the wedge between borrowing and lending rates. If this is the case, the overall transmission mechanism might not have been weakened, but rather the changing intermediation channels have further revealed the friction that exists in the banking intermediation mechanism.

Average Coverage ratio of 5 large Bank Group

2001-9/2014 Figure 11



Coverage Ratio = Non-interest Income ÷ Operational Expenses

[8] The coverage ratio is defined as the ratio of non-interest income divided by the operational expenses.

3. There emerged in the data an indiscriminate rise in the banks' lending rate from 2008 that goes beyond the effect of the credit risk and the trade-off effect mentioned above. This result may indicate that, due to the asymmetry of information between borrowers and creditors, banks have increased their lending rates to all borrowers including the good ones, as a lingering effect of the crisis. This persistence points to a weakening of the intermediation process, again perhaps reflecting and exacerbating the lack of competition in the SME and household sectors.

Conclusion

The emergence of institutional investors managing the long-term retirement savings of Israeli households has clearly altered the pattern of financial intermediation in the past decade. Households increasingly hold their savings through these institutions, which in turn provide a growing share of credit to the large non-financial businesses. However, Israeli banks are still funded mainly by deposits, but those are less sticky than the traditional retail deposits as these have shrunk from 62% to 48% of total deposits. The case study on banks' intermediation of capital points to friction in the banking sector, particularly where the fall in their coverage ratio of recent years implies a widening of the gap between deposit and lending rates. This does not unequivocally infer a weakening of the transmission mechanism. Indeed, increased competition from the institutional investors is refocusing banks' lending to SMEs and households, areas where the oligopolistic nature of the banking system is likely to allow them broader margins. If this is the case, then the transmission mechanism is likely to have become more efficient overall, assuming of course that the corporate bond market and direct credit lending by institutional investors appropriately price the risk involved. A more troublesome finding of the case study on banks is that the financial crisis seems to have had a lingering effect on deposit-lending spreads, affecting all borrowers. Thus unrelated to the transformation of the financial intermediation map, the global financial crisis seems to have weakened the transmission mechanism.

Appendix

Conceptual framework

This section details the conceptual framework which we use for the empirical analysis and, in particular, the identification of the effects of a change in the credit risk on the transmission mechanism. We focus here on the banking financial intermediation and thus the conceptual framework is of the banking sector.

We assume that there are two types of households in the model – each one is characterised by a representative agent. The first one deposits its savings with the financial intermediary in order to smooth its consumption. The second type of agent turns to the financial intermediary for loans to finance the operation of their projects. For simplicity, we assume that the imperfect competitive financial industry is represented by one monopolistic financial intermediary operating in this economy.

We also assume that there exists a central bank that, in the money market, sets an infinitely elastic supply of money at a policy rate rm. We assume that the market for deposits is perfectly competitive, while the loan market is a monopolistic market. Since the financial intermediary can either use the deposit money to extend loans to investors or borrows from the central bank for the same purpose, the reserve requirement adjusted deposit rate $\frac{r_{dt}}{1-rr}$ must at equilibrium be equal to the policy rate. As for the supply of loans, we further assume that granting loans exposes the financial intermediary to credit risk. There is asymmetry of information between the borrower and the financial intermediary and therefore the credit risk can only partially be priced by the lending rate rL. In particular real investment of one unit involves a loss of 1-λ units, 0< λ<1 at the end of the period. The parameter λ is unobservable, but there exists a relationship between λ and various observable credit risk indicators (eg loan loss reserves, problematic loans ratio and so on). In fact λ satisfies the following relationship

$$\lambda = \Gamma(\gamma) + \varepsilon, \quad \Gamma' < 0, \ 0 \le \lambda \le 1.$$

where γ is an observable credit risk indicator and ε is an i.i.d random variable that is normally distributed with zero mean and a constant variance σ2. We assume that only the investors (the borrowers) are aware of the realisation of εt at period t.

The pricing of the loans is done by the financial intermediary in accordance with its profit-maximising first-order conditions. The households are the financial intermediary owners and they are risk-neutral. The expected profit function is given by

$$E_t\Pi_t = \lambda_t L_t r_{Lt} - (1-rr)D_t r_{dt} - r_{mt}L_{mt} - c(w_t)$$

where L is the aggregate outstanding loan balances, D is the total bank deposit balances, Lm is total monetary loans balances granted to the financial intermediary by the central bank. Where rr is reserve requirement, and c(w) is the total net operational expenses which is a function of the wage rate, w.

Assuming that the financial intermediary holds equity at an amount of K (as required), the intermediary resource constraint is

$$L_t + rrD_t = D_t + L_{mt} + K_t$$

From the first-order conditions for profit maximisation, we get the following pricing relationships:

(1) $$\frac{r_{dt}}{1-rr} = r_{mt}$$

(2) $$\lambda_t \left(1 + \frac{1}{\eta_t}\right) r_{Lt} = \frac{r_{dt}}{1-rr}$$

where η is the price elasticity of the demand for loans.

The specification of the banking profit equation and condition (2) hint at the perception that, due to the asymmetry of information where the borrower knows more about his/her probability of default, the financial intermediary requires an inadequate credit risk premium. Given rd, it transpires from (2) that, in reaction to an increase in the credit risk (λ decreases), the financial intermediary increases its lending rate rL so that its exposure to the credit risk is divided over fewer borrowers. Of course, if the financial intermediary had all the information it would price (adequately) only the borrowers whose probability of default changed (increased).

Log-linearisation of (2) and of the function $\lambda = \Gamma(\gamma)$ around the equilibrium $[r_{dt}^*, r_{Lt}^*, \eta_t^*, \Gamma(\gamma_t^*)]$ yields

(3) $$r_{Lt} = [-\alpha^* \frac{1}{1+\eta^*}] + \alpha^* r_{dt} - [\alpha^* \eta_\gamma^{\lambda *}] \frac{\gamma_t - \gamma^*}{\gamma^*} + [\alpha^* \frac{1}{(1+\eta^*)\eta^*}] \eta_t$$

where $\alpha^* \equiv \frac{r_L^*}{r_d^*}$ is the equilibrium interest rate ratio, and $\eta_\gamma^{\lambda *} \equiv \frac{\gamma^*}{\lambda^*} \frac{\partial \lambda}{\partial \gamma}$.

We use the estimated coefficients of equation (3) to examine the operation of the transmission mechanism since the onset of the global financial crisis. We note that the estimation of the constant (the markup) in equation (3) is affected by the credit demand price elasticity. When the elasticity is larger (the sector is more competitive) the estimated constant will be larger. This methodology allows us to study the effect of changes in the degree of the competition on the transmission mechanism. In the regressions, we let these constants vary utilising dummy variables. The transmission mechanism relies on the relationship between the monetary policy rate and the market interest rates (deposit and lending). Thus we can use the estimated equations (1) and (3) as a basis for the examination of the effects of credit risk on the transmission mechanism.

Estimating equation (3) requires the use of instrumental variables since this equation describes the relationship between endogenous variables that are determined simultaneously. For that purpose, we utilise as instrument lagged variables as well as deviations of GDP from HP trend and the key policy rate of the central bank of Sweden, which is found to be highly correlated with that of the Bank of Israel, rm, and, at least to some extent, it is exogenous.

The quantitative analysis

The data

To study the effects of the financial market reforms on the monetary policy transmission mechanism, we utilise monthly data on the marginal lending and deposit rates that commercial banks charge and pay, respectively, during the previous month. In addition, we use the Bank of Israel (henceforth BOI) key policy rate.[9] We use panel data that consist of an individual bank's interest rates with duration one to three months, three to six months, six to 12 months and above 12 months. For the banks' exposure to credit risk, we use quarterly data on the bank's loan loss reserves. We also use the pricing of the commercial bank issued bonds vs risk-free government bonds. The sample includes monthly data from January 1999 up to April 2012 in the five largest banking groups in Israel.[10] To control for shifts in the demand for bank loans, we use seasonally adjusted monthly GDP and the monthly composite state of the economy index. We also use in the regression quarterly data on the banks' non-interest income and operational expenses, as well as their total assets and total risk-adjusted assets.

We use the BOI key rate as the benchmark interest rate on which the market participants based their pricing. Banks in addition follow the monopolistic bank's first-order conditions in the pricing of the loans. Given that the commercial bank deposit rates closely followed the BOI key rate – supporting the assumption of perfect competition in the deposit market – the analysis in this study focused on the correlation between the dynamics of the BOI key rate and dynamics of the banking lending rates. In fact, this is the essence of the monetary policy transmission mechanism.

Regression results

Quarterly panel data on the marginal banking (deposit and loan) interest rates and on banking loan loss reserves allow the transmission mechanism to be estimated as is reflected by the relationship between the lending rate, the credit risk and the marginal cost of raising the bank liabilities equations (2) and (3). We also study the trade-off between banking interest income and net operational income. To that end, we include in the regressions three alternative indicators of net operational income: (i) the coverage ratio (operational income vs operational expenses); (ii) the ratio of operational income to total assets; and (iii) total operational income to risk-weighted assets. We use 2SLS in the empirical estimation to overcome the endogeneity of the various interest rates as well as of the loan loss reserves.[11]

Result 1. The determination of the deposit rates depends on the BOI policy key rate but does not depend on the degree of risk the bank is exposed to. Market discipline by depositors doesn't seem to be present.

On the other hand, during the period of the sample years, variations emerge in the wedge between the banks' bond yield and the government bond yield,

[9] We use only fix nominal rates.

[10] Since these micro-banking data cannot be displayed publicly, we report only the regression results.

[11] For instrument variables we use the Bank of Israel key policy rate, lagged market interest rates and the lagged problematic loan ratio.

indicating variations in the capital market credit risk premium (see Graph 10). This result is inconsistent with the aforementioned regression estimates, unless we interpret the regression result as an empirical indication of the fact that large banks in Israel are considered too big to fail, or that there exists (de facto) bank deposit insurance. The estimated coefficients on RM in both regressions (see Tables (1) and (2)) are significantly positive and robust and in most cases smaller than unity.

From the regression results displayed in Tables (1) and (2) it transpires that the deposit rates are insensitive to the commercial bank's exposure to credit risk, and we thus expect the credit risk dynamics to be embedded in the lending interest rates.

Result 2. The estimated coefficient of the problem loan ratio is found significantly positive and robust (see Tables 3 and 4), indicating that the lending rate increases with the credit risk. We interpret this positive coefficient as an indication that banks know and price their exposure to credit risk imbedded in extending loans to individual borrowers.

In these regressions we also include a dummy variable, (see Dum08 in Tables 3 and 4), that takes the value 0 before and including the fourth quarter of 2007 and the value one thereafter.

Result 3. The dummy variable is found significantly positive in the estimated regression of the short run (one to three months) lending rate (see Table 3) reflecting a ceteris paribus rise in the lending rate and thereby in the interest rate differential in the first quarter of 2008. This increase is beyond the effect of the ratio of the problem loans on the lending rate.

In an asymmetry of information environment, this indiscriminate increase of the lending rate affects all borrowers (including the good ones) and thus has the potential of impairing the monetary policy transmission mechanism. The coincidence of this dummy effect on the lending rate and the timing of the onset of the global financial crisis and the persistence of the shock hint at the possibility that the likelihood of a realisation of a systemic credit risk increased in 2008 and that this increase was not just an idiosyncratic one.

In these lending rate regressions, we also examine the hypothesis that commercial banks utilise the trade-off between net interest income and net non-interest (operational) income. That is, in situations where banks are faced with a reduction in net non-interest income (eg due to a downturn in the economy), they raise the interest rate differential by, for instance, increasing the lending rate for which demand is relatively inelastic, and vice versa. This is, of course, problematic because an irrelevant factor (eg the banks' operating expenses) enters the pricing for investors/borrowers, causing inefficiency. It also has the potential to impair the transmission mechanism. For this purpose, we include in the regressions the coverage ratios, COV RATIO (see Tables 3 and 4).

Result 4. The coverage ratio is found to be negative (as expected) but weakly significant in the regression of the short run (one to three months) lending rate (Table 3). This empirical result is consistent with the use of the aforementioned trade-off and in itself implies a potential effect on the transmission mechanism.

In equation (3) there appears the elasticity of the public demand for loans, which depends among other things on macro variables. However, these variables (eg the deviations of GDP from its HP trend) are not significant.

The data we use for the aforementioned statistical tests include marginal pricing of the banking supply of deposit and demand for loans. For robustness, we also perform the regression utilising panel data on the average interest rates for households' utilisation of lines of credit. For this regression, we use similar explanatory variables (as above) and use similar regression methodology of 2SLS. To allow for differential effects of *rm* on the lending rate when it is raised vs the case where it is decreased, we include in addition to *rm* as explanatory variables the variables *rm*ddown* and *rm*dup*, where the *ddown* gets the value 1 when *rm* falls and 0 otherwise, and dup gets the value 1 when *rm* rises and 0 otherwise.[12] The results are summarised in Table 5. All the explanatory variables came out significant with the expected signs (including the coverage ratio) and qualitatively similar to the results reported in Tables 3 and 4. Although the coefficients of *rm*ddown* and *rm*dup* turn out to be significant with the right signs, the differential effect is not.

Regression results of the one- to three-month deposit interest rates — Table 1

Dependent Variable: **RD_13C**
Method: Panel Two-Stage Least Squares
Sample (adjusted): 2002Q2 2011Q4
Periods included: 39
Cross-sections included: 5
Total panel (balanced) observations: 195
Convergence achieved after 29 iterations
Instrument list: C SWEDEN CYCLE_PRL_CR(-1) CYCLEGDP(-1)
Lagged dependent variable & regressors added to instrument list

	Coefficient	**Std. Error**	**t-Statistic**	**Prob.**
C	-0.3421	0.0858	-3.9857	0.0001
RM	0.8929	0.0190	47.1057	0.0000
CYCLE_PRL_CR(-1)	0.0234	0.0143	1.6424	0.1022
AR(1)	0.7596	0.0509	14.9245	0.0000
Cross-section fixed (dummy variables)				
R-squared	0.9953	Mean dependent var		3.2365
Adjusted R-squared	0.9951	S.D. dependent var		1.9586
S.E. of regression	0.1372	Sum squared resid		3.5195
F-statistic	180.6488	Durbin-Watson stat		1.8266
Prob(F-statistic)	0	Second-Stage SSR		95.8769
Instrument rank	11			
Inverted AR Roots	0.76			

Where CYCLE_PRL_CR(-1) is the rate of the problematic loans in total loans (in deviations from HP trend). Among the instrument variables (see list in Table 1) we use CYCLEGDP(-1) which is the deviations from HP trend in GDP, and SWEDEN which is the Swedish policy interest rate.

[12] Note that by construction *dup* + *ddown* does not add up to unity since there are instances where r_m remains unchanged.

Regression results of the six to 12-month deposit interest rates Table 2

Dependent Variable: **RD_612C**
Method: Panel Two-Stage Least Squares
Sample (adjusted): 2004Q1 2011Q4
Periods included: 32
Cross-sections included: 5
Total panel (balanced) observations: 160
Convergence achieved after 6 iterations
Instrument list: C RM(-1) CYCLE_PRL_CR(-1) CYCLEGDP(-1) SWEDEN
Lagged dependent variable & regressors added to instrument list

	Coefficient	**Std. Error**	**t-Statistic**	**Prob.**
C	0.5519	0.1437	3.8415	0.0002
RM	0.8110	0.0432	18.7534	0.0000
CYCLE_PRL_CR	0.0791	0.0667	1.1854	0.2377
AR(1)	0.4080	0.0930	4.3860	0.0000
Cross-section fixed (dummy variables)				
R-squared	0.9383	Mean dependent var		3.1771
Adjusted R-squared	0.9355	S.D. dependent var		1.2419
S.E. of regression	0.3154	Sum squared resid		15.1214
F-statistic	81.5604	Durbin-Watson stat		1.9800
Prob(F-statistic)	0	Second-Stage SSR		51.5620
Instrument rank	10			
Inverted AR Roots	0.41			

Regression results of the one- to three-month lending interest rates Table 3

Dependent Variable: **RL_13C**
Method: Panel Two-Stage Least Squares
Date: 01/06/13 Time: 20:35
Sample (adjusted): 2002Q4 2011Q4
Periods included: 37
Cross-sections included: 5
Total panel (balanced) observations: 185
Convergence achieved after 8 iterations
Instrument list: C DUM08 SWEDEN CYCLE_PRL_CR(-4) COV_RATIO(-1) CYCLE_PRL_CR(-1)
Lagged dependent variable & regressors added to instrument list

	Coefficient	**Std. Error**	**t-Statistic**	**Prob.**
C	5.4147	0.7629	7.0975	0.0000
DUM08	0.4815	0.2260	2.1304	0.0345
RD_13C	0.9568	0.1476	6.4847	0.0000
CYCLE_PRL_CR	0.4338	0.2206	1.9670	0.0508
COV_RATIO(-1)	-1.6339	1.1538	-1.4161	0.1585
AR(1)	0.7856	0.0518	15.1616	0.0000
Cross-section fixed (dummy variables)				
R-squared	0.9353	Mean dependent var		7.6645
Adjusted R-squared	0.9320	S.D. dependent var		1.9263
S.E. of regression	0.5024	Sum squared resid		44.1724
F-statistic	172.9788	Durbin-Watson stat		2.1471
Prob(F-statistic)	0	Second-Stage SSR		68.9898
Instrument rank	14			
Inverted AR Roots	0.79			

Regression results of the six- to 12-month lending interest rates Table 4

Dependent Variable: **RL_612C**
Method: Panel Two-Stage Least Squares
Sample (adjusted): 2002Q4 2011Q2
Periods included: 35
Cross-sections included: 5
Total panel (balanced) observations: 175
Convergence achieved after 15 iterations
Instrument list: C DUM08 SWEDEN CYCLE_PRL_CR(-4) COV_RATIO(-1) CYCLE_PRL_CR(-1)
Lagged dependent variable & regressors added to instrument list

	Coefficient	**Std. Error**	**t-Statistic**	**Prob.**
C	4.7675	1.1629	4.0996	0.0001
DUM08	0.4652	0.3317	1.4026	0.1626
RD_612C	0.9830	0.2552	3.8520	0.0002
CYCLE_PRL_CR	0.3747	0.1957	1.9148	0.0572
COV_RATIO(-1)	-1.8007	1.4568	-1.2361	0.2182
AR(1)	0.8959	0.0416	21.5458	0.0000

Cross-section fixed (dummy variables)

R-squared	0.9165	Mean dependent var	7.0671
Adjusted R-squared	0.9119	S.D. dependent var	2.3570
S.E. of regression	0.6995	Sum squared resid	80.7358
F-statistic	153.4615	Durbin-Watson stat	2.5925
Prob(F-statistic)	0	Second-Stage SSR	103.1543
Instrument rank	14		
Inverted AR Roots	0.9		

Regression results of the average interest rates on households' utilisation of lines of credit

Table 5

Dependent Variable: **HHD**
Method: Panel Two-Stage Least Squares
Sample (adjusted): 2002Q3 2012Q1
Periods included: 39
Cross-sections included: 5
Total panel (balanced) observations: 195
Convergence achieved after 25 iterations
Instrument list: C DUM08 COV_RATIO(-2) SWEDEN(-1) SWEDEN(-1) *DDOWN SWEDEN(-1)*DUP COV_RATIO(-1) CYCLE_PRL_CR(-1) CYCLE_PRL_CR(-3)
Lagged dependent variable & regressors added to instrument list

	Coefficient	**Std. Error**	**t-Statistic**	**Prob.**
C	9.5733	1.0798	8.8657	0.0000
RM	0.7709	0.0466	16.5458	0.0000
RM*DDOWN	-0.0320	0.0137	-2.3279	0.0210
COV_RATIO	-6.6855	1.9202	-3.4818	0.0006
CYCLE_PRL_CR	0.2523	0.1328	1.8996	0.0591
DUM08	0.2839	0.1665	1.7051	0.0899
RM*DUP	0.0346	0.0160	2.1574	0.0323
AR(1)	0.8321	0.0496	16.7815	0.0000
Cross-section fixed (dummy variables)				
R-squared	0.9647	Mean dependent var		9.2586
Adjusted R-squared	0.9625	S.D. dependent var		1.9362
S.E. of regression	0.3748	Sum squared resid		25.7018
F-statistic	201.0984	Durbin-Watson stat		2.3002
Prob(F-statistic)	0	Second-Stage SSR		55.5664
Instrument rank	18			
Inverted AR Roots	0.83			

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Changes in financial intermediation structure

Their implications for central bank policies: Korea's experience

Huh Jinho[1]

Abstract

Korea's financial intermediation structure has changed significantly since the global financial crisis: the shares of corporate fund-raising through direct financing and of fixed rate and collateralised lending have expanded. Corporate reliance on direct financing has increased, but indirect financing still serves as the major funding channel. Accordingly, bank lending and deposit rates and credit are important transmission channels for monetary policy. Against the backdrop of these changes in the financial intermediation structure, this paper will discuss the implications for monetary policy from the perspective of the effectiveness of policy rate transmission channels, the impact of external shocks such as changes in the monetary policy stance of major economies, and financial stability.

Keywords: financial intermediation, bank lending, corporate bond issuance, monetary policy transmission

JEL classification: E52, E44

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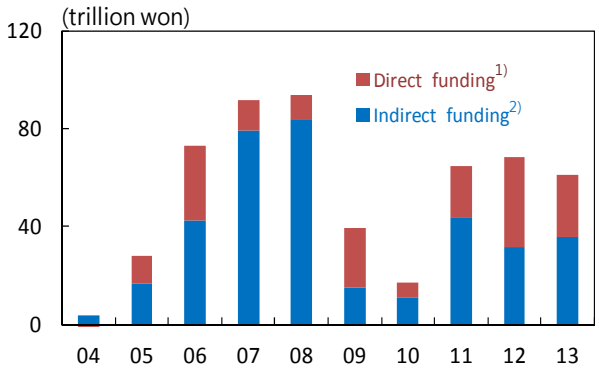
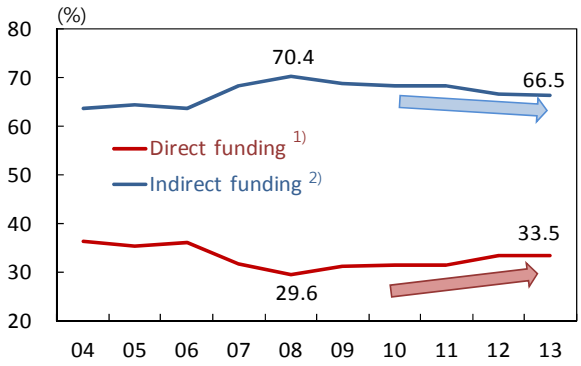
1. Bank lending markets

Since the global financial crisis, corporations' reliance on indirect funding has fallen as their borrowing from banks has contracted to a considerable extent, while their funding through direct finance has steadily increased. The share of indirect funding in total domestic funding (outstanding amount basis) fell from 70.4% in 2008 to 66.5% in 2013. Indirect funding is still the main channel for corporate funding, however, with its share in total funding remaining much higher than that of direct funding.

Corporate funding volumes, by type
(net increases) Figure 1



Shares of corporate funding by type
(outstanding amount basis) Figure 2



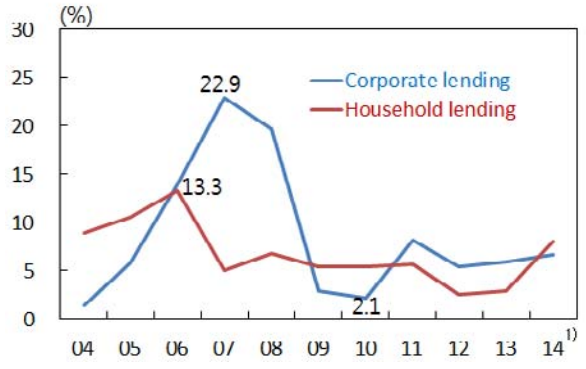
Notes : (1) Corporate bonds, CP; (2) Deposit money bank lending
Source: Bank of Korea.

Bank lending to the corporate sector shrank dramatically immediately after the financial crisis, but then gradually recovered. The growth in household lending meanwhile slowed, due mainly to government measures to curb household debt. The annual rate of increase in corporate lending reached 22.9% in 2007, but then declined sharply to 2.1% in 2010 in the aftermath of the financial crisis. It has accelerated again since 2011, but is still below its pre-crisis level, owing to the delayed economic recovery and to tighter credit standards at banks. The rate of increase in household lending meanwhile accelerated to 13.3% in 2006, but after that fell to the 2–7% level for the next several years, owing mainly to the sluggish housing market and to government measures to curb household debt. It then accelerated greatly in 2014, however, due primarily to low interest rates and the easing of the loan-to-value (LTV) and debt-to-income (DTI) regulations with the aim of revitalising the housing market. Meanwhile, the loan-to-deposit ratio regulation[2] introduced at end-2009 has worked as a factor that changes the focus of banks in their funding operations from business expansion to improving asset soundness, thus contributing to some extent to slower growth in bank lending.

[2] The loan-to-deposit ratio (average outstanding balance basis) regulation = loans in won/deposits in won ≤ 100%. The financial supervisory authorities have restricted banks' Korean won lending to within 100% of their Korean won deposits since the end of June 2012.

The share of fixed rate loans has risen in lending to both corporations and households since 2010. In particular, as the government encouraged banks to expand their fixed rate loans in order to improve the household debt structure, the share of these loans in household lending rose from 6.6% at the end of 2009 to 29.9% at the end of November 2014, a faster pace than their comparable weight in corporate lending (20.6% at end-2009 to 33.3% at end-November 2014).

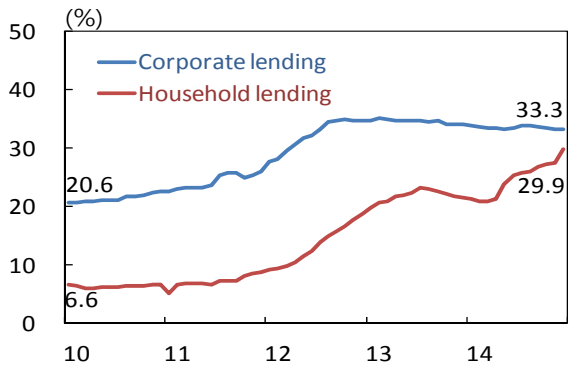
Rate of growth in corporate and household lending — Figure 3



Note: (1) Excluding the effect of the inclusion of loans in accordance with the merger of Korea Development Bank with Korea Finance Corporation for the 2014 figure.

Source: Bank of Korea.

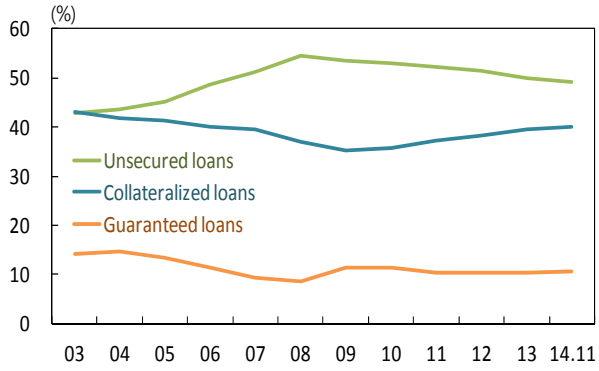
Share of fixed rate bank loans (outstanding amount) — Figure 4



Source: Bank of Korea.

As banks have maintained a conservative attitude toward lending since the financial crisis, the share of collateralised loans in corporate lending increased from 36.9% at the end of 2008 to 40.1% at the end of November 2014, whereas that of credit loans declined from 54.6% to 49.2% over the same period. The share of lending to corporations with low credit ratings rose to 8.1% at the end of August 2010 but then fell back to 5.1% at the end of November 2014.

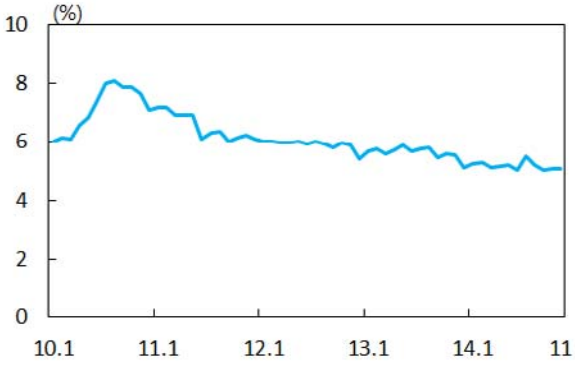
Share of collateralised loans in corporate lending[1] — Figure 5



Note : (1) Based on the outstanding amount at end-period

Source: Financial Supervisory Service.

Share of lending to corporations with low credit ratings[1] — Figure 6



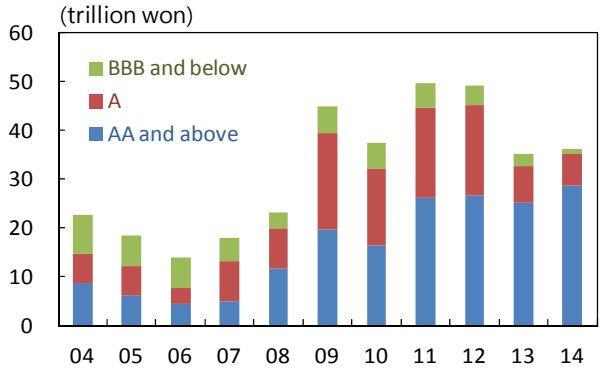
Note: (1) Based on corporations with 7th to 10th credit ratings in the 10-scale rating system.

Source: Bank of Korea.

2. Bond markets

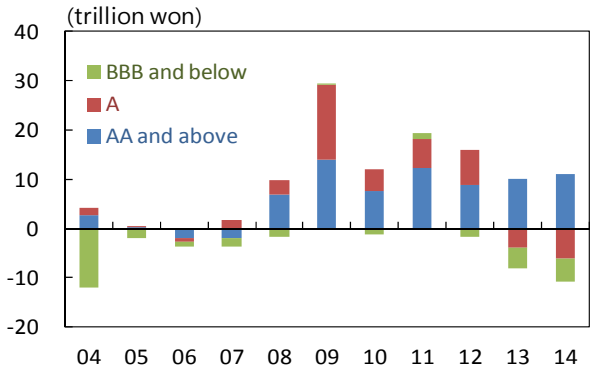
Corporate bond issuance has increased significantly since the financial crisis, due to the decline in long-term market interest rates and to corporate efforts to raise long-term funds. Since 2013, meanwhile, the issuance of corporate bonds by sub-par companies rated A or lower has shrunk considerably owing to heightened credit risk aversion after a series of defaults by well known names. Since 2014, however, the fundraising situation has varied even among subprime companies, as seen, for example, in the increased demand for corporate bonds issued by some subprime issuers.

Total volume of corporate bond issuance — Figure 7



Source: Korea Securities Depository.

Volume of corporate bond net issuance — Figure 8

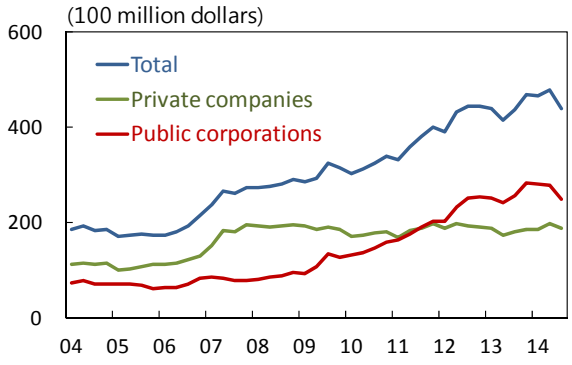


Source: Korea Securities Depository.

Overseas corporate bond issuance has increased significantly, as global liquidity has accumulated and international investors have regained their appetite for risk following quantitative easing by advanced economy central banks. In particular, energy-related public corporations have rapidly expanded their bond issuance for purposes such as raising funds for foreign direct investment. The outstanding amount of overseas bond issuance by public corporations more than tripled from $7.7 billion at the end of 2007 to $25.4 billion at the end of September 2014.

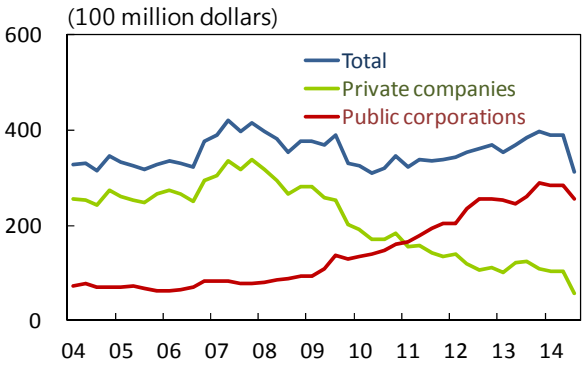
Public corporations, which have made very few investments in international debt securities, have seen their net foreign liabilities increase greatly. On the other hand, the net foreign liabilities of private companies declined sharply from $33.8 billion at end-2007 to $5.7 billion at end-September 2014 as their holdings of foreign bonds increased rapidly on the back of abundant foreign liquidity generated by the current account surplus.

Outstanding amount of overseas corporate bond issuance — Figure 9



Source: Bank of Korea (Statistics on external credit/liabilities).

Corporations' net external liabilities[1] — Figure 10



Note: 1) External liabilities (foreign bonds, borrowings from overseas etc)—external credits

Source: Bank of Korea (Statistics on external credit/liabilities).

3. Implications for monetary policy

While the dependence of corporates on direct financing has increased moderately since the financial crisis, indirect financing is still their major source of funding. Accordingly, banks' lending and deposit rates, and other credit channels, continue to be the key transmission channels for monetary policy.

Changes in financial intermediation since the financial crisis, such as the growing weight of fixed rate lending, the conservative lending attitude of financial institutions, and credit differentiation have acted to weaken the effects of monetary policy transmission. As fixed rate lending is based on long-term market rates and at a rate fixed until maturity, the effects of policy rate adjustments are transmitted relatively slowly compared to those via variable rate lending. Moreover, the conservative lending attitude of financial institutions, which focus mainly on extending prime and collateralised loans, together with credit differentiation in the direct and indirect financial markets, is hindering the transmission of policy rate adjustment by restricting the access of companies with poor credit and collateral to the direct and indirect financial markets.

However, empirical analysis using a dynamic panel model shows that the transmission effects of policy rates on banks' lending and deposit rates have grown significantly since the financial crisis.[3] Despite the constraints mentioned above,

[3] In the short term, and compared with the pre-financial crisis situation, the scale of the adjustment of bank lending rates after a change in the policy rate more than doubled after the crisis (based on the month of the policy rate change: 31% → 74%). In the long term, while the degree of adjustment was almost the same (89% → 85%), its pace has gathered speed with the shortening of the transmission period (11 → four months). See Bank of Korea, "Analysis of the Transmission Effects of the Policy Rate on Bank Lending Rates", Monthly Bulletin, July 2014.

post-crisis regulations on banks' loan-to-deposit ratios[4] and on loan premiums[5] are thought to have heightened the effectiveness of the interest rate transmission channels.

Since corporate overseas bond issuance has increased greatly, the related rollover costs could increase if global interest rates go up due to any shift in the US Fed's monetary policy stance. However, only 4.1% of private companies' funding is external (as at September 2014), and their net external debt has declined greatly. Unless global liquidity conditions worsen dramatically, they are thus unlikely to face huge difficulties in raising funds overseas.

As their net external debt has expanded with the surge in bond issuance overseas, public corporations are more likely than private companies to be exposed to external shocks.[6] However, the proportion relative to GDP of the outstanding bonds issued overseas by public corporations stood at only 2.2% as of 2013, and the issuance of foreign currency-denominated bonds and their share relative to GDP are unlikely to increase very fast given the government's policy of debt reduction (announced in December 2013). Bond maturities[7] are also diversified, at more than five years on average. Therefore, even if financial jitters emerge in EMEs and foreign bond markets become strained due to monetary policy normalisation in advanced economies, the effects on external funding by public corporations in Korea will likely be limited.

[4] The regulation on Korean won-denominated loan-to-deposit ratios has steepened banks' fund supply curve in the lending market, causing lending rates to fluctuate to a larger extent in the event of a policy rate adjustment.

[5] To increase the transparency of bank lending rate calculation, the government introduced regulations on premiums such as the model guidelines on premiums (Nov. 2012) and disclosure of comparative rates (March 2013), and this acted to restrict banks' behaviour in adjusting premiums in a direction opposite to the movements of the policy rate and market interest rates.

[6] The proportion of funds raised overseas in public corporations' total fundraising was 6.4% as of September 2014.

[7] **Maturities of corporate bonds issued overseas**[1]

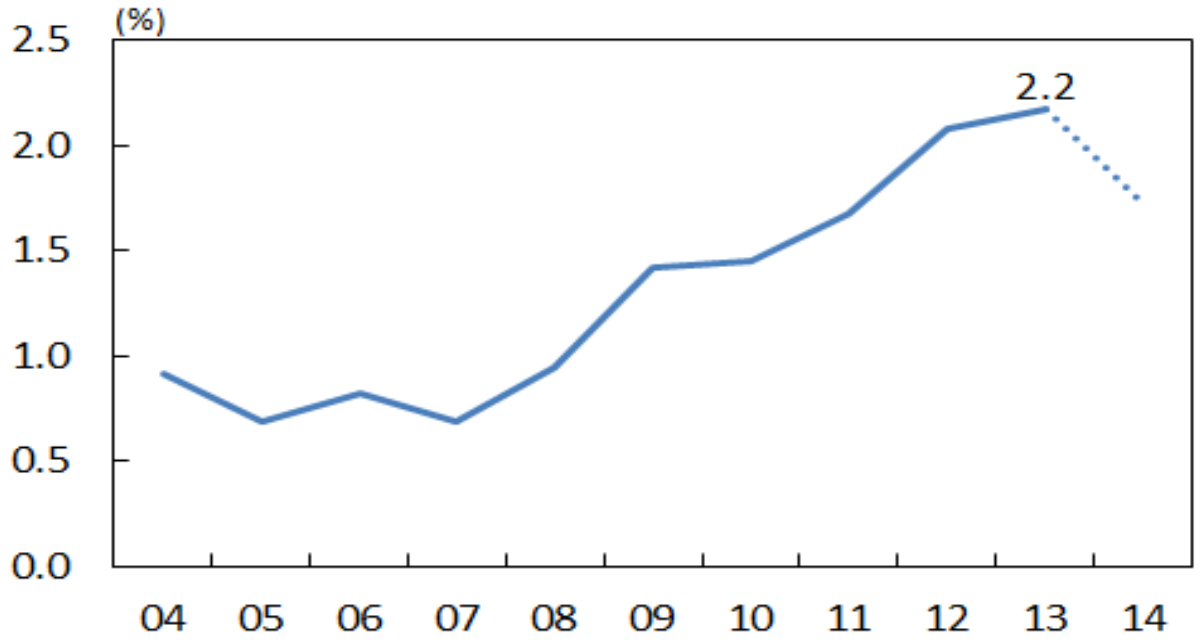
(year)

	2008	2009	2010	2011	2012	2013	2014[2]
Public corporations	5.8	5.0	5.7	5.6	8.3	5.4	7.5
Private companies	4.0	4.7	7.2	5.4	7.8	4.2	4.0
Total	4.8	4.9	6.1	5.5	8.1	5.0	6.7

Notes : 1 Based on weighted averages of total amounts outstanding
2 Between January and August 2014
Source : Yonhap Infomax.

Proportion relative to GDP of outstanding bonds issued overseas by public corporations

Figure 11



Note: IMF, *World Economic Outlook* estimates used for 2014 GDP.

As at end-September 2014 for outstanding bonds issued overseas.

Sources: Bank of Korea, external debt statistics; IMF, *World Economic Outlook*.

We need to be cautious in using monetary policy to respond to a contraction in financial markets caused by credit risk aversion. During 2013 and 2014, the issuance of subprime company bonds fell after the insolvencies of several conglomerates. However, bank lending offset the sluggish corporate bond market to some extent, and credit differentiation induced the restructuring of weak companies, which was assessed to be a positive development.[8] But, as it is growing credit risk aversion that has constrained the access of subprime companies to funds, we need to bear in mind that the effect of interest rate policies might be weak.

Meanwhile, macroprudential policies such as the LTV and the DTI ratio regulations have supplemented monetary policy. The Korean government introduced these measures in order to respond to overheating in the housing market and rising household borrowing. These policies have been positively viewed as having helped Korean households to maintain their financial soundness while weathering the global financial crisis. Although the Bank of Korea lowered its Base Rate sharply in response to the economic slump immediately after the financial crisis, household debt accumulation remained muted thanks to the tightening of the LTV and DTI restrictions. However, the Base Rate was lowered together with the easing of these restrictions in the second half of last year, and the complementary effects of these macroprudential policies were thus weakened.

[8] It was found that many subprime companies have prepared capital to redeem their corporate bonds through cash holdings and disposals of assets.

Although the share of fixed rate loans has increased, it still lags well behind that of variable rate loans. With hikes in interest rates expected going forward, the interest repayment burdens of many companies and households will rise. In response to the shifts to tighter monetary policy in the future, it would be desirable for marginal companies to undergo a swift restructuring, while microeconomic policies are improved in order to help low-income families to increase their repayment capabilities.

Changing patterns of financial intermediation and implications for central bank policy: the Malaysian perspective

Bank Negara Malaysia

Abstract

The effects of the 2008 global financial crisis have confirmed the increasing interaction between global financial conditions, on the one hand, and domestic financial intermediation and the effectiveness of the central bank's monetary policy, on the other. This paper details Malaysia's perspective on the financial sector reforms undertaken over the past decade, which strengthened the financial system's resilience and ensured uninterrupted domestic intermediation despite global economic and financial market uncertainty. Notwithstanding changing patterns of financial intermediation, Malaysia has been able to rely on a broad financial policy toolkit that has enabled monetary policy to focus on its main objective of maintaining price stability while giving due regard to economic developments.

Keywords: banking institutions, debt securities market, financial intermediation, Malaysia, monetary policy, macroprudential policy, bank-based financing, market-based financing

JEL classification: E44, E52, E58, G18, G21, G28

I. Overview

The Malaysian economy has experienced significant financial deepening over the last decade. The size of the financial system was approximately 5[1] times GDP in 2013 (in 2000 it was approximately 3.5 times GDP), with a growing contribution to real GDP of 9.1% (2005: 7.5%). The role of market-based financing has become significantly more pronounced, particularly for established and large corporations. Financing from the private debt securities market as a share of domestic business financing rose further over the last decade, reflecting a more diversified financing structure. This resulted in a lower concentration of loans from the banking system to meet financing needs. Household financing, together with lending to small and medium sized enterprises (SMEs), has remained the mainstay of the banking system. A notable feature of the Malaysian financial sector is the dual system of conventional and Islamic finance. This system was established pursuant to a strategy that had the objective of promoting an inclusive financial system and of strengthening linkages between the financial system and the real economy.

Structurally, the diversification of intermediation channels has served to promote a more efficient allocation of financial resources domestically and mitigate undue external pressures. The combination of market-based and bank-based financial systems has provided a wider array of financial policy tools to respond to macroeconomic and financial stability risks. This has increased policy flexibility. At the same time, more developed financial markets and stronger financial institutions, as a result of financial reforms implemented following the Asian financial crisis, have enabled Malaysia to better weather episodes of heightened global economic uncertainty and international financial market volatility. This was borne out during the 2008 global financial crisis. The ensuing episode of market volatility remained modest in Malaysia. Intermediation activity continued undisrupted, reflecting a more resilient financial system as broad-based domestic funding sources for Malaysian businesses reduced vulnerabilities to external developments.

On the whole, domestic structural developments have contributed towards the strengthening of monetary policy effects on the economy. This is notwithstanding the somewhat increased exposure to global monetary and financial conditions. Various macroprudential measures implemented since 2010 to mitigate the risks of financial imbalances are likely to have complemented certain channels of the monetary transmission mechanism. However, these did not substitute for the monetary policy stance being at the right level so as to mitigate broad-based risk-taking behaviour which may have been detrimental to medium-term growth prospects.

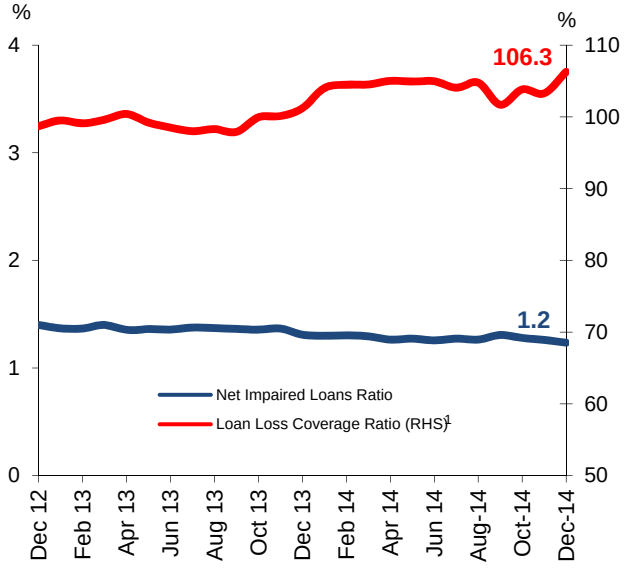
This paper comprises five sections. Sections II and III provide an overview of the Malaysian financial system, focusing respectively on the role of banking institutions and debt securities market. Section IV discusses the impact of the patterns of financial intermediation on domestic monetary policy. Section V concludes.

[1] Financial system depth is proxied by the stock of outstanding loans granted by financial institutions, equity market capitalisation and the stock of outstanding bonds, all relative to GDP.

II. The role of banking institutions

The assets of the banking sector have grown considerably over the last decade, to 210.5% of GDP in 2014 (2004: 184%). Of this, the share of Islamic banking assets has grown from only 2.7% in 2004 to 22.8% of total assets of the banking system at end-2014. Loans remain the largest component of banking system assets. Despite the global slowdown that followed the 2008 financial crisis, credit to the economy continued to expand at an average annual growth rate of 9.3% between 2008 and 2014 (based on the stock of loans outstanding). This has been accompanied by sustained improvements in asset quality (Chart 1).

Net impaired loans ratio and loan loss coverage ratio — Graph 1



Note: Beginning January 2010, loans are reported based on FRS139; [1] Refers to ratio of individual plus collective impairment provisions to total impaired loans.

The past decade has also witnessed a notable shift in bank lending to households. Loans to households now constitute a significantly larger share of banking sector loans (2014: 56.9%) compared to earlier periods (1998: 32.8%). This trend is driven primarily by an increasing demand for credit in tandem with higher consumption and investment activities on the back of an expanding economy and rising incomes. Ample liquidity conditions, alongside sustained efforts by the Malaysian authorities to promote financial inclusion, with a focus on enhancing not only access but also the effective use of financial services, have further contributed to the growth in loans to households.

The growing significance of loans to households has resulted in a greater dispersion of credit risk and corresponding changes in credit risk management approaches by banking institutions, with the wider use of credit scoring models for risk assessments. In Malaysia, the establishment of a public credit registry (Central Credit Reference Information System or CCRIS) in 2001, which captures both positive and negative credit information relating to household borrowers from financial institutions, has supported sound credit risk assessments. Reflecting the

increased exposure of financial institutions to households, institutional arrangements have also been put in place to pre-emptively respond to potential stress in the household sector. Specifically, a fully operational credit counselling and debt management programme is in place to assist households that may face financial difficulty.

The banking system's household loan portfolio remains largely secured. A significant proportion of household borrowing is for the purchase of properties and motor vehicles, which collectively accounts for close to 77% of total household loans. Banks' exposure to the property sector (through the financing and holding of debt securities) amounted to about 26% of the total assets of the banking system, of which 17% was mainly exposure to households for the purchase of residential property. In the more recent period, there was a marked increase in unsecured personal financing as a share of total household loans, driven by low borrowing costs and rising consumer spending. While the banking sector continues to account for the bulk (about 80%) of household financing needs, the rising demand for personal financing has also been increasingly met by significant growth in the activities of non-bank financial service providers. Between 2010 and 2012, personal financing by non-bank financial service providers expanded on average by 28.2% annually to account for 57.5% of total personal financing to households in 2012.

In response to these developments, a series of macroprudential policies were implemented since 2010 to mitigate the risks of an excessive accumulation of household debt. This included measures to comply with responsible financing practices, such as strengthened affordability assessments and requirements. The measures were also extended to non-bank financial service providers to reduce opportunities for regulatory arbitrage given the increasing role of these providers in intermediating household funding needs. With the continued strong growth in housing loans and rising property prices, fiscal and macroprudential measures were also implemented to reduce speculative purchases in the property market. Collectively, these measures have reduced the build-up of risks in the household and property sectors.

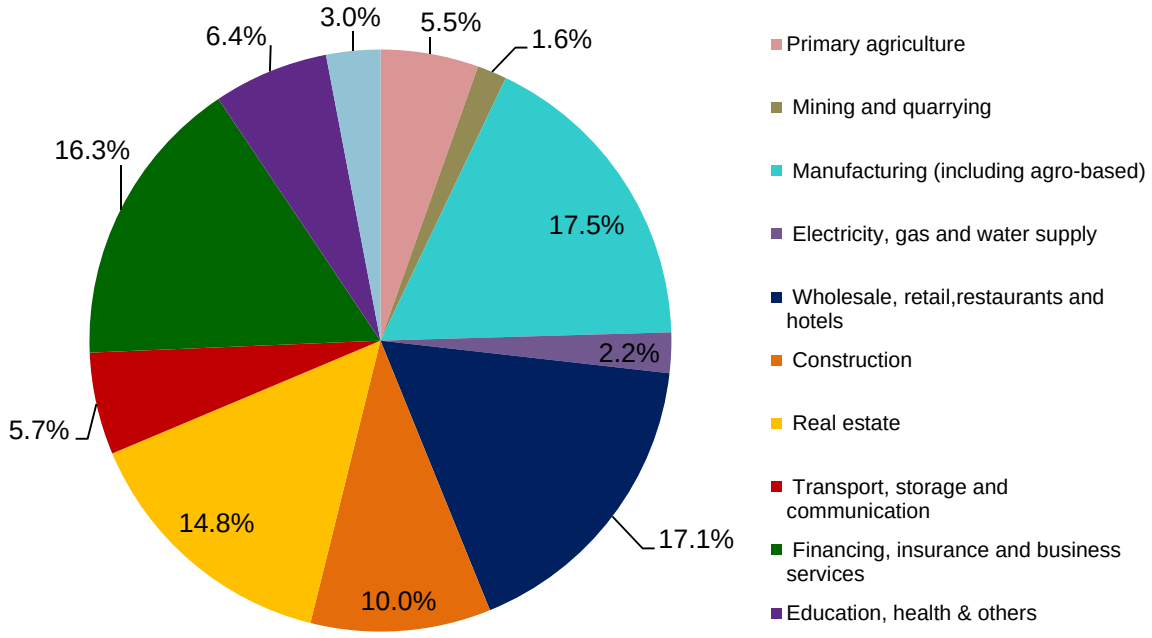
Bank lending to businesses is broad-based (Chart 2). A significant share of the portfolio comprises lending to SMEs, including micro-enterprises, which has increased over the last decade to account for 45.8% of overall bank lending to businesses (2001: 40.3%). This is supported by a coordinated national SME development strategy that has expanded access to financing for these businesses while improving the quality of loans extended. The introduction in 2006 of a nation-wide micro-financing scheme[2] by the Central Bank of Malaysia (CBM) has also increased the role of banks in providing access to financing for viable micro enterprises. Commercial banking institutions remain the largest providers of financing to SMEs. At end-2014, commercial bank loans to SMEs accounted for 94.3 % of total loans extended to SMEs. Complementing the role of banks, development financial institutions[3] (DFI) retain an important role in bridging financing gaps and acting as catalysts to promote broader access to financing from

[2] The Micro-financing Scheme provides small loans ranging from RM1,000 to RM50,000 for micro-enterprises and is solely for business financing, such as for working capital and capital expenditure purposes.

[3] Financial institutions mandated by the government to promote specific social and economic objectives.

the private sector, particularly in specialised and new growth industries as well as key strategic sectors.[4] Reflecting their focus on specific mandates, total assets of DFIs represent less than 9% of total assets of the banking system, and that share has remained broadly unchanged in the last 5 years.

Banking system - loans to businesses by sector — Graph 2



December 2014

Loans extended by the banking sector are predominantly denominated in ringgit. However, demand for foreign currency loans has been on a rising trend owing to the working capital needs of the overseas operations of Malaysian businesses. The foreign expansion of Malaysian banks in the last decade has enabled such banks to fund their loans with local currency deposits, thus reducing their reliance on offshore wholesale funding and currency mismatches. The overall share of foreign currency loans to total loans outstanding remains small at about 4%.

Floating-rate loans have increased in the last decade to account for 72% of total outstanding loans (2005: 59%). While this has contributed towards reducing the interest rate risk exposures of banks (or rate of return risk for Islamic banks), movements in borrowing costs will, however, have a larger potential impact on banks' asset quality. In view of this, significant focus is given in the supervisory activities of the Central Bank of Malaysia (CBM) on ensuring sound credit assessments by banks, and on stress testing to ensure that banks maintain adequate financial buffers against the potential deterioration in the debt servicing capacity of floating-rate borrowers.

[4] Including technology and agriculture-based industries.

Average lending rates have been on a declining trend since late 2006, reflecting efficiency gains achieved by banks as well as heightened competition. The combination of benign domestic credit conditions, ample liquidity and more intense competition has led to an under-pricing of risks among some banks. This prompted measures by the CBM to strengthen pricing practices through the implementation of standards on risk-informed pricing and supplement existing supervisory interventions. The introduction of a new reference rate framework which came into effect on 2 January 2015 will promote further discipline in banks' pricing practices by increasing the level of transparency in retail lending rates.[5]

Collateral practices, in terms of the level and composition of loan security coverage, have remained largely unchanged. The market value of collateral, as a percentage of total loans outstanding and total loans approved, stood at 133% and 70%, respectively, at the end of 2014. Properties account for the bulk (66%) of collateral accepted. Other common forms of collateral accepted include shares, unit trust funds and guarantees. Valuation practices for collateral provided against loans have been aligned with the International Financial Reporting Standards (IFRS) since 1 January 2010, resulting in a shift from prescriptive-based rules to principle-based standards. Supervisory standards were correspondingly strengthened to reinforce sound valuation practices.

Debt securities holdings constitute the second largest component of the Malaysian banking system's assets, of which public debt securities and domestic non-financial corporate paper comprise respectively 57% and 33% of such holdings. Hence, while market-based financing has become increasingly important, the banking system continues to play an important role in this evolution through its total holdings of outstanding private debt securities over the past decade (2014: 26.4%, 2004: 35.3%). Such holdings, however, also expose banking institutions to additional indirect channels for the transmission of risk from significant institutional investors in the capital markets, such as pension funds and insurers, as well as non-resident investors in the domestic financial markets. Volatile and significant price movements arising from the liquidation of assets held in common with banks would affect the valuations of debt securities on banks' balance sheets. This risk is currently largely mitigated by the profile of bank holdings, which are predominantly in higher-rated and more liquid paper. Bank holdings of foreign currency debt issues and non-resident debt issues remain limited and manageable, respectively representing about 7% of total debt securities held by banking institutions at end-2014.

The liability structure of banks has remained broadly unchanged and reflects a significantly stronger liquidity position compared to the period before the Asian financial crisis. A diversified deposit base accounts for approximately 70% of total funding. Drawing from the lessons of the Asian financial crisis, banking institutions are now less reliant on interbank and other market-based funding. At end-2014, the share of deposits from households and businesses constituted respectively 35.4% and 34.8% of total deposits. Securitisation activities of the banking institutions remain limited and have declined since 2007, comprising less than 0.2% of total

[5] Under the new reference rate framework, retail lending rates set by banks are determined by and expressed as the bank's benchmark cost of funds plus a positive fixed spread over the tenor of the loan. For most banks, the benchmark cost of funds is referenced to the Kuala Lumpur Interbank Offered Rate (KLIBOR).

loans outstanding (2007: 0.7%) in an environment of ample liquidity. Hire purchase receivables comprise the bulk (about 70%) of loans sold to Cagamas (the national mortgage corporation), followed by housing loans. The bulk of securitised transactions are undertaken with recourse to banking institutions as part of liquidity management strategies. Strong incentives are therefore preserved for banks to maintain sound underwriting standards. Reflecting stronger liquidity buffers maintained by domestic banks as well as ample liquidity conditions, the banking system has also been a net lender in the domestic interbank market in the past several years, with net placements with the CBM totalling RM91 billion in 2014 (2007: RM164 billion).

Of late, competition for banking system deposits has intensified, with such deposits growing at a slower rate between 2013 and 2014 than in earlier periods. Factors contributing to this include the increased outflow of funds as a result of investments abroad by resident non-bank corporates as well as the reversal of non-resident portfolio funds. The on-going process of financial deepening has resulted in access to a broader range of financial products and services, including alternative investment options. This, combined with increasingly discerning consumers with more sophisticated and differentiated needs, and investors in search of higher yields, has moderated placements of deposits within the banking system. The increased competition for deposits also reflects banks' anticipation of the new liquidity coverage ratio (LCR) rules under Basel III which, will come into effect in Malaysia in June 2015. These factors have prompted pricing adjustments to both deposit and wholesale market rates, which have previously been relatively low. Generally supportive conditions for debt issuance, reduced regulatory arbitrage between banks and non-bank financial service providers (as a result of prudential measures applied to significant non-bank institutions), as well as greater clarity about the operationalisation of the new LCR rules, are expected to ease the current pressure on deposit and wholesale market rates.

The overall dependence of banks on external wholesale markets to fund domestic or overseas operations remained marginal at less than 11% of total funding. Hence, the impact on banks' balance sheets of a potential tightening of global financing conditions was limited. Based on the network contagion analysis undertaken on cross-border claims and liabilities of Malaysian banks with major banking counterparties, the combined effects of credit and funding shocks are expected to have a limited direct impact on the Malaysian banking system. The indirect impact arising from capital flows on domestic funding conditions is similarly contained. Under a simulated worst-case scenario of severe portfolio outflows,[6] the potential shortfall in US dollar liquidity would not exceed 6%[7] of the CBM's international reserves.

Foreign banks in Malaysia are required to be locally-incorporated and comply with capital and liquidity standards at the local entity level. This serves as an important safeguard in mitigating contagion risk that can arise from stress affecting foreign financial institutions that have significant operations in Malaysia. During the global financial crisis, the operations of foreign banks in Malaysia were less exposed to funding pressures arising from the withdrawal of intra-group financing. Such a

[6] Assuming outflows equivalent to 100% of cumulative inflows since global financial crisis.

[7] As of 15 January 2015.

withdrawal was observed to have been more pronounced among banks operating as branches in the region. The requirement for dividend payments to be approved by the CBM has also served to mitigate the contagion impact of adverse external shocks on domestic credit intermediation by preserving strong capital buffers within the Malaysian subsidiaries. Throughout the global financial crisis, the operations of foreign banks in Malaysia have remained resilient and profitable (with high capitalisation levels and sustained credit quality).

III. The role of the debt securities market

Since the Asian financial crisis, the debt securities market has assumed a more significant role in financing growth of the Malaysian economy. Total outstanding securities in that market amounted to RM 1,117.0 billion at end-2014, or 104.4% of GDP (at end-2013). Over the period 2004 to 2013, the domestic debt securities market grew at a compounded average growth rate (CAGR) of 10.9%, compared with the growth in domestic bank credit of 10.4%. Malaysia is one of the few emerging economies with a private sector debt securities market comparable in size to those of advanced financial systems. It is also a leading international centre for sukuk (Islamic) bond issuance. In 2014, the private debt securities market represented 41.7% of total outstanding debt securities.

Although the debt securities market was historically dominated by government bonds, measures taken to develop the private debt securities market have made financing more efficient, in particular for large corporates, complementing the role of the banking system. These measures include enhancing the price discovery process through the Bond Information and Dissemination System (BIDS) and the establishment of domestic credit rating agencies. In parallel, a more efficient issuance process has been facilitated by a web-based Fully Automated System for Tendering (FAST) as well as the development of a Real-Time Gross Settlement System (RENTAS) that has also mitigated settlement risk. The establishment of Malaysia's first financial guarantee insurer, Danajamin Nasional Berhad, has further supported the ability of viable corporations with a lower credit standing to source funding through the debt securities market. Corporates financing from the debt securities market has correspondingly increased to 37.1% of total business financing at end-2014 (1998: 1.8%).[8]

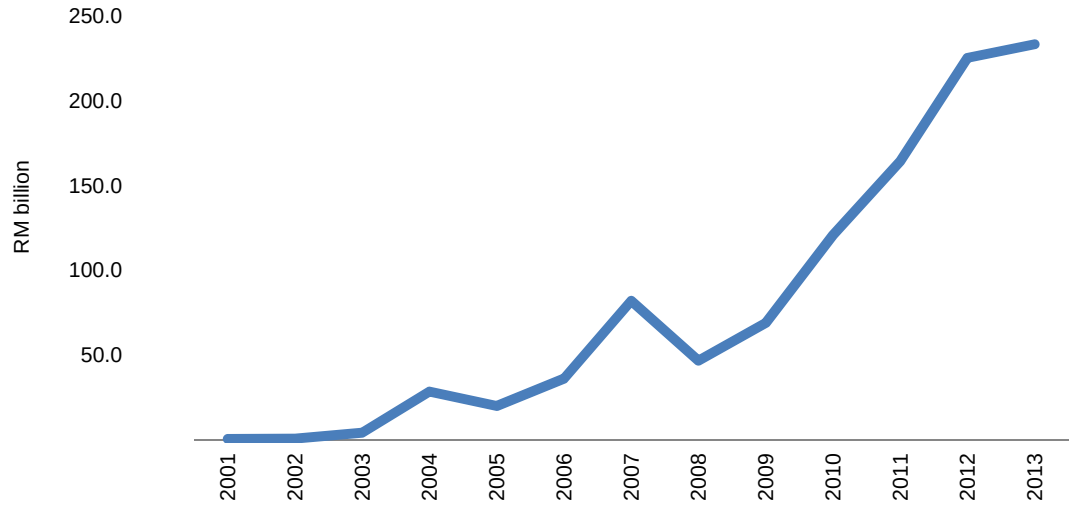
Another prominent feature of Malaysia's financial landscape is the sukuk bond market. The country hosts the largest such market with total issuance of approximately RM272.3 billion in 2014 and total outstanding securities of RM 582.7 billion at end-2014. Malaysian sukuk securities accounted for 65.6% of global issuance in 2014 and 57% of the total stock of sukuk securities outstanding at end-2014. The sukuk market grew at a CAGR of 23.6% during the period 2001-2014, far outpacing the conventional debt securities markets (CAGR: 13.8%). Its share of the total debt securities market correspondingly increased from 25% in

[8] The percentage share is calculated as the ratio of outstanding private debt securities (PDS) to total domestic business financing. Total domestic business financing comprises outstanding loans of the banking system and development financial institutions (DFIs) to businesses (including SMEs), and outstanding PDS. The 1998 figure excludes outstanding loans from DFIs.

2001 to 52.2% in 2014. Issuance has been supported by a more liberalised market place which has allowed multilateral financial institutions, multinationals and national corporations from other jurisdictions to issue both ringgit and non-ringgit denominated sukuk securities. Foreign investor participation in the sukuk market has also increased. Of importance is the structure of that market, which is based on underlying assets that reinforces the link between financial transactions and real economic activity.

As with other Asian economies, Malaysia witnessed a surge in capital inflows in the period following the global financial crisis. These large inflows were precipitated by unprecedented monetary easing in several advanced economies. Since the introduction of the first quantitative easing programme (QE1) by the US Federal Reserve in 2008, Malaysia has accumulated US$ 69.4 billion of non-resident portfolio inflows (4Q 2008-4Q 2014),[9] channelled mainly into the debt securities market. Correspondingly, non-resident participation in the government securities market[10] has increased from 11.4% of total government bonds outstanding in 4Q 2008 to 28.0% in 4Q 2014.[11] The proportion of non-resident participation in the private debt securities market, however, remains relatively small (4Q 2008: 5.0% of total outstanding private debt securities; 4Q 2014: 3.0%).

Foreign holdings of Malaysian debt securities — Graph 3



Source: Bank Negara Malaysia.

While the surge of capital inflows comes with a risk of abrupt reversals, the development of the financial sector has contributed to the preservation of orderly market conditions in an environment of more volatile capital flows. This was evident during the "taper tantrum" episode (May-August 2013) when Malaysia experienced significant outflows following the US Federal Reserve's announcement of its

[9] Source: Department of Statistics Malaysia

[10] Comprising Malaysian Government Securities (MGS), Government Investment Issues (GII), Malaysian Treasury Bills and Government Housing Sukuk.

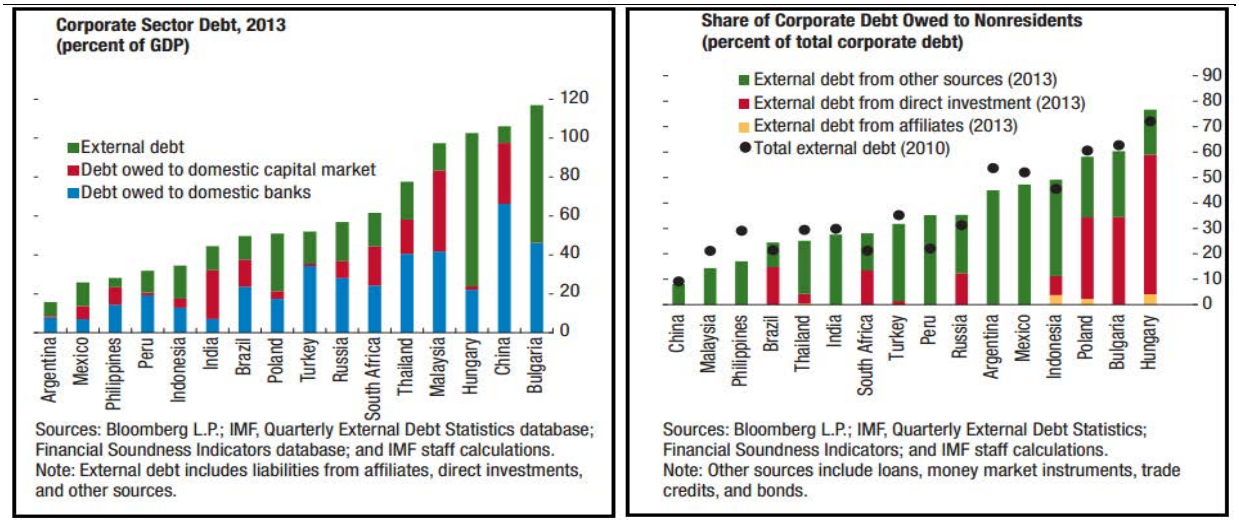
[11] In terms of the MGS market, non-resident participation had increased from 13.5% in 4Q 2008 to 46.9% in 3Q 2014.

intentions to scale back its quantitative easing measures. Malaysia did not experience highly disruptive price movements due to deeper financial markets, a broader investor base (supported by strong domestic institutional investors), a more developed insurance industry and a larger fund and wealth management industry (with the capacity to absorb episodes of heavy selling by non-residents). Despite selling pressure by non-residents in the Malaysian government securities market (MGS), MGS yields across the five- to ten-year tenors increased moderately within a range of 58 and 92 basis points (Philippines: 59 and 73 basis points; Thailand: 76 and 92 basis points; Indonesia: 240 and 276 basis). At the same time, liquidity in the bond market remained intact as it was underpinned by strong demand from domestic institutional investors.

The maturity profile of both public and private debt securities has lengthened but remains relatively short. The average maturity at issuance for all sectors (government, financial corporate and non-financial corporate) expanded from 4.36 years in 2004 to 5.49 years in 2013. Efforts to extend the maturity profile of debt have seen well-received issuance of bonds with maturities of up to 30 years. The extended maturity profile has reduced the exposure of borrowers to refinancing risk particularly for projects with a longer gestation period, such as infrastructure, power plants and toll roads. The broader investment horizon for investors has also contributed to the improvement of the asset liability management of insurance companies and pension funds with longer term obligations.

In terms of domestic exposure to international borrowing, growth in external borrowing was low prior to 2013. However, corporations in emerging market economies, including Malaysia, have more recently increased such borrowing through the offshore issuance of debt securities (see Chart 4). The external borrowing of non-bank corporations in Malaysia rose rapidly in 2013 before moderating in the second half of 2014 to account for 18.9% of total business sector debt (2013: 19.2% of total).

Cross country comparison of non-bank corporate sector balance sheet exposure Graph 4



Source: IMF (2014).

External borrowing is largely concentrated in capital intensive sectors (such as oil and gas, telecommunication and transportation) and issued for the overseas

operations of businesses in these sectors. Such borrowing is naturally hedged by foreign currency earnings. External borrowingby residents is also subject to approval by the CBM and information submitted in connection with such approval shows that resident companies, including large multinational companies, have been active in hedging their foreign currency exposures through derivative transactions with onshore banks.

The growing international debt issuance and external borrowing of non-financial corporations, particularly in emerging economies, have raised additional concerns about the effectiveness of domestic monetary transmission and the stability of banks' funding sources.[12] In the case of Malaysia, the bulk of external borrowing by non-financial corporations is earmarked for the expansion of overseas operations. While non-resident corporations in Malaysia have been receiving an increasing amount of inter-company loans, these are mainly provided by the global parents to invest in the business activities of these companies in Malaysia. There is limited evidence of "carry trade" activities, as indicated by the gap between gross leverage (debt to earnings) and net leverage (debt minus cash to earnings) of non-financial corporations, which has not exhibited a widening trend. This shows that the proportion of new debt held as cash balances with banks has not increased substantially. In fact, the share of non-financial corporate deposits declined slightly to account for 34.8% of total bank deposits as at end-2014 (2013: 35.5%; 2012: 36.1%; 2011: 37.3%), due to higher investment abroad by a few large corporations in recent periods.

Based on stress tests conducted by the CBM on the debt servicing capacity of non-bank corporations in Malaysia,[13] the impact from higher borrowing costs and a significant depreciation of the ringgit would be limited. The post-shock aggregate interest coverage ratio (ICR) of sampled corporations would remain comfortably above the prudent threshold of 2 times.[14] However, the impact from a decline in operating profits (due to lower earnings and/or higher costs from operating activities) would be far more significant. These results suggest that corporate vulnerabilities arising from higher external borrowings continue to be relatively contained.

IV. Implications for monetary policy

A number of factors seem to have contributed towards strengthening the impact of monetary policy in Malaysia. As a whole, improvements in access to financing and a widening in the range of financial products, coupled with other factors such as

[12] Due to the favourable interest rate differentials, non-financial corporations in emerging economies could undertake "carry trade" i.e. borrowing cheaply from abroad and placing the funds in local banks (typically in the form of deposits).

[13] Simulation based on the performance of 160 companies tracked by the CBM (representing 80% of Bursa Malaysia's market capitalisation).

[14] The IMF defines a weak debt servicing capacity as an interest coverage ratio of less than 2 times. The interest coverage ratio is defined as operating profit over interest expense.

demographic shifts, appear to have increased the sensitivity of domestic economic activity to policy rate changes.

Firstly, the pass-through of policy rate changes to retail lending rates has become progressively stronger (see Chart 5).[15] One reason is the increasing use of financial market rates, such as KLIBOR, as benchmarks for the pricing of loan and deposits. As the transmission of overnight policy rate (OPR) changes to these money market rates has been fast and complete, transmission to retail lending rates has been enhanced as well. Nevertheless, while as a whole the interest rate pass-through has become stronger, it remains uneven. Alarger pass-through has been observed for loan and deposit products that are tied to the short-end of the financial market yield curve, such as floating-rate housing loans, than with lending rates that are priced off the longer end of the curve, such as fixed rate loans for the purchase of cars.

Secondly, the development of financial markets has also increased the holding of securities (including equity) by businesses and households (2013: unit trust and equity holdings accounted for 20% of households' total assets; 2002: 13%[16]). As a result of this shift, changes in housing and financial wealth (including unit trust and equity holdings) have become a key determinant of private consumption (see the box in CBM (2013) on the determinants of consumption in Malaysia). This has strengthened the wealth channel of monetary policy, as the greater accumulation of financial assets has increased the sensitivity of balance sheets to asset price movements arising from monetary policy changes. For example, housing wealth is the largest contributor to private consumption growth after income, contributing on average to 14.5% of consumption between 2005 to 2Q 2013.

Thirdly, the substantial share of floating-rate loans (about 70%) suggests that the impact of a change in the policy rate should have an effect on repayments, disposable income and, ultimately, consumption. This impact is expected to differ by income groups, with concentration mainly in middle income households. This is due to the size of their exposure to floating rate loans, which are used to finance the purchase of residential property, and their relatively higher marginal propensity to consume.

The degree of sensitivity to global monetary and financial conditions can be assessed from two angles. The first is the extent of direct reliance on external financing by either banks or non-banks. The second is the indirect impact of capital flows on domestic financing costs and banks' sources of funds.

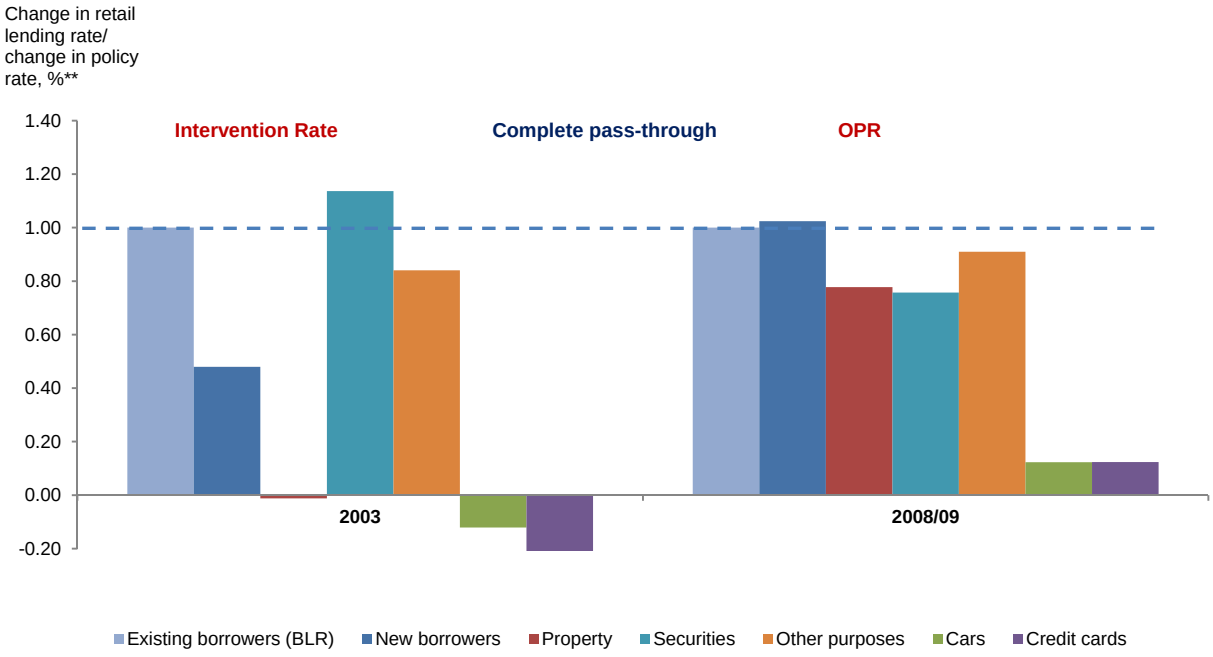
From the perspective of the monetary transmission mechanism, these may potentially lead to weakening effects. On one hand, financing supply and costs tied to global monetary and financial conditions are beyond the reach of domestic monetary policy. On the other hand, there might be a possible dampening effect on the pass-through of policy rate changes arising from the accumulation of liquidity. At the same time, a curtailment or reversal of global financing may lead to a tightening of domestic monetary and financial conditions, even as the policy rate

[15] Wholesale and retail rates of return for Islamic financing are generally similar to those of conventional credit. This is also the case for the pass-through of policy rate changes.

[16] The percentage share is calculated as the ratio of unit trust and equity holdings to total financial and real assets (deposits, insurance, unit trust and equity, Employee Provident Fund (EPF) savings, and housing wealth).

remains unchanged. As noted earlier, notwithstanding the recent increases in external financing, the dependence of Malaysian corporates and banking institutions on external funds has remained relatively low. These trends suggest that direct cross-border credit and international bank lending have not increased significantly in their relevance for the monetary transmission mechanism.

Transmission of policy rate reductions to household retail lending rates Graph 5



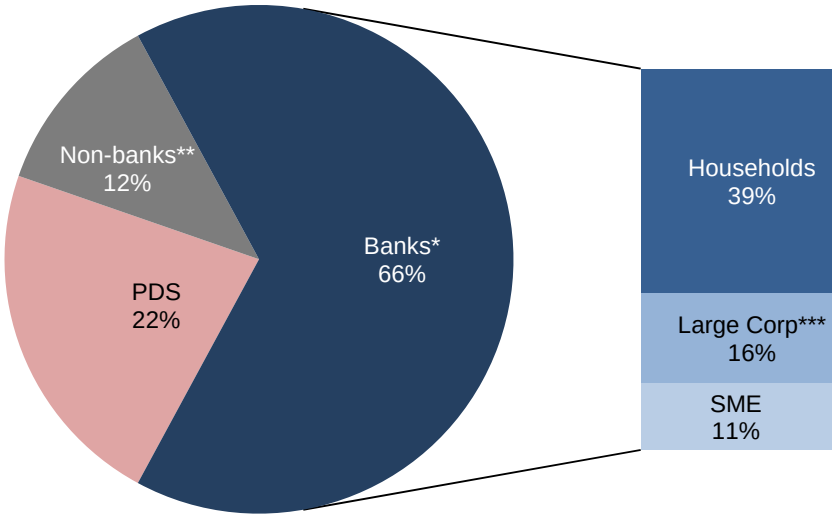
* With the exception of the base lending rate (BLR) for "Existing Borrowers", retail lending rates reflect the average lending rates (ALRs) on new loans approved.

** In 2003, the policy rate was reduced by 50 bps from 5.00% to 4.50% under the Intervention Rate system. In 2008/2009, the policy rate was reduced a cumulative 125 bps from 3.25% (Nov 2008) to 2.00% (Feb 2009) under the OPR framework. Changes in rates over different periods of adjustment were calculated as the average over 6 months before and after the policy rate change. The rates were normalised to an adjustment of 100 bps.

In terms of the indirect impact of capital flows, as noted in Section III, as with many other emerging market economies, Malaysia has experienced an increase in portfolio capital inflows, making the consideration of this channel of sensitivity particularly important. Nevertheless, these developments *per se* do not substantially affect the CBM's ability to influence the economy for a couple of reasons. One, while MGS yields are used to price private debt securities (PDS), other domestic factors, such as liquidity and credit premiua, also affect the pricing of PDS. Two, bank-based credit is still the main source of financing for the economy, particularly among households and SMEs (see Chart 6), and retail lending rates are predominantly priced off money market rates.

Domestic debt-based financing of the private sector

(Share of Outstanding Value as at end-December 2014) Graph 6



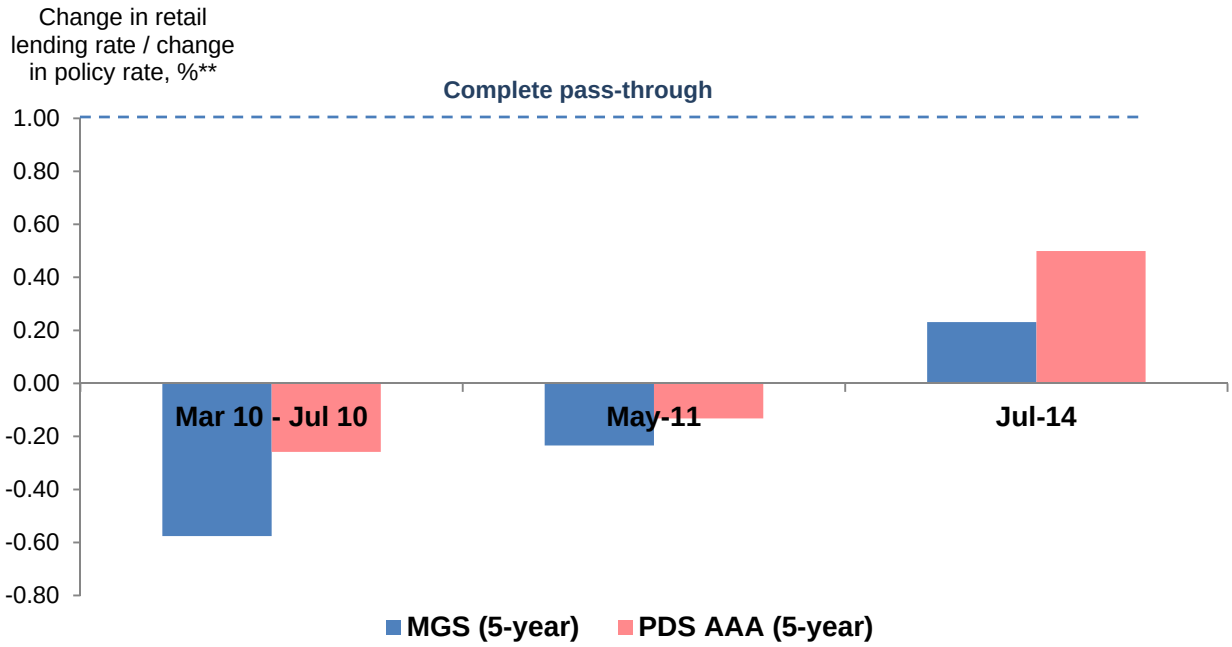
* Comprises outstanding loans of the banking system.

** Comprises development financial institutions (DFIs), other non-bank financial institutions, Treasury Housing Loan Division, insurance and stockbroking companies.

*** Large corporations comprise domestic business enterprises (excluding SMEs), non-bank financial institutions and banking institutions.

In the post-global financial crisis period, amid the increased participation of non-residents in the public debt securities market, there was relatively weak pass-through of OPR changes to bond yields, more so for MGS than PDS (see Chart 7). Capital inflows have also had indirect effects on banks' balance sheets via the increase in private sector deposits. In an environment of intense competition, this ample liquidity situation helped banks meet increased credit demand while maintaining low or stable lending rates (see Singh (2014) for a more extensive discussion of the transmission channels of global monetary conditions on domestic financial conditions). Nevertheless, in contrast to the case of bond yields, there are partial indications of noticeably weak pass-through of policy rate changes to lending rates on new loans approved (see Chart 8). Furthermore, as noted earlier, the net impact of monetary policy on the economy has strengthened compared to the early 2000s owing to various developments in the economy.

Transmission of policy rate increases to bond yields Graph 7



* Bond yields reflect 5-year Malaysian Government Securities (MGS) and AAA-rated Private Debt Securities (PDS) yields

** The OPR was increased during these periods as follows: Nov 2005-Apr 2006, 80 bps; Mar – Jul 2010, 75 bps; May 2011, 25 bps; Jul 2014, 25 bps). Changes in rates over different periods of OPR adjustment were calculated as the average over 6 months before and after the OPR change. The difference was then normalised to an adjustment of 100 bps.

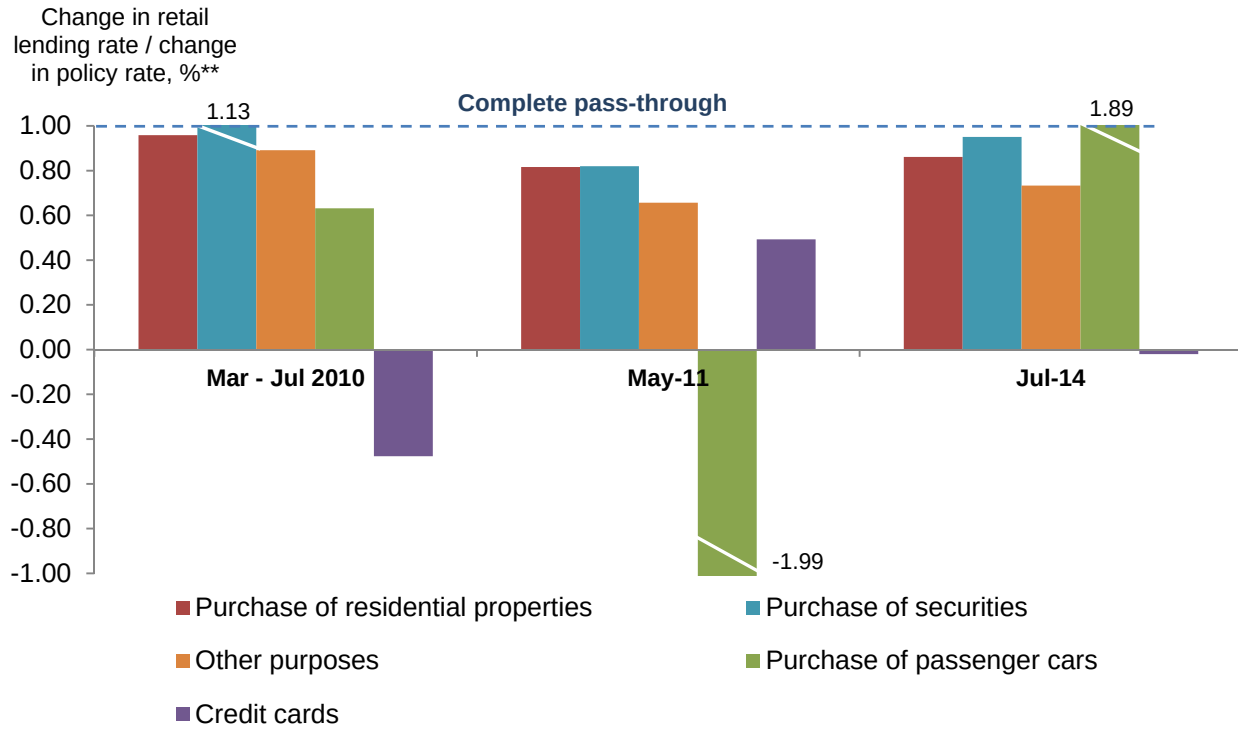
Several other factors have also helped to dampen sensitivity to global developments and prevent sharp adjustments in domestic financial conditions. For instance, in terms of the sensitivity of balance sheets, corporates and banks alike have been able to weather externally generated volatility in recent years, owing to greater flexibility in hedging foreign currency exposures,[17] and a sound capital and funding positions of banks.

In the financial markets, the growing demand for investible assets from domestic institutional investors, including insurance companies and pension funds, has helped to stabilise prices and yields during selling episodes by non-residents. The CBM also has a wide range of money market instruments to manage domestic liquidity. This provides flexibility in dealing with the volatility of capital flows. In particular, the issuance of CBM securities, which are subsequently taken up by non-residents, helps to cushion the impact of capital flows on the prices of other financial assets, and also prevents liquidity brought in by non-residents from manifesting itself as excess liquidity on banks' balance sheets. Going forward, these factors will provide important buffers against the effects of volatile capital flows arising from the divergence in monetary policies in the advanced economies. The

[17] The average daily volume of foreign exchange swaps, forwards and options increased from US$ 1.8 billion in 2008 to US$ 4.7 billion in 2014.

CBM closely monitors the impact of movements in capital flows on domestic monetary and financial conditions. Despite upward pressure on funding costs amid heightened competition for stable deposits in recent periods, lending rates have remained broadly stable in a competitive lending market. Aggregate surplus liquidity within the banking system also remains ample.

Transmission of policy rate increases to household retail lending rates — Graph 8



* Retail lending rates reflect the ALRs on new loans approved.

** The OPR was increased during these periods as follows: Nov 2005-Apr 2006, 80 bps; Mar – Jul 2010, 75 bps; May 2011, 25 bps; Jul 2014, 25 bps). Changes in rates over different periods of OPR adjustment were calculated as the average over 6 months before and after the OPR change. The difference was then normalised to an adjustment of 100 bps.

While changes in financial intermediation have to some extent increased Malaysia's exposure to external influences, the main objective of monetary policy formulation in Malaysia remains the same; that is to achieve price stability whilst giving due regard to developments in the domestic economy. Monetary policy is therefore conditioned upon changes in financial intermediation in so far as they have implications for this final objective. There is also a role for monetary policy to the extent that changes in financial intermediation lead to a broad increase in risk taking. This change in behaviour may manifest itself as financial imbalances which threaten macroeconomic stability over the longer-term (ie beyond the typical monetary policy horizon of one to two years).

It follows that under the exceptional circumstances of large financial shocks and acute financial stress, a case can be made for monetary policy action, even of an unconventional nature, and liquidity provision. This is especially so if financial developments threaten to disrupt economic activity and future price stability. In this regard, financial stability and price stability concerns are not inconsistent.

During the period of global shortage of US dollar liquidity following the collapse of Lehman Brothers in 2008, the CBM provided a US dollar facility to Malaysian firms involved in international trade to ensure that trade financing, especially in US dollars, was not interrupted. Further back, during the Asian financial crisis recovery period, bank lending rates were linked directly to the policy rate then prevailing (the three-month intervention rate), to allow for the faster transmission of changes in the policy rate. Funds for lending to SMEs, and credit allocation targets were also used to influence the direction of credit extension (Singh (2014)).

Importantly, however, depending on the nature of shocks and risks, different situations will require different policy responses. Policymakers need to be wary of overburdening monetary policy when other policies are needed to address risks and deficiencies in the financial system and economy. More generally, risks emanating from changes in financial intermediation, including potential adverse effects from capital outflows and sharp changes in borrowing costs, should be managed pre-emptively by building buffers and addressing vulnerabilities. It is best to preserve financial stability at the outset rather than having to deal with the fallout from instability.

It is likely that macroprudential measures have complemented certain channels of the monetary transmission mechanism in the recent period. However, these do not substitute for the appropriate monetary policy stance needed to achieve the primary mandate of price stability and mitigate the adverse effects of financial imbalances on medium-term growth prospects. Given the balance of risks to inflation and economic growth, monetary conditions were progressively normalised over 2010 to 2014 with a cumulative increase in the OPR of 125 basis points. The policy interest rate was also increased in part to mitigate the risk of a widespread build-up of financial imbalances.

The macroprudential measures referred above have been implemented since late 2010. A targeted approach was adopted given that risks of financial imbalances had developed in specific market segments, especially in the property and retail lending sectors. An over-reliance on monetary policy in such circumstances could have had more widespread damaging effects on the broader economy. Given that these measures can affect banks' lending behaviour, they are likely to have complemented the credit and asset price channels of the monetary transmission mechanism and dampened elements of risk-taking. These measures were implemented alongside other fiscal and long-term structural measures, for example, the imposition of a real property gains tax (RPGT) and enhancing housing supply.

Based on Malaysia's experience, depending on the nature of imbalances being addressed, macroprudential policies are most effective when used in complement to monetary policy and/or supplemented with an array of complementary supervisory, fiscal and structural policies. For example, the loan-to-value (LTV) ratio limit is targeted at speculative purchases for borrowers with three or more outstanding housing loans and implemented alongside fiscal and long-term structural measures. In addition, the coverage of macroprudential measures needs to be sufficiently broad to minimise cross-sectional spillovers, such as a shifting of risk from banks to the shadow banking system. The above would require (i) the central bank or financial stability authority to be empowered by the law to do so; (ii) a robust governance arrangement for effective checks and balance; and (iii) a solid coordination mechanism with other domestic regulatory and supervisory authorities, or government agencies, to implement, monitor and enforce such

measures over time. In Malaysia, the CBM, as the macroprudential authority, is equipped with a broad range of financial stability policy instruments that can be extended to entities that are beyond its supervisory oversight. In considering the application of such policy to entities that are not regulated by the CBM, coordination begins at the decision-making stage, where the Financial Stability Executive Committee,[18] which is chaired by the Governor, is legally empowered to deliberate and decide on proposed orders with the objective of preserving domestic financial stability.

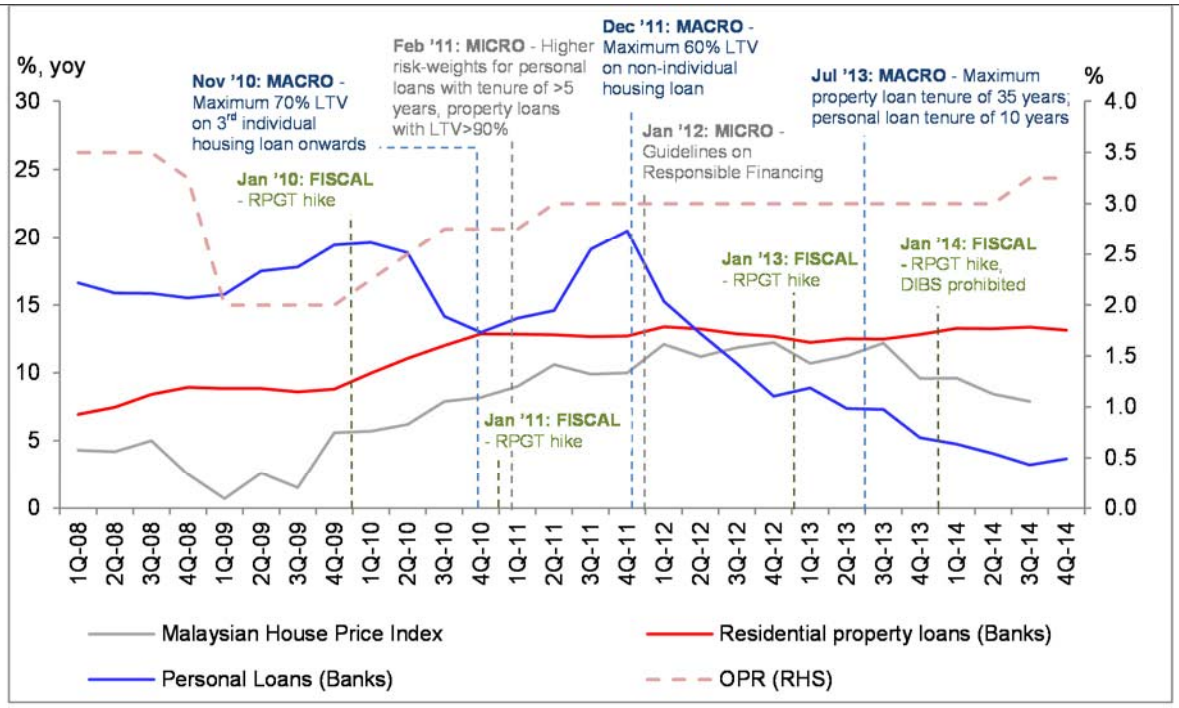
Following the implementation of various measures, household debt growth[19] moderated from 15.1% in 2010 to 9.9% in 2014, with observed signs of reduced speculative activity in the property sector. The growth of house prices also moderated (2Q 2014: 8.4%; 2013: 11.6%), although it still remains relatively high (1990-2012: 6.0%) due in part to structural factors, such as inelastic housing supply in the short-term and higher demand for housing resulting from demographic changes. Broadly, as well, improvements have been observed in the underwriting standards of banks in recent years.

The use of a broad policy toolkit allows monetary policy to focus on its main objectives of maintaining price stability while giving due regard to developments in the economy. However, this does not reduce the importance of calibrating the stance of monetary policy to mitigate broad-based excessive risk-taking behaviour, which would be detrimental to longer-term growth prospects. Recognising the interaction between monetary and financial stability policies, the Bank has also established the Joint Policy Committee (JPC) to deliberate on cross-cutting issues and to ensure the effective coordination of policies that may have an impact on the financial system and the broader economy.

[18] The Executive Committee, established under the Central Bank of Malaysia Act 2009, decides on recommendations to issue financial stability orders or extend liquidity assistance to entities not regulated by the Bank, or to provide capital support to the Bank's regulated entities, for the purpose of averting or reducing risks to financial stability. The Executive Committee comprises the Secretary General to the Treasury, Chairman of the Securities Commission Malaysia, Chief Executive Office of the Malaysia Deposit Insurance Corporation, selected independent technical experts and heads of other supervisory agencies (where relevant, by invitation).

[19] Comprises outstanding household loans extended by banks and non-banks. Non-banks comprise DFIs, other non-bank financial institutions, Treasury Housing Loan Division, insurance and stockbroking companies.

Policy measures, and credit and house price developments (2008-2014) Graph 9



V. Conclusion

The Malaysian financial system has undergone significant evolution, particularly over the last two decades. From a predominantly bank-based system, financial intermediation in Malaysia has become more diversified, characterised by the increased role of capital markets and non-bank financial intermediaries. Concomitantly, the interlinkages with the global and regional financial systems have also increased, in tandem with similar trends in the real sector.

While these developments have resulted in more efficient financial intermediation, the optimal allocation of resources and diversification of risks, they have also changed the nature and speed at which risks and vulnerabilities can be transmitted across markets and national boundaries. As a result, central banks and other policymakers have needed to build buffers to support the robust functioning of their financial systems and have required a wider array of policy tools to deal with emerging risks and shocks effectively and pre-emptively.

In this regard, Malaysia's relative financial stability has also been largely attributable to a series of reforms undertaken to strengthen the resilience of the financial system to withstand such shocks and emerging risks. Additionally, Malaysia relies on a broad policy toolkit, recognising that different policy instruments may be required for different situations and objectives. Macroprudential measures implemented over the past few years have been aimed at addressing risks in specific segments of the financial system and the economy. This has allowed for monetary policy to focus on its primary mandate of price stability.

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Is trouble brewing for EMEs?[1]

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Abstract

Discussions regarding financial stability have revolved mainly around the degree of leverage in financial institutions. However, some authors have argued that mechanisms associated with unleveraged institutions could entail financial instability. With this in mind, we aim to shed light on the possible presence of run-like dynamics in the in- and outflows emanating from bond funds vis-à-vis a group of emerging market economies (EMEs). In addition, we examine some of the implications of US monetary policy on these dynamics. As argued by some authors (see Feroli et al (2014)), although bond funds are mostly unleveraged, the type of incentives they face might generate run-like dynamics. Such dynamics could prove unfavourable for financial stability. Indeed, we find evidence of the presence of run-like dynamics in the bond flows of several EMEs, although some economies seem to be more vulnerable than others. We also find evidence that changes in US monetary policy affect such dynamics, and that the strength of those dynamics could have increased since the beginning of 2013. Our main concern in this paper relates to run-like dynamics that could potentially take place in the near future. In other words, we hypothesise that hitherto we have seen only a handful of episodes with run-like dynamics, although we believe that there is a good chance that more such episodes could follow.

Key words: Financial leverage, emerging market economies, US monetary policy, unconventional monetary policy

JEL codes: F3, F4

[1] The views expressed in this paper are those of the authors and do not necessarily reflect the views of the Bank of Mexico. Comments are welcome. We would like to thank the Financial Stability Directorate, the Central Bank Operations Directorate, and the Economic Research Directorate at the Bank of Mexico for providing us with some of the data. Conversations with Fabrizio López Gallo, Andrés Jaime, Claudia Tapia Rangel, and Ariadna Valle Carmona have been useful.

Introduction

The unprecedented easy monetary policy stances implemented in advanced economies (AEs) have had substantial implications for the world economy, and, in particular, for most EMEs. For their part, EMEs have assessed how far such policies have contributed to speeding up their economic recovery and they have considered the possible unintended consequences. One of the main implications has been the significant capital flows into and out of EMEs, of which bond markets have contributed to a significant share.

Since the global financial crisis, a leitmotiv in financial stability policy discussions has been the degree of leverage in financial institutions. In effect, leverage has been identified as a central factor behind the recent global financial crisis. Accordingly, many financial sector reforms have been designed with the goal, among others, of providing better incentives for financial institutions to attain sustainable (ie closer to socially optimal) levels of leverage.[2]

Nonetheless, some authors have argued that given the magnitude of bond-related flows, and the incentives faced by many asset management companies, a low degree of leverage in the financial institutions involved will not necessarily ensure a stable financial ride through the tightening of the US policy rate.[3]

Against this backdrop, following the work of Feroli et al (2014), we seek evidence of the existence of run-like dynamics in bond flows in a set of EMEs. We also explore some of the possible implications of US monetary policy for such dynamics. Run-like dynamics can be rationalised by the presence of delegated investment decisions between the ultimate owners of the invested capital and the managers of the funds, and a concern for the relative performance of these actors.[4] Nonetheless, other mechanisms could also be contributing to such dynamics. We emphasise some of the aspects that are relevant to EMEs.

Of course, this is not to say that the degree of leverage is either more or less important. Its relative importance is indeed a very pertinent question, but one that will not be addressed here. In other words, we seek evidence of a specific channel among other possible ones, but without taking a specific stance on its relative strength.

[2] Leverage in countries receiving capital flows has also been highlighted as a determining factor of the capacity with which economies will be able to deal with the eventual tightening of the US policy rate, particularly so in EMEs (Rajan (2013)). To quote Rajan (2013): "As leverage in the receiving country builds up, vulnerabilities mount and these are quickly exposed when markets sense an end to the unconventional policies and reverse the flows." What is more, Rajan (2014) has argued that "Leverage need not be the sole reason why exit may be volatile after prolonged unconventional policy. Investment managers may fear underperforming relative to others [...]". We explore this in detail for the case of bonds flows in and out of EMEs.

[3] As is made clear in the previous footnote, we believe that the level of financial leverage is relevant in both the investment institutions that originate the flows and the economies that are the recipients of such flows.

[4] This is not the only potential agency conflict. For example, Chevalier and Ellison (1997) document that, while the owners of the invested capital would like to maximise the risk-adjusted returns of their funds, fund managers would like to maximise the value of those funds. In particular, fund managers tend to maximise the funds' risk-return profile at the end of the year which, in turn, determines their compensation.

The study of the relationship between asset prices and financial stability is, of course, not new. For example, Borio and Lowe (2003) argue that "sustained rapid credit growth combined with large increases in asset prices appears to increase the probability of an episode of financial instability." While credit is not a component of the models we use here, significant increases in bond prices are indicative of potential financial stability problems, as we will be exploring in more detail.

Relatedly, Stein (2014b) underlines, in the context of financial stability and monetary policy, that instead of mainly focusing on a measure of financial leverage as an input into the monetary policy framework, we should additionally look at risk premia in the bond market.

It goes without saying that the monetary authorities of the AEs are pursuing their own interests. In effect, they are following their legal mandates. Nonetheless, given their monetary policy stances – in terms of the magnitude of those stances, the time they have been in place, and the degree of uncertainty involving their implementation and exit – one has to recognise that the implications of such monetary policies are less well understood. In short, we are keenly interested in understanding the economic implications that these policies entail for EMEs.

Finally, our general concern is about the run-like dynamics that could potentially take place in the near future. In other words, we hypothesise that up to this point we have only seen a handful of episodes of run-like dynamics, but there is a good chance that more will follow.

Preliminary analysis: EMEs

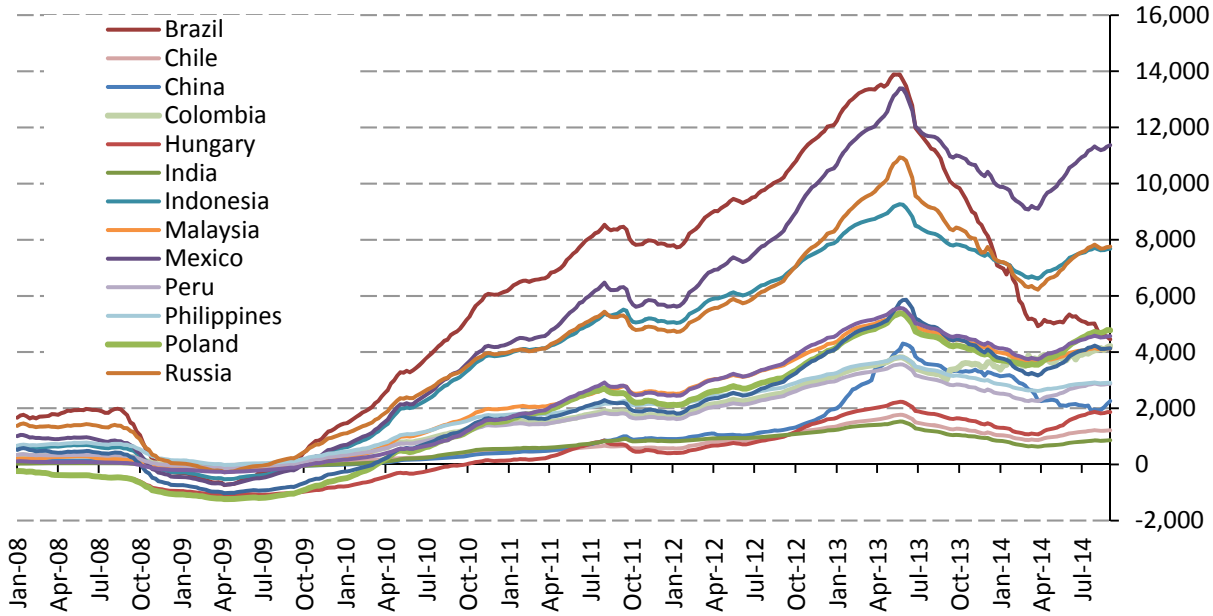
To set the stage, we present some evidence relating to the recent evolution of bond flows to and from EMEs, and to the returns associated with well-known EMEs' bond market indices. To begin with, based on a simple visual inspection (Graph 1), we note some of the properties of cumulative bond flows.

First, such flows are highly correlated. Second, in general, the longer inflows have been accruing to an economy, the greater their fall once an outflow episode takes place. Relatedly, the pace of the inflows tends to be slower than that of the outflows. This was seen most clearly in September 2011. Third, some of the most significant changes in the direction of flows are associated with US monetary policy announcements, most notably during the so-called taper tantrum of May 2013.

In addition, the aggregated bond flows pertaining to EMEs and the spread on the universe of securities covered by the EMBI Global Index display three features (Graph 2). First, they tend to co-move negatively (ie bond flows and related bond prices co-move positively). Second, the correlation between the spread on the EMBI Global Index and changes in bond flows seems to have increased as of Q3 2011. In other words, variations in the EMBI spread lead to greater changes in bond flows after Q3 2011. Third, the bond flows' variance has increased since around Q3 2011.

Cumulative bond flows in selected EMEs

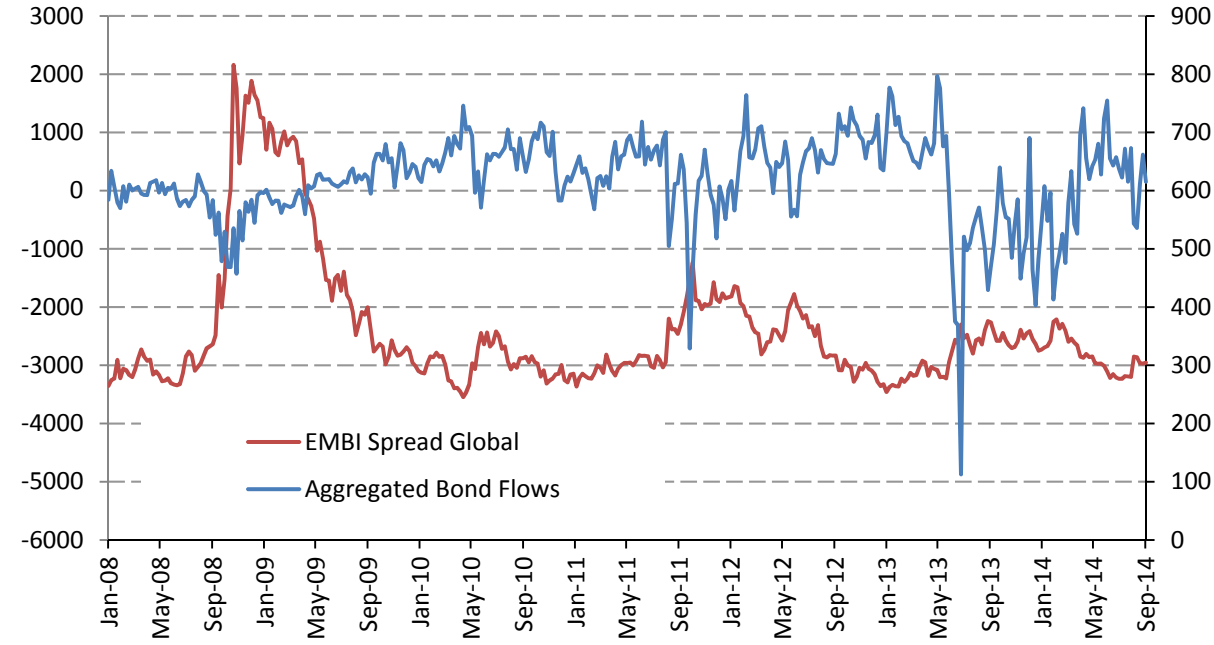
US dollars millions, weekly periodicity — Graph 1



Source: EPFR

Aggregated bond flows in EMEs and spread of Global EMBI Index

US dollars millions, and index, weekly periodicity — Graph 2



Source: EPFR and Bloomberg

All told, high correlations among bond flows, their negative co-movement with the spreads on the EMBI Global Index, and sharp bond outflows provide joint evidence pointing to the presence of run-like dynamics, as we will explore in detail in the rest of the paper. This situation contrasts with the classic case in which an increase in the risk premium (ie a lower price) eventually prompts an upsurge in capital inflows, as some investors seize the opportunity to invest. In addition, we will see that EME-related bond flows and the EMBI spread seem to be affected by monetary policy decisions in the United States.

1. The model

In this section, we use the model posited by Feroli et al (2014), which is a simplified version of the model developed by Morris and Shin (2014), as a framework for the analysis of our data. At times, we also refer to Banerjee (1992), who put forward a simple model of herd behaviour. Those models will prove useful in organising part of our discussion.

Next, we make three important clarifications. First, we do not intend to calibrate or estimate an economic model. Instead, our analysis is mostly based on the estimation of a set of vector auto-regressions (VARs). Second, the facts we document could be the product of other economic mechanisms behind the run-like dynamics of the bond flows and the relevant bond market indices. Three, although we use one specific model to guide our analysis, just as in Feroli et al (2014), we do not favour one mechanism over another. Thus, there could well be other economic mechanisms leading to the type of dynamics that we seek to document.

A brief description of the model posited in Feroli et al (2014) is as follows. There are two types of investor:

(i) *Passive* investors who are risk-averse. Each such investor chooses between holding one unit of the risky asset and investing the equivalent of that unit in a money market account, offering a floating rate that is directly associated with the policy rate. Everything else constant, the floating rate is the safest return.

(ii) *Active* investors who are risk-neutral. Each one also chooses either to hold a risky asset or having her/his capital in a money market account. However, they are *delegated* investors. Thus, although they care about long term fundamentals, they are also concerned about their *relative performance* vis-à-vis their peers. Such a concern can be rationalised in several ways. Active investors can have a reputation motive or a career concern (see Scharfstein and Stein (1990) and Hong et al (2000)). A poor relative performance would probably involve a loss of some their clients (Chevalier and Ellison (1998)). The redemption pressure funds face could be considered as another motive.

In their model, each active investor keeps a watchful eye on the performance of its peers. In practice, this can be achieved by having investors measuring their performance against the same benchmark index. Every active investor knows this. Thus, active investors play a game in which the effort that one exerts will affect the efforts of the others.[5]

[5] As pointed out by Feroli et al (2014), the delegated relationship is typically a sizeable chain of relationships. Thus, although conceptually one can think of a principal and an agent, in practice it would probably involve several principal-agent relationships, positioning the initial principal from

Exploring the model further, there is a fixed supply of risky securities denoted by S. All investors care about the fundamental expected value V of the risky security at some terminal date T. Passive investors have a quadratic utility function.[6] The aggregation of their first-order conditions implies a linear demand of the form: $p = V - (\sigma^2/\tau)\, q$, where p and q are, respectively, the price and quantity demanded of the risky asset by the passive investors. Also, σ^2 can be interpreted as the variance of the risky asset, and τ is a risk-sensitive coefficient.[7] The lower the value of the coefficient, the more risk-averse the passive investors are.

There are n active investors, where $n<S$. As active investors are risk-neutral, they will demand the risky asset at price V (or at a smaller value) as long as they do not think that their relative performance is a concern. In such a case, each active investor's demand for one unit of asset is totally elastic. Thus, if all active investors have a position in the risky asset, in the aggregate they will demand n such assets.

Passive investors will not pay V for the risky asset since they are risk-averse. Instead, they will demand the remaining S-i risky assets, where i is the number of active investors which hold a unit of the risky asset, at an equilibrium market price p. This price is determined by the passive investors' linear demand and by the number of active investors which hold a unit of the risky asset, ie $p = V-(\sigma^2/\tau)(S-i)$, where $0\leq i\leq n$.

If an active investor, say, buys a unit of the risky asset, its price increases by (σ^2/τ). Conversely, if that investor sells its unit of the risky asset, the asset's price decreases by (σ^2/τ). Moreover, if all active investors sell their positions in the risky asset, its price falls by $(\sigma^2/\tau)n$, to reach a price of $V-(\sigma^2/\tau)S$, its minimum bound.

Suppose then that there are no active investors with a position in the risky security. The first active investor would buy it at $V-(\sigma^2/\tau)S$, and the jth active investor would do so at a price $V-(\sigma^2/\tau)(S-(j-1))$. The investor's return also depends on the order in which the asset has been sold, as mentioned, as every time an active investor sells its position in the risky asset, the asset's price drops by (σ^2/τ).

In general, an active investor will seek to have a position in the risky asset first. Once the investor has such a position and suspects that the rest of the active investors will abandon theirs, that investor will seek to leave its position as soon as possible. In short, buying before the rest of the active investors, and selling ahead of the run, yields the greatest return.[8]

As mentioned, both types of investor have access to a money market account which pays a floating rate closely associated with the policy rate. More specifically, an investor that rolls over its investments in the money market account obtains a gross return of: $1+r = \mathbf{E_t}\ \Sigma^{T}_{m=1}\ (1+i_{t+m})$, where i_{t+m} is the policy rate at time t+m.

the last agent farther apart. In this context, a relative ranking could be interpreted as an effective monitoring device.

[6] Explicitly, the investor's utility function is: $Vy - (1/2\tau)y^2\sigma^2 + (W-py)$, where y is the position in the risky-asset, σ^2 its variance, and W the investor's wealth.

[7] Morris and Shin (2014) derive the aggregate demand, noting that $\tau=(\tau_1+\tau_2+...+\tau_K)$, where τ_i is the risk coefficient of the i^{th} individual active investor.

[8] Specifically, assume that at some point all delegated investors buy a unit of the risky asset. Then if such investor sells it in the k^{th} place, she will sell at a price of $V-(\sigma^2/\tau)((S-n)+(k-1))$. Thus, under such scenario, buying at j and selling at j yields $(\sigma^2/\tau)[n+j-k]/\{V-(\sigma^2/\tau)(S-(j-1))\}$.

Thus, the return on the money market account depends on the expected path of monetary policy.

The active investor that ranks last faces a penalty fee. That is, on top of the investor's low return relative to that of its peers, it loses C. Thus, in the model, active investors play a global game, which is a simplified version of the model in Morris and Shin (2014). Specifically, assuming a uniform density of beliefs over the other active investors' decisions to sell their position in the risky asset, it can be shown that investors will prefer the risky asset if r is less than a threshold:[9]

$$r \leq (V-p)/p - C/n. \quad (1)$$

The intuition is straightforward: adjusted for the penalty and the number of active investors, the investment opportunity with the higher premium (ie (V-p)/p) is preferred. Thus, as C augments or as n decreases, the threshold declines. The effect of the penalty's size is direct: a bigger one will make more active investors turn to the money market account as the threshold declines when the number of active investors decreases.[10]

Note that a larger τ, ie less risk-sensitive passive investors, implies smaller differences in returns between investors. Conversely, a smaller τ, ie more risk-sensitive passive investors, leads to greater differences in returns between these investors. As an extreme case, suppose that passive investors are nearly risk-neutral, ie, τ is very large. Thus, based on their demand curve, $p = V-(\sigma^2/\tau)(S-i)$, changes in their position in the risky asset would lead to negligible changes in its price, leading to undistinguishable rankings between passive investors.[11] Conversely, in the context of Banerjee (1992), greater differences in returns would more probably lead to herd-like behaviour.

At this point, it is useful to elaborate on the model's intuition. Active investors care about the risky asset's fundamental long-run value. Yet, they have a relative ranking concern in the short-run, which is realised in the penalty taken by the active investor that ranks last. Importantly, the risky asset market's size is sufficiently small that changes in the active investors' positions affect prices significantly.[12]

[9] The uniform density assumption is motivated by a result in Morris and Shin (2014). In that paper, the penalty fee is endogenously determined as a function of the proportion of active investors having a portfolio value above the investor's portfolio value which is penalised (denoted by x). In their model, x's density is a uniform one.

[10] Following the analogy of the musical chairs game, one gets more concerned the fewer players are left. In this game, assuming a uniform density for getting a chair, given n participants, one fails to get one with probability 1/n. Thus, if n is big, the probability is low. On the other hand, as n decreases, the probability grows until it reaches 1/2.

[11] A direct way of seeing this is considering two extreme cases in the model. On the one hand, as τ tends to infinity, p tends to V and all returns in the risky asset tend to 0. Thus, as all investors get the same return, the probability of ranking last approaches 0. Price dynamics are, following the analogy, as if in the game of musical chairs there was one chair for every player. On the other hand, as τ diminishes, p becomes more sensitive to changes in the passive investors' position in the risky asset. Thus, as differences in returns grow wider, the probability of someone ranking last increases, since distinguishing their relative ranking becomes easier.

[12] This is one of the reasons we are concerned with EMEs, particularly given the size of capital outflows and inflows that some such countries have faced relative to the size of their financial (especially bond) markets.

Thus, in tandem, the allocation decisions of active investors, given the changeable money market account's floating rate, and exacerbated by relative ranking concerns, can lead to a sudden change in active investors' positions. As a few active investors change their portfolio allocation towards the money market account, those active investors who do not, based on their short-run concern of ranking last, sell their positions in the risky assets, giving place to the run-like dynamics.

In our estimation work, active investors' increments in risky assets are captured by bond inflows; conversely, decrements result in bond outflows. Risky assets' prices are captured by the EMBI spreads. In effect, in the model prices and spreads show a direct and negative correlation. In addition, the policy rate is measured by the Wu and Xi rate, which tries to capture non-conventional monetary policy; that is, it tries to measure through a negative policy rate further monetary accommodation at the zero lower bound.

All in all, we test for three main predictions of the relationship between flows, risk premia, and the policy rate of the model in Feroli et al (2014).

(i) As a result of the presence of the two types of investor, and the relative performance concern, there is a positive feedback effect between bond flows and prices (ie a negative feedback between bond flows and risk premia).

(ii) Sharp outflows are more likely than smooth ones, since the relative performance concern is heightened when there are sharp movements, increasing the risk premium (ie reducing bond prices).

(iii) A rise in the policy rate is likely to set off episodes of outflows, as r rises, and the probability of it surpassing the threshold level in (1) increases. In short, such a change in the policy rate leads to a fall in active investors' demand for risky assets. As its price falls, its risk premium increases.

After describing the data, we explore these predictions.

2. Data: EMEs

Our database has time series for the following 14 EMEs: Brazil, Chile, China, Colombia, Hungary, Indonesia, Malaysia, Mexico, Peru, Philippines, Poland, Russia, South Africa and Turkey. In order to assess possible run-like dynamics in these economies as a group, we also consider an aggregated time series. We use the EMBI spreads as proxies to the risk premia in the model (Table 1). In theory, the risk premium should be based on the actual prices of the bonds under management by the funds. Yet, we do not have access to the data at a country level and at a high frequency.

We do, however, have access to the assets under management (AUM) at an aggregate level for EMEs from the EPFR Global database. This allows us to compare the percentage change in the price of the AUM with the percentage change in the EMBI spread. Accordingly, we compare the estimated change in the value of the AUM for all EMEs with the change in the EMBI spread (see the appendix). The

corresponding series are highly correlated. This gives us confidence in using the EMBI spread as proxy for the risk premium for each EME.[13]

Moreover, the EMBI spread measures the risk premium of EME bonds denominated in US dollars (satisfying minimum liquidity requirements). In addition, the index's denomination is appropriate in the sense that the comparison investors make is against the US policy rate.

EMBI spreads for EMEs

Index

Table 1

Country	Mean	Std. Dev.	Max	Min
Aggregated	206.02	84.06	580.36	97.29
Brazil	226.28	71.12	670.00	134.00
Chile	147.20	62.52	409.00	67.00
China	135.22	64.30	328.00	26.00
Colombia	202.91	92.48	699.00	96.00
Hungary	271.04	159.21	758.00	56.00
Indonesia	283.70	153.87	1099.00	137.00
Malaysia	142.84	68.85	481.00	66.00
Mexico	194.31	75.96	596.00	93.00
Peru	193.10	82.06	612.00	94.00
Philippines	219.58	91.18	678.00	101.00
Poland	145.68	75.15	370.00	45.00
Russia	245.89	143.93	892.00	89.00
South Africa	204.63	108.76	752.00	51.00
Turkey	271.85	93.78	733.00	145.00

Notes: Aggregated refers to the average of all EME EMBI spreads. Period: 01/04/2006 to 09/03/2014

Source: EPFR

We use the EPFR bond flows data as a proxy to the changes in active investors' positions in the risky asset in the model (Table 2). As explained on their website, EPFR tracks both traditional and alternative funds domiciled globally, with $23.5 trillion in total assets. Their aim is to provide a comprehensive view of how institutional and individual investor flows drive global markets. What is more, the EPFR data have the advantage of covering funds domiciled in the United States and Europe (Jotikasthira et al (2011)).

In this context, one might have concerns about the properties of the EPFR bond flows database. First, there is an issue relating to the extent to which the flows covered by the database are managed by funds that are subject to a delegated investment relationship. Second, there are questions concerning the proportion of funds in the database which are leveraged. Third, there is the issue of how

[13] As a corollary, this result is consistent with the representativeness of the EPFR bond flows data. Had we not observed a high correlation between the percentage change in the value of the assets under management (at an aggregate level for EMEs from the EPFR database) and the percentage change of the EMBI spread, questions on the EPFR database's representativeness could have been raised.

representative the EPFR data are of investors' bond flows in global markets. We believe that none of these should be a significant concern for our analysis, as we argue next.

First, the fact that non-delegated investors, which could be included in the database, do not necessarily care about their relative performance should not affect our results. Consider, on the one hand, that run-like dynamics could still persist to the extent that delegated investors are responsible for a significant portion of the AUM. Thus, non-delegated investors would have an incentive not to ignore their peers under a delegated investment relationship.[14] Crucially, finding evidence favourable to the model using the data referred to would illustrate the significance of delegated investors in the market. Under the assumption that non-delegated investors' behaviour is a force against the dynamics of delegated investors' actions, we would then find less evidence favourable to such dynamics.

Note the significant differences between the EMBIs spreads' characteristics, and the bond flows among EMEs (Tables 1 and 2). This reflects some of the differences of the EMEs in our sample.

EPFR bond flows statistics

US dollars millions Table 2

Country	Mean	Std. Dev.	Max	Min
Aggregated	141.72	604.41	1810.82	-4472.85
Brazil	9.83	116.26	317.26	-789.98
Chile	2.68	14.00	44.25	-123.08
China	4.98	43.42	366.55	-290.18
Colombia	9.31	47.66	376.59	-295.38
Hungary	4.11	25.91	93.06	-143.25
Indonesia	16.96	53.63	163.52	-319.31
Malaysia	9.11	32.21	114.54	-201.04
Mexico	25.10	87.37	318.79	-589.22
Peru	6.34	24.37	78.84	-172.65
Philippines	6.42	24.15	76.02	-143.17
Poland	10.55	41.70	147.78	-281.09
Russia	17.12	81.14	327.00	-644.13
South Africa	10.08	35.66	103.64	-218.71
Turkey	9.12	50.98	190.85	-372.91

Notes: Weekly frequency. Aggregated refers to the summation of bond flows for all our EMEs. Period: 01/04/2006 to 09/03/2014
Source: EPFR

Second, EPFR bond flows capture a relatively representative sample of traditional and non-traditional funds. Moreover, more than 90% of the funds considered are typically traditional (ie unleveraged).[15] Table 3 presents the specific

[14] In effect, their response can be interpreted as being part of a rational speculative bubble.

[15] For example, see Table 3.

composition of the funds' data by classes. Note that potentially leveraged classes are in the minority (hedge funds and the lesser part of ETFs). In addition, note that the majority are open-ended and could therefore potentially face redemption pressures when underperforming. Moreover, related to this, Borensztein and Gelos (2000) find that in EME mutual funds herding behaviour is more widespread among open-ended funds than among closed-end ones.

Third, EPFR collect flows data in two frequencies: weekly and monthly. The monthly collections involve a broader sample of funds. Yet, when we compare the EME time series that are available in weekly and monthly frequencies, we find a high degree of correlation between the respective bond flows.[16] In our exercises, we obtained a measure of monthly flows simply by summing up the weekly flows in each month. This distinction is relevant since, as was mentioned earlier, EPFR collect their data on a weekly and monthly basis. We only use the weekly data because data at such frequency are better suited to supporting a causality hypothesis between the series.[17]

More generally, some authors (eg Miyajima and Shim (2014)) have argued that EPFR bond flows are not very representative of the entire universe of investment funds, as the funds surveyed are small in size relative to major custodians.[18,19] Nonetheless, to begin with, the fact that the implicit change in their values is well captured by the EMBI spreads provides favourable evidence for their representativeness. Furthermore, even under some degree of "under-representativeness", our focus is neither on predicting the time when an outflow episode might occur nor on estimating its precise effects. Moreover, by finding that the bonds flows we use clearly have an effect on the corresponding EMBI index (and conversely), we underscore the relevance of the mechanisms we are assessing.

[16] The correlation for the aggregated bond flows' series on a weekly basis with the series on a monthly basis is 0.86 for the January 2005–August 2013 estimation sample. Once a quarterly average is taken in both series, such correlation goes to 0.92 for the same estimation sample.

[17] This is the case except for the equities data which have a monthly frequency from the source (see Appendix).

[18] To quote Miyajima and Shim (2014): "the individual institutional investors represented by the EPFR data are believed to be relatively small in size compared with those that use the major global custodians. Therefore, the EPFR institutional flows may not be a very good proxy for the entire universe of institutional investment flows."

[19] In the particular case of Mexico, when comparing the EPFR bond flows to the change in positions for Cetes, Bonos and TIIE swaps, which are reported to the Central Securities Depository (Institución para el Depósito de Valores, Indeval), one obtains a correlation of around .80% for such time series during 2013. To estimate the correlation, a simple moving average for the change in positions is taken, since such series are more volatile than the EPFR bond flows' series. Thus, their movements, which is what we are interested in, are strongly correlated.

EPFR Global - number of mutual funds that report on a weekly basis

as of October 1, 2014 Table 3

Type	No. of classes	% of total
Open-end	51,315	99.05%
Closed-end funds	494	0.95%
Total	51,809	100.00%

Open-end funds sub-sets	No. of classes	% of total
Traditional	46,397	90.42%
Hedge funds	72	0.14%
Insurance funds	1,284	2.50%
ETF only	3,562	6.94%
Total	51,315	100.00%

Source: EPFR bond flows statistics

In sum, as argued, we do not think that the characteristics of the EPFR bond flows database could overturn our main results. However, we acknowledge that the exact estimated coefficients could potentially change if we had access to the exact counterparts of the time series in the model.

In addition, there might be a number of measurement issues regarding reported flows. As pointed out in Feroli et al (2014), funds can merge, be liquidated, and/or be created. To alleviate these issues, we took a weighted average of bond flows of the past four weeks for some estimations.[20] We nonetheless underline that our main results do not hinge on such a transformation.

What is more, one has to consider the asset-gathering capabilities of investment institutions as well. Such institutions have a comparative advantage in information gathering and analysis. Moreover, they tend to use similar risk management tools, which increase the likelihood of observing similar changes in their portfolio allocation decisions.

The lion's share of assets under management is concentrated in a handful of investment institutions (Table 4). As an illustration of this concentration, consider the assets under management of the top 20 companies as a proportion of those managed by the top 50 companies (see table below). The concentration observed echoes the importance of asset-gathering capabilities among asset management companies. Crucially for our analysis, a change in the capital allocated by any one of these institutions could have significant implications for EME financial markets.

[20] Only for the bivariate VAR in the bonds flows and EMBI spread section, for which data have a weekly frequency, and the analogous exercises.

Assets under management (AUM) of the top 20 asset management companies (AMC) relative to the top 50 AMC

as of 31/12/13 in US dollars millions

Table 4

Name	Country	AUM	AUM % of Top 50 Total	AUM Cumulative
BlackRock	US/UK	4,329,162	10.5%	10.5%
Vanguard Asset Management	US/UK	2,753,926	6.7%	17.1%
State Street Global Advisors	US/UK	2,345,556	5.7%	22.8%
Fidelity Investments	US/UK	1,945,267	4.7%	27.5%
BNY Mellon Investment Management	US/UK	1,584,992	3.8%	31.3%
J.P. Morgan Asset Management	US/UK	1,557,391	3.8%	35.1%
PIMCO	US/Germany/UK	1,539,651	3.7%	38.8%
Deutsche Asset & Wealth Management	Germany/US	1,283,290	3.1%	41.9%
Capital Group	US	1,251,462	3.0%	44.9%
Pramerica Investment Management	US	1,109,072	2.7%	47.6%
Amundi	France	1,071,170	2.6%	50.2%
Northern Trust Asset Management	UK/US	884,770	2.1%	52.3%
Franklin Templeton Investments	US/UK	880,992	2.1%	54.5%
Natixis Global Asset Management	France/US	867,289	2.1%	56.6%
Wellington Management Company	US	834,671	2.0%	58.6%
Goldman Sachs Asset Management Int.	US/UK	807,889	2.0%	60.5%
Invesco	US/Belgium/UK	779,186	1.9%	62.4%
AXA Investment Managers	France	753,574	1.8%	64.2%
Legal & General Investment Management	UK	744,802	1.8%	66.0%
T.Rowe Price	US/UK	692,627	1.7%	67.7%

Source: www.ipe.com

Bond flows and risk premia: EMEs[21]

We estimate a bivariate VAR having as variables the EPFR bond flows and the EMBI spreads, at a weekly frequency from 1 July 2009 to 9 March 2014. Whereas the use of a higher frequency is more likely to demonstrate a hypothesis of causality, the use of lower frequency data would involve other "contaminating" effects.

The identification procedure for the impulse-response functions is based on the Cholesky decomposition of the VAR's variance-covariance matrix. As is well-known, the variables' order is central to such an identification technique. On impact, the EMBI spreads respond to a shock to EPFR bond flows. Intuitively, this implies that prices move faster than quantities.[22]

[21] In other additional exercises (not reported), we consider estimations that add as a control variable the cumulated bond flows in the past month as a third variable (see Appendix).

[22] Also, a lag of two periods is used in the VAR, broadly in line with the four tests used to determine an optimal lag (FPE, AIC, HQIC and SBIC), and emphasising comparison among EMEs. Note that we always estimate the optimal lag based on the full samples.

Following the order of the model's three main implications, we first present evidence on a possible negative feedback loop between bond flows and risk premia. Thus, consider the cumulative responses of bond flows to shocks to the EMBI spreads (Graph 3). Only three out of 14 economies in our sample do not present a statistically significant response: China, Hungary, and Malaysia. The Philippines and Russia present marginally significant responses.

Cumulative impulse-response functions

as of 31/12/13 in US dollars millions — Graph 3

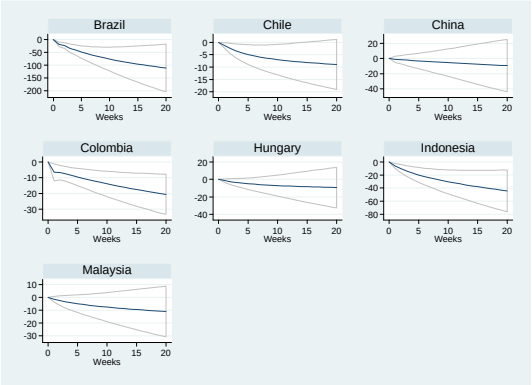


Exhibit A. EMBI spreads -> bond flows

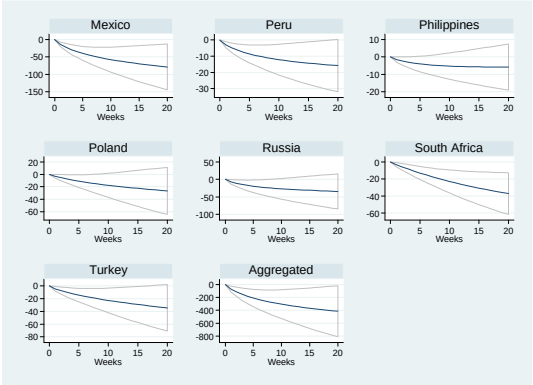


Exhibit B. EMBI spreads -> bond flows

Notes: These functions are estimated on the basis of a bivariate VAR using data from EPFR and Bloomberg. We obtained the aggregated time series by adding the bond flows, and by taking the average of the EMBI spreads of all the EMEs in our database. Confidence level 90%.

Estimation sample: 01/07/2009 to 09/03/2014

Sources: Own estimations with data from EPFR and Bloomberg

It is important to note that the magnitude of the individual response depends on the EME in question. For example, Brazil's response is sizeable, but that of Chile is smaller. In terms of the duration of responses, Brazil, Colombia, Indonesia, Mexico, South Africa, and the aggregated time series, are notable in that all have statistically significant cumulative responses for more than 20 weeks after the shock. For the 11 EMEs that have statistically significant responses, the signs of the responses are in line with what is predicted by the type of mechanism that we considered. In effect, a positive shock to the risk premium (EMBI spread) reverses the bond flows. Note that the aggregated time series are also in accordance with such a prediction.

More specifically, based on the model, an increase in the risk premium is indicative of active investors leaving their position in the risky asset. Thus, an unexpected and significant increment in the EMBI spread will likely induce active investors to join a possible run, captured by the increase in bond outflows. In particular, note that for many EMEs, the rate of outflows is greater in the initial periods (the slope of the cumulative response is larger).

We also consider the cumulative responses of the EMBI spreads to shocks to the bond flows (Graph 4). Only China and Colombia do not present statistically significant responses in our sample of 14 countries. In terms of size, Indonesia and Turkey have notable responses. Moreover, Hungary, Indonesia, Peru, Poland, Russia, South Africa and Turkey all have responses which last for more than 20 weeks after the shock.

Cumulative impulse-response functions Graph 4

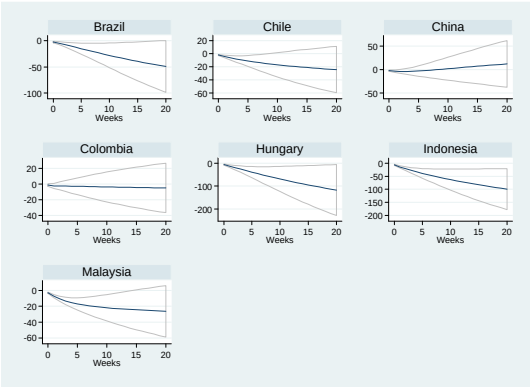


Exhibit A. Bond flows -> EMBI spreads

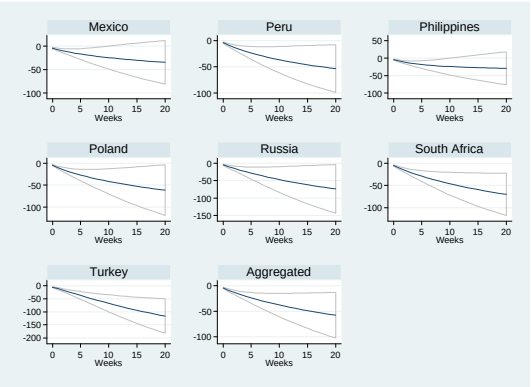


Exhibit B. Bond flows -> EMBI spreads

Notes: These functions are estimated on the basis of a bivariate VAR using data from EPFR and Bloomberg. We obtained the aggregated time series by adding the bond flows and taking the average of the EMBI spreads of all the EMEs in our database. Confidence level 90%.
Estimation sample: 01/07/2009 to 09/03/2014
Sources: Own estimations with data from EPFR and Bloomberg

In all 12 cases in which the responses are statistically significant, we observe that a prediction of the model is satisfied. Namely, a positive shock to bond flows is associated with a reduction in the risk premium (EMBI spread). This also holds true for the aggregated time series.

In the model, as more active investors take a position in the risky asset (inflows increase), such investors do so with the expectation that the risk premium will be greater than the floating rate. In effect, all are attempting to obtain the highest return.

Of course, as the number of delegated investors with a position in the risky asset increases, the risk premium decreases (the price increases) and the threshold level of the former is reached at some point. Given the friction relating to the agency problem at the heart of the model, we should then observe evidence of run-like dynamics.

In sum, we have found some evidence favourable to the first prediction of the model in many EMEs. Naturally so, economies respond differently to each shock. Thus, countries like China seem not to be sensitive to surprises on any of these variables, while economies such as Brazil seem to be quite responsive to them.

Bond flows and risk premia under regime-switching: EMEs

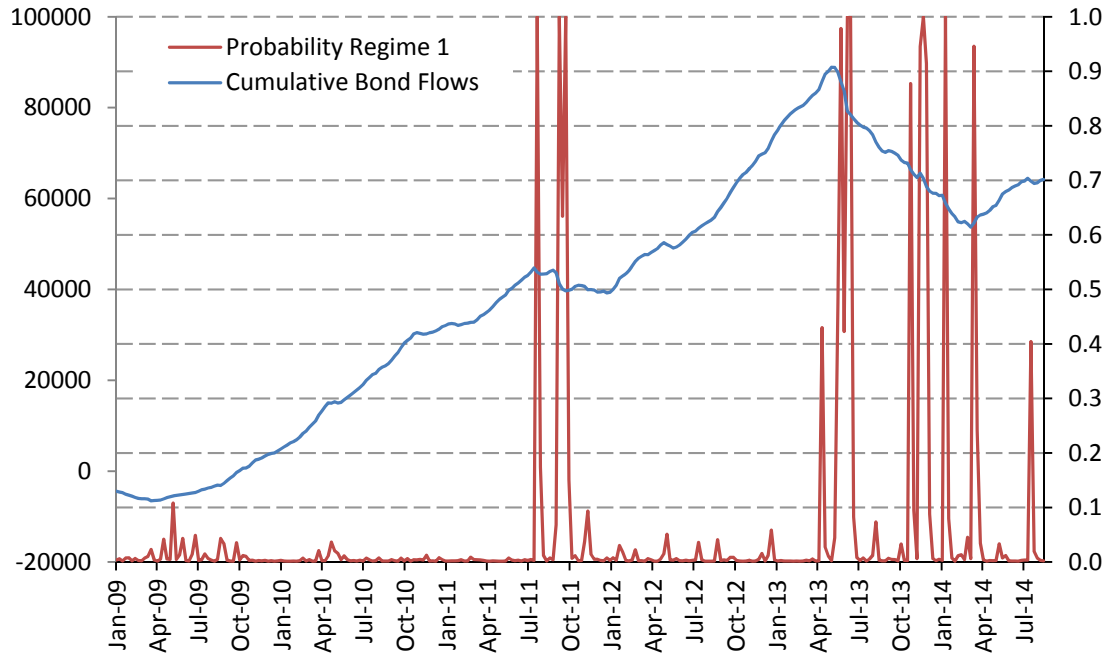
By assumption, in a VAR the response's magnitude to a shock is symmetrical regardless of its direction. However, the model predicts that outflows tend to move at a swifter speed, as the run-like mechanism is set off. In other words, and as we have observed in the preliminary analysis, bond outflows tend to be more acute than inflows. Thus, to seek further evidence of such a prediction, we introduce a regime-switching model into the variance-covariance matrix of the bivariate VAR model with aggregated data (similar to the one just estimated). As is common, the regime-switching is modelled as a Markov chain.

Under the assumption that regime states tend to coincide with inflows and outflows episodes, respectively, there are at least three relevant implications of the regime-switching model. First, the covariance term when episodes of outflows take place should be greater than when episodes of inflows occur. Changes in flows due to variations in risk premia should be more sensitive when outflows take place. Second, the probability of remaining in an episode of inflows is greater than the probability of switching to a regime of outflows. Third, the episodes of outflows are less persistent relative to the episodes of inflows. Note that these statements refer to the Markov chain model behind the regime-switching model.[23]

By assumption, there are two regime states in the model. Once we estimate the regime-switching VAR, we have the result that regime state 1 is associated with the greatest negative covariance between the shocks to bonds flows and the shocks to EMBI spreads. Conversely, regime state 2 is associated with the covariance term nearest to zero. Thus, consider the estimated probability of being in regime state 1, and the cumulative bond flows in our EMEs as shown in Graph 5.

Cumulative aggregate bond flows and probability of regime 1

Graph 5



Note: Estimation sample: 01/07/2009 to 09/03/2014
Source: Own estimations with data from EPFR

We observe that regime states in fact do tend to coincide with inflows and the sharpest episodes of outflows. Ex post, such findings could be seen as a foregone

[23] Analytically, the regime-switching model has two states: state 1, with marked outflow episodes, and state 2, with inflow or tranquil outflow episodes. This model has four transitional probabilities, denoted by $^{p}i,j$, ie the probability of switching to regime j given that the current regime is i in one period. The second implication says that $p_{22}>p_{21}$ or equivalently $p_{22}>0.5$. The third implication is that $p_{22}>p_{11}$.

conclusion. However, it is not necessarily the case as, for example, other mechanisms affect bond flows and risk premia.

We note that regime 1, the one with the large negative covariance term, is generally associated with episodes of outflows. This can be interpreted as evidence favourable to the first implication listed above. What is more, the estimated probability of staying in regime state 2, the one associated with episodes of inflows, is 0.97. Analytically, this object is p_{22}, ie the probability of switching to regime 2 given that the current regime is 2. On the other hand, the probability of staying in regime 1, or $p_{11,}$ is 0.6. While this last probability is still persistent, it is less so than the probability of remaining in an episode of inflows. For the most part, these are broadly in line with the model.

All in all, the introduction of regime-switching in the VAR model provides further evidence that is consistent with the predictions of the model with delegated investment and a relative performance concern in terms of the second prediction.

Preliminary analysis: AEs

A natural comparison is to estimate the same model but with bond data for advanced economies (AEs). In effect, such economies are a natural control group. However, it is important to make a further distinction among AEs. There are those AEs that have had a reasonable economic performance and that markets perceive as having maintained a sensible macroeconomic policy framework (such as Germany and the United Kingdom, for example). On the other hand, there are AEs that have had an unsatisfactory economic performance or whose macroeconomic management is perceived to have been subpar (such as Portugal and Spain). Of course, an economy can fall between such classifications. Moreover, some of these economies have benefited from financial support from multilateral institutions. As emphasised by Stein in Hodler (2012), markets internalise and react to such policies.

The AEs in our database are Belgium, Finland, France, Germany, Greece, Ireland, Italy, Japan, the Netherlands, Portugal, Spain and the United Kingdom. Of course, EMBI spreads are not available for AEs. Instead, we use credit default swaps (CDS) spreads as a proxy for risk premia in the model.[24] As for the bond flows, we similarly use the EPFR data. The same caveats apply to the EPFR bond flow data for AEs as those mentioned previously for EMEs.

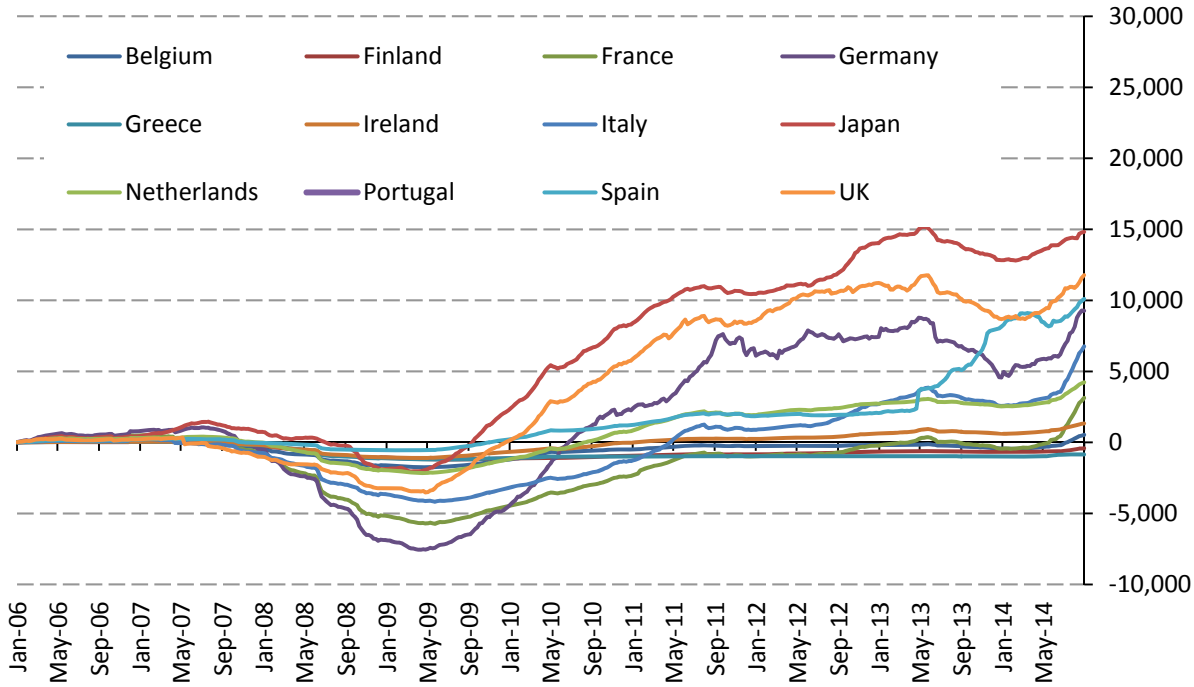
Thus, as a preliminary analysis, consider the cumulative bond flows for the AEs in our database (Graph 6). The dynamics are quite different from those of the EMEs. Except for Germany, Japan and the United Kingdom, the bond flows have lower correlations. In particular, outflows do not seem to be as correlated, nor as sharp, when compared to those of EMEs. The time series of the average CDS and the aggregated flows are less suggestive of the presence of run-like dynamics (Graph 7). Indeed, up to this point, there is not much evidence of run-like dynamics in the case of AEs.

[24] It is known that CDS spreads are closely correlated with EMBI spreads.

Cumulative bond flows in selected AEs

US dollars millions

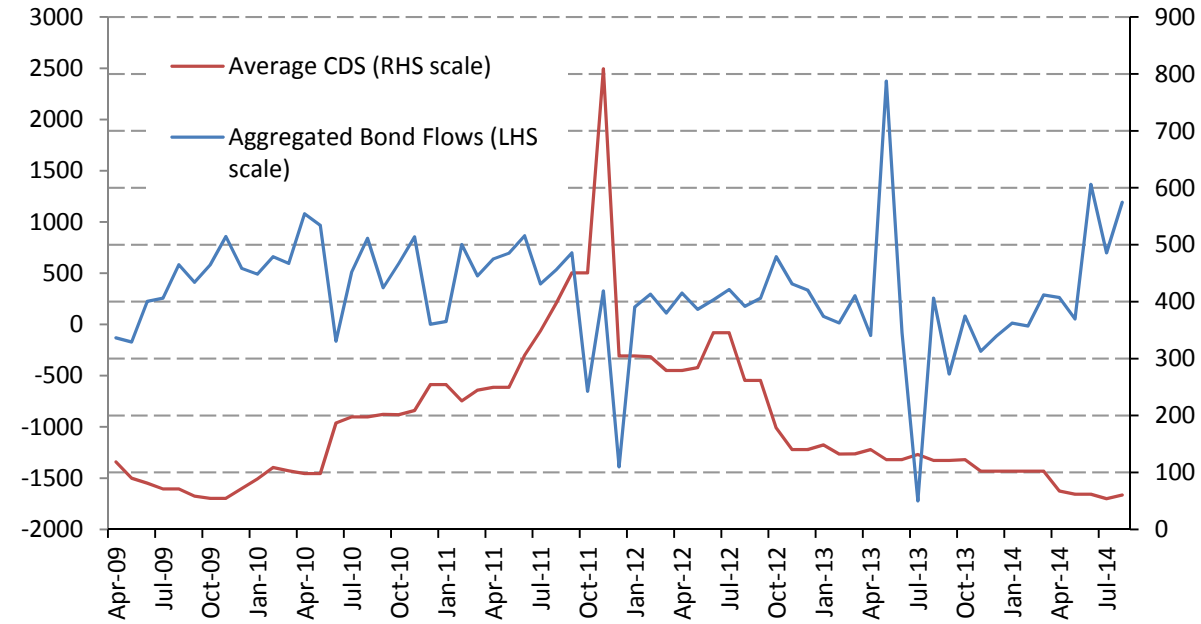
Graph 6



Note: Weekly flows.
Source: EPFR and Bloomberg

Bond flows and average CDS

Graph 7



Notes: US dollars millions, monthly frequency, index.

Sources: EPFR and Bloomberg

3. Data: AEs

The CDS statistics partly reflect the economic differences among the AEs in our sample (Table 5). Likewise, the bond flows' statistics are partly explained by such differences. Naturally, it is important to have a heterogeneous sample, so as to be able to seek evidence of run-like behaviour in AEs with differing macroeconomic performances and policies (Table 6).

CDS statistics: AEs

Percentage points — Table 5

Country	Mean	Std.Dev.	Max	Min
Belgium	81.46	84.09	381.43	2.05
Finland	27.55	22.26	89.51	4.37
France	59.72	57.89	249.63	1.67
Germany	32.42	27.30	109.93	2.13
Greece	346.59	842.92	6200.00	4.00
Ireland	271.44	253.52	1060.01	5.48
Italy	158.91	145.61	576.82	5.64
Japan	51.93	37.57	157.21	2.17
Netherlands	56.68	28.74	132.99	10.83
Portugal	304.27	348.90	1374.97	4.09
Spain	161.10	151.34	624.50	2.63
UK	60.37	27.35	161.59	16.50

Notes: Estimation sample: 01/04/2006 to 09/03/2014

Bond flows statistics AEs

US dollars millions, weekly — Table 6

Country	Mean	Std.Dev.	Max	Min
Belgium	1.17	22.09	97.47	-165.77
Finland	-0.92	11.91	32.08	-145.03
France	6.92	73.35	372.95	-580.53
Germany	20.45	163.59	644.67	-975.60
Greece	-1.88	12.10	24.92	-172.08
Ireland	2.96	16.29	64.84	-129.19
Italy	14.93	74.33	430.19	-432.51
Japan	32.72	87.63	335.23	-297.21
Netherlands	9.34	37.27	150.16	-258.46
Portugal	1.43	4.40	35.29	-23.75
Spain	22.31	88.33	1242.33	-308.51
UK	26.00	105.58	407.59	-468.41

Notes: Estimation sample: 01/04/2006 to 09/03/2014

Bond flows and risk premia: AEs

In this section, we focus on the bivariate VAR (bond flows and spreads) for AEs. As explained, we use CDS spreads as proxies for the risk premia on AEs.

We note that Belgium, Finland, France, Italy, Japan, the Netherlands and the United Kingdom have statistically significant responses to a shock to CDS spreads (Graph 8). In the case of Belgium, Finland, France, Italy and the Netherlands, the response lasts for more than 20 weeks. Note, however, that Japan's and the United Kingdom's responses are short-lived. Spain has a marginally statistically significant response. Based solely on these cumulative impulse-response functions (CIRFs), there could be potential for run-like dynamics in some AEs.

Cumulative impulse-response functions — Graph 8

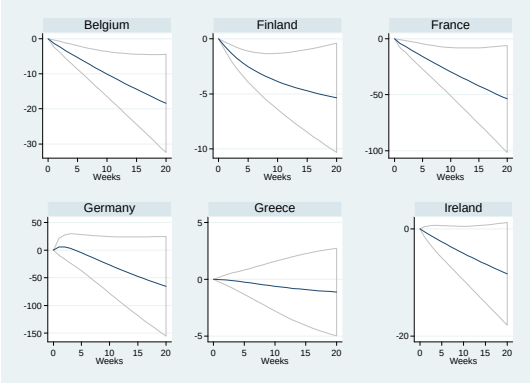


Exhibit A. CDS -> bond flows

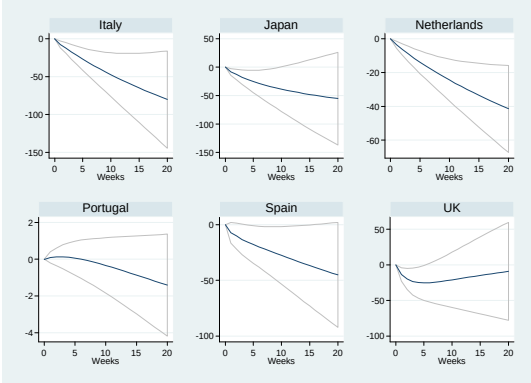


Exhibit B. CDS -> bond flows

Notes: These functions are estimated based on a bivariate VAR. Confidence level 90%.
Estimation sample: 01/07/2009 to 09/03/2014
Sources: Own estimations with data from EPFR and Bloomberg

On the other hand, as for the responses of CDS spreads to a shock to bond flows (Graph 9), we note that only Japan's response is statistically significant, albeit it lasts for no more than five weeks, and it is small relative to its standard deviation (Table 5). Thus, based on these CIRFs, there is little evidence of run-like behaviour in the bond flows for our AEs sample.

In sum, we find that economies such as Germany and the United Kingdom fail to show evidence of run-like dynamics associated with bond flows. In contrast, some economies have statistically significant responses, including Belgium, France and Italy, among others. As is well known, those economies have faced economic difficulties, such as problems with their banking sectors, or have had to make sharp fiscal adjustments, or both. As underlined by Rajan (2014), "even rich recipient countries with strong institutions, [...], have not been immune to capital-flow-induced fragility."

Initially, it might be considered puzzling not to observe significant responses in economies such as Greece and Portugal. This may have been the result of the multilateral aid they received and of expectations by investors of possible future aid. Under such expectations, run-like dynamics are less probable.

Cumulative impulse-response functions Graph 9

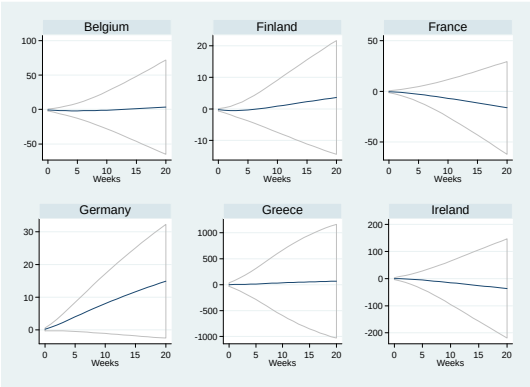


Exhibit A. Bond flows -> CDS

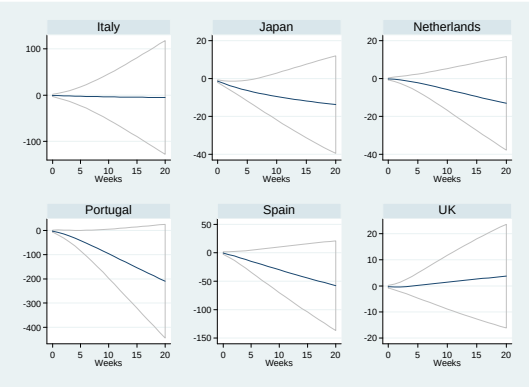


Exhibit B. Bond flows -> CDS

Notes: These functions are estimated based on a bivariate VAR. Confidence level 90%.
Estimation sample: 01/07/2009 to 09/03/2014
Sources: Own estimations with data from EPFR and Bloomberg

In general, the CIRFs obtained present evidence that is less favourable to the existence of run-like dynamics. In effect, shocks to bond flows do not lead to statistically significant changes in the CDS of AEs.

Bond flows, risk premia and US monetary policy: EMEs

In this section, we go back to the case of EMEs to explore the third implication of the model. To this end, we estimate a tri-variate VAR.[25] The variables we include in this model are: the first principal component (PC) of the EPFR bond flows, the first principal component (PC) of EMBI spreads, and the Wu and Xia rate, using as an estimation sample a period ranging from January 2009 to August 2014. As explained earlier, the Wu and Xia rate attempts to account for unconventional monetary policy, which is certainly crucial at the present juncture. The time series frequency is monthly, as is that of the Wu and Xia rate.

Note that we obtain from all the bond flows and, separately, from all the EMBI spreads, a first principal component. We use these time series starting from January 2009 to estimate the VAR model. To estimate the principal components, we use the series from January 2006.

The first principal component of a set of time series captures the most variability possible in such a set within a single time series. In a sense, it summarises the most information possible in the original time series set within one variable.

[25] To make the bivariate VAR using the EPFR data with a weekly frequency and the tri-variate VAR comparable, we transform the EPFR data with a weekly frequency to a monthly frequency in order to estimate the tri-variate VAR.

Based on the results in Section 5, we have excluded China from our data set for this exercise, as it lacks a significant response in its associated CIRF. It is worth mentioning that the VAR model is estimated with a lag of one.[26]

The shock identification is also based on the Cholesky decomposition and thus the ordering of the variables is crucial. On a scale of the slowest to the fastest moving series, we assume that the Wu and Xia rate is the slowest, followed by bond flows and the EMBI spread. In effect, the quantities are faster than the rate, but slower than the prices.

Thus, the main predictions from the model are: (i) a positive shock to the policy rate is associated with an increase in bond outflows. As the active investor's threshold is surpassed, investors seek to invest in the safe asset (the money market account), and (ii) in tandem, a positive shock to the bond flows is associated with a decrease in the risk premium, as more active investors gain a position in the risky asset (Graph 10).

Impulse-response functions — Graph 10

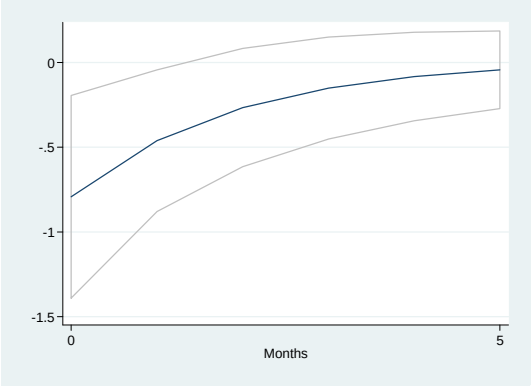


Exhibit A. Wu and Xia Rate→ PC of bond flows

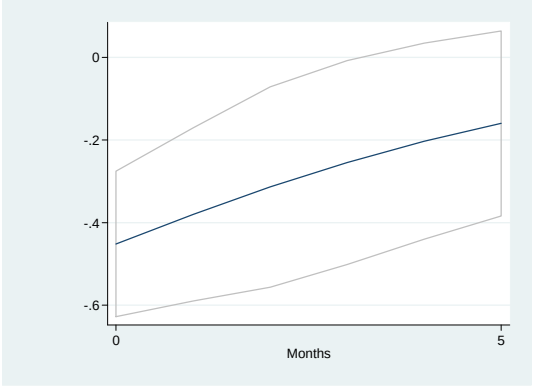


Exhibit B. PC of bond flows→ PC of EMBI spreads

Notes: These functions are obtained from the tri-variate VAR model.
Estimation sample: 01/2009-08/2014
Sources: Own estimations with data from EPFR, Bloomberg and Wu and Xia (2015)

We find that both predictions hold when using the Wu and Xia rate as a measure of the US monetary policy stance, and the PC of bond flows and, separately, of the PC of EMBI spreads. In effect, the PC of the response of bond flows to a shock to the Wu and Xia rate, and the response of the PC of EMBI spreads to a shock to the PC of bond flows are both statistically significant. The first one is significant for about two months, and the second one for about three. Note that the latter is somewhat economically significant (see Table 7).[27]

Interestingly, if we estimate the same VAR model but for the period between January 2013 and August 2014, the PC of bond flows' response to a shock in the Wu

[26] This is largely in line with the tests previously cited to determine an optimal lag. In all VARs estimated in this paper, the lag is determined using the full samples.

[27] As stated in the introduction, our main concern is about the run-like dynamics that could potentially take place in the future. Thus, we hypothesise that, up to this point, we have only seen a handful of such episodes. Accordingly, we would not necessarily expect fully fledged economically significant responses.

and Xia rate increases noticeably. Note that the immediate response is around –2.5 (Graph 10), while it is –0.8 when the starting date of the estimation sample is 01/2009 (Graph 11).[28]

Impulse-response functions

Graph 11

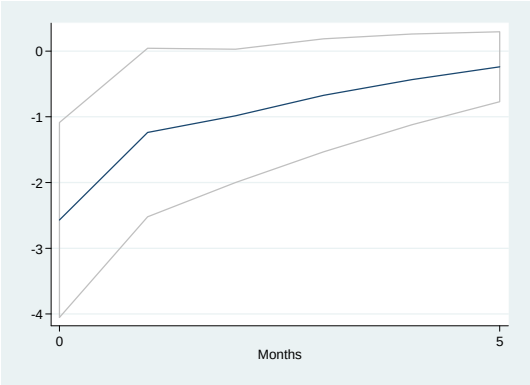


Exhibit A. Wu and Xia Rate→ PC of bond flows

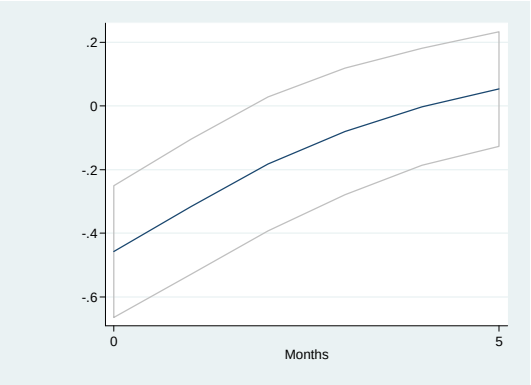


Exhibit B. PC of bond flows→ PC of EMBI spreads

Notes: These functions are obtained from the tri-variate VAR model.
Estimation sample: 01/2013-08/2014
Sources: Own estimations with data from EPFR, Bloomberg and Wu and Xia (2015)

Moreover, this is in line with the dynamics of the estimated probability in the regime-switching model in the sense that regime switches to state 1 became more frequent towards the beginning of 2013, that is, as markets perceived that a change in the direction of monetary policy in the United States was approaching.[29] This last set of results suggests that the possible effects of a change in US monetary policy on run-like dynamics increased at around that time.

In sum, we conclude that there is evidence that (i) as a group, EMEs are vulnerable to changes in the US policy rate through channels akin to the one we are exploring; and (ii) there exist mechanisms which might jeopardise financial stability.

General statistics for the principal components of bond flows and EMBI spreads, and the Wu and Xia rate

Table 7

Variable	Mean	Std. Dev.	Max	Min
PC Flows	0.00	3.41	7.06	-16.11
PC EMBI Spread	0.00	3.29	14.46	-3.98
Wu and Xia Rate	0.62	2.69	5.26	-2.99

Sources: Own estimations with data from EPFR, Bloomberg and Wu and Xia (2015)

[28] Another IRF of interest is the response of the PC of bond flows to a shock to the PC of EMBI spreads. We explored such IRF also using principal components, but do not report the results. They are in line with the analogous IRFs obtained at a country level.

[29] As described, regime state 1 is the one associated with the greatest (negative) conditional covariance. Conversely, regime state 2 is the one associated with the covariance term nearest zero.

Bond flows, risk premia and US monetary policy: AEs

As a control exercise, we estimate the same tri-variate VAR based on the data of a group of AEs. Specifically, we first consider the PC of bond flows' response to a shock in the Wu and Xia rate (Graph 12, Exhibit A). We observe that, in contrast to the result for EMEs, it is positive. We also note that it only lasts for about a month. This result suggests that as the interest rate in the group of AEs goes up, portfolio shifts take place that imply inflows to those economies, as would be expected. Alternatively, as a group AEs could be acting as a safe haven, since an increase in the Wu and Xia rate leads to a rise in inflows.

Moreover, we also consider the PC of the response of CDS spreads to a shock to the PC of bond flows (Graph 12, Exhibit B). Such a response is clearly not statistically significant. This is not surprising given the results we have seen for the individual bivariate VARs.

Impulse-response functions — Graph 12

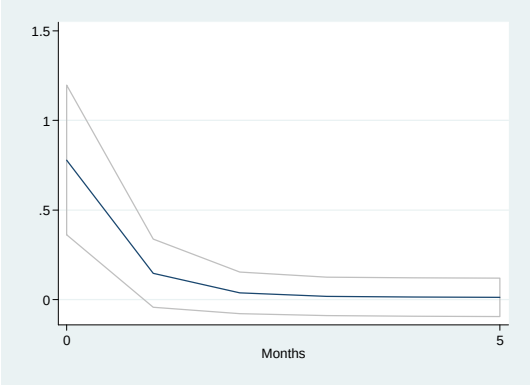


Exhibit A. Wu and Xia rate → PC of bond flows

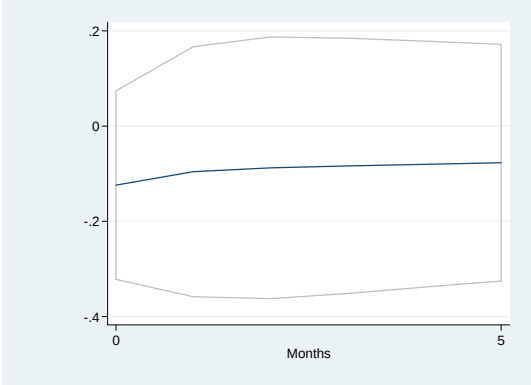


Exhibit B. PC of bond flows → PC of CDS

Notes: These functions are obtained from the tri-variate VAR model. All AEs are included when estimating the tri-variate VAR.
Estimation sample: 01/2009-08/2014
Sources: Own estimations with data from EPFR, Bloomberg and Wu and Xia (2015)

Furthermore, we estimate two versions of the tri-variate VAR. First, we exclude Germany, the United Kingdom and Greece from our sample of AEs. This decision is based on the results of the bivariate VAR, as these economies' bond flows and CDS seem to be the least responsive. We estimate the PC of bond flows and CDS spreads separately as we have done previously.

General statistics for the PC of bond flows, PC of CDS for AEs, and the Wu and Xia rate — Table 8

Variable	Mean	Std. Dev.	Max	Min
PC Flows	0.00	2.79	7.31	-13.12
PC CDS	0.00	2.98	7.11	-3.66
Wu and Xia Rate	0.62	2.69	5.26	-2.99

Sources: Own estimations with data from EPFR, Bloomberg and Wu and Xia (2015)

The response of the PC of bond flows to a shock in the Wu and Xia rate, being positive, does not have the expected sign. The response of PC of CDS to a shock to PC of bond flows is not statistically significant. Nonetheless, it is worth mentioning that the response is small relative to the standard deviation.[30] (The IRFs have been estimated but are not presented.)

Second, we use an estimation sample ranging from January 2013 to August 2014. In such a case, the effect of the Wu and Xia rate's shock on the PC of bond flows is similar. Moreover, the effect of the flows' shock on the PC of CDS spreads is not statistically significant. (Again, the IRFs have been estimated but are not presented.)

All in all, the evidence does not suggest the presence of run-like dynamics in the bond flows in the AEs as a group, although there is some heterogeneity in the case of individual countries. What is more, economies which have faced economic challenges have some significant responses but the evidence for the type of mechanism we are looking for in general breaks down with the positive response of bond flows to a shock to the Wu and Xia rate. It should be in the direction opposite to the one expected based on the type of mechanism we have assessed. In effect, it seems that, as a group, AEs act as safe havens.

Concluding remarks

Much attention has focused on the implications of the degree of leverage of financial institutions for financial stability. Nonetheless, other mechanisms that are essentially unrelated to the degree of leverage might play a significant role in affecting financial stability. The type of mechanism we have explored could be associated with the ability of EMEs to deal with an eventual tightening of the US policy rate.

As the data analysed strongly suggest, the possible effects of run-like behaviour in bond markets are latent. Moreover, they could be distinctive for different EMEs, which means that some economies should be more concerned than others in terms of the implication this channel might have. Moreover, if this channel has gained strength, as some of the evidence suggests it has, it would add to existing concerns.

What is equally relevant from the point of view of policymakers is that there might be little they could do about this, at least in the short and medium term. This is because the current economic policy tools cannot necessarily target run-like dynamics.

Stein (2014a) has emphasised that this depends on the level at which the run behaviour might take place: ie whether it is at the investor or fund manager level. If it is at the investor level, financial authorities might be able to impose a fee on investors who decide to withdraw their funds in order to internalise the externality they would impose on those left behind. If, however, it is at a fund manager level, it is not obvious what the financial authorities could do. Of course, in practice, any

[30] The magnitude of the immediate response is 10% of its standard deviation.

measure affecting investors could be difficult to implement and could lead to an increase in policy uncertainty.

More generally, following global financial reform efforts in the last few years, this type of mechanism would be relevant to the extent to which non-banking institutions have assumed greater prominence, particularly given that they are exempt from most macroprudential regulations.

Although we have found evidence favourable to the existence of run-like dynamics in bond flows in and out of EMEs, we have not taken a stand on their implications. In effect, we have highlighted that this channel is one of several potential ones. Nonetheless, we underscore that a generally low level of financial leverage by investors should not be seen as guaranteeing a smooth ride for EMEs as the US monetary policy rate is eventually normalised.

Moreover, our main concern is about the run-like dynamics that could potentially take place in the future. In other words, we hypothesise that hitherto we have only seen a handful of such episodes, although there is a good chance that more will follow. This is in the same vein as Borio (2010), who has stated: "What looks like low risk is, in fact, a sign of aggressive risk-taking." In fact, in our context, low risk premia could very well be the prelude to a run.

Appendix

We performed important extensions and complementary estimation exercises to test the robustness of our results. However, we do not report them in this paper. In what follows, we provide a brief description of these exercises and of their main implications. First, we compare the AUMs' percentage change in value with the percentage change in the EMBI spreads for EMEs as a group. These time series show high correlations. This result provides support for using the EMBI spreads as proxies for individual EME's AUM values. As mentioned, this is also supportive of the EPFR bond flows' representativeness.

Second, we estimate "risk-on" and "risk-off" episodes based on bond flows and compare their behaviour to that of the aggregated EMBI spreads.[31] We observe that sharp changes in bond flows are associated with significant changes in aggregated EMBI spreads. In addition, we analyse the correlations between, on the one hand, the VIX index, and, on the other, the PC of bond flows and the PC of EMBI spreads. We observe recent drops in the correlations, which suggests that the VIX explains less of the observed variability of the two variables.

Third, we estimate a tri-variate VAR but add a cumulative bond flows variable. The variable attempts to control for the stock of bonds accumulated in the past month. This is an important variable in terms of the model, as it proxies the number of active investors already present with a position in the risky asset. In this estimation, the feedback mechanisms between bond flows and indices are essentially maintained.

Fourth, we conduct robustness checks for aspects we believe are relevant as well. These controls are: (i) the country's recent economic performance based on the changes of their EMBIs; (ii) the level of leverage in the banking sector of an economy; and (iii) geographical location. These additional estimations are supportive of the idea that the run-like dynamics we explored are to an extent independent of economic performance, level of leverage in the banking sector and geographical location.

Fifth, we make a re-estimation of the two main VARs previously mentioned, but use aggregated EME data on equity flows instead of bond flows. Generally, equity markets are much more liquid. Thus, it is less likely that one could find evidence of run-like dynamics in equity flows. Confirming our prior, we find little evidence favourable to the presence of run-like dynamics.

Sixth, as an extension to the tri-variate VAR model for EMEs, we add the economic policy uncertainty index as a fourth variable. In the model, the comparison between the risk premium and the floating rate return may be seen as representative of uncertainty. Thus, this exercise explores an uncertainty element that might be relevant to the mechanism we explored. Specifically, we observe that an impulse to the uncertainty index leads to a positive response by the PC of bond

[31] We construct such an indicator following Feroli et al (2014). The risk-on/risk-off indicator is estimated on the basis of the deviations of the average bond flows with respect to their historical standard deviations.

flows. Thus, assuming that the Federal Reserve is less likely to tighten the policy rate under the presence of more economic policy uncertainty, this result is consistent with the type of mechanisms we have explored.

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Evolution of bank and non-bank corporate funding in Peru[1]

Renzo Rossini[2] and Zenon Quispe[3]

Introduction

Bank lending remains the most important funding source for Peru's non-bank private sector. However, the corporate bond market is slowly emerging as an additional source of funds for domestic firms. As in other emerging market economies, Peruvian domestic non-financial corporations have been issuing bonds in the international capital markets,[4] partly replacing domestic market bond issuances. Offshore issuance is cheaper, owing to quantitative easing in the developed world, and can also be attractive in terms of market efficiency, liquidity and economies of scale, in contrast to the less liquid local market. Although certain non-bank financial entities such as domestic pension funds are in a position to encourage the development of the domestic capital market, these entities are mainly oriented to the international markets.

[1] Prepared for the BIS Deputy Governors' meetings on "Changing patterns of financial intermediation: implications for central bank policy", 26–27 February 2015, Basel. We thank Adrian Armas, Paul Castillo, Alex Contreras and Kenji Higa for their comments and excellent support.

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[3] Advisor to the General Manager of the Central Reserve Bank of Peru.

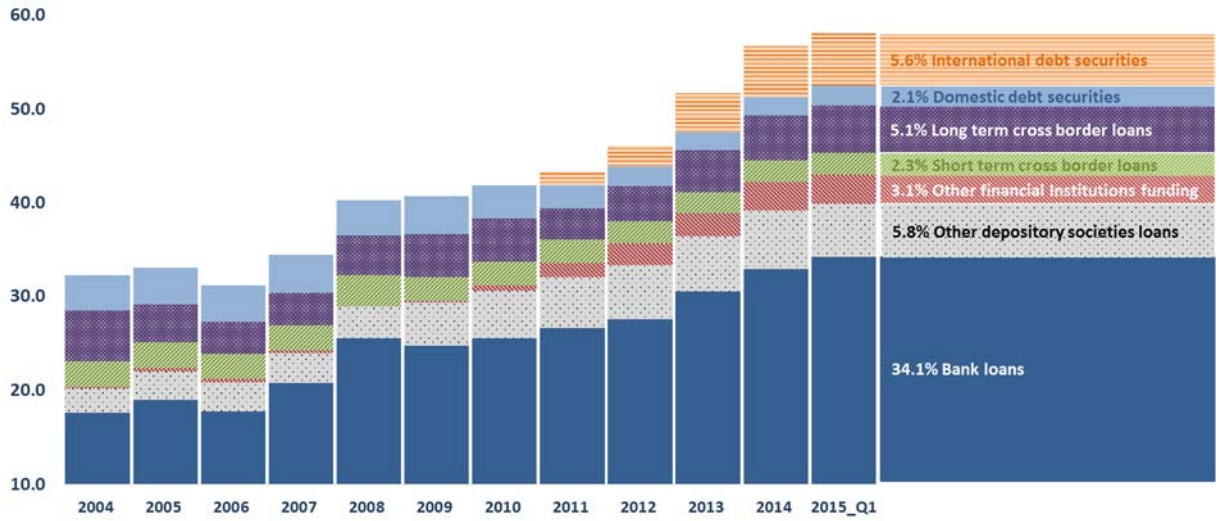
[4] Shin and Turner (2015) highlight the shifting pattern of financial intermediation and its major implications not only for monetary policy in the current low interest rate environment but also for financial stability. Of particular interest is the heightened sensitivity of emerging economies to global long-term interest rates.

Financial intermediation and the role of banks

Over the past decade, robust GDP growth and low and stable inflation in Peru have contributed to a deepening of financial intermediation (including credit from banks and non-banks, and domestic and international market bond issuances), which almost doubled in size from 27.6% of GDP in 2004 to 51.2% in 2014.

Total credit to non-financial private sector

Share of nominal GDP — Chart 1

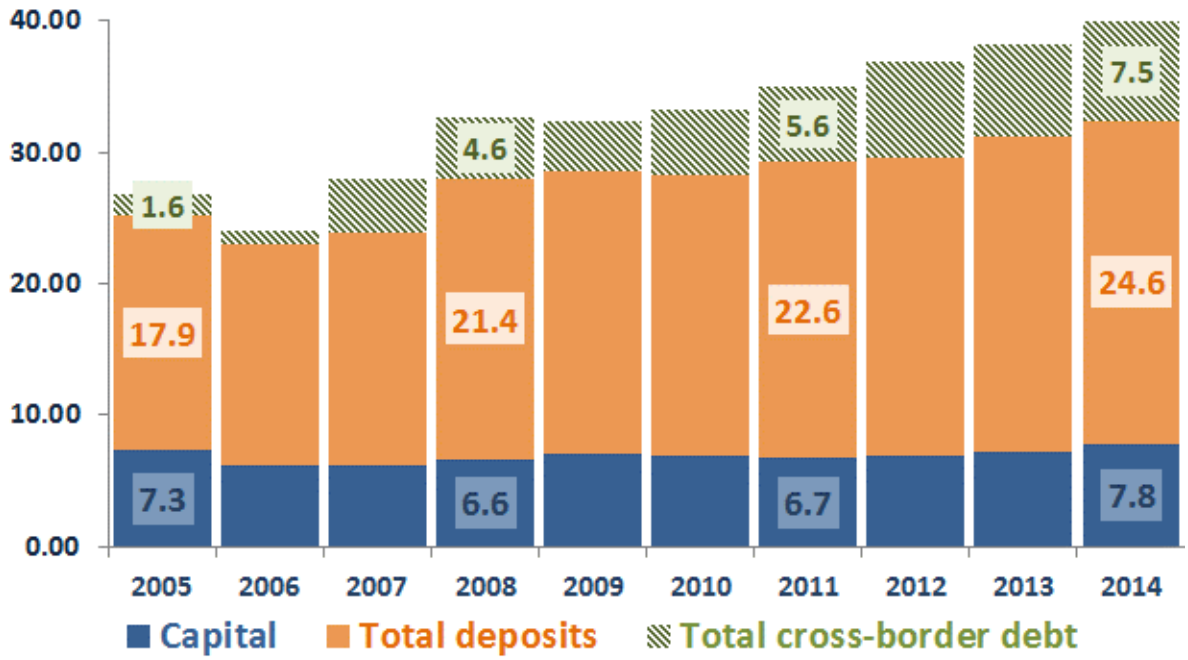


The banking system has played a crucial role in this process, increasing its provision of credit to the private sector from 20.3% of GDP to 41.1% during the same period. Moreover, the share of banks in total market-based funding increased from 73.7% in 2004 to 80.2% in 2014. The other market fund providers (non-bank financial entities and domestic and international bond issuances) increased their total share from 7.3% of GDP in 2004 to 10.1% in 2014.

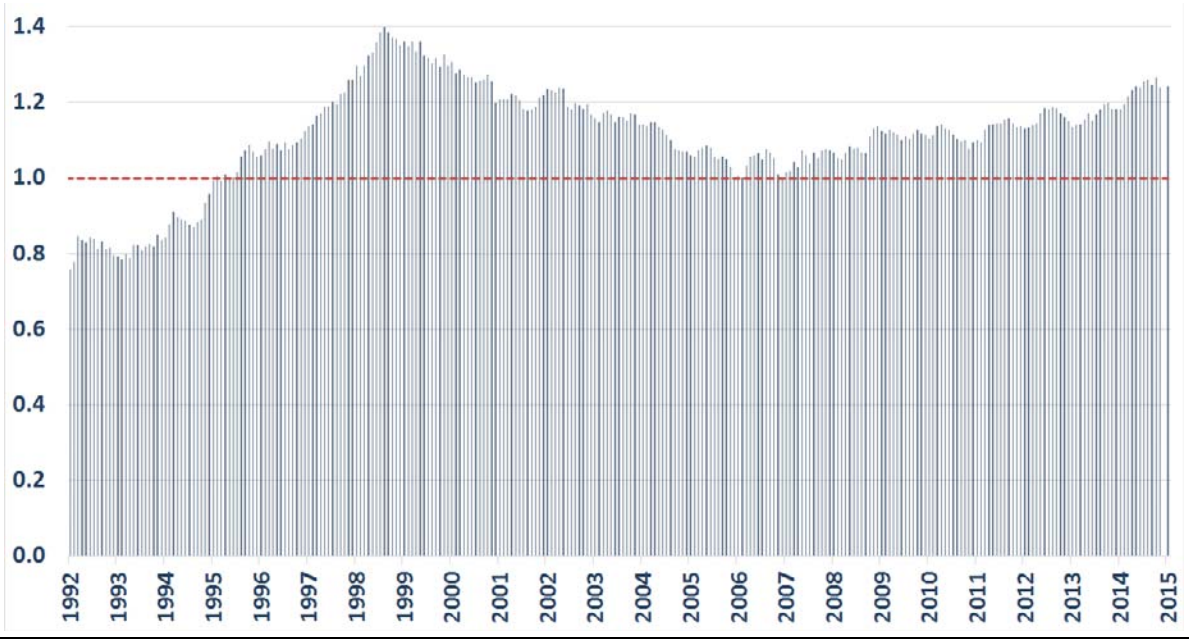
Deposits are the main source of funding for banks. They increased steadily from 17.9% of GDP in 2005 to 24.6% in 2014, followed by an increase in banks' external debt from 1.6% of GDP to 7.5% during the same period. Bank capital increased slightly, from 7.3% of GDP in 2005 to 7.8% in 2014.

Main liabilities of banks

Share of nominal GDP Chart 2



Credit-to-deposit ratio: 1992–2015 Chart 3



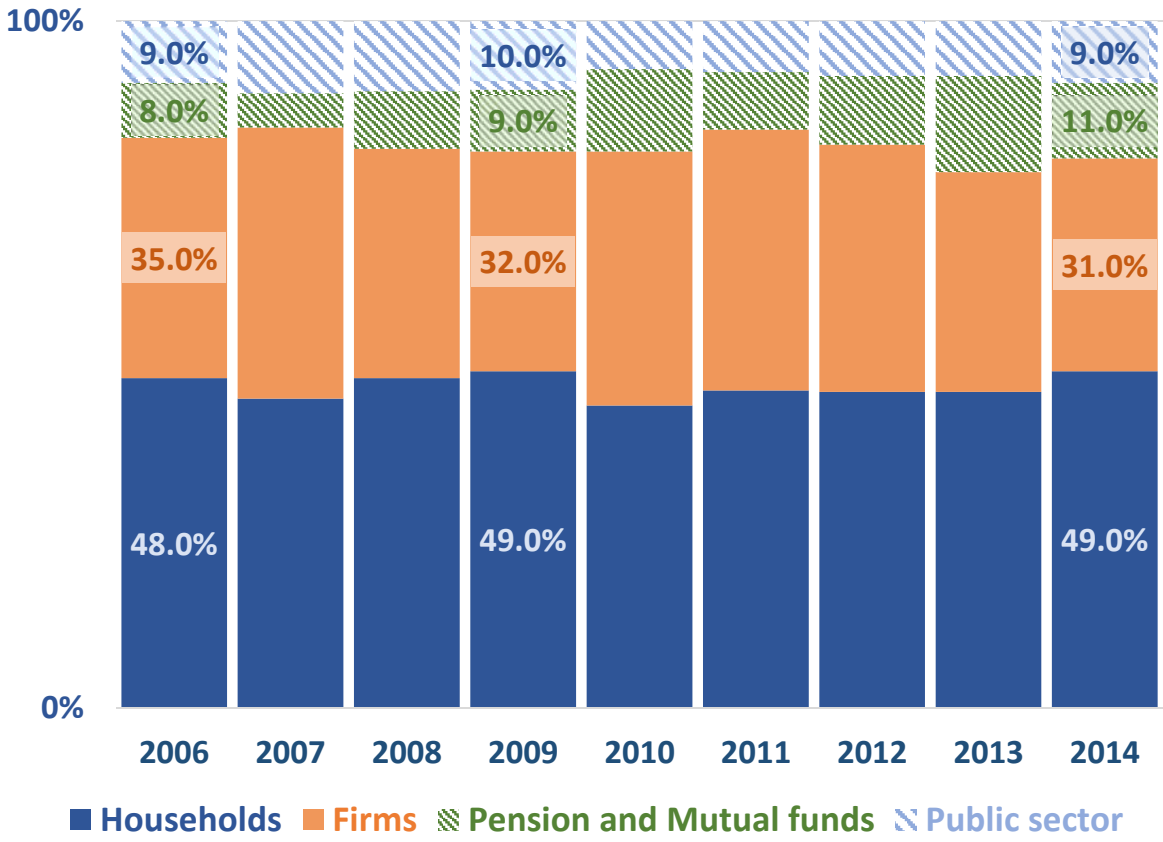
The credit-to-deposit ratio has been higher than one for most of the period following the full deregulation and opening of the financial system during the early 1990s. Chart 3 shows that the peaks in the depository institutions' credit-to-deposit ratio coincided with periods of higher capital inflows. This process highlights the

need for macroprudential policies to reduce the risks associated with short-term capital inflows in the context of a partial dollarisation of the economy.

In terms of composition, Chart 4 shows that household deposits constitute roughly half of all deposits since 2006 and that this figure has been relatively stable. Public sector deposits have been stable as well (9% of total deposits in 2014).

Structure of bank deposits

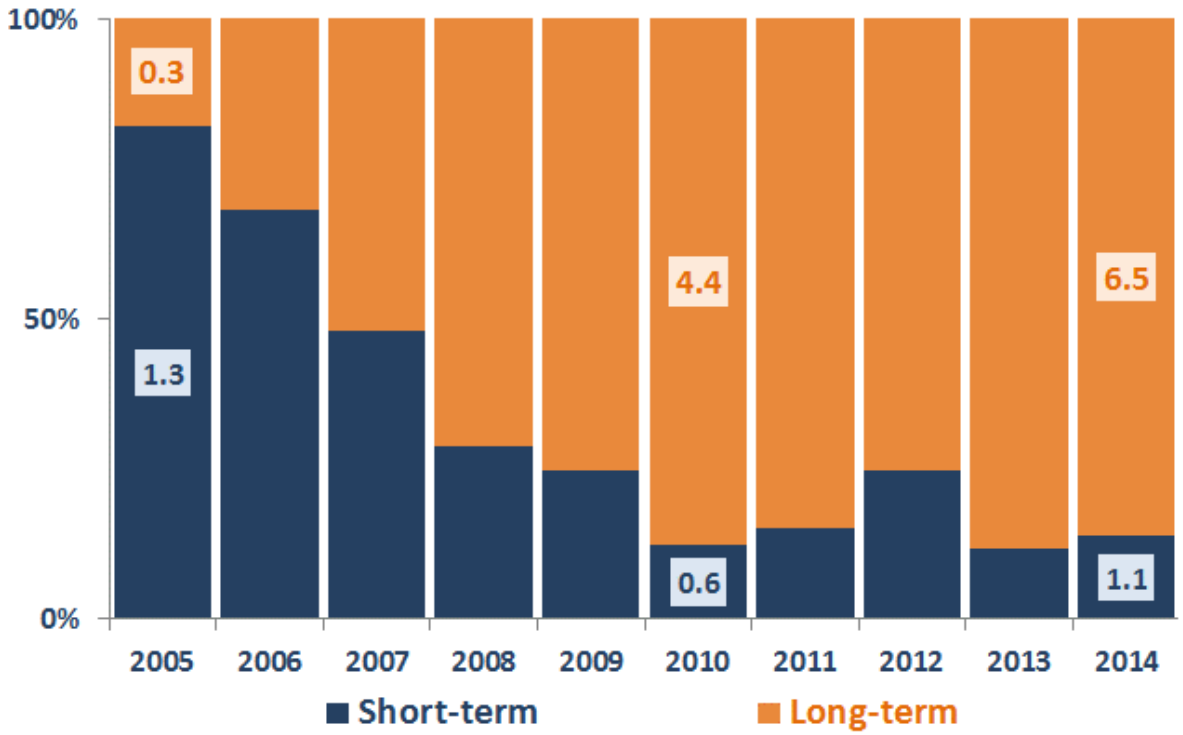
(As a share of total bank deposits) Chart 4



The share of firms' deposits declined from 35% in 2006 to 31% in 2014, while the proportion of funding from pension and mutual funds increased (14% in 2013 and 11% in 2014). Even though their share of total deposits averages around 10%, the evolution of pension and mutual fund deposits may entail some vulnerability as a funding source for commercial banks. This is because pension and mutual funds are more volatile in their allocation of funds (given their search for yield) and they switch quickly between domestic and foreign currency assets, generating currency mismatches in banks' balance sheets that are later covered in the FX forward market.

Short-term and long-term cross-border debt of banks

(As a share of nominal GDP) Chart 5



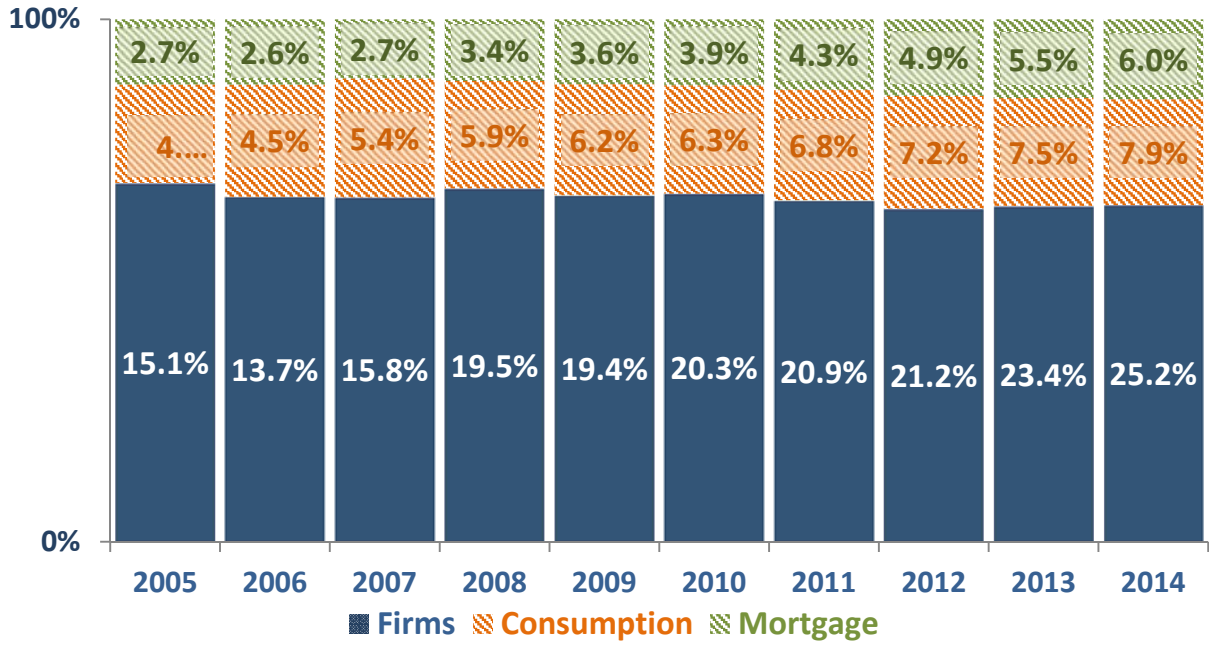
The external debt of the banking system has increased its share in GDP during the last decade. Maturities are mostly long-term (6.5% of GDP in 2014), while short-term external debt stands at 1.1% of GDP.

Credit. Growth in banking credit for consumption and housing has been strong. Mortgage loans increased from 2.7% of GDP in 2005 to 6.0% in 2014, and credit for consumption increased from 4.1% of GDP to 7.9% during the same period. In terms of its share of total lending, credit to firms decreased from 68.7% in 2005 to 64.4% in 2014. Meanwhile, mortgage loans increased their share from 12.6% to 15.3% and credit for consumption rose from 18.8% to 20.3% during the same period. Credit to large and medium-sized companies as a proportion of total bank credit has decreased as a consequence of greater use of other sources of funding, including bond issuances in both the domestic and international capital markets.

As regards credit to firms, the proportion of credit extended to corporate and large firms has fallen from 41% of credit in 2010 to 38% in 2014. Small and micro firms have lost share in banking credit as well (7% in 2014 compared with 10% in 2010) but these firms have found a better match with non-banking institutions. This confirms the finding that household credit has gained in importance and shows that it is mainly the biggest firms that have lost ground.

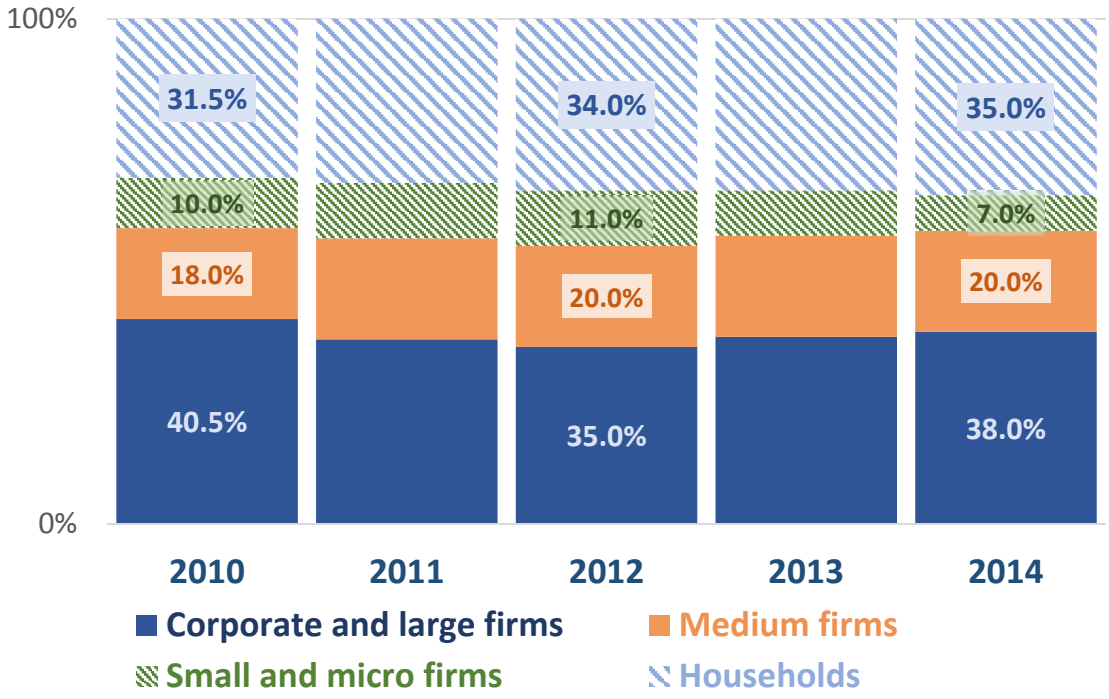
Structure of bank lending

(As a share of nominal GDP) Chart 6



Bank lending to the non-financial private sector

(As a share of total bank loans) Chart 7



Furthermore, the number of large firms has remained small, while the number of micro small and medium-sized firms has increased significantly. The number of medium-sized firms in particular has increased twentyfold in just five years.

Number of debtors of the financial system Table 1

Type of credit	2010	2011	2012	2013	2014
Corporative	461	484	518	580	666
Large firms	1 711	1 681	1 973	2 246	2 499
Medium size firms	14 601	17 813	21 919	26 394	281 555
Small firms	230 285	284 641	343 562	380 859	389 910
Very small size firms	1 253 951	1 403 097	1 519 494	1 594 053	1 615 890
Total	1 501 009	1 707 716	1 887 466	2 004 132	2 290 520

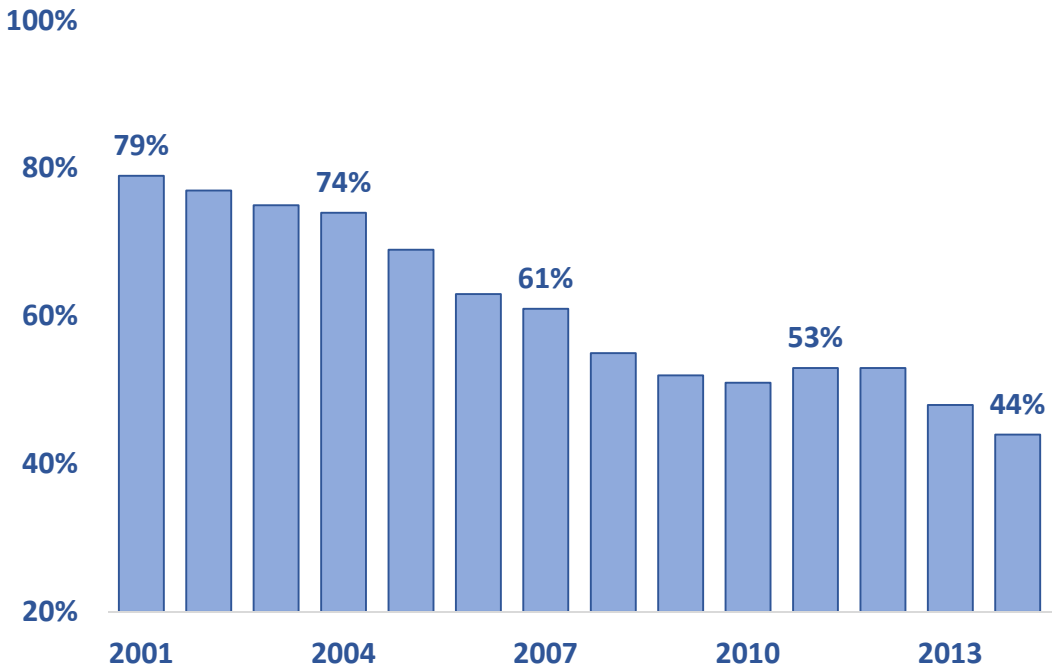
Financial dollarisation in Peru. One of the main concerns arising from Peru's credit market is financial dollarisation. Even though it has decreased steadily from 2001 (79%) to 2014 (44%), the share of credit extended in dollars by commercial banks is still significant. This poses a threat to financial stability because firms with liabilities in foreign currency and revenues in domestic currency experience a negative balance sheet effect when the domestic currency depreciates significantly. This in turn has a negative impact on the credit delinquency ratios of commercial banks and economic activity in general. Peru suffered from such a shock in 1998 after the Russian crisis; delinquency ratios doubled, the number of banks halved, and Peru entered a recession that lasted approximately 18 months.

Dollarisation levels have fallen in the bond market as well. In the case of government bonds, dollarisation decreased from 85% in 2001 to 44% in 2013, while in the corporate bond market it fell from 95% in 2001 to 49% in 2013.

On the funding side, the dollarisation of deposits has decreased steadily during the last decade, in line with credit dollarisation.

Dollarisation of credit to the non-financial private sector

(As a share of total bank credit) Chart 8

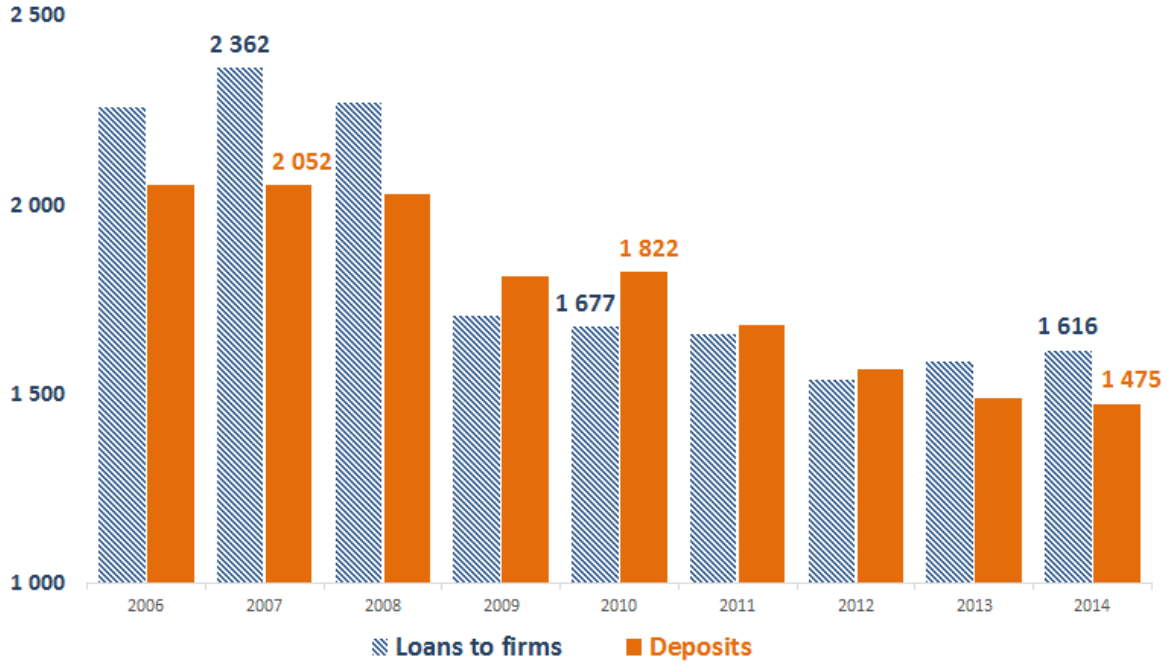


Bank concentration. Another characteristic of the Peruvian financial market is its level of concentration. Although the Herfindahl-Hirschman index[5] for loans has been on a downward trend, decreasing from 2,362 in 2007 to 1,616 in 2014, it still points to a moderate level of concentration. In addition, Céspedes and Orrego (2014) estimate a statistic of market competitiveness and find a certain degree of concentration in the banking system consistent with a monopolistic competition market structure. They also find some evidence of increasing competition in the Peruvian banking industry, which would be consistent with the arrival of new banks and the narrowing of interest rate spreads.

[5] The Herfindahl-Hirschman Index (HHI) is a commonly accepted measure of market concentration. The HHI is calculated by squaring the market share of each firm competing in the market and then totalling the resultant numbers. The HHI takes into account the relative size distribution of the firms in a market. It approaches zero when a market is occupied by a large number of firms of relatively equal size and reaches its maximum of 10,000 points when a market is controlled by a single firm. The HHI increases both as the number of firms in the market decreases and as the disparity in size between those firms increases. The Department of Justice and the Federal Trade Commission, in the United States of America, generally consider markets in which the HHI is between 1,500 and 2,500 points to be moderately concentrated, and consider markets in which the HHI is in excess of 2,500 points to be highly concentrated. U.S. Department of Justice and the Federal Trade Commission (2010).

Herfindahl-Hirschman Index

(1,500 to 2,500 = moderately concentrated) Chart 9



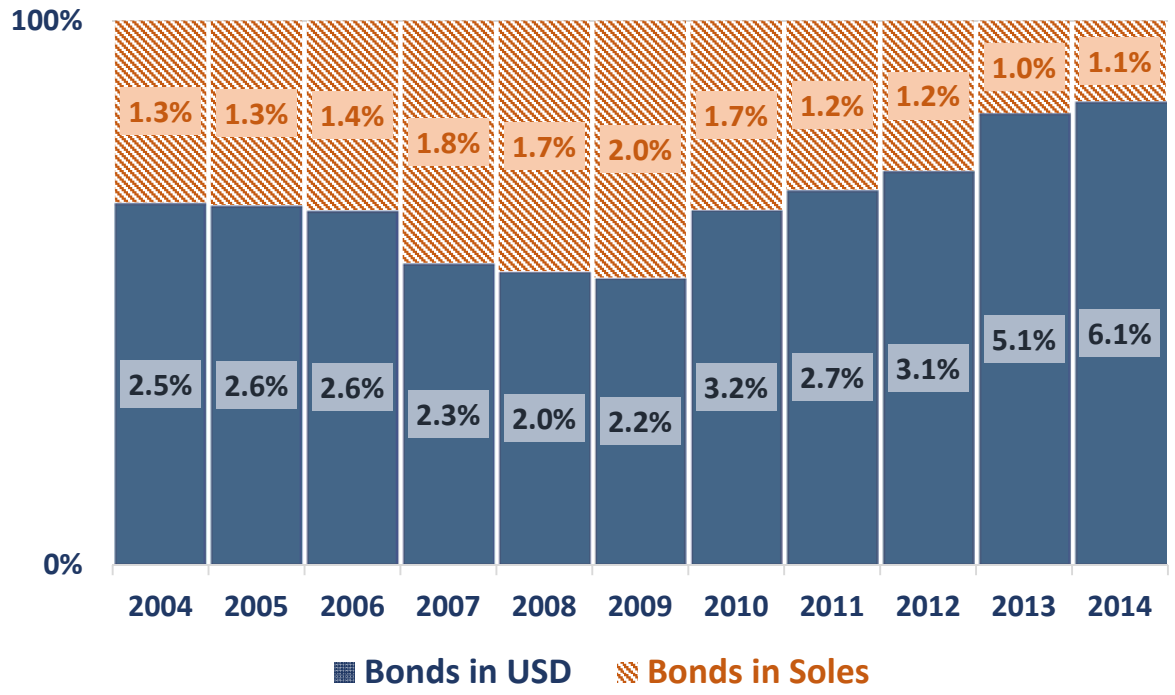
Evolution of the bond market in Peru

Private corporate bonds. Although bank lending remains the most important funding source for Peru's non-bank private sector, corporate bond issuances have slowly become an additional provider of funds for domestic firms, increasing from 3.8% of GDP in 2004 to 7.2% in 2014. In terms of currency denomination, the share of corporate bond issuances in new soles (PEN) increased steadily during 2004–09, from 1.3% of GDP to 2.0%, while the share of US dollar-denominated bonds dropped from 2.5% to 2.0%.

However, in response to the substantial easing of monetary policy in the developed world and the subsequently very low international interest rates, corporations since 2009 have switched from domestic to international capital markets for bond-based funding, causing the share of foreign currency-denominated corporate bond issuances to increase from 2.0% of GDP in 2008 to 6.1% in 2014. Conversely, the share of domestic currency corporate bond issuances fell from 2.0% of GDP in 2009 to 1.1% in 2014.

Structure of domestic non-financial firms' debt securities, by currency of denomination

(As a share of nominal GDP) Chart 10



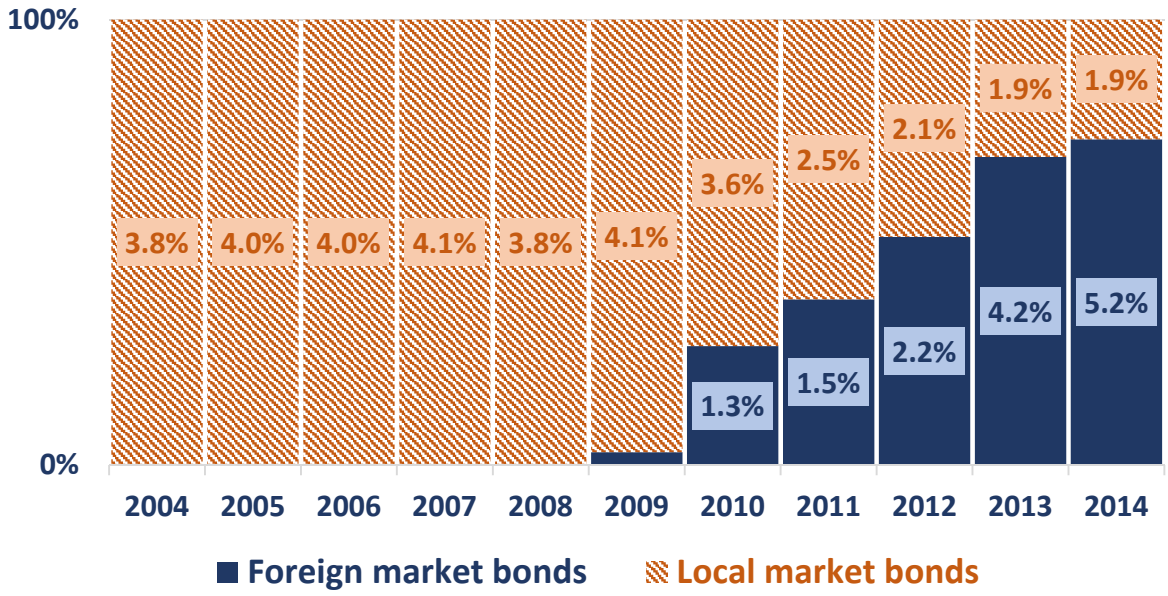
From 2001 until 2009, corporate bonds were basically issued in the domestic capital market. However, the subsequent changes in international funding market conditions combined with the strength of Peru's macroeconomic fundamentals – as reflected in the upgrade of its sovereign debt to investment grade in April 2008 and the important reduction in its sovereign risk spread from 524 bp in December 2008 to 179 bp in December 2009 – encouraged domestic corporations to issue bonds in international markets, partly replacing domestic market issuances.

The share of domestic corporations' international bond issuances quickly increased from 0.1% of GDP in 2009 to 5.2% in 2014, while the domestic market issuances dropped from 4.1% of GDP to 1.9% during the same period.

Due to its small size, corporate bond funding may still not present any real challenges to domestic financial stability. However, the increasing dollarisation of corporate bond issuances related to the reliance on international bond markets may bring about pressures on financial stability through exchange rate-related credit risk, particularly during periods of monetary policy normalisation in the developed world. This risk increases the Peruvian economy's vulnerability to a still high degree of financial dollarisation.

Structure of domestic non-financial firms' debt securities, by market of issuance

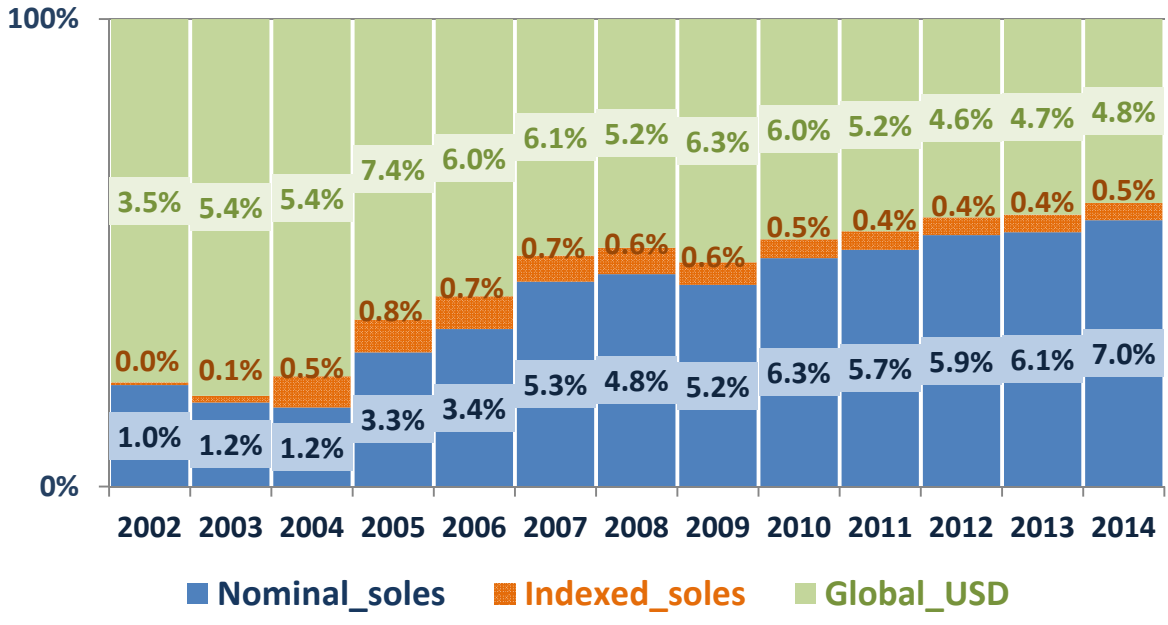
(As a share of nominal GDP) Chart 11



Sovereign bonds. Since 2003, the government has promoted the domestic capital market by issuing Treasury bonds and allocating them in the primary capital market through the Market Creators Program, which also has the purpose of regularly setting prices for issued bonds, ensuring liquidity and market deepening, and generating benchmark yield curves.

Government debt securities, by type of issuance

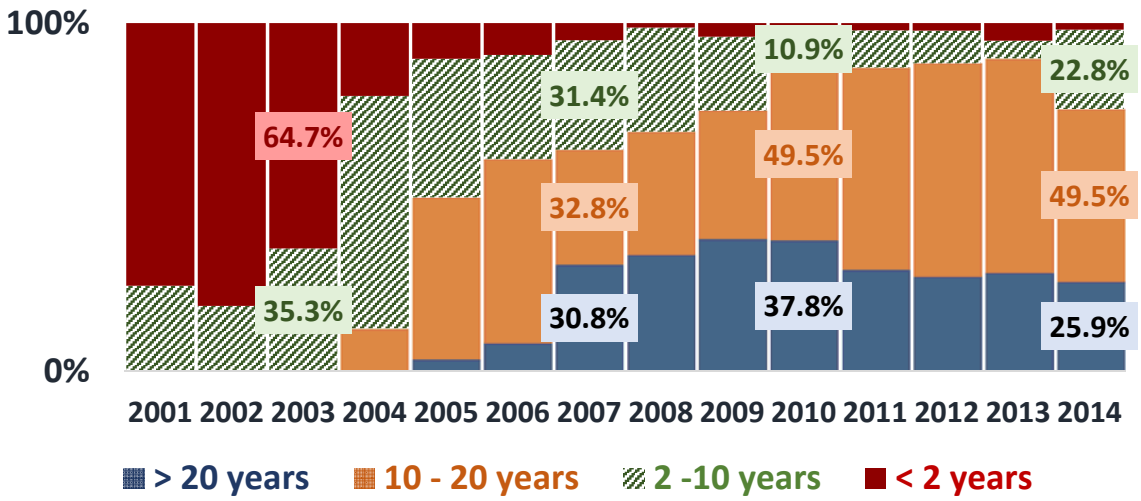
(As a share of nominal GDP) Chart 12



The share of domestic currency Treasury bonds increased from 1.2% of GDP in 2004 to 7.0% in 2014, while the share of global USD sovereign bonds decreased from 7.4% of GDP in 2005 to 4.8% in 2014. This process has greatly reduced the dollarisation of government debt and, consequently, the Treasury exposure to exchange rate risk. Moreover, the government has steadily increased the maturity of its bonds, with more than 75% of the total balance of bonds having maturities longer than 10 years (26% of which have maturities longer than 20 years). In February 2014, the Treasury issued a nominal bond with a maturity of 40 years.

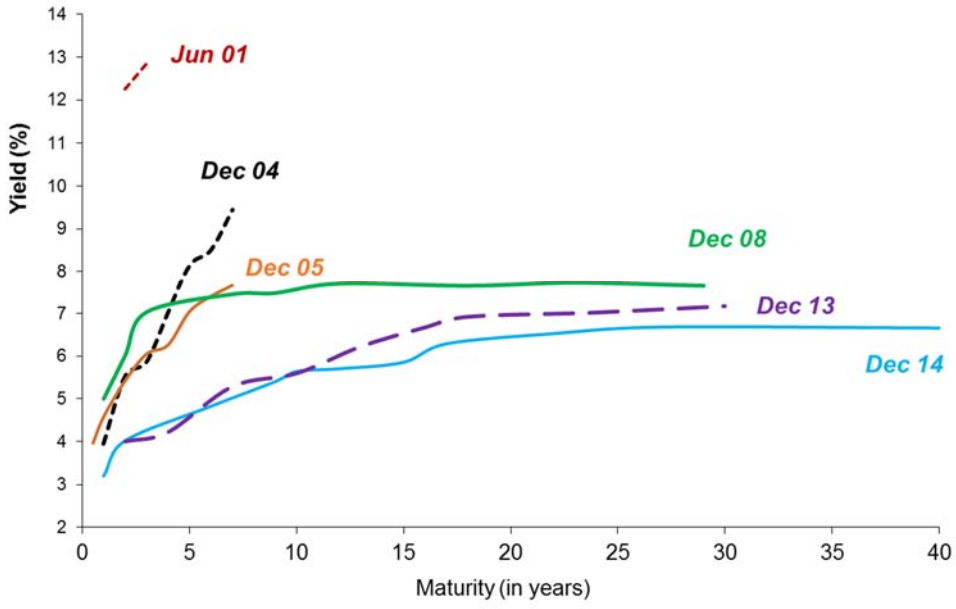
Term structure of government debt securities

(As a share of total) Chart 13



Yield curve of government debt securities

(Percentages) Chart 14



Since July 2013, the Treasury has begun to issue short-term titles (three, six, nine and 12 months) in order to complete the short leg of the yield curve. The yield curve now goes from three months up to 40 years, the longest term structure for nominal interest rates in a Latin American domestic currency.

I. Constraints on the development of the corporate bond market in Peru

The domestic bond market remains relatively small, even though it has a well functioning Treasury bond segment that provides a benchmark yield curve for the pricing of private sector issuances, and although the private pension funds (AFPs) have sufficient resources to encourage its development. The outstanding stock of private bonds increased from 4.7% of GDP in 2001 to 14% in 2013.

Large Peruvian firms have preferred mainly to issue in external markets, although the number of firms with such access is very small. In 2014, the external issuance of corporate debt was roughly triple that of domestic issuance, even though only 12 Peruvian firms issued debt in the external market that year (17 in 2013 and none 10 years ago), compared with 17 in the domestic market (42 in 2013 and 36 a decade ago).

Local issuers prefer to issue bonds abroad due to the higher level of liquidity in international markets, the broad investor base, and a greater variety of risk-hedging instruments, which can help to reduce funding costs. Demand for longer-term bonds with fixed rates and larger notional values is also greater in external markets.

According to Black and Munro (2010), Minzen et al (2012) and Guscina et al (2014), the main reasons for issuing bonds abroad are:

– Risk management: companies with revenues in foreign currency (ie exporters) have a natural incentive to fund their activities by borrowing abroad.

– Arbitrage opportunities: financial companies take advantage of issuing bonds in foreign markets and hedging those operations using currency swaps, thus reducing funding costs without incurring foreign exchange risk. Even though exploiting these arbitrage opportunities should lead to a convergence of funding costs across countries, the literature on interest rate parity finds that small deviations persist due to market imperfections (transaction costs, market size, market incompleteness, information asymmetries and regulatory friction), particularly in long-term bond markets.

– Market completeness: local companies prefer to issue bonds abroad to access larger and more liquid markets, as discussed above.

– Diversification of funding sources: in particular, domestic financial institutions have an incentive to form a diversified funding base that includes both domestic and foreign investors.

Evidence from Asia in Black and Munro (2010) suggests that financial firms issue bonds abroad mainly to benefit from arbitrage opportunities, while Minzen et al (2012) show that corporate firms in Asia issue bonds abroad to take advantage of large liquid markets, thus reducing funding costs.

Guscina et al (2014) find that, over the last 10 years, new bond issuances abroad by a sample of emerging markets and less developed countries reflect both demand and supply factors. The key demand drivers are easy financial conditions due to the search for yield and a demand for diversification, while increasing financial needs, coupled with underdeveloped domestic markets and a favourable

interest rate environment in foreign markets have turned international bond markets into an attractive alternative source of funds.

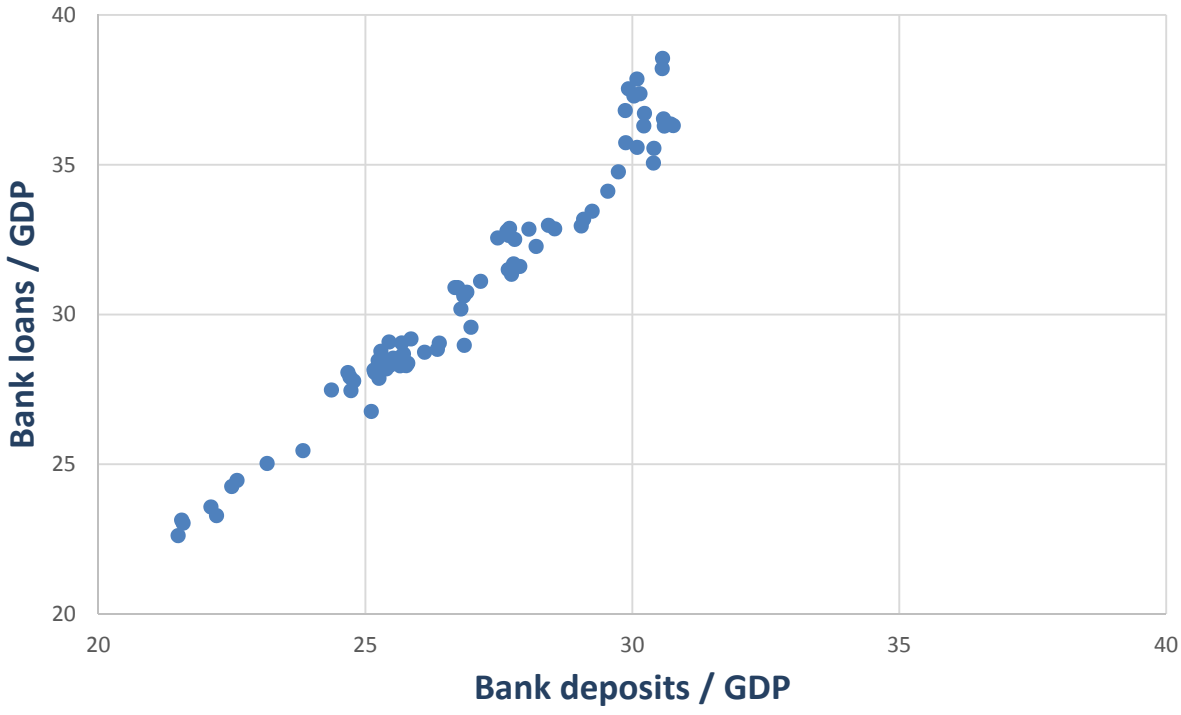
Furthermore, Batten and Szilagyi (2002) argue that in Japan, the high concentration of market power in the hands of banks, supported by government policy, continues to impede bond market development. They also state that banks' large equity stakes in non-financial corporations, coupled with strategically set loan and deposit rates, have ensured a close relationship with corporate borrowers. They quote Samuelson (2000) to the effect that, "like stallions who preside over a harem of mates, each leading bank feeds capital and advice to a collection of companies who may even have invested materially in each other's share of stock".

In Peru, households look to financial institutions as their main deposit-takers, and bank savings represent the principal funding source for bank lending (bank deposits are equivalent to, on average, 88% of bank lending).

Bank loans and bank deposits

(XY Chart, as shares of nominal GDP)

Chart 15



Private pension funds. The value of private pension funds in Peru increased from 11.4% of GDP in 2004 to 20% in 2014. Almost 41% of these funds are invested abroad. The pension funds' domestic market investments are concentrated in government securities (17.7% of their portfolio) and financial institutions' instruments (18.2%). Their holdings of non-financial corporate bonds have decreased, from 13% in 2007 to 6.9% in 2014. Table 2 shows that pension funds

prefer international investments, having increased their portfolio weight of these investments from 10.2% in 2004 to 40.6% in 2014. In contrast, they reduced their positions in non-financial institutions from 52.2% in 2004 to 23.4% in 2014.

Private pension funds' portfolio composition Table 2

Private Pension Funds

	2004	2007	2011	2014
Total fund value (Millions USD)	7 820	20 155	30 064	38 089
(Percentage of GDP)	**11.4**	**19.1**	**17.4**	**19.9**
Investment Portfolio Composition (%)	**100.0**	**100.0**	**100.0**	**100.0**
a. Government securities	24.3	21.9	17.0	17.7
b. Financial institutions	13.4	8.1	14.4	18.2
Deposits in domestic currency	5.9	2.1	3.8	0.8
Deposits in foreign currency	1.9	0.3	0.7	5.8
Bonds	3.6	2.4	4.1	5.7
c. Non-financial institutions	52.2	56.8	40.1	23.4
Common and investment shares	37.0	39.7	25.5	11.4
Corporate bonds	11.3	13.0	9.9	6.9
d Foreign Investmets	10.2	13.2	28.5	40.6

Implications for monetary policy

Since the Global Financial Crisis, there has been growing interest in assessing the impact of financial intermediation on the transmission mechanism of monetary policy. Particularly in Latin America, including Peru, the quantitative easing policies of developed economies have increased domestic banks' access to cheap foreign funding. In addition, large domestic companies have gained access to foreign funding by issuing foreign currency bonds. The availability of cheap foreign funding to large domestic firms has also prompted domestic banks to expand lending to small and medium firms, for which delinquency rates have been higher due to the initial learning process for new borrowers. This new dynamic in financial intermediation has facilitated the expansion in bank credit and also fuelled domestic asset prices.

These issues pose problems for the transmission mechanism of monetary policy, particularly when the central bank tightens its monetary policy stance to contain inflationary pressures.

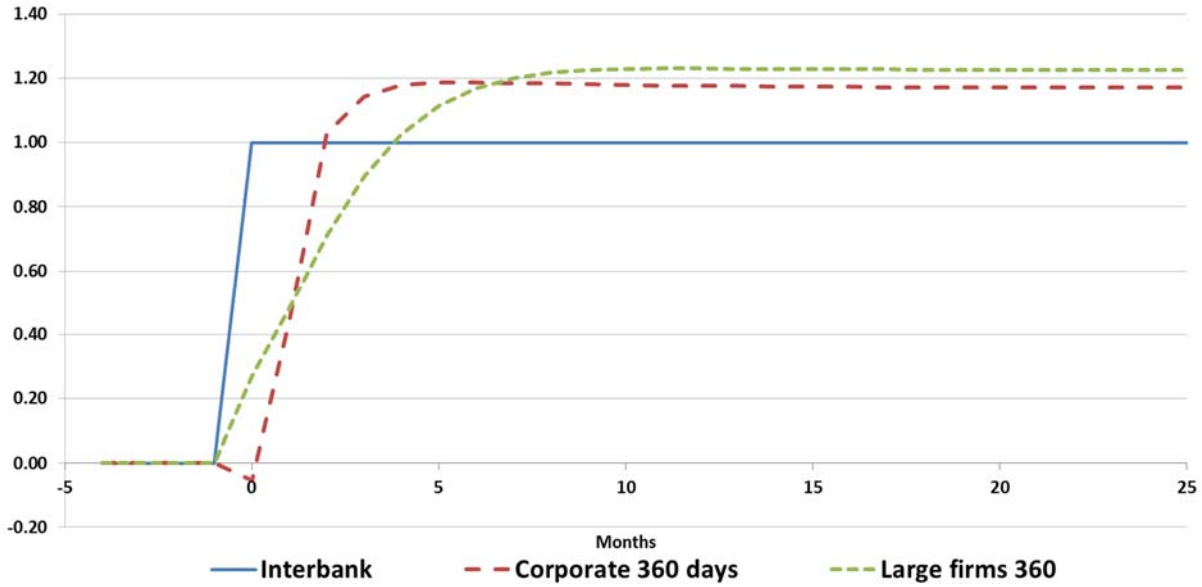
With respect to the traditional transmission channel of monetary policy – the interest rate channel – empirical evidence presented in the Central Reserve Bank of

Peru's *Inflation Report* in October 2014[6] shows that the effectiveness of this channel has not changed significantly in the last five years and that monetary policy has remained effective through this channel. As we can see in Table 3 and the corresponding graphs, changes in interbank rates as a result of changes in the policy stance are fully passed through to loan rates, while the pass-through to deposit rates is incomplete.

Interest rate pass-through — Table 3

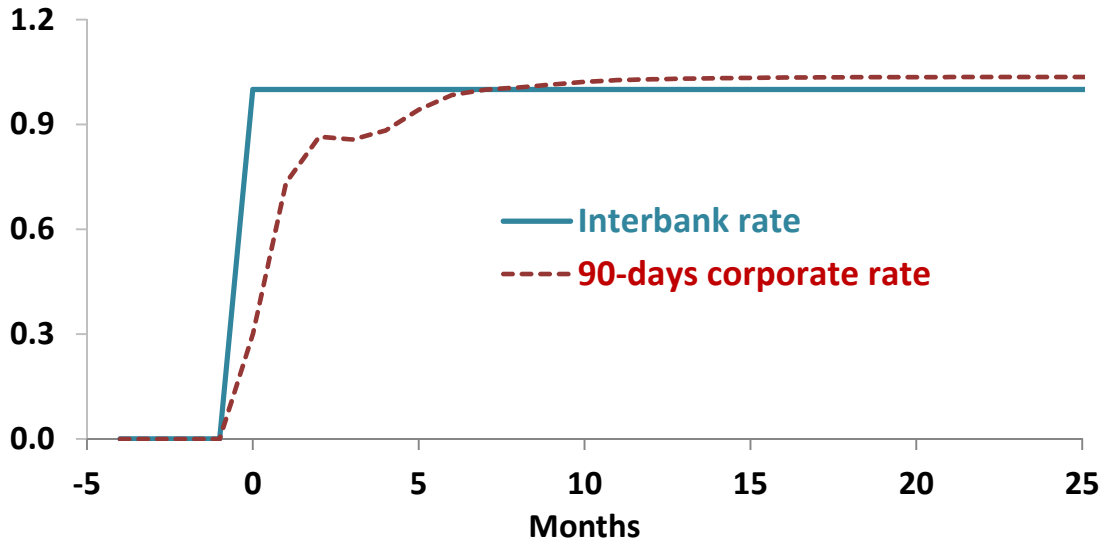
Long-term pass-through			
	Rodriguez (2010)		Inflation report Oct-2014
	Pre-crisis sample	Full sample (2010)	Full sample (2014)
Lending rates			
90-days corporate rate	1.07	1.04	1.04
360-days rate	0.65	0.68	
360-days corporate rate			1.17
360-days rate for large firms			1.23
Deposit rates			
Savings	0.53	0.46	0.45
30-days deposits	0.82	0.86	0.85
180-days deposits	0.81	0.81	0.81
360-days deposits	0.74	0.70	0.69

Response of 360-day corporate rate to a 1% change in the interbank rate — Chart 16



[6] We would like to acknowledge the assistance received from Mr Kenji Higa, who carried out the calculation of the interest rate pass-through.

Response of 90-day corporate rate to a 1% change in the interbank rate Chart17



As regards the lending channel, Tovar et al (2012) explain that reserve requirement (RR) management plays a countercyclical role in managing the credit cycle. In particular, in the upswing, hikes in RRs may increase lending rates, slow credit growth, and curb the excess leverage of borrowers in the economy. In the downswing, they can ease liquidity constraints in the financial system, thus operating as a liquidity buffer. RR management enhances the lending channel of monetary policy.[7]

With respect to the asset price channel, increases in short-term interest rates put equity prices under pressure by making equity less attractive than bonds. There is no empirical evidence for the case of Peru, but the effect seems to be less important here, since growing demand for domestic assets among foreign investors searching for yield has kept asset prices growing even under tighter monetary policy.

The exchange rate channel should have a higher impact, since an increase in the policy rate to smooth economic growth would increase the interest rate differential, which in a context of capital inflows should heighten the effect of this mechanism.

In the case of Peru, it is important to note that increased capital inflows have a limited effect on the transmission mechanism of monetary policy due to the implementation of macroprudential policies that contain the inflationary impact of the inflows on domestic credit and asset prices.

Macroprudential policies aimed at mitigating the impact of capital inflows on asset prices and excessive bank lending have facilitated the implementation of a

[7] The lending channel is the mechanism through which monetary policy alters the loan supply when some firms can be deemed to be bank-dependent for their credit needs, so that a change in the supply of bank loans has an impact on the real activities of firms, and when prices are sticky. See Peek and Rosengren (2014).

monetary policy that is independent of the monetary policy stance in developed economies.

In particular, tighter reserve requirements for banks' foreign funding and countercyclical capital and provision requirements have helped contain excessive credit growth and currency mismatches due to cheap foreign funding.

The use of reserve requirements aims to dampen the expansion of credit in foreign currency and to stabilise the total credit to the domestic private sector. Additionally, in order to de-dollarise the economy and reduce the risks associated with the financial dollarisation, the Central Reserve Bank of Peru has implemented further reserve requirement measures:

- since March 2013, additional reserve requirements related to the expansion of mortgage and car loans in USD;
- since October 2013, additional reserve requirements related to the expansion of total USD loans;
- since January 2015, incentive to replace foreign currency loans with domestic currency loans via additional reserve requirements if lenders fail to reduce USD credits.

The following additional macroprudential measures have been used by the central bank and the supervisory agency:

Measures that tackle excessive leverage

a. Changes in the average reserve requirement in domestic currency depending on the phase of the credit cycle.

b. Dynamic provisioning and countercyclical capital requirements, and higher capital requirements according to the type of credit (mortgage loans, revolving and non-revolving consumer loans).

These macroprudential measures aim to increase the resilience of the financial sector to negative shocks and reduce the likelihood of a financial crisis. They also help maintain the effectiveness of monetary policy, since they target specific areas where systemic risk is building up, allowing monetary policy to focus on containing inflationary pressures.

Special attention should be given to the recently implemented liquidity coverage ratio (LCR), as its impact on the transmission mechanism of monetary policy needs to be analysed carefully. Since central banks implement monetary policy by providing liquidity to, and withdrawing liquidity from, the banking system, an interaction between liquidity requirements and central bank liquidity provision and absorption is evident. There is also some theoretical evidence that the LCR may increase the steepness of the very short end of the yield curve by introducing an additional premium for interbank loans that extend beyond 30 days (Bech and Keister (2012)). Since the implementation of LCR is still ongoing, there is no empirical evidence yet on its impact on the transmission mechanism of monetary policy.

Conclusions

Bank lending remains the most important funding source for Peru's non-bank private sector, but the corporate bond market is slowly becoming an additional provider of finance for domestic firms. The upgrade of Peru's sovereign debt in a context of low interest rates and abundant international liquidity has encouraged large domestic corporations to issue bonds in the global markets, replacing in part domestic market bond issuances. This also reflects the illiquidity of the domestic capital market, in contrast to the efficiency of international markets. Although private pension funds manage large funds, they are mainly oriented to international markets. The transmission mechanisms of monetary policy have maintained their effectiveness thanks to the implementation of reserve requirement measures and other macroprudential policies.

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Increased financial intermediation in the Philippines: some implications for monetary policy[1]

Diwa C Guinigundo[2]

Abstract

This paper examines how the monetary transmission mechanism is affected by changes in the pattern of financial intermediation in the Philippines. By estimating the nature of monetary policy pass-through and the influence of monetary policy changes on outstanding bank credit, this study finds that, in general, monetary policy transmission has been stronger and faster, especially during the past decade. The estimates also indicate that banks have shifted to the Special Deposit Account rate as the basis for pricing loans, instead of the overnight policy rate. Meanwhile, the results of a rolling regression show that pass-through and speed of adjustment for the longer-term time deposit rate, Treasury bill rates and Treasury bond rates became stronger prior to the global financial crisis in 2008 and in 2012 following surges in capital flows. However, there was a general decline in the immediate pass-through for savings deposit and bank lending rates after 2012. When inflation and growth are considered, policy rate changes continue to be a significant driver of overall bank credit. These findings underscore the relative importance of the changing pattern of financial intermediation and the close interaction between monetary and financial stability.

Keywords: financial intermediation, monetary policy pass-through, Philippines

JEL classification: E52, E58, G15

[1] A paper prepared for the Bank for International Settlements Emerging Markets Deputy Governors Meeting, 26–27 February 2015, Basel, Switzerland. The usual institutional disclaimer applies.

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1. Introduction

This paper describes the changes in the pattern of financial intermediation in the Philippines and examines the corresponding implications for the transmission of monetary policy of the country's central bank. In recent years, the manner by which central banks conduct monetary has evolved, following the appearance of financial market rebalancing as indicated by, for example, the drop in interest rates and the rise in capital flows in and out of emerging market economies (EMEs). In the case of the Philippines, Guinigundo (2014) finds a relevant channel from movements of US Treasury bond yields to Philippine Treasury bond yields in recent years, following the rise in foreign investments in bond markets.[3] A transmission channel behind such a finding has been the significant foreign equity and debt flows to emerging market economies, including the Philippines. In fact, outstanding transactions in the Philippine bond market have grown by 62.8% from 2007 to 2013, or an annual average of 9.5%, as non-financial corporations have tapped the bond market as an alternative source of financing. These developments imply that the pattern of financial intermediation from bank-based to market-based may have changed and that monetary policy may need to be re-assessed in the light of the possible impact of capital flows, not only in the financial sector but also in the real sector.

As indicated in many studies, financial markets are essential to the conduct of monetary policy as the latter is implemented mainly through the operation of these markets. In particular, the impact of monetary policy on the real economy depends on the structure of the financial system, including the degree of financial market development and changes in these markets that affect their functioning.[4] Developments in the financial sector reflect changes in the structure of the economy – including changes in balance-sheet positions, financial sector technology, innovations and institutional changes mainly brought about by financial sector liberalisation, or in expectations concerning future policy of advanced economies. Given these developments, financial intermediaries, such as banks, have become more capable of reconciling the different motives of savers and borrowers in terms of maturity and returns in a globalised financial system. Because these changes tend to alter the economic effects of a given monetary policy measure, central banks need to continuously reinterpret the impact of such changes on the channels of monetary policy transmission.

Beck et al (2014) argued that the role of financial intermediaries in monetary policy transmission has evolved since the global financial crisis (GFC) in 2008. While the traditional literature focuses on overall loan supply, the post-GFC literature has emphasised the risk-taking channel of monetary policy, suggesting that low interest rates typically lead to the mispricing of risks, thus resulting in a lower risk premium and increased lending to riskier borrowers. The traditional view of monetary policy transmission has focused on the interest rate channel and the substitutability of different asset classes by investors, including banks. The traditional view of the

[3] In particular, the results of the model show that the degree of pass-through from the US 10-year bond to the 10-year Philippine bond has become significant from 2008 to 2013 compared with the pre-crisis period of 2003 to 2007.

[4] See Singh et al (2008).

monetary policy transmission mechanism views financial intermediaries more as a pass-through mechanism but not as market actors in themselves.

This study examines the impact of increasing financial intermediation on monetary policy pass-through and bank lending. In doing so, it considers both conceptual insights and empirical analyses in assessing the impact of financial intermediation on monetary policy. First, we revisit the role of financial intermediaries in the Philippine financial landscape. Second, the nature of interest rate pass-through is estimated from changes in policy rate to deposit rate, bank lending rates and to other long-term market interest rates using the insights from recent Philippine experience of financial intermediation. Third, the paper estimates a rolling regression with a five-year window to check the impact of structural changes and the global financial crisis on the monetary policy pass-through. Fourth, the study examines the influence of BSP policy actions on overall bank lending conditions.

The paper is structured in five parts. Section 2 highlights the role of the recent changes on financial intermediation in the Philippines. Section 3 details the impact of financial market developments on monetary policy in terms of immediate and long-run pass-through and the speed of adjustment to long-run relationships as well as the impact of monetary policy actions on the bank lending channel. Sections 4 and 5 conclude with implications for monetary policy formulation and a summary of findings and insights.

2. The role of financial intermediaries in the Philippine financial landscape

The role of financial intermediaries in the Philippines has evolved to improve financial depth, breadth and access.[5] Such evolution, however, has been characterised by the fact that banks continue to dominate the Philippine financial system.[6] As of end-December 2013, banks represented 35.4% of the total BSP-supervised financial institutions. Apart from banks, the BSP also supervises non-banks with quasi-banking functions and/or trust licenses, financial allied subsidiaries/affiliates of banks and quasi-banks, non-stock savings and loan associations, pawnshops and other financial institutions which under special laws are subject to BSP supervision. The number of financial institutions under the effective supervision of the BSP reached 27,939 as of end-December 2013. Of these financial institutions, pawnshops accounted for the majority at 63.2% or 17,652 units. Meanwhile, most of the banks are domestic (98.4%) and only a few are foreign (1.6%). Most foreign banks are branches of foreign banks and only a few are

[5] Financial depth provides a measure of the size of the financial system relative to the size of the economy while financial breadth is a gauge of the relative importance of banks relative to capital markets. Financial breadth indicates how far the financial system has diversified from the provision of banking services toward greater use of capital markets for financing.

[6] Major bank categories are universal and commercial banks, thrift banks and rural and cooperative banks.

foreign bank subsidiaries. As of end-December 2013, there were four offshore banking units (OBUs)[7] operating in the Philippines.

Streamlining of the banks. The banking system has been streamlined as a result of continued industry consolidation and the exit of weaker players. The number of head offices declined in 2013 but this was offset by the increase in the number of newly established regular branches as well as "light branches" or other banking offices (OBOs)/microbanking offices (MBOs)) that served as additional financial access points for the effective delivery of banking services particularly in the countryside. As of end-December 2013, there were 465 MBOs that offered a wide range of financial products and services particularly in hard-to-reach areas. With the forthcoming ASEAN economic integration by 2015, the continuing challenge for local banks is to scale up in size to be able to compete with the bigger banks in the region.[8] Under the ASEAN Banking Integration Framework (ABIF), each ASEAN economy should have at least one qualified ASEAN bank (QAB) ready for regional passporting by 2018.[9]

Greater banking convenience. Banks have been responding well to market innovations for greater banking convenience (BSP (2014)). Electronic banking (e-banking) platforms have evolved greatly in recent years, including automated teller machine (ATM) networks, internet banking, mobile phone banking, and the use of electronic money (e-money) instruments such as cash/remittance cards and electronic wallets which are accessible via mobile phones or other access devices. To keep pace with changing market dynamics, banks have capitalised on the use of e-banking technology to provide fast, efficient and reliable services to a broader customer base. Developments in banking technologies will likely play a pivotal role as local banks gear up for greater competition and prepare for the ASEAN banking integration starting 2015. Moreover, competition is expected to heighten with the enactment of the Republic Act no 10641 on 15 July 2014, which liberalises the entry of foreign banks in preparation for the ASEAN financial integration.

Banks dominate the financial system amidst rising deposits by corporations in recent years. Banks captured an 81.3% share of the financial system's total resources, while non-banks[10] held only an 18.7% share as of end-December 2013. Since 2008, the asset[11] and liability structure of domestic banks has been stable. Deposit liabilities remained the major source of funding. Total deposits of all banks operating in the Philippines as of end-December 2013 grew by 181.3%

[7] Section 1(b) of Presidential Decree no 1034 defines OBUs as a branch, subsidiary or affiliate of a foreign banking corporation which is duly authorised by the BSP to transact offshore banking business in the Philippines.

[8] As of 5 March 2014, two Asian banks have formalised their plan to operate in the Philippines. This is on top of five other foreign banks that earlier expressed an interest in entering the Philippine market.

[9] The full banking integration under ABIF is in 2020.

[10] Non-bank financial institutions (NBFIs) are financial institutions that do not have a full banking license but they facilitate bank-related financial services, ie investment, risk pooling, contractual savings and market brokering. Only NBFIs with quasi-banking functions (NBQBs) and those without a quasi-banking function but are subsidiaries and affiliates of banks and NBQBs are subject to BSP supervision. There were 12 operating NBQBs in the Philippines consisting of five investment houses (IHs), six financing companies (FCs) and one other non-bank as of end-December 2013.

[11] Banks' assets are mainly in the form of loans and cash and due from BSP/other banks.

from end-December 2004 and by 80.4% from end-December 2008, largely from non-financial and financial corporations. It may be noted that from end-December 2008, deposits by non-financial corporations and financial corporations with banks rose by 112.8% and 195.4%, respectively, to end-December 2013, or an annual average of 20.3% for non-financial corporations and 37.1% for financial corporations from 2008 to 2013.

Steady build-up in cash and due from BSP/other banks notable after 2008. Meanwhile, banks' preference for safe and liquid assets such as the BSP-managed Special Deposit Accounts (SDA) reflected their search for higher yield and at the same time, a strong demand for safety in order to manage liquidity. In turn, the share of cash and due from BSP/banks to total assets rose to 24.5% at end-December 2013 from 13.7% in 2009. Meanwhile, banks' other assets, which include derivatives for trading and non-deliverable forward (NDF) activities, continued to drop in end-December 2013. The latter decline was due to the impact of the BSP's measure in December 2012 to impose limits/caps[12] on banks' NDF activities to avoid potential systemic risks from these transactions.

Bank loans structure generally steady. The structure of the domestic banks' loans has not changed in recent years. The total loan portfolio[13] amounting to PHP 4.3 trillion as of end-December 2013 was largely peso-denominated (88.1%) and comprises mostly loans and receivables. Loans to private corporations accounted for the bulk (52.5%), followed by loans to individuals for consumption purposes (17.1%). Meanwhile, there was a slight shift in the asset mix of foreign banks from loans and investments to safer and more liquid cash and due from banks after 2008. Nonetheless, foreign banks subsidiaries continued to extend credit to domestic borrowers. In particular, in 2013, foreign bank subsidiaries, which sourced 70.0% of their liabilities from the peso deposits of residents, granted loans to households (residential borrowers) amounting to PHP 69.3 billion (or 1.5% of the total loans to residents), of which 13.1% was in foreign currency.

Bank loans to the real estate, renting and business services (RERBA) sector have risen since 2012. The manufacturing sector used to account for the bulk of the loans outstanding of universal and commercial banks to production sectors, but this trend has changed since September 2012, when RERBA's share to total loans has started to exceed that of the manufacturing sector. From December 2009 to August 2012, the average share of manufacturing sector was 18.7%, while that of RERBA was 17.5%. From September 2012 to January 2015, the average shares of RERBA and manufacturing were 20.1% and 18.2%, respectively.[14] The outstanding loans of universal and commercial banks to RERBA grew by 12.3% at end-December 2009 and by 22.0% at end-December 2013. In January 2015, outstanding loans to RERBA continued to post a double-digit growth (15.4%) and its share (19.9%) continued to be the highest among the production sectors, although in terms of growth, signs of deceleration have been observed recently.

[12] The limits/caps include: (a) limiting local banks NDF exposure to 20.0% of capital; (b) limiting local branches of foreign banks NDF exposure to 100.0% of capital; and (c) forbidding pre-termination of NDF contracts, see www.bsp.gov.ph/downloads/publications/faqs/exchange.pdf.

[13] Net of specific loan loss provisions

[14] It should be noted that prior to 2001 the banking system's outstanding loans to real estate, renting and business services included financial institutions.

Pre-emptive macroprudential measures were adopted in 2014 to manage potential risks in real estate financing. These measures include increased monitoring of banks' real estate exposures, the implementation of the real estate stress test (REST)[15] limit for real estate exposure, and the enhancement of rules on credit risk management. In terms of real estate exposures (REEs), the REEs of universal, commercial (U/KBs) and thrift banks (TBs) reached PHP 1.2 trillion at end-September 2014. This is 5.6% higher relative to the previous quarter, representing 22.1% of total loan portfolio of U/KBs and TBs during the period. The expansion in banks' REEs is primarily attributed to the growth of real estate loans, which comprised 84.3% of REEs as of end-September 2014. Of total real estate loans, about 60%[16] were obtained by land developers, construction companies and other corporate entities, while the remaining were received by borrowers acquiring residential properties.

Nevertheless, banks displayed strong profitability through 2013 amidst the search for higher-yielding assets. Driven mainly by interest payments on loans, along with reduced interest payments on deposit liabilities, the latest bank capital adequacy ratios (CAR) of 17.7% as of end-December 2013 for the Philippine banking system and 17.0% as of end-September 2014 for universal and commercial banks are both above the BSP (10%) and international standards (8%). However, non-interest earning activities[17] registered a rising and significant contribution to net profit growth, reflecting the industry's search for higher yields by taking on more risky assets. Among non-interest based revenues, fees and commissions, unrealised gains from the marking to market of financial instruments, particularly of derivatives such as financial futures, options, forwards and swaps and profits from sale/redemption/de-recognition of non-trading financial instruments, displayed a notable increase (BSP (2014)).

Non-financial corporations' leverage has increased while that of households has remained modest. Meanwhile, the borrowings of non-financial corporations (NFCs) have increased over the past seven years, based on a BSP internal study.[18] The rising debt levels of about 66 sampled firms resulted in their combined debt-to-equity (D/E) ratio climbing from 76% in 2007 to 99% in 2013. The rise in leveraged positions can be attributed to the accommodative lending environment that allowed firms to acquire funding at favourable costs. Meanwhile, the latest data show the steady rise in consumer loans extended by banks, both in absolute terms and relative to the size of the economy.[19] The year-on-year growth

[15] REST is a pre-emptive macroprudential measure that was introduced in May 2014 to contain the possible formation of asset price bubbles. It is a prudential real estate stress test (REST) limit on the aggregate real estate exposures of universal/commercial banks (U/KBs) and thrift banks, on a solo and consolidated basis. The REST limit combines a macroprudential overlay of a severe stress test scenario, the principle of loss absorbency through minimum capital ratio thresholds, and heightened supervisory response.

[16] Data as of end-June 2014.

[17] Refers to fees earned on core operations such as deposit-taking and lending, and fees and commissions from the trading and selling of financial instruments.

[18] Based on the Financial Stability Report of the Financial Stability Committee, June 2014 (BSP internal report).

[19] Consumer credit extended by banks includes auto loans, credit card receivables, residential real estate loans and other personal loans. For the purposes of classifying household loans into housing

of outstanding consumer loans rose from 2.4% at end-December 2000 to 18.1% at end-June 2014. In terms of the ratio to nominal GDP, consumer loans rose steadily from 2.7% in 2000 to 6.7% in June 2014.

Financial market developments indicate a change in the pattern of intermediation in recent years. While bank loans have remained the major source of finance for the private sector, some non-financial corporations have tapped market-based financing for their business operations since 2007. Along with the streamlining of the banks and market innovations, such a change is expected to influence the pass-through to the lending rate. To the extent that assets have found their way back to banks' balance sheets in the form of higher-yielding debt securities and deposits with the BSP's SDA facility, the strategic and operational aspects of monetary policy will become more challenging in the future.[20]

3. Financial developments and monetary policy in the Philippines: some evidence using the interest rate pass-through and bank lending

This section examines whether increasing financial developments have had any discernible impact on the monetary policy transmission mechanism by changing the interest rate pass-through. This study estimates the immediate and long-run pass-through and the speed of adjustment towards the long-run impact. In many studies, the interest rate pass-through from the policy rate to bank deposit and lending rates, along with Treasury bill rates and Treasury bond yields, is clearly an important dimension of the effectiveness of monetary policy in affecting aggregate demand and inflation, even in the presence of capital flows. Monetary policy transmission is expected to be faster and stronger following financial market developments, implying that monetary policy has become more efficient in influencing the cost of funds. Otherwise, a slower and weaker pass-through suggests that monetary policy has become less effective in transmitting impulses to the real sector.

3.1 Empirical methodology

Using the two-step Engle-Granger Error Correction Model (ECM), this study followed Singh et al's (2008) specification to assess the importance of financial market developments in influencing the pass-through from changes in the policy rate to bank retail rates, savings and time deposits to other market interest rates (bank lending rates), the short-term paper rate (91-day and 364-day Treasury bill rates) to the long-term bond rate (five-year and 10-year Treasury bond rates) from 1986 to 2014.

and consumer credit, we reclassified consumer credit to include auto loans and credit card receivables only.

[20] See Genberg (2008).

The first step estimates the long-run relationship between the market interest rates *(i)* and the policy rate *(ρ)* in equation 1 below,

$$i_t = \alpha^* + \beta^* \rho_t + \varepsilon_t. \quad (1)$$

The second step estimates the short-run relationship in equation (2) below by incorporating the error correction term or the lag residual from the long-run relationship in equation (1).

$$\Delta i_t = \gamma + \alpha_1 \Delta i_{t-1} + \alpha_2 \Delta i_{t-2} + \beta_0 \Delta \rho_t + \beta_1 \Delta \rho_{t-1} + \beta_2 \Delta \rho_{t-2} + \delta \epsilon_{t-1} + \mu_t. \quad (2)$$

The immediate impact or pass-through is represented by β_0 in equation 2, the long-run pass-through is represented by β^* in equation 1, and the speed of adjustment towards the long-run relationship is represented by δ in equation 2.

The results in Table 1 (Appendix A) highlight the following insights:

- In general, there is evidence of stronger pass-through using the BSP overnight RRP rate starting in 2002 or the start of inflation targeting (IT) as the framework for monetary policy. Moreover, the speed of adjustment towards the long-run impact appears to be faster during the shorter (IT) period compared to the longer time period, indicating that market innovations may have helped to accelerate the transmission to market interest rates.
- Among the different types of market rates, the long-run pass-through is largest for longer term rates, such as five-year and 10-year Treasury bonds, followed by 91-day and 364-day Treasury bill rates, bank lending rate, time and savings deposit rates.
- However, the average immediate pass-through during the IT period is less complete and slower than the average long-run pass-through.
- Notably, there is negative immediate pass-through to the bank lending rate, an indication of an apparent disconnect between the BSP overnight RRP rate and the bank lending rate in pricing loans during the IT period.[21]

An important observation on the estimated interest rate pass-through is the apparent change in banks' interest rate benchmark for lending from the overnight policy to the SDA rate. It can be recalled in Section 2 that banks' cash holdings and deposits with the BSP have grown significantly since 2008, implying that banks, in the aftermath of the GFC in 2008, have decided to invest in safer and higher-yielding investments.[22] In line with this development, this paper uses the weighted policy rate to determine the interest rate pass-through to market interest rates from 1991 to 2014. The exercise yielded the following results:

- Table 1 shows that using a weighted policy rate, or a weighted average of the overnight RRP rate and SDA rate, a stronger and faster average pass-through can be observed from 1991 to 2014. A closer look at the IT period (2002 to 2014) shows that the average long-run pass-through is stronger but the

[21] The results also show that there is a negative immediate pass-through to five-year and 10-year Treasury bond rates. However, the adjusted R^2 is not significant.

[22] This includes deposits held by banks with the BSP under the Special Deposit Account (SDA) facility. As of end-December 2013, SDA outstanding balance amounted to PHP 1.4 trillion. This amount has declined to PHP 1.1 trillion as of end-September 2014.

average immediate pass-through seems weaker than the longer time series (1991 to 2014).

- By type of market interest rate, savings deposit and bank lending rates appear to have had an incomplete long-run pass-through and slower adjustment even during the IT period, following the cut in the BSP policy rate in 2012.[23]

There are two possible reasons for the apparently weaker immediate monetary pass-through. One is lower inflation expectations. In an environment of stable and constant inflation expectations, responses to policy rate changes are expected to be partial as increases or decreases in policy rates would be viewed as temporary and likely to revert to average or normal levels. The enhanced transparency and accountability associated with the shift to inflation targeting in 2002 have served to increase the BSP's awareness of the importance of the expectations channel in the conduct of monetary policy (Guinigundo (2014)). A comparison of the behaviour of private sector inflation expectations and the BSP's inflation forecast from January 2009 to October 2014 implies some convergence between the two series, suggesting that inflation expectations continue to be well anchored.[24] A recent international survey has identified the Philippines as one of the countries for which transparency has improved the most (Dincer and Eichengreen (2014)).[25]

Based on a few studies, another factor which could account for lower immediate pass-through to long-term bond rates is the perceived strong correlation between long-term bond rates across countries following surges of capital flows.[26] Studies have noted that yields on longer-term domestic bonds have been affected by global monetary factors especially after the GFC. This is seen as emerging market economies' domestic bond markets have grown and foreign participation has risen, domestic yields have become more closely linked to yields in the main financial centres. In such a scenario, monetary policy may have become less effective as raising policy rates does not necessarily increase interest rates at the longer end. Using a vector autoregressive (VAR) model, the channel from movements of the US 10-year bond yields to the Philippine 10-year bond yields has been found to be relevant from 2008 to 2013 compared to the pre-crisis period of 2003 to 2007, following the rise in foreign investments in bond markets (Guinigundo (2014)).

To check whether structural changes in the policy framework could have fundamentally affected the nature of interest rate pass-through, including the impact of GFC, a rolling regression was estimated with a five-year window from 2002 to 2014 using the BSP overnight RRP rate and the weighted policy rate

[23] The overnight policy rate was reduced by 100 basis points in 2012 and was raised by 50 basis points in 2014.

[24] Average coefficient of variation between the private sector and the BSP's monthly inflation forecast dropped from 0.6 in 2009 to 0.1 percentage points in 2012 to 0.04 percentage points from January to October 2014. Such a convergence may reflect the positive response of the private sector to the BSP's communication strategy of announcing its inflation forecast as well as its policy intentions for the medium term.

[25] The other central banks for which the transparency index increased the most include Hungary, Thailand and Turkey.

[26] Ghosh et al (2012) also found that during periods of surging capital inflows, such flows tend to be directed more toward bank loans and debt securities. This relationship is presumably because debt flows are the most responsive to changes in global environment and relative rates of returns.

(Appendix B).[27] The results show that, in general, the immediate and long-run pass-through and speed of adjustment for time deposit rate, 91-day and 364-day T-bill rates and five-year and 10-year T-bond rates became stronger prior to 2007 (or, prior to GFC), remained steady from 2009 to 2011 and strengthened in 2012.

From the supply side, the apparently stronger and faster monetary pass-through seen especially in longer-term T-bill and T-bond rates prior to 2007 and 2012 onwards partly reflected the significant flow of capital to capital markets from advanced economies to the Philippines. From the supply side, the decision of the BSP to cut its policy rate by 100 basis points (25 bps each in January, March, July and October) seems to have enhanced the pass-through from the policy rate to five-and 10-year Treasury bonds. Based on our studies, surges in capital flows tend to depress market interest rates. However, the reduction in the BSP policy rate in 2012 instead worked in the same direction as capital flow surges. Such an impact would then have had a cumulative impact on the longer tenors, due to lags in the transmission of policy, which would have raised the measured transmission to longer tenors.

From the demand side, such a finding mainly underscores the credibility of inflation targeting to anchor inflation expectations and the institutional reforms the Philippines has implemented to broaden the development of the Philippine capital markets and to enhance system integrity and market confidence which contributed to well functioning financial markets. These reforms include the issuance of a broader array of securities to satisfy specific investor preferences and the improvement in the infrastructure of the government securities market.[28]

By contrast, there was a general decline in the immediate pass-through for savings deposit and bank lending rates after 2012. This finding implies that the reduction in policy rate and lower inflation expectations on savings deposit and bank lending rates may have affected the immediate monetary policy pass-through.

As a caveat, this exercise assumes that, aside from policy rate, there are no other variables that would explain the movements of market interest rates. The study takes this as an area for further research.

3.2 The bank lending channel

This paper extends the analysis of monetary policy pass-through as a gauge on how monetary policy actions influence overall bank lending behaviour using additional economic indicators, such as real GDP growth and inflation. Recent empirical studies have distinguished the impact of credit channel on monetary policy through firm's balance sheets and the bank lending channel.[29] Findings from recent studies have found the presence of the risk-taking channel of monetary policy by using monetary policy decisions exogenous to the economy as an identification strategy and

[27] Appendix B shows major interest rates only, such as the 91-day Treasury bill rate, bank lending rate and the five-year Treasury bond rate.

[28] M Tuaño-Amador, E Glindro and R Claveria, "Some perspectives on the monetary policy transmission mechanisms in the Philippines", *Bangko Sentral Review*, 2009.

[29] See Kashyap et al (1993).

loan/borrower-level data to estimate risk differentials.[30] In a separate research paper, Meisenzahl (2014) finds a stronger effect of the balance sheet channel mechanism during normal times, while the bank lending channel gains importance during the crisis.

In the Philippines, the presence of a bank lending channel was confirmed in few recent studies (see Guinigundo (2008), Bayangos (2010) and Aban (2013)). Banks are still the major sources for financing for the private sector, and monetary policy tends to affect loan growth, especially for small banks. Using Aban's (2013) specification, this paper empirically tests the presence of a bank lending channel from the first quarter of 2001 to the third quarter of 2014, using banks' year-on-year growth of loans outstanding (net of reverse repurchase) as the dependent variable and the year-on-year growth of real GDP, year-on-year inflation, overnight RRP rate and an error term as independent variables (Table 2, Appendix A).[31] To check the robustness of the regression equation, this exercise uses the weighted policy rate (combination of the overnight RRP rate and SDA rate) as alternative benchmark rate for pricing loans.

The estimates show that bank lending is a significant channel of monetary policy transmission even with the impact of the GFC. In particular, the results indicate that movements in monetary policy (whether using the overnight RRP rate or the weighted policy rate) are significant and inversely related to loan growth. Together, these results may suggest that the influence of monetary policy on bank credit has become more important amidst changes in the pattern of financial intermediation.

4. Implications for monetary policy

In most studies, financial deepening and greater competition among financial intermediaries typically serve to increase the influence of monetary policy on the economy. The findings of this paper so far indicate that there is indeed a mutual dependence between conducting monetary policy and promoting the development of financial markets. Such a relationship poses some implications with regard to the formulation and conduct of monetary policy.

First, the finding that financial development has, in general, led to stronger interest rate pass-through – in terms of immediate and long-run pass-through – and faster adjustment to the long-run relationship especially during the inflation targeting period indicates that IT should remain at the centre of the monetary policy framework amidst the challenges posed by increasing financial intermediation. In fact, interest rate pass-through is expected to become much stronger in the near future with the current trend towards greater financial integration, particularly in the Asian region. This means that the effectiveness of monetary policy in Asian

[30] See Jimenez et al (2012), Ioannidou et al (2009), and Beck et al (2014).

[31] In the initial estimates, the growth of M2 (savings and time deposits), nominal peso-dollar rate and the gap between actual CAR from the BSP and BIS limits were included as additional factors affecting loan growth. These variables were subsequently removed from the final equation as the coefficients of these variables were statistically insignificant at the 5% and 10% level of significance.

countries is likely to increase in the future, at least in terms of its influence on the cost of funds.

Second, the finding that the immediate pass-through during the IT period has been less complete and slower than the average long-run pass-through implies that inflation targeting has been effective in anchoring inflation expectations to achieve stable inflation, even in periods of uncertainty. The BSP manages short-term interest rates to influence long-term interest rates, thereby managing expectations. At the same time, faced with the implications of the surges in capital inflows, in particular, the wide swings in the peso movements, the increase in domestic liquidity and the heightened risks to financial stability, the BSP's credibility in managing uncertainties has been important. In the past few years, the BSP has responded to inflationary pressures with gradual changes in its policy interest rate as a means of managing inflation expectations, avoiding policy surprises, and signalling the BSP's commitment to its price stability mandate.

Third, the finding that the immediate pass-through has been partial for almost all market rates, especially during the IT period, indicates that a more in-depth examination of the neutral policy interest rate may need to be considered and a longer forecast of relevant indicators for monetary policy beyond the two-year policy horizon may need to be explored. This is necessary because, under the BSP's inflation targeting framework, decisions on interest rates are based on an assessment of the inflation environment over a policy horizon of two years, given inflation and growth prospects. Genberg (2008) argued that financial market developments may have changed both the neutral (equilibrium) policy interest rate and the horizon of relevant forecasts, including inflation.

Fourth, the finding that monetary policy changes directly feed into longer-term Treasury bond rates implies that, as financial markets develop, monetary policy operations will have to be more flexible. This means that, while monetary policy has relatively limited capacity to offset the spillovers that global economic and policy developments can impose on domestic economies, monetary policy should be able to complement structural and macroprudential policies in countering short-term economic fluctuations. With integrated global capital markets, movements in long-term Treasury bond rates can be heavily influenced by cross-border transaction flows around capital movements, trade financing, remittances and price arbitrage, and risk transfer instruments. This implies that central banks operating in floating exchange rate regimes, particularly in smaller countries, are constrained in their ability to run independent monetary policies, as international investor activity has a greater influence over long-term rates (Wheeler (2014)).

Towards this goal of making monetary policy more adaptive and flexible to changing market conditions, the following insights and experiences explain some factors that can help to maintain the central bank's effectiveness in generating financial market responses for the transmission of its monetary policy.

4.1. Role of financial market information

At the BSP, financial market information is used to understand policy expectations as well as the influence and transmission of monetary policy in the financial markets over the short and longer term. Financial market surveillance through the Environment Scanning Exercise (ESE) at the BSP is a synthesis of both in-depth research and dialogue with market participants. Alternative methods include using

the survey data of forecasts by financial market analysts, financial market indicators and surveys of traders conducted ahead of each policy announcement. Such data and information from market participants can be assessed and incorporated into the macroeconomic modelling process.[32]

4.2. Calibration of monetary tools to address the greater role of financial markets in policy transmission

Macroprudential policies should be used to help prevent asset price booms and complement monetary policy. But there is still scope to further determine the interaction of monetary and macroprudential policies, the costs and benefits of macroprudential interventions, and the circumstances where such policy initiatives are likely to be successful. In the case of the Philippines, the BSP resorted to other measures, such as an increase in the reserve requirements and measures to identify bubble formation.

The BSP has rationalised banks' reserve requirements policy since 2008. The reserve requirement ratio was reduced in 2008 following the global credit tightening during the GFC but was raised in 2011 to mitigate the increasing level of domestic liquidity and the upside risks to inflation. To simplify the implementation and increase the effectiveness of reserve requirement as a monetary policy tool, operational adjustments were introduced in February 2012. The adjustments included the unification of the existing statutory reserve requirement and liquidity reserve requirement into a single set of reserve requirement; and the non-remuneration of the unified reserve requirement. In 2014, the BSP announced increases in banks' reserve requirement ratio by 1 percentage point effective April 2014 and another 1 percentage point effective May 2014 to address the continued strong liquidity growth and rapid credit expansion.

4.3 Reliance on prudential measures

Given the high information requirements to identify bubble formation a priori, the BSP relies more on supervisory and regulatory measures to manage these potential risks. In particular, the BSP has issued several regulatory reforms to further strengthen risk management practices in the banking system and enhance capital buffers against possible unforeseen shocks. These measures include: (a) approval of enhanced regulation on credit risk management of banks and quasi-banks; (b) approval of guidelines for determining so-called "D-SIBs" or banks which are deemed systemically important within the domestic banking industry; (c) increases in the minimum capital requirements for all bank categories, on top of the capital requirement under Basel III; and (d) approval of the amendments to the regulations

[32] The BSP uses the Philippine Financial Stress Index (PFSI) to measure the degree of financial stress in the financial system, the Asset Price Index to measure the development of asset price bubbles, the Bank Distress Index to evaluate the possible occurrence of a banking crisis, network analysis to identify major triggers and channels of contagion by measuring financial interconnectedness of banks and corporates, stress testing to measure vulnerability of the banking system's capital adequacy ratio to changes in credit, market and liquidity risk, and an Early Warning System to measure the probability of a currency crisis using indicators from the external, monetary, financial, real, fiscal and global economy.

governing the derivatives activities of banks to allow thrift banks with the authority to issue foreign letters of credit and pay/accept/negotiate import/export drafts/bills of exchange, to act as dealers of deliverable foreign exchange forwards, if they meet certain criteria.

As mentioned in the previous section, a pre-emptive macroprudential measure has been introduced to contain possible formation of asset price bubbles. In May 2014, the BSP approved the adoption of a prudential REST limit on the aggregate real estate exposures of universal/commercial banks and thrift banks, on a solo and consolidated basis. The REST limit combines a macroprudential overlay of a severe stress test scenario with the principle of loss absorbency through minimum capital ratio thresholds, and a heightened supervisory response.

Fifth, the observation that non-financial corporations may have increased their external borrowing implies that the BSP may need to strengthen the measurement of the magnitude and dimension, as well as monitoring of the source and destination, of capital flows data and the development of a formal vulnerability and risk framework to cope with the potential financial disruptions that could stem from significant and volatile debt flows. These measures are relevant in the design of appropriate monetary and macroprudential policy. In particular, a comprehensive analysis of the channels through which a foreign affiliate of a non-financial corporation could transfer funds from its home country to the Philippines, after having obtained funds abroad, may be important. It may be noted that in some studies, these debt flows are largely driven by financial operations rather than real sector activities, and hence could give rise to financial stability concerns (Avdjiev et al (2014)).

5. Summary of findings and insights

This study examines the impact of increasing financial intermediation in the Philippines on monetary policy transmission. Financial developments in the Philippines in recent years have reflected the BSP's efforts to improve financial depth, breadth and access amidst surges in capital flows, especially in the aftermath of the global financial crisis. This paper maintains that the formulation of monetary policy and macroprudential policy will have to consider more carefully the linkage with financial system and other financial shocks that come from within and outside the country. The effectiveness of monetary policy in influencing economic activity and inflation becomes crucial as it ultimately depends on the various financial developments and shocks that can potentially change the way monetary policy is transmitted through the financial system.

By estimating the nature of monetary policy pass-through and influence of monetary policy changes on outstanding bank credit, this study finds that, in general, the monetary policy transmission has been stronger – in terms of both immediate and long-run pass-through – and faster – in terms of the speed of adjustment to long-run relationships – especially during the inflation targeting period. These findings imply that, in general, monetary policy has become efficient in influencing the cost of funds amidst streamlining of the banks and greater banking convenience.

Meanwhile, the results of our rolling regression further reinforce the monetary policy pass-through estimates. Broadly, the results show that pass-through and speed of adjustment for longer-term time deposit rates, Treasury bill rates and Treasury bond rates have become stronger prior to the GFC in 2008 and in 2012 following surges in capital flows. However, there was a general decline in the immediate pass-through for savings deposits and bank lending rates starting in 2012. The latter finding seems to imply that the impact of the cut in the BSP policy rate by 100 basis points in 2012 and lower inflation expectations on savings and bank lending rates may have affected the immediate monetary policy pass-through. When inflation and growth are considered, policy rate changes continue to be a significant driver of overall bank credit.

Moreover, the paper yields significant insights. There appears to be some disconnect between monetary policy changes and the bank lending rate during the IT period, and banks seem to have shifted to the SDA rate as an alternative benchmark for pricing loans. Another important finding is that monetary policy changes directly feed into longer-term Treasury bond rates. To the extent that Treasury bonds are largely influenced by global factors, the conduct of monetary policy becomes more challenging. This is highlighted by the fact that, based on recent data, non-financial corporations may have increased their external borrowing.

All in all, the changing role of financial intermediaries in monetary transmission underscores the close interaction between monetary and financial stability. The impact of such changes in financial intermediation on monetary policy can be seen as relevant in the future. To the extent that that the bulk of assets has found its way back to banks' balance sheets, the role of banks in the transmission of monetary impulses to the real sector has to be continuously monitored. Moreover, financial market developments may have changed both the equilibrium policy interest rate and the horizon of relevant forecasts, including inflation. These imply that the strategic and operational aspects of monetary policy will become more challenging in the future.

Appendix A

Interest rate pass-through

Table 1

		Overnight RRP Rate (Policy Rate)					
		1986–2014			2002–2014 (IT period)		
Variable	Description	LRPT	IPT	Speed	LRPT	IPT	Speed
SD	Savings deposit rate	0.39	0.03	–0.08	0.76	0.20	-0.15
TD	Time deposit rate	0.64	0.03	–0.07	1.44	0.20	-0.05
BL	Bank lending rate	0.60	0.04	–0.06	0.96	–0.13	-0.11
91D	91–day T–bill rate	0.77	0.07	–0.07	1.16	0.11	-0.07
364D	364–day T–bill rate	0.78	0.04	–0.02	1.51	0.05	-0.06
5YTB	5–year T–bond rate (Bloomberg, secondary)	1.41	0.56	–0.04	1.60	–0.004	-0.02
10YTB	10–year T–bond rate (Bloomberg, secondary)	1.42	0.44	–0.02	1.64	–0.01	-0.02
Average		**0.86**	**0.17**	**–0.05**	**1.30**	**0.06**	**–0.06**
		Weighted Policy Rate					
		1991–2014			2002–2014 (IT period)		
Variable	Description	LRPT	IPT	Speed	LRPT	IPT	Speed
SD	Savings deposit rate	0.56	0.07	–0.11	0.66	0.24	-0.15
TD	Time deposit rate	0.71	0.09	–0.11	1.23	0.10	-0.06
BL	Bank lending rate	0.67	0.05	–0.10	0.85	–0.04	-0.14
91D	91–day T–bill rate	0.84	0.11	–0.08	1.03	0.29	-0.08
364D	364–day T–bill rate	0.89	0.08	–0.05	1.33	0.23	-0.06
5YTB	5–year T–bond rate (Bloomberg, secondary)	1.34	0.56	–0.04	1.40	0.13	-0.02
10YTB	10–year T–bond rate (Bloomberg, secondary)	1.36	0.42	–0.03	1.45	–0.02	-0.02
Average		**0.91**	**0.20**	**–0.07**	**1.14**	**0.15**	**–0.08**

Note: LRPT = Long-run pass-through; IPT=Immediate pass-through; Speed = Speed of adjustment to long-run impact (taken as absolute). Source of data: Author's estimates.

Bank lending channel

Table 2

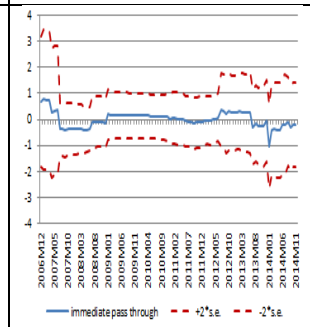
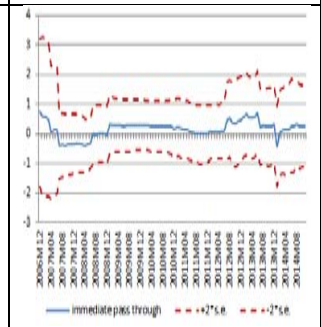
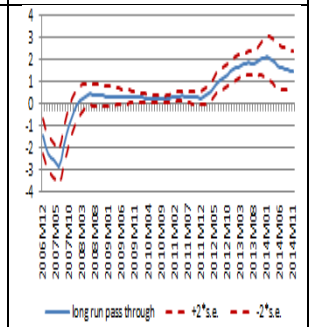
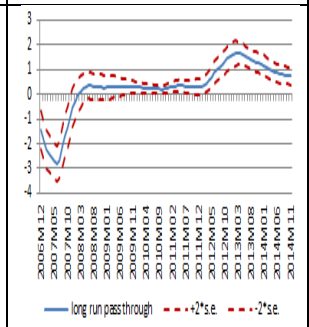
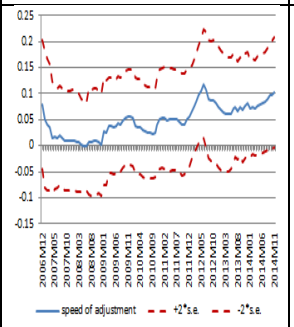
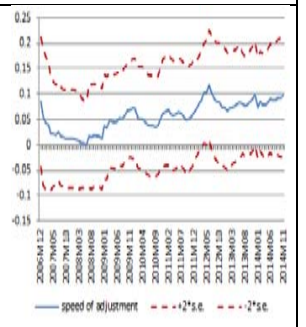
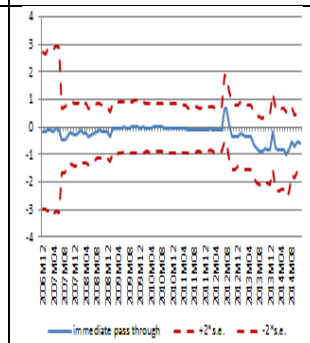
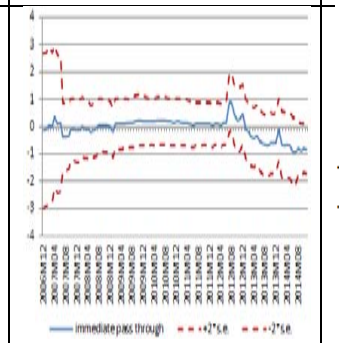
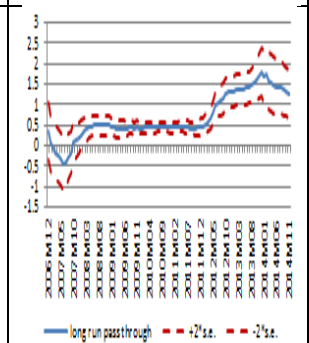
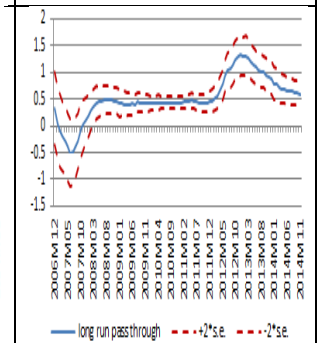
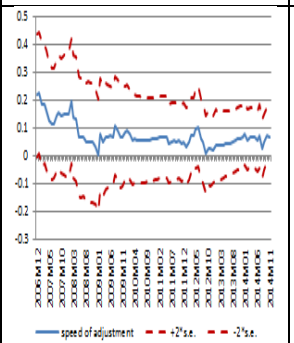
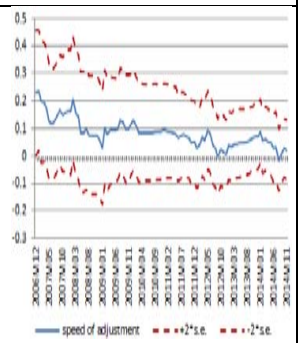
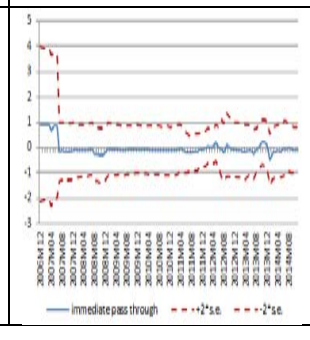
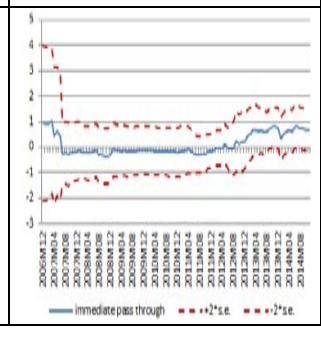
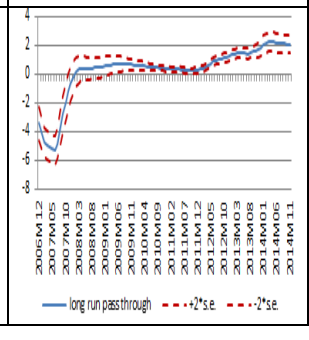
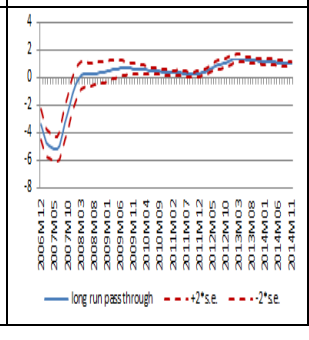
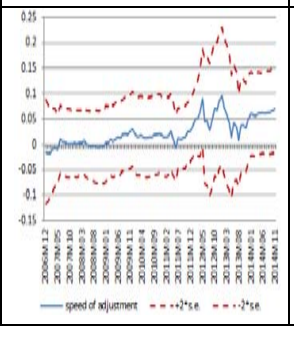
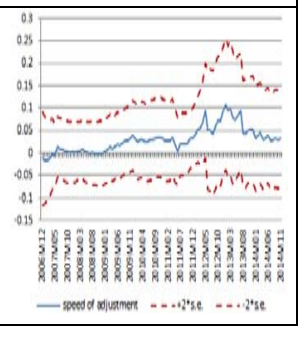
Dependent variable: bank lending (Net of RRP) growth rate	Policy rate: overnight RRP rate	Policy rate: weighted policy rate
Constant	0.06 (0.01)***	0.05 (0.01)***
Policy rate	–0.01 (0.00)***	–0.01 (0.00)***
GDP growth	0.21 (0.04)***	0.21 (0.04)***
Inflation	1.10 (0.45)***	1.14 (0.46)***
AR(1)	–0.17 (0.14)	–0.15 (0.14)
Adjusted R^2	0.54	0.53
Durbin-Watson	1.99	1.98
F-statistic	16.20	15.62

The asterisks represent statistical significance (*) at 10%; (**) at 5%; and (***) at 1%. Figures in parentheses are standard errors.

Source of data: Author's estimates.

Appendix B:

Figure 1: Rolling regression with five-year window using data from January 2002 to October 2014 (Selected variables only)

Interest Rates	Immediate pass-through		Long-run pass-through		Speed of Adjustment	
	RRP Overnight	Weighted Policy Rate	RRP Overnight	Weighted Policy Rate	RRP Overnight	Weighted Policy Rate
91-day T-bill rate						
Bank lending rate						
Five-Year Treasury Bond Rate (Bloomberg secondary)						

Source of data: Author's estimates.

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The evolution of banking sectors in Central and Eastern Europe – the case of Poland

Piotr Wiesiołek and Dobiesław Tymoczko[1]

Abstract

Changes in the Polish financial system were so rapid that some stages of financial development were skipped. At the beginning of the transformation process, banks' main balance sheet items were short-term loans and deposits. At the end of the 1990s, foreign investors started to rapidly increase their share of banking sector assets. And with the inflow of foreign capital came the transfer of technologies, know-how, and also business models from parent companies. These models were based on granting housing loans. As a consequence, it is households rather than enterprises that are now the most important customers for banks in the Central and Eastern European (CEE) countries. In fact, the share of household loans (mainly mortgage loans) in banking sector assets in the CEE countries is the highest among all EU countries. Banks financed their activities through a growing deposit base, later supplemented by loans from parent companies.

The future of the Polish banking sector will depend on the evolution of the global financial system. Banks will probably start to rely more on traditional sources of financing and their portfolio of liquid assets will be greater than before the outbreak of the global financial crisis. As for the asset side of the balance sheet, housing loans are likely to continue to occupy the dominant position. The overwhelming demand for housing (in Poland, as in other CEE countries, the vast majority of residential property is owned, rather than rented), coupled with very low average income relative to the price per square metre, make it impossible for banks to do without long-term financing. Covered bonds are a possible source of such financing.

It would be desirable to design and implement instruments which could change the current structure of banking sector assets (lower the share of household loans). The existing structure is clearly not conducive to the economy's international competitiveness. The question remains, however, as to how banks might be induced to steer their credit flows away from households and towards manufacturers.

Keywords: financial system development, banking sector, bank lending, CEE countries

JEL classification: F65, G21, N20, O16

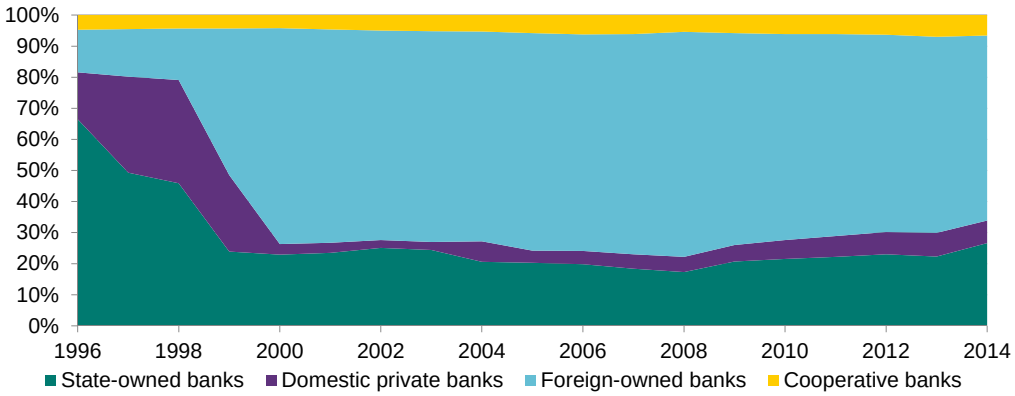
[1] The authors would like to thank Michał Konopczak for his invaluable comments, and Sylwester Kozak and Sławomir Zajączkowski for their research assistance.

Prediction is very difficult, especially about the future. So before we try to do this, we have to take a look at the past. We strongly believe *historia est magistra vitae*, so we will start by presenting the evolution of the Polish banking sector over the last 20 years.

Changes in banking

The story of the Polish financial system is not long, but it is quite dynamic. During the economic transformation many things had to change. These changes were rapid and some stages of financial development were skipped. At the start of this process, the Polish banking sector resembled the old-fashioned banks of the 19th century. The main balance sheet items were short-term loans and deposits. Around the mid-1990s, revolutionary changes in the ownership structure were observed. Along with the inflow of foreign capital came the transfer of technologies, know-how, and also business models from parent companies. The IT revolution, for instance, allowed the Polish banking sector to practically skip the use of cheques. In the 21st century the ownership structure was already more or less fixed and a fairly uniform model of banking was established.

Polish banking sector assets – ownership structure — Graph 1



Source: Narodowy Bank Polski (NBP).

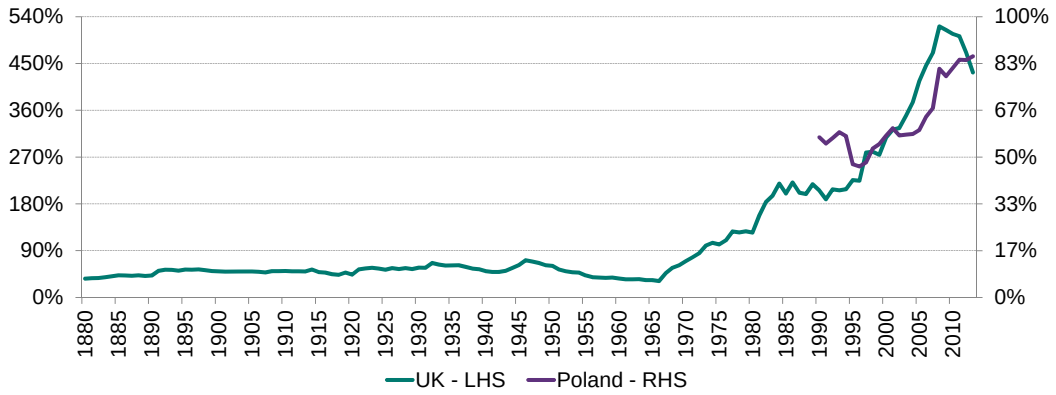
What was this model? Both research and practice confirm that, in the developed markets, the introduction of credit-scoring gradually pushed banks to grant loans to households rather than to enterprises.[2] This process was commonplace across Europe, but in the CEE countries the related adjustment was incredibly condensed. As a result, the structural changes that took dozens of years in Western Europe emerged in the CEE region very suddenly and were spread over just a few years.

The "invention" and rapid development of housing loans was just one of several important changes that were observed in the developed economies with respect to

[2] Building assets, building credit: creating wealth in low-income communities, N Retsinas and E Belsky (eds), Brookings Institution Press, Washington DC, 2005.

the structure of banks' balance sheets. The growing share of proprietary trading was another. These new business lines were often financed by an increase in short-term market liabilities (wholesale market), frequently from international sources. The above-mentioned changes dramatically affected the ratio of banking sector assets to GDP. Assets were increasing in line with leverage, especially in investment banks.[3] For instance in the UK this process started as early as the 1970s and lasted for more than 30 years. Interestingly enough, the same process was observed in some countries (eg Germany, the United States) before the Great Depression. The growth of leverage in the US banking sector was also similar.[4]

Banking sector assets to GDP in the United Kingdom and in Poland — Graph 2



Sources: UK (Assets) – Bank of England (Monetary financial institutions' balance sheets, income and expenditure); D Sheppard, *The Growth and Role of UK Financial Institutions 1880-1962*, Methuen, 1971; UK (GDP) – Office for National Statistics; Reuters; Bank of England (B Mitchell, *British Historical Statistics*, Cambridge University Press, 1988, J Sefton and M Weale, *Reconciliation of National Income and Expenditure: balanced estimates of national income for the United Kingdom, 1920–1990*, Cambridge University Press, 1995; Poland: NBP, GUS.

It is worth mentioning that the growth of banking sector assets shows only part of the financial intermediation implosion. Due to securitisation, some assets were moved to other financial institutions.[5]

The ratio of banking sector assets to GDP was also picking up in CEE countries, but for slightly different reasons.

The model of banking which involved promoting loans for households (mostly housing loans) on a large scale was imported from headquarters before a culture of cooperation with enterprises had sufficient time to emerge. As a consequence, households rather than enterprises have become the most important clients of banks in the CEE countries. In fact, the share of household loans (mainly mortgage loans) in the assets of the banking sector in the CEE countries is the highest among

[3] T Adrian and H S Shin, "Money, liquidity, and monetary policy", *American Economic Review*, no 99(2), 1999, pp 600–5.

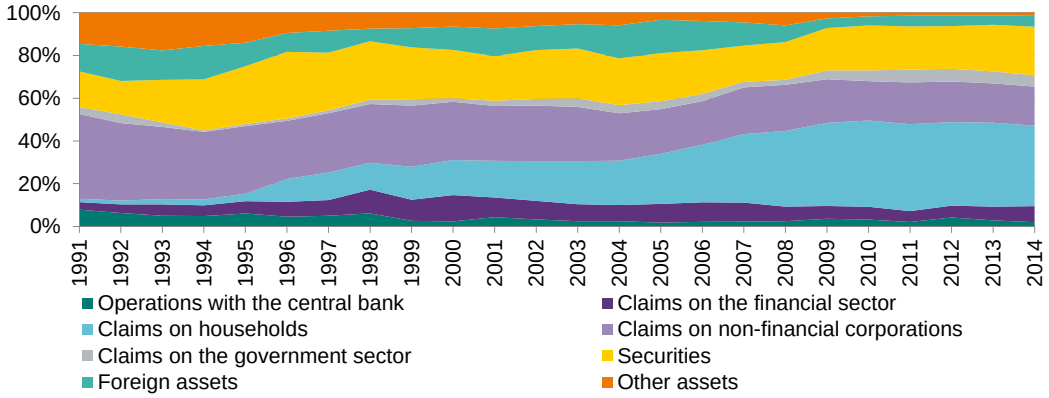
[4] C Borio, H James and H S Shin, "The international monetary and financial system: a capital account historical perspective", *BIS Working Papers*, no 457, August 2014.

[5] For instance, in the United States, the assets of non-banking financial institutions providing, among others, financing for banks were greater than the assets of banks themselves. See: T Adrian and H S Shin, "The changing nature of financial intermediation and the financial crisis of 2007–09", *Federal Reserve Bank of New York Staff Reports*, no 439, March 2010.

all EU countries. A similar picture emerges when comparing the ratio of household loans to loans for enterprises.

Structure of assets in the Polish banking sector

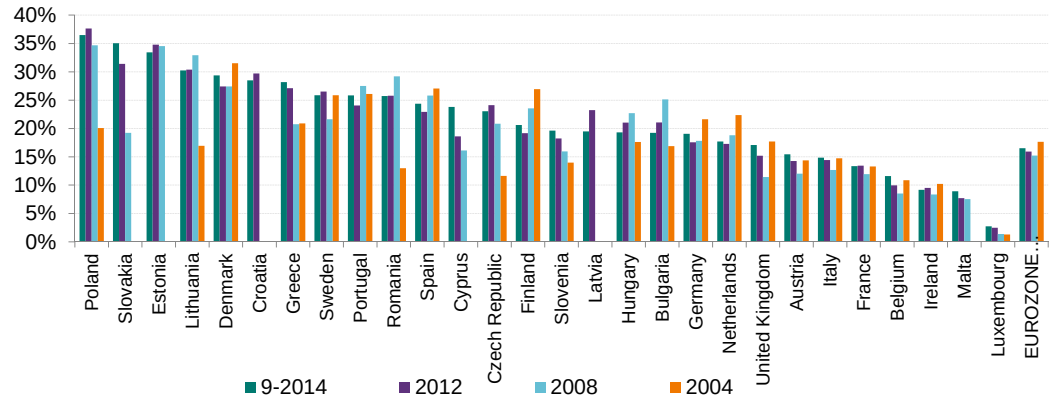
Graph 3



Source: NBP.

Share of household loans in banking assets

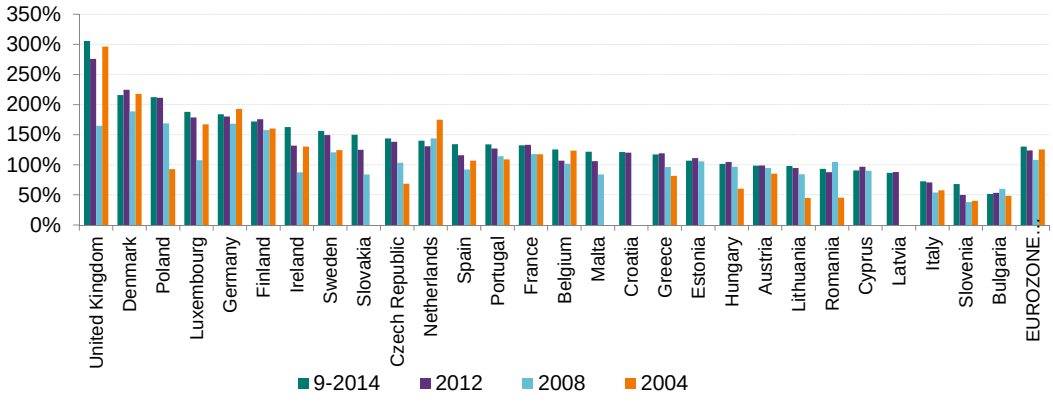
Graph 4



Source: ECB (Monetary, Financial Institutions and Markets Statistics – Balance Sheet Items Statistics).

Ratio of household loans to loans for enterprises

Graph 5

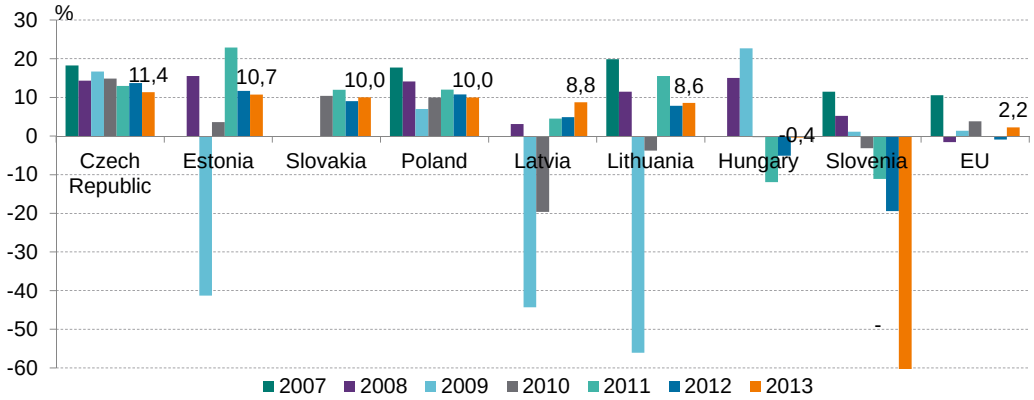


Source: ECB (Monetary, Financial Institutions and Markets Statistics – Balance Sheet Items Statistics).

Proprietary trading has not developed in the banking sectors of CEE countries. There are several reasons for this:

1. The traditional banking activities performed by banks in the region were highly profitable, so their parent companies did not insist on increasing profits by encouraging branches and subsidiaries to engage in excessive trading;
2. Parent companies wanted to centralise risk management and the most profitable trading activities in their headquarters; they did not want to share the sweets; and
3. Banks from the region were not prepared to speculate in the global financial markets and the potential for investing in regional markets was limited owing to the paucity of suitable instruments and relatively low liquidity of most market segments.

ROE in banking sectors of selected CEE countries — Graph 6



Note: Weighted average for the EU; data for Estonia (2007), Slovakia (2007–09), Latvia (2007) and Hungary (2007) were not available.

Source: Own calculations based on ECB consolidated data.

Contrary to what was observed in the developed banking sectors, banks in CEE countries did not rely on financing the increase of assets in different wholesale markets. They did not have to, because they were able to finance their activities through a growing deposit base, later supplemented by loans from parent companies. Subsequently, a huge inflow of capital to the region was observed. Financing credit expansion in the CEE countries from abroad was similar to the financing of German banks before the Great Depression.[6] Using the methodology proposed by J-H Hahm et al, both interbank loans and credit lines from headquarters might be classified as non-core liabilities. The growing role of non-core liabilities is a good measure of procyclicality of the banking sector.[7] This was also in line with the financial instability hypothesis of H Minsky.[8]

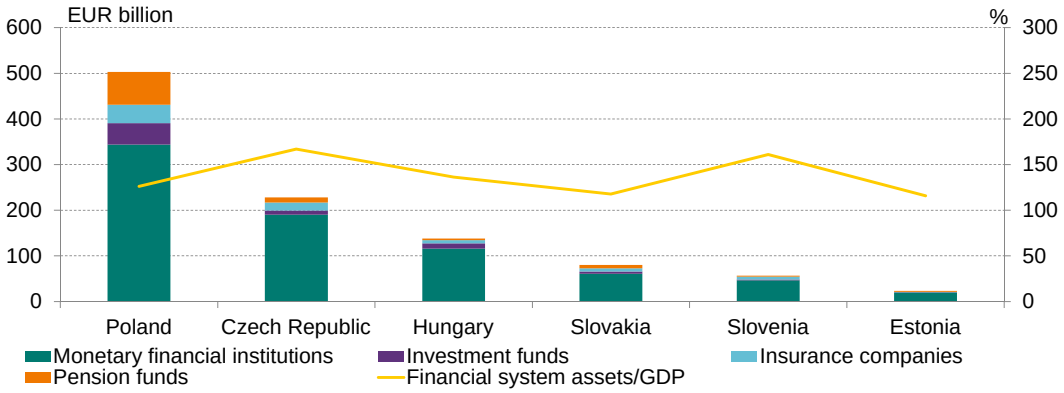
[6] C Borio, H James and H S Shin, op cit.

[7] J-H Hahm, F Mishkin, H S Shin and K Shin, "Macroprudential policies in open emerging economies", *NBER Working Paper*, no 17780, 2012.

[8] H Minsky, "The financial instability hypothesis", Levy Economics Institute, *Working Paper*, no 74, May 1992, pp 6–7, www.levyinstitute.org/pubs/wp74.pdf.

Before the global financial crisis, economists broadly agreed that the structure of a financial system was irrelevant for economic growth and that there was no single optimal structure suiting the needs of all countries.[9] Still, according to the available literature, market-oriented financial systems tend to behave better in unusual conditions.[10] This was confirmed during the global financial crisis: the economic slowdown in countries with market-oriented financial systems was shorter than in countries with bank-oriented financial systems.[11] Even though the Polish financial system is bank-oriented (banking loans are the main external source of financing for enterprises), it is the least bank-oriented in the region.

The structure of financial sector assets in selected CEE countries — Graph 7



Source: Own calculations based on ECB, Eurostat, GUS and NBP data, as well as data provided by national central banks.

Financial system development and economic growth

Before the global financial crisis there was broad agreement in the mainstream of the literature about a positive relationship between financial system development and economic growth.[12] This relationship was confirmed in empirical studies.[13] After

9 R Merton and Z Bodie, "The design of financial systems: towards a synthesis of function and structure", *NBER Working Paper*, no 10620, 2004; R Rajan and L Zingales, "Financial dependence and growth", *American Economic Review*, vol 88, 1998, pp 559–86.

10 F Allen and D Gale, "Diversity of opinion and financing of new technologies", *Journal of Financial Intermediation*, vol 8, 1999, pp 68–89.

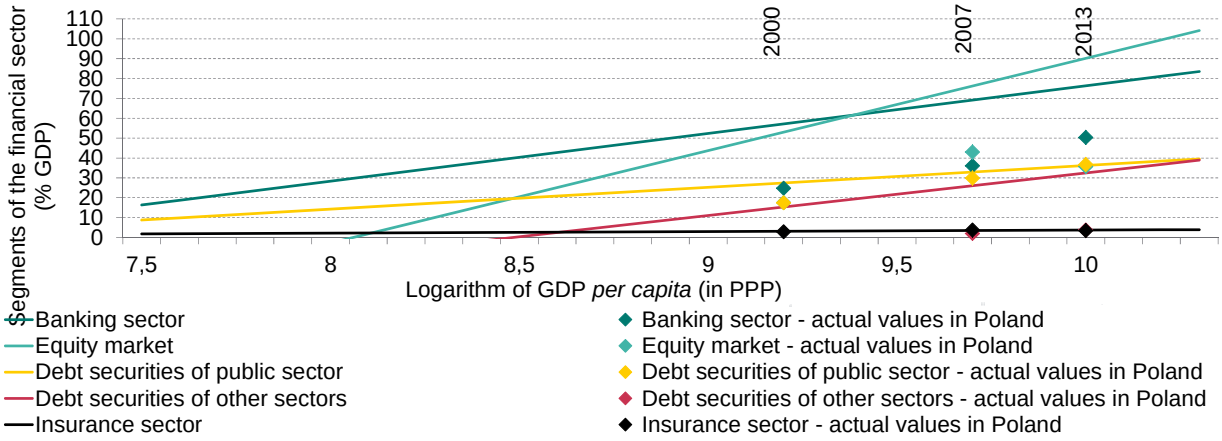
11 A Demirgüç-Kunt, E Feyen and R Levine, "The evolving importance of banks and securities markets", *Policy Research Working Paper*, no 5805, World Bank, September 2011.

12 M Miller, "Financial markets and economic growth", *Journal of Applied Corporate Finance*, vol 11, 1998, pp 8–14; K Neusser and M Kugler, "Manufacturing growth and financial development: Evidence from OECD countries", *Review of Economics and Statistics*, vol 80, 1998, pp 636–46; P Rousseau and P Wachtel, "Financial intermediation and economic performance: historical evidence from five industrial countries", *Journal of Money, Credit and Banking*, vol 30, 1998, pp 657–78; P Rousseau and R Sylla, "Emerging financial markets and early U.S. growth", *NBER Working Paper*, no 7448, 1999.

13 R King and R Levine, "Finance and growth: Schumpeter might be right", *Quarterly Journal of Economics*, vol 108, 1993, pp 717–38; R Levine and S Zervos, "Stock markets, banks, and economic

the outbreak of the crisis, this axiom was undermined, and many papers questioned the positive correlation between financial system development and GDP growth.[14]

The development of the financial system depending on GDP per capita — Graph 8



Note: The values of the regression function were estimated for panel data, which included the information on the financial systems of 209 countries in 1991–2012. The following development measures of the individual sectors of the financial system were used:

- banking sector: loans to non-public sector to GDP (for Poland – banking sector loans and advances to the non-financial sector in domestic and foreign currency),

- equity market: equity market capitalisation to GDP (domestic enterprises listed on the Main Market of GPW),

- insurance market: non-life and life insurance premium to GDP,

- public sector debt securities: outstanding value of general government debt securities to GDP,

- debt securities of other sectors: outstanding value of debt securities of financial institutions and enterprises to GDP.

More in: T Beck and A Demirgüç-Kunt, "Financial institutions and markets across countries and over time: data and analysis", *World Bank Policy Research Working Paper*, no 4943, May 2009.

The regression function was estimated using the Fixed Effects GLS method in relation to the banking sector and equity market, and the Random Effects GLS method in relation to debt securities of the public sector, other sectors and the insurance sector. The model was selected on the basis of the Hausman test (compare M Verbeek, *A guide to modern econometrics*, John Wiley & Sons, 2004, pp 351–52).

Source: "Rozwój systemu finansowego w Polsce w 2013 r.", P Sobolewski and D Tymoczko (eds), Narodowy Bank Polski, 2014.

In this context, the Polish banking sector's potential to support economic growth could also be examined, taking into account its size. Based on the assessment of the ratio of banking assets to GDP, it might be concluded that the critical thresholds pointed out in the literature still lay ahead.[15] A few years ago the Polish financial system was said to be underdeveloped as compared with the euro

growth", *American Economic Review*, vol 88, 1998, pp 537–58; R Levine, N Loayza and T Beck, "Financial intermediation and growth: causality and causes", *Journal of Monetary Economics*, vol 46, 2000, pp 31–77; R Rajan and L Zingales, "Financial dependence and growth", *NBER Working Paper*, no 5758, 1996.

[14] J Arcand, E Berkes and U Panizza, "Too much finance?", *IMF Working Paper*, no 12/161, 2012; *Is Europe overbanked?*, Report of the Advisory Scientific Committee, ESRB, no 4, June 2014.

[15] The above mentioned thresholds are elaborated upon in *Is Europe overbanked?*, Report of the Advisory Scientific Committee, ESRB, no 4, June 2014; S Law and N Singh, "Does too much finance harm economic growth?", *Journal of Banking & Finance*, vol 41, April 2014: S Cechetti and E Kharroubi, "Reassessing the impact of finance on growth", *BIS Working Papers*, no 381, July 2012. The calculation for Poland is based on "Rozwój systemu finansowego w Polsce w 2013 r.", P Sobolewski and D Tymoczko (eds), Narodowy Bank Polski, 2014.

zone financial system. Nowadays it has become obvious that excessive growth of the financial sector might be harmful for the economy and for economic growth.

Even though the Polish financial system was relatively small, fast-growing assets financed from abroad did cause imbalances, an example of what Borio and Disyatat have called "excess financial elasticity".[16]

The future of banking in Poland

The evolution of the Polish banking sector will depend on the evolution of the global financial system. Some changes are already observable. In the developed markets, banks have started to rely more on traditional sources of financing and their portfolio of liquid assets is bigger than before the outbreak of the crisis. The same trend is likely to emerge in Poland, as it is difficult to imagine that loans will continue to be financed using credit lines extended by parent companies, even though Polish banks – compared with those of other CEE countries – did not need to deleverage.

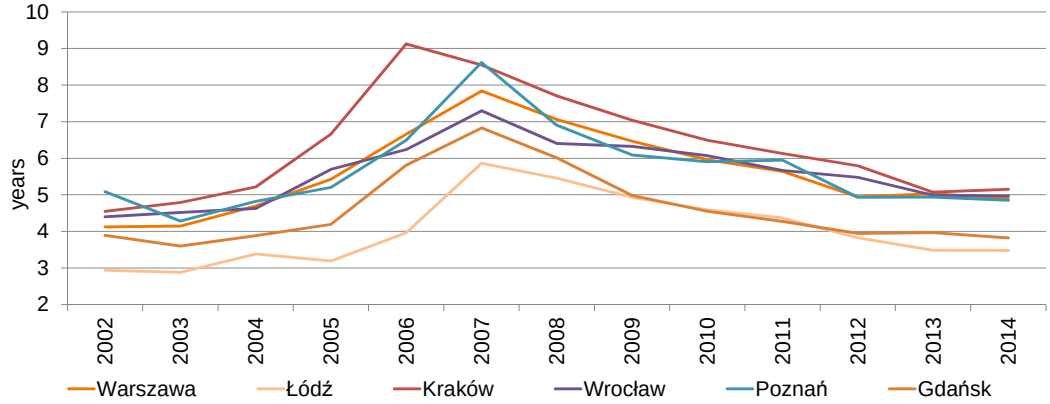
So what could be the source of financing for banks? Typically – deposits. However, banks are well aware of the limitations of this category of funding: deposits usually grow in line with income, and it is reasonable to assume that income grows in line with GDP. This means that it is impossible to dramatically increase the ratio of banking assets to GDP using only deposits as a source of funding. This is why banks invented securitisation, wholesale funding, rehypothecation and so on. But all these sources will be rather limited in the coming years, especially in CEE countries, where there is no tradition of financial engineering. Hence, whether they like it or not, banks operating in Poland will have to rely on traditional sources of funding, ie deposits.

As for the asset side of the balance sheet, housing loans are likely to retain their dominant position. The overwhelming demand for houses (not only in Poland, where the vast majority of real estate is owned, rather than rented), coupled with very low average income relative to the price per square metre, make it impossible to do without long-term financing from banks. The economic conditions behind the prospects for the evolution of both assets and liabilities of the Polish banking sector seem to form a vicious circle – demand for credit without the possibility of meeting it.

There is, however, one possible source of financing that does not require complicated financial engineering: covered bonds. In Poland only specialised institutions – mortgage banks (hypo banks) – are eligible to issue covered bonds. The legislation on hypo banks and covered bonds is now being amended to facilitate the issuance of those securities. Together with changes in European regulations (eg regarding NSFR), banks will have to rely to a greater extent on long-term financing, and covered bonds might be one solution to the problem. This prospective avenue of development has already been remarked, among others, by the largest Polish bank, which decided to establish a hypo bank.

[16] C Borio and P Disyatat, "Global imbalances and the financial crisis: Link or no link?", *BIS Working Papers*, no 346, May 2011.

Price to income in selected Polish cities Graph 9



Note: The price-to-income ratio is calculated as the price of an average dwelling (average usable area in sq metres multiplied by the average annual price – 50% primary housing market and 50% existing stock market) divided by the annual income of average household in the local market.

Source: NBP.

Even with a sufficient supply of securities such as covered bonds, the demand for them is crucial if the market is to develop. In Poland, pension funds could be interested in acquiring covered bonds. As they were obliged to remove Treasury securities from their assets, which automatically made their portfolios riskier, they might want to stabilise the return on their investment using assets with a relatively low volatility/risk. Covered bonds meet this condition. Voluntary pension funds, which need to emerge and develop to increase the replacement rate for future pensioners, could be another source of demand for covered bonds. These sources of demand might be supplemented by foreign investors.

Macroprudential policy and its role in influencing the development of the banking sector

There is an abundant literature on macroprudential policy instruments and rules for organising them.[17] Macroprudential policy can be divided into structural and cyclical policy. At present, there is no need to use macroprudential tools to limit the cyclical component of systemic risk in Poland. However, as mentioned before, the share of household loans in banking assets in CEE is one of the highest in the EU. Such a structure for banking assets is evidently not conducive to the economy's international competitiveness. For this reason, it would be desirable to design and implement instruments that could change this structure. On the one hand, the growth of mortgage loans at least in Poland is probably inevitable (as we pointed out earlier on in the text) but, on the other hand, banks should support GDP growth. This could be done not by investing in cement, but by financing innovative

[17] IMF, *Macroprudential Policy: An Organizing Framework*, March 2011; N Arregui, J Benes, I Krznar, S Mitra and A Santos, "Evaluating the net benefits of macroprudential policy: A cookbook", IMF, July 2013.

enterprises. Of course there remains the question of how to convince banks to steer their credit flows from households to manufacturers.

Unfortunately there seems to be no one good answer to this question. The history of using microprudential instruments for macroprudential purposes is very short. It is even not obvious whether macroprudential policy should indeed be used to influence the structure of banking sector assets (for this would not be a typical, conventional structural macroprudential policy). There is no doubt that one of the objectives of macroprudential policy is to limit systemic risk stemming from one kind of credit (mortgage loans are widely used as an example), but what about supporting the growth of another kind of credit? We believe it is the other side of the coin. And it seems to be in line with the recommendation of"putting in place adequate anchors in individual jurisdictions".[18]

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[18] C Borio, "The international monetary and financial system: its Achilles heel and what to do about it", *BIS Working Papers*, no 456, September 2014.

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Changing patterns of financial intermediation: implications for central bank policy

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Abstract

The most prominent changes in Russian financial intermediation in recent years were related to the growing role of domestic financial markets. These developments have presumably increased the efficiency of the Bank of Russia's interest rate policy and the efficiency of monetary transmission in general. The relative importance of banks has been growing steadily. Although the debt securities market has also developed, banks still play the dominant role. Banks effectively respond to the provision of systemic liquidity by the Bank of Russia, as evidenced by the stable share of highly liquid assets in their total assets. The Russian banking sector shows a high level of stability, which is additionally confirmed by periodic stress tests.

Keywords: central bank policy, financial intermediation, financial markets

JEL classification codes: E58, O16

[1] First Deputy Governor of the Bank of Russia.

A. The role of banks

1. How did the relative importance of banks and market-based financing change in EMEs over the past decade?

Over the past decade the relative importance of banks has been growing steadily. Although the debt securities market has also evolved (eg in 2014, the domestic corporate bond market was characterised by high issuance from Russian companies), banks still play the dominant role.

2. How has the composition of assets and liabilities of domestic banks changed? What does this imply for the liquidity, maturity and credit risks banks face as well as their credit extension decisions (pricing etc)? In particular, what is the structure of their lending (eg (i) households vs corporates; (ii) fixed vs variable rate; (iii) collateral practices; (iv) domestic vs foreign currency) and how has it changed? How has the degree of competition evolved? And what has been the role of government-owned banks/financial intermediaries?

The composition of assets and liabilities is presented in Tables A1–A5 (sent to the BIS on 8 December 2014).

As of 1 January 2014, state-controlled banks accounted for the majority (51.4%) of banking sector total assets. The share of large private banks amounted to 28.8%. The share of foreign-controlled banks in the banking sector's total assets was 15.3% (among them, the share in banking sector total assets of banks in which decisions taken are influenced by Russian residents was 5,9%). .

The funding base of credit institutions expanded mainly due to funds in customer accounts (household deposits are an important source of funding). Funds from the Bank of Russia became an important source for expanding the funding base in the reporting period: their value increased by 70% in 2013, primarily due to their considerable growth (90%) in the second half of the year, while their share of banking sector liabilities grew from 5.4% to 7.7%.

The banks effectively adapt to the provision of systemic liquidity by the Bank of Russia, as evidenced by the stable share of highly liquid assets in banks' total assets. The Russian banking sector shows a high level of stability, which is confirmed by periodic stress tests.

In 2013, banks continued to build up their loan portfolios, but the dynamics and structure of loans saw a number of changes. The total value of loans to non-financial organisations and households increased as their share of banking sector assets grew by 0.5 percentage points to 56.5%. The value of loans and other funds provided by banks to non-financial organisations rose by 12.7% over the reporting period (the same growth rate as in 2012). The growth rate of consumer loans remained high last year. Their value increased by 28.7%. For most of 2013, the interbank loan market showed a higher growth rate than in 2012, mainly due to more intensive business with non-residents. The value of interbank loan claims increased by 21.3%.

The structure of the corporate lending market remained unchanged in 2013: state-controlled banks accounted for more than 50% of the market.

Consumer lending is one of the most competitive segments of the banking services market; state-controlled and private banks maintain a virtually equal presence.

In 2013, banking concentration indicators continued to increase. The share of the top 200 credit institutions in terms of assets in banking sector total assets barely rose in the reporting year, amounting to 94.9% at the end of the year as against 94.3% in 2012; this indicator has grown by 1.1 percentage points over the last five years (2009 to 2013). In 2013, the share of the five largest banks in terms of assets expanded from 50.3% to 52.7% and over a five-year period, their share has increased by 4.8 percentage points.

Quantitative estimates of concentration that are commonly used internationally, particularly the Herfindahl-Hirschman Index (HHI) dynamics, show that in terms of banking assets, the concentration level in 2013 remained moderate.

The average of the most liquid assets as a share of the banking sector's total average assets increased from 7.4% in 2012 to 7.6% in 2013. Funds held in bank deposit and correspondent accounts with the Bank of Russia amounted for more than 30% of the most liquid assets. Traditionally, at the beginning of the year the amount of these funds grows substantially. The share of assets maturing in excess of one year in total assets assigned to Quality Category I increased from 28.5% to 39.5% in 2013. The share of liabilities maturing in excess of one year in total liabilities also grew, from 23.0% to 24.7%.

The credit risk exposure of Russian banks was determined to a significant extent by the quality of loans issued to non-financial organisations. These accounted for 55.7% of total loans issued as of 1 January 2014. Overdue loans to borrowers from this group increased by 1.0% in the reporting period, while lending rose by 12.7%. Overdue loans to non-financial organisations decreased from 4.6% to 4.2% during the reporting year. For rouble-denominated loans, this figure fell from 5.3% as of 1 January 2013 to 4.9% as of 1 January 2014, and for loans denominated in foreign currency, it went down from 2.2% to 1.9%.

3. How have international banks' business models (eg centralised vs subsidiary) evolved since the 2008 financial crisis? Does the nature of a bank's business model influence the supply of credit during periods of adverse external shocks?

Since in Russia foreign banks are allowed to open only subsidiaries, their business model has not evolved much since 2008. At the same time, foreign banks have deleveraged, mainly due to the introduction of the Basel 2.5 and Basel III capital requirements. After the publication of the final Basel III capital rules in October 2011, the annual growth of foreign banks' assets fell from 37% to 6% (while the average assets growth rate in the banking sector amounted to 20%).

B. The role of debt securities markets

4. What is the structure of the debt held in the form of securities, both sovereign and corporate (size, maturity, fixed/flexible rate, collateral, currency) and how has it evolved? How has the relative importance of domestic and international debt issuance changed?

The Russian securities market comprises such main segments as government, regional (sub-federal and municipal) and corporate bond markets. Corporate bonds (placed both in the domestic and international debt markets) account for 69% of the total bond market portfolio as of the end of November 2014 compared with 66% as of the end of 2009.

The market has successfully overcome the after-effects of the global financial crisis. Despite its exposure to serious external shocks, the Russian debt market remained relatively stable during the period from 2009 to 2014 and continued to perform its function of redistributing financial resources in the national economy.

The domestic bond market expanded rapidly in the period under review. In 2013, the annual volumes of government, regional (sub-federal and municipal) and corporate bonds that were floated in the domestic market reached record highs (of 0.8, 0.1 and 1.7 trillion roubles respectively).

Government borrowing in the domestic market is the main source of federal budget deficit financing. The measures taken in 2012 to liberalise the federal loans bond (OFZ) market have increased investors' interest in OFZ bonds, allowing the Russian Ministry of Finance to improve the structure of the portfolio of outstanding government bonds. As a result, secondary trading volumes in OFZ bonds have grown considerably. The volume of secondary government bond operations (including transactions conducted by non-residents) has increased substantially, ahead of OFZ settlements via international depositary and clearing systems.

The corporate bond market in Russia (both internal and external segments) is one of the youngest and the fastest-growing segments of the debt securities market (by quantity and volume of bond placements). The strongest demand in the primary and secondary segments of the corporate bond market was for the securities of top-quality issuers, for whom bond issuance represents an important source of funding and an alternative to bank borrowing.

At the same time, over the past few years the volume of Russian corporate bonds issued in the external market has grown at a faster pace than the volume of corporate bonds outstanding in the domestic market. The strong interest of Russian companies in issuing corporate eurobonds can be attributed to their lower cost and the longer average term of external borrowed funds. By the end of November 2014, the value of eurobonds issued by Russian non-bank corporations in the external market (denominated in US dollars) had grown by 1.6 times as compared with the end of 2009.

In 2014, as a result of geopolitical and economic risks, the domestic bond market saw a sharp fall in issuing activity and a rise in bond yields. The par value of domestic bond market portfolio growth slowed down by two times in 2014 compared with a similar indicator in 2013. In December 2014 the yields of federal loan bonds as well as the yields of regional and corporate bonds rose by 7–8 percentage points compared with the end of December 2013.

5. In addition, a major development over the past five years has been the shift of borrowing by EME non-bank corporations away from banks to international debt markets. What are the implications of this for the financing of firms?

The main sources of long-term financing for Russian non-bank corporations are the domestic credit market and the local corporate bond market. These financing sources are supplemented by borrowing in the international debt markets.

The ratio of bank loans of non-financial organisations to GDP was 36.4% as of September 2014 compared with 32.3% as of the end of 2009. The value of Russian non-bank corporations' eurobonds outstanding in the external market was equivalent to 5.1% of GDP, up from 4.3% in 2009, while that of Russian non-bank corporations bonds in the domestic market was equivalent to 3.7% of GDP, down from 5.1% in 2009.

6. What would be the impact on bank and non-bank corporations' balance sheets of a potential tightening of global financing conditions?

Just like other emerging market economies (EMEs), Russia is exposed to the risks of tightening global financing conditions. When the leading central banks increase their key policy rates, EMEs may face capital outflows, an increase in credit spreads, a reduction in financial asset prices and the depreciation of their national currencies.

In 2014, external financing conditions for Russia tightened in response to the sectoral sanctions imposed by a number of advanced economies targeting a group of Russian banks and state-owned companies. Thus, as of 1 December 2014, the average weighted yield on corporate eurobonds stood at 8.4%, which is 297 basis points higher than at the start of the year.

Under current conditions, the Russian financial sector is already facing constraints on access to external financing. As a result, greater importance is being placed on internal sources of economic growth. In parallel, the limited capacity of the domestic market coupled with the discernible upward trend in inflation has caused rouble-denominated bond yields to rise.

The average weighted yield on corporate rouble-denominated bonds went up by 511 basis points to 13.5% over the 11-month period. Thus, financing conditions have already tightened significantly in Russia. Therefore, we do not expect that an increase in the key policy rates of the leading central banks (eg those of the US Federal Reserve System and the Bank of England) will have any substantial direct impact on the Russian economy.

7. What is the share of corporate deposits in the total bank deposits? To what extent has it been affected by international debt issuance by non-financial corporations? What other interactions between banks and non-bank corporations' balance sheets are likely to be important from the viewpoint of monetary and financial stability?

The share of deposits and other funds raised from legal entities (except credit institutions), including transferable deposits in total bank deposits, as of the end of 2013, accounted for nearly half of all deposits and remained unchanged.

There is no evidence of any interaction between international debt issuance by non-financial corporations and the share of corporate deposits in total bank deposits.

C. Implications for monetary policy

8. How have recent changes in financial intermediation affected the transmission mechanism of monetary policy in EMEs (eg size and speed of pass-through of changes in policy rates, responsiveness of overall credit conditions and asset prices, impact on debt service ratios and, through these, on the macroeconomy)?

The most prominent changes in Russian financial intermediation in recent years were related to the growing role of domestic financial markets (determined by both the slow growth in external debt and the transition to a floating exchange rate regime by the Bank of Russia). These developments have presumably increased the efficiency of the pass-through of the Bank of Russia's interest rate policy and the efficiency of monetary transmission in general.

At the same time the role of the Bank of Russia's interest rate policy has increased significantly. The share of the Bank of Russia's credit in total banking sector liabilities rose from about zero pre-crisis to more than 10% in 2014. The pass-through of the Bank of Russia's policy rate on market interest rates and other domestic financial market indicators is estimated to be faster and more pronounced. The fact that domestic lending has become the primary source of money creation and an important factor in aggregate demand formation suggests that the macroeconomic efficiency of monetary policy has increased.

9. How has it changed the sensitivity to global monetary and financial conditions?

While external financial conditions have been unstable, the national financial system and the Russian economy as a whole have proved to be less vulnerable to these changes. Due to the increased relative importance of interest rate policy over exchange rate policy, the money supply and domestic financial conditions in general are less dependent on the dynamics of the exchange rate.

The rouble exchange rate has showed a perceptible reaction to the fluctuations of interest rates in developed markets, to risk aversion (risk-on/risk-off) and to global capital flows as well as to recent political tensions. Meanwhile, the reaction of the domestic real sector and demand for foreign currency (dollarisation) have eased as the market has adapted to a more flexible exchange rate. Estimated exchange rate pass-through on domestic inflation has fallen from about 0.3 percentage points (per 1% change in the nominal effective exchange rate) pre-crisis to 0.1–0.15 percentage points more recently.

10. How should monetary policy adapt to the changes in financial intermediation? For instance, to what extent should it react to sharp changes in risk premium in EME debt markets (through interest rate and/or balance sheet measures) and respond to broader vulnerabilities?

Changes in external economic conditions posed a serious challenge to monetary policy in 2013–14. The US Federal Reserve's tapering of accommodative measures and the virtual shut-down of access to foreign capital markets in the second half of 2014 have affected the dynamics of our financial market indicators, leading to large-scale capital outflows from Russia and rouble depreciation. This dynamic became the key pro-inflationary factor. The Bank of Russia has responded to these challenges by seeking to restrict the negative influence of external conditions on the economy.

Aiming to dampen the fluctuations of the rouble exchange rate in 2014, the Bank of Russia carried out large-scale foreign exchange interventions in line with established rules. In January–October 2014, net sales of foreign currency by the Bank of Russia amounted to $70.5 billion. The largest sales of foreign currency by the Bank of Russia occurred in March and October, when pressure on the rouble exchange rate was particularly strong.

The restrictions imposed by certain countries on access to foreign financial markets for a number of Russian organisations were an additional factor that made for increased tension in the domestic FX market and contributed to a deterioration in the banking sector's ability to manage foreign exchange liquidity, and they also posed a risk to the stable functioning of domestic financial markets. To limit these risks, in September and October 2014, the Bank of Russia introduced two new types of operations with foreign currency: USD/RUB buy/sell FX swaps and FX repos.

In November 2014, the Bank of Russia abolished its exchange rate mechanism, which had implied the conduct of regular interventions in line with established rules.

This, in fact, signified a transition to a floating exchange rate regime. The move has also allowed the Bank to counter speculation on the FX market. If financial stability comes under threat, the Bank of Russia can intervene in the domestic FX market; however, such operations will be irregular. In early December 2014, due to the rouble's significant deviation from its fundamental level and the excessive increase in its volatility, which posed a threat to financial stability, the Bank of Russia intervened in the FX market on several occasions.

The rouble depreciation observed at the end of 2013 and in 2014 led to a further acceleration in consumer price growth and an increase in inflation expectations. In order to limit inflation risks, restrain inflation expectations and resist growing inflationary pressure, the Bank of Russia raised its key rate several times in 2014, by a total of 11.5 percentage points to 17%.

11. To what extent do macroprudential policies influence the transmission mechanism of monetary policy? How far do they complement or substitute for interest rate policies?

The monetary policy objective is to maintain low and stable inflation. However, the development of the financial sector, which provides the monetary policy transmission mechanism, may be attended with the build-up of imbalances in different segments of the market. In this case, macroprudential policy tools may prove most efficient for systemic risk prevention.

The procyclicality of the financial system may be often recognised as one of the most common undesirable side-effects of monetary policy, as low interest rates are apt to stimulate increased risk appetite. . Under these conditions, macroprudential constraints are applied to iron out potential imbalances, for instance those associated with overheating in the consumer and mortgage lending segments of the financial markets.

Since 2013, the Bank of Russia has successfully implemented a set of risk mitigation measures focusing on the unsecured consumer lending segment of the market. In mid-2012, the annual growth rate of unsecured consumer lending exceeded 60%.

Measures to cool down the market included a requirement to increase the minimum loan loss provisions or reserves held against potential unsecured consumer loan losses and an increase in the risk ratio for calculating the capital adequacy ratio with regard to loans with high effective interest rates. After the macroprudential policy measures were implemented, the annual growth rate of unsecured consumer lending fell to 15.3% as of 1 October 2014.

Prospective measures targeting the mortgage lending segment of the market are currently under discussion. Mortgage lending growth is running at 33.7% year on year. There is no evidence of a housing bubble for the moment: the share of non-performing loans (NPLs) is low (1.5%), while the rate of house price growth remains lower than the inflation rate. But a substantial amount of loans with a high LTV (of more than 70%) gives some cause for concern.[2] Under these conditions, the Bank of Russia is planning to set differentiated risk ratios for loans depending on the LTV ratio.

[2] The LTV is calculated as the ratio of the loan amount to the property value as of the date of the loan issue.

Changing patterns of financial intermediation: Implications for central bank policy

Financial intermediation in Saudi Arabia

Saudi Arabian Monetary Agency

Abstract

In Saudi Arabia, financial intermediation has further increased over the last few years as banks continue to dominate the supply of credit to both the corporate sector as well as households. Bank balance sheets have continued to grow owing to heavy public spending and accelerating private sector activity in recent years. Banks' total assets were equivalent to three quarters of GDP in 2014. Saudi Arabia's countercyclical approach in fiscal and monetary policies helped dampen the effect of oil price volatility on the banking sector and overall economic growth. Moreover, SAMA has been able to maintain financial stability through the use of various monetary policy tools and its orthodox application of macroprudential measures. As for interest rate policy, it will broadly continue to follow developments in US policy rates given the pegged exchange rate to the US dollar. For Saudi Arabia, SAMA policy rates and macroprudential factors characterise the policy framework that has allowed SAMA to prudently manage the liquidity in the system.

Keywords: Financial intermediation, banking sector, bank credit, monetary policy

JEL classification: E510

Background

The Saudi financial system currently comprises the Saudi Arabian Monetary Agency (SAMA), 24 banks with a network of 1,931 branches, a stock exchange, five specialised credit institutions (SCIs),[1] and other non-bank financial entities, such as securities and brokerage firms, insurance sector and finance companies. Key financial products include corporate stocks and bonds, government bonds, SAMA bills, financial derivatives, and some Islamic products (eg sukuk). In common with other emerging economies, banks still dominate provision of credit to the private sector, accounting for 96.6% of total bank credit in February 2015. There is some evidence that banks are lending on a longer-term basis. Lending to households has been growing in importance. Bank balance sheets have continued to grow on the back of accelerating private sector activity and a high rate of public spending in recent years. The asset base of the banking sector expanded by an annual average growth rate of 10.3% to SAR 2.1 trillion ($568.7 billion) during 2007–14. In 2014, banking assets stood at 75.6% of GDP.

Banks and SCIs are the key credit suppliers in Saudi Arabia. Banks' role relative to that of SCIs has strengthened over the years. The importance of the banking sector can be judged by an uptick in the money multiplier from 5.9 in 2012 to 6.1 in 2014.

Financial intermediation and central banking post crisis

Globally, there has been a noticeable change in both financial intermediation and central banking operations. In advanced economies, the deleveraging of bank balance sheets had a negative impact on credit growth and economic activity. In EMEs, which are mostly bank-centric, the outcome was mixed. These developments have influenced central bank operations, leading them to adopt unconventional policies in advanced economies resulting in expanded balance sheets while also tightening prudential measures. EMEs have likewise tightened prudential measures but have not adopted unconventional policies. In Saudi Arabia, bank credit growth has been brisk, reflecting a gradual secular deepening of the financial system, against an environment of strong overall economic activity backed by steady fiscal spending without triggering inflationary pressures. This is because bank credit growth and risk exposure are subject to strictly enforced prudential measures.

The financial sector plays an important role for economic growth. A lesson learnt during the recent financial crisis is that too large a financial sector brings about fragility and too small hampers real growth. There is no useful theory on the optimal size of the financial sector, but the recent episodes are indicative of the fact that a highly overleveraged banking sector far in excess of nominal GDP does not augur well for financial stability. In Saudi Arabia, the banking sector is equivalent to three quarters of national GDP, reflecting modest leverage and a high capital cushion, and this is likely to grow as financial deepening continues.

[1] The SCIs comprise the Agriculture Development Fund, the Saudi Credit and Saving Bank, the Public Investment Fund, the Saudi Industrial Development Fund, and the Real Estate Development Fund.

The post-crisis preoccupation is how far to go in regulation versus the danger of damaging the process of bank intermediation. Is the regulatory trajectory getting so overwhelming that it affects economic growth or is the cost worth bearing for maintaining long-term financial stability and economic activity? In our view, the latter argument is stronger. In Saudi Arabia, the application of prudential measures by a single strong regulator, which is also responsible for monetary policy (ie SAMA) has not only kept the banking sector resilient but has also helped stabilise economic growth over time.

Implications for monetary policy

Saudi Arabia is a fiscally dominant economy, where the budgetary stance is countercyclical by design: it either stimulates growth (when deficits are run) or dampens it (by running surpluses) in order to stabilise the growth path of the economy. Monetary policy plays a supporting role. As SAMA's monetary policy is anchored in the stability of the USD/SAR exchange rate through the pegged regime, combined with an underborrowed economy, which has an emerging market status, the interest rate lever has limitations. In addition, SAMA sets reserve requirements and engages in repo and reverse repo transaction. Because of the limited supply/stock of government and corporate debt, SAMA issues SAMA bills to regulate liquidity and credit conditions. In terms of policy effectiveness, macro- and microprudential measures have played an important part in preserving financial stability. This is evidenced by the fact that Saudi Arabia has not had to undertake extraordinary steps to support the financial system or to boost bank intermediation.

Going forward, what remains debatable is whether central banks should intervene vis-à-vis asset price pressures. In the case of Saudi Arabia, the answer currently is in the negative, given that factors influencing asset prices tend to be beyond the remit of the central bank (eg land and housing supply).

In conclusion, Saudi Arabia's countercyclical approach in fiscal and monetary policies helped dampen the effect of oil price volatility on the banking sector and overall economic growth. Moreover, SAMA has been able to maintain financial stability through the use of various monetary policy tools and its orthodox application of macroprudential measures. As for interest rate policy, it will broadly continue to follow developments in US policy rates given the pegged exchange rate arrangement to the US dollar. For Saudi Arabia, SAMA policy rates and macroprudential factors have characterised a policy framework that has allowed SAMA to prudently and effectively manage the liquidity in the system.

Trends in financial intermediation: Implications for central bank policy

Monetary Authority of Singapore

Abstract

Accommodative global liquidity conditions post-crisis have translated into low domestic borrowing costs and strong domestic credit growth, with household and corporate leverage trending upwards. Bank lending remains the predominant source of financing in Singapore, with cross-border and foreign currency exposures growing as the domestic banking system channels funds to emerging Asia. The Monetary Authority of Singapore (MAS) closely monitors the potential financial stability implications of such trends in financial intermediation. With monetary policy directed at securing medium-term price stability for the overall economy, MAS employs macroprudential tools and complementary policies to address specific financial stability risks.

Keywords: Financial intermediation, monetary policy, exchange rate framework, financial stability, macroprudential policy

JEL classification: E44, E52, E58, G21

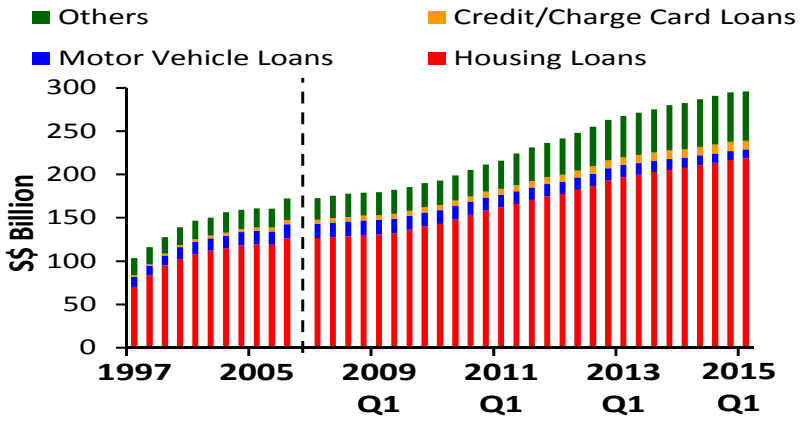
1. Financial intermediation in Singapore – recent trends

The prolonged low interest rate environment post-crisis has contributed to strong domestic credit growth. Singapore's monetary policy centres on the management of the exchange rate rather than domestic interest rates and, as its financial markets are internationally integrated, interest rates in Singapore are largely driven by global developments and investor expectations of future movements in the Singapore dollar. Consequently, accommodative global liquidity conditions have translated into low domestic borrowing costs. Since end-2006, domestic interest rates have declined significantly, with the three-month SGD interbank offered rate (SGD SIBOR) falling from 3.4% p.a. at end-2006 to around 0.4% in 2011, and remaining relatively unchanged until end-2014.[1]

Household and corporate leverage has trended upwards on the back of low interest rates and easy financing conditions:

- Households. The household debt-to-income ratio increased from 1.9 times in 2008 to 2.2 times in 2014 . MAS has taken measures to encourage financial prudence, including tighter rules on housing loans and unsecured credit, and the pace of growth in household debt has since slowed markedly. In Q1 2015, the growth of household liabilities moderated to 4.8% year on year, compared to an average of 9.2% year on year over the last five years. The composition of household debt has remained broadly constant, with housing loans continuing to account for a large share of household sector liabilities (74% as at Q1 2015, see Graph 1).

Household debt — Graph 1



Source: Singapore Department of Statistics.

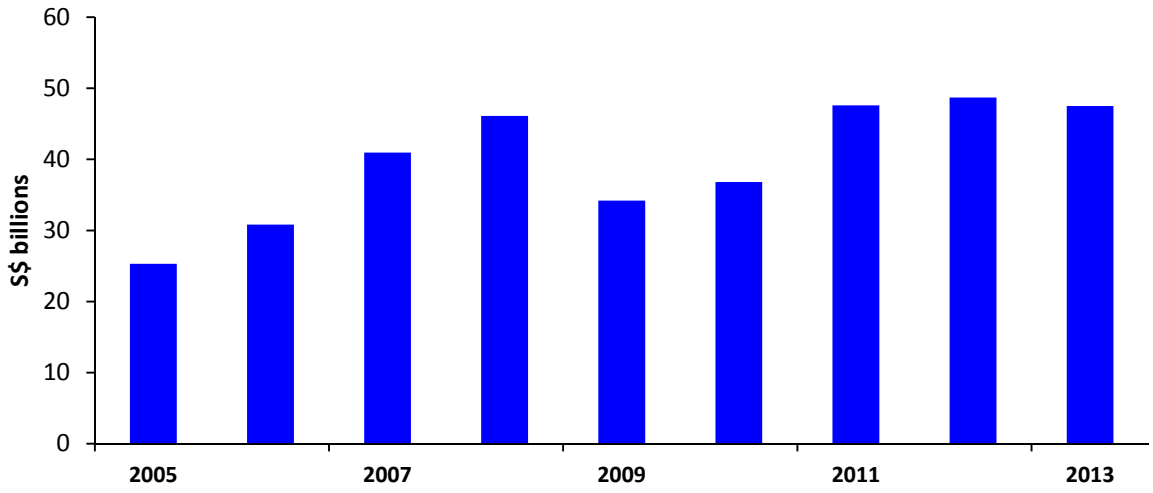
Note: Data for 1997–2007 are as at Q4.

- *Non-financial corporates (NFCs).* The prolonged low interest rate environment has seen corporate debt rising, with the debt-to-GDP ratio for listed corporates

[1] As at end-January 2015, three-month SGD SIBOR was about 0.65%.

moving up from 52% in Q2 2008 to 81% in Q3 2014, and has since stabilised at 75% since Q4 2014. Corporates may have taken advantage of low borrowing costs to bring forward capital expenditure or restructuring plans (Graph 2). Indeed, there are some indications that low borrowing costs have led to a shift in the capital structure of corporates from equity to debt. The median debt-to-equity ratio of listed corporates rose from 33% in Q4 2008 to 41% in Q1 2015.

Capital expenditure by corporates — Graph 2



Source: Thomson Financial.

Capital markets activity has increased, although bank lending remains the predominant source of financing.

- The Singapore corporate bond market has grown steadily. The outstanding volume of Singapore corporate bonds continued to grow, increasing at a CAGR of 9.9% from 2008 to 2013, to reach SGD 272.4 billion as at end-2013. Market-based financing can be beneficial as it allows corporates to diversify their investor base and lock in lower interest rates. In comparison, bank lending remains the predominant source of financing in Singapore, with outstanding total non-bank corporate loans at SGD 870 billion as of Q1 2015.
- "Shadow banking" risks in Singapore remain small. Non-bank, non-insurer financial intermediaries such as real estate investment trusts, broker-dealers and investment funds had assets comprising only 5.5% of total financial system assets as at end-2013.[2] These intermediaries do not perform significant credit intermediation or significant maturity and liquidity transformation, and are not highly leveraged.

[2] Monitoring Universe of Non-bank Financial Intermediation (MUNFI) estimates from FSB Shadow Banking Report 2014.

In recent years, there has been an increase in cross-border and foreign currency credit intermediation to emerging Asia, reflecting the ongoing search for yield and robust growth in emerging economies.

- The Singapore banking system intermediates funds between advanced economies and emerging Asia, to support growth and trade in the region. Since 2008, a growing number of local and international corporates have used Singapore as a funding hub to expand across Asia. Accordingly, the Singapore banking system's role has evolved from being a net lender to advanced economies, to being a conduit of funds to emerging Asia.

2. Interaction between monetary and macroprudential *policy*

Singapore's monetary policy framework does not utilise interest rates or any monetary aggregate to influence key economic variables. Instead, the instrument of monetary policy is the trade-weighted exchange rate, known as the Singapore dollar nominal effective exchange rate (SGD NEER). The SGD NEER is managed against a basket of currencies[3] of Singapore's major trading partners and competitors, and is allowed to fluctuate within a prescribed policy band.[4]

The exchange rate transmission mechanism operates independently of financial intermediation. Instead, the exchange rate policy is directly transmitted to economic variables through its influence on import prices and on derived demand for Singapore's exports.

- *Import price channel*. As Singapore imports much of what it consumes, domestic prices are determined to a large extent by world prices. The exchange rate acts as a filter for imported prices, directly influencing the price of goods and services expressed in terms of domestic currency.
- *Derived demand channel*. Due to the export-oriented nature of the Singapore economy, an appreciation of the exchange rate will moderate external demand for Singapore's exports, decreasing demand for domestic factor inputs and factor prices. This, in turn, reduces the domestic demand for non-tradable goods and services, and puts downward pressure on prices. Conversely, a depreciation of the currency will help to boost exports and exert upward pressure on aggregate demand and prices.

[3] The currencies used and the weight each currency is given reflect the level of Singapore's dependence on that particular country for trade. MAS reviews and revises the composition of the basket from time to time, to take into account changes in Singapore's trade patterns. A basket of currencies is used, rather than pegging the Singapore dollar against a single currency, because of the diversity of Singapore's trading partners and sources of imported inflation.

[4] As far as possible, MAS allows market forces to determine the level of the SGD NEER within the prescribed band. By establishing a ceiling and floor for the SGD NEER, the SGD NEER is allowed to absorb short-term market volatility, providing more flexibility in managing the exchange rate and limiting any spillover that this volatility may have on the real economy.

In Singapore, the design of macroprudential policies complements the exchange rate-based monetary policy.[5]

- Monetary policy in Singapore is directed at securing medium-term price stability for the overall economy, and is not aimed directly at addressing risks associated with the asset markets.
- As monetary policy centres on the exchange rate, interest rates are essentially imported from abroad. Under this framework, macroprudential policy is required in a complementary fashion to secure macroeconomic and financial stability. For example, there is a central role for some form of macroprudential instruments to ensure that credit growth is not excessive.

Monetary and macroprudential policy can affect both of the twin objectives of price and financial stability. ***The critical question is how to take into account the spillover effects and obtain an optimal mix of the two policies.*** Conceptually there would be an iterative process to arrive at the optimal mix of monetary and macroprudential policies. The optimal mix would be based on ***an assessment of the different elasticities of response to monetary and macroprudential policies across the goods and credit/asset markets.***

- In reality, this iterative process works through close coordination and information exchange among policymakers, so that the desired objectives of price and financial stability can be achieved more efficiently.

3. Potential risks from financial intermediation

MAS closely monitors the trends in financial intermediation as they have implications for financial stability. MAS will take measures as necessary, including the use of macroprudential tools, to address financial stability risks.

Risks to banks

In acting as an intermediary of fund flows to the region, banks in Singapore are exposed to credit, funding and liquidity risks.

- Cross-border credit exposures to particular markets could pose risks in the event of external economic shocks, as a rising number of distressed corporate borrowers would translate into credit losses and higher NPLs. Emerging Asia

[5] MAS is of the view that monetary policy should be directed at securing medium-term price stability for the overall economy and the design of macroprudential policies continues to complement its exchange rate-based monetary policy. This means that:

(i). Monetary policy takes into account both CPI All-Items Inflation and MAS Core Inflation.

(ii). To the extent that asset prices affect the medium-term trajectory of prices and output (eg through second-round effects on Core Inflation and its persistence), monetary policy should remain on a tightening bias to signal to economic agents that the central bank stands ready to anchor inflation expectations and dampen economic activity.

(iii). However, monetary policy will not seek to directly offset the asset price cycle. To the extent that low domestic borrowing costs (which reflect the abnormally low global interest rates) fuel increases in asset prices, it is preferable to deal with asset price inflation through macroprudential tools.

now accounts for more than half of Singapore's banking system's cross-border exposures. Amidst a more uncertain outlook for Asia, banks in Singapore would need to carefully monitor the risks from their increased exposures to the region.

- Loans by foreign banks in Singapore are often funded through intragroup deposits from their head office or related banks. While intragroup funding reduces counterparty risk, a bank would be vulnerable to liquidity risk if it were unable to access head office funding in times of stress.
- Loan-to-deposit (LTD) ratios have fallen from their recent peak in Q2 2014, with the overall LTD ratio easing to 108% in Q1 2015. This trend has been driven by the foreign currency LTD ratio falling to 133% in Q1 2015, as foreign currency loan growth moderated even as foreign currency deposits continued to grow; meanwhile, the SGD LTD ratio remained below 100%. The higher foreign currency LTD ratio is a consequence of Singapore's role as an international financial centre since cross-border loans from Singapore, including trade finance, are mostly foreign currency-denominated.

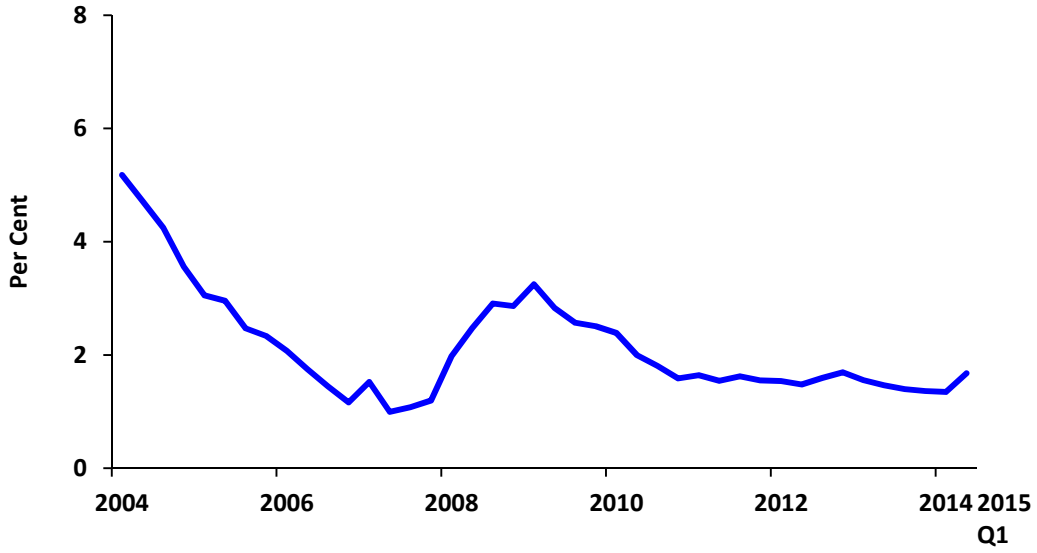
MAS closely supervises banks to ensure that their risk management processes and controls are sound.

- MAS conducts annual industry-wide stress tests to assess banks' resilience to a range of external and domestic shocks. Stress scenarios used in MAS stress tests have included interest rate shocks and a severe property market downturn, and adverse economic growth scenarios affecting banks' NPLs. The results of the 2014 industry-wide stress tests indicate that banks in Singapore are resilient, with CAR levels remaining above regulatory requirements in stress scenarios.
- MAS assesses banks' liquidity risks through regular reviews of banks' funding and liquidity profiles, and ongoing interactions with home regulators of foreign banks to assess the level of head office support in times of stress. In addition, MAS regularly stress tests banks' liquidity positions as part of the annual industry-wide stress test.

Risks to corporates and households

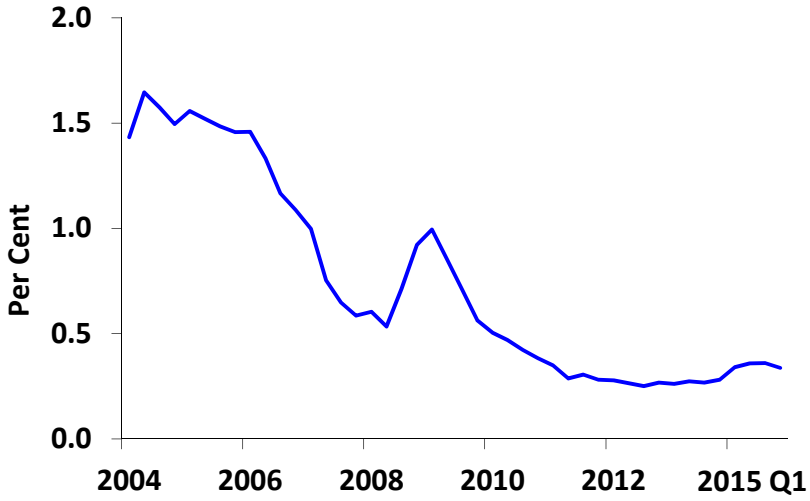
Despite the increase in borrowing, corporate and household balance sheets have remained healthy. The debt-servicing ability of listed corporates remains strong, with the median interest coverage ratio standing at 4.3 times in Q1 2015. The asset quality of banks' corporate and household loan portfolios remains high, with the non-performing loan (NPL) ratio for non-financial corporate loans remaining low at 1.7% in Q1 2015 (Graph 3). Likewise for households, the NPL ratio for housing loans has stayed below 0.5% (Graph 4), and credit card charge-off rates have been largely stable at 4–5% since 2010.

Corporate NPL ratios Graph 3



Source: MAS.

Housing loan NPL ratios Graph 4



Source: MAS.

MAS closely monitors household and corporate balance sheets to detect emerging financial stability risks. Should the benign macroeconomic and financing environment deteriorate, highly leveraged corporates and households may face financing risks and find debt repayment burdens unsustainable.

MAS stress tests of corporate balance sheets suggest that the corporate sector is generally robust. While the proportion of firms with high debt-to-equity and debt-to-EBITDA ratios has crept up, they do not pose systemic risk. The majority of corporates have sufficient solvency buffers to service interest expenses, and a

significant number of the highly leveraged corporates hedge against interest rate and currency risks.

MAS will continue to encourage financial prudence and put in place measures to keep household debt at a manageable level.

- *Housing market measures*. The combination of low borrowing costs and a buoyant property market could result in some households over-extending themselves in the housing market. The banking system also has significant loan exposure to property (26% of total non-bank loans as at Mar 2015). MAS has deployed a range of macroprudential tools to encourage financial prudence and to pre-empt financial stability risks from a disorderly correction in the property market. These include loan-to-value (LTV) limits, loan tenure caps, and a prohibition on interest-only loans for housing loans, and a Total Debt Servicing Ratio (TDSR) framework for property-related loans. These policies, combined with other fiscal and administrative measures,[6] have helped to stabilise property prices.
- *Motor loans and consumer credit*. To encourage prudence with regard to motor loans and consumer credit, MAS has reintroduced financing restrictions on motor vehicle loans[7] and strengthened rules on unsecured credit facilities and credit cards.[8] These measures have led to an improvement in the credit profile of borrowers in Singapore and slowed the pace of growth in household debt. MAS will continue to monitor lending and borrowing activities, and take further measures where necessary to keep household debt at a manageable level.

Emerging risks

While banks remain the dominant source of credit in Singapore, the growth of market-based financing, while providing a useful alternative to traditional bank lending in Asia, will bring new risks.

Risks may arise as more corporates source funding from capital markets. MAS is aware that corporate bond market disruptions could have a knock-on effect

[6] Singapore has taken a whole-of-government approach to coordinate property market agencies across different agencies. Besides the credit-based measures listed above, Singapore also imposed fiscal measures such as seller stamp duties and additional buyer's stamp duty to discourage speculative activity in the housing market, and it has also used supply side policies and government land sales to help meet housing demand.

[7] MAS reintroduced financing restrictions on motor vehicle loans in February 2013. The maximum LTV is 60% for a motor vehicle with open market value (OMV) that does not exceed $20,000 and 50% for a motor vehicle with OMV of more than $20,000. The term of a motor vehicle loan is capped at five years.

[8] Since June 2014, financial institutions (FI) have been required to conduct checks with credit bureaus and take into account the total credit limits and total outstanding debt balances of a borrower before they can grant a borrower a new credit card, a new unsecured credit facility or an increase in credit limit.

In addition, with effect from June 2015, an FI will not be allowed to grant additional unsecured credit to a borrower who is 60 days or more past due on any credit card or unsecured credit facility. FIs will also be prohibited from granting further unsecured credit to a borrower whose outstanding unsecured debt aggregated across all FIs exceeds his annual income for three consecutive months or more.

on corporates' ability to raise further debt financing and the cost of re-financing. MAS continues to monitor the liquidity and volatility in secondary markets given concerns over a withdrawal by banks from market-making activities, and industry initiatives to enhance secondary liquidity of bond markets.[9]

MAS will continue to monitor developments in shadow banking activities in Singapore. Shadow banking activities are assessed to pose minimal risk to Singapore's financial system at this point. However, an increase in non-bank intermediation involving significant maturity transformation, liquidity transformation credit risk transfer or leverage could create systemic concerns and would bear watching.

[9] For instance, a number of dealer banks have set up internal crossing networks to match client orders so as to pool liquidity. In addition, technology has been developed to facilitate the sharing of information on bond inventories across different liquidity pools. A number of industry players have also called for buy-side firms to step in to provide secondary market liquidity, and for secondary transactions to be shifted onto electronic trading platforms. This could help diversify the pool of liquidity providers and would make the corporate bond market more resilient to shocks.

Changing patterns of financial intermediation: Implications for central bank policy

South African Reserve Bank

Abstract

South Africa has attracted substantial inflows of foreign capital since the 2008 global financial crisis, but this has not coincided with or resulted in major changes in financial intermediation – including in the shadow banking sector. Instead, debt growth has been concentrated in the public sector: the government debt ratio has nearly doubled since the crisis albeit at relatively low levels, with a threefold increase in non-resident holding of rand-denominated government bonds, contributing to the financing of widening fiscal and current account deficits. Private sector credit growth, by contrast, has stagnated amid stricter bank lending criteria and balance sheet consolidation by households. Although the shadow banking system has expanded, this increase has come at the expense of the banks, and remains relatively small. South Africa's vulnerability to global monetary shocks has been reflected primarily in the widening of the twin deficits. The more recent monetary policy response has been a gradual tightening cycle, complemented by fiscal consolidation.

Key words: financial crisis, banking, financial markets, international financial markets

JEL classification: G01, G21, G10, G15

For South Africa, the problems posed in the outline for this meeting ring half true. South Africa is indeed exposed to global monetary shocks. It has attracted significant amounts of foreign capital in the period since the 2008 global financial crisis and has seen those flows abate as policymakers in the United States shift towards monetary policy tightening. Domestic monetary policy has been adjusted in response to the depreciating currency and its pass-through effects, and consistent with the country's flexible inflation target framework. Yet, this experience was not shaped by changes in financial intermediation. It is, therefore, necessary to consider developments in foreign financing separately from financial intermediation.

Foreign financing: Before the crisis, South Africa had already developed a sophisticated financial system. Financial inflows from abroad typically entered South Africa as portfolio flows into the Johannesburg Stock Exchange, where they financed large corporates. By contrast, small and medium enterprises tended to rely on domestic banks. The biggest change, since the crisis, has been that the state has become a larger borrower. These debt instruments have proven popular with foreign investors, but most of these purchases have been made on domestic markets, meaning that the debt is foreign-held but rand-denominated. Non-resident investors' holdings of rand-denominated debt and equity have increased from about 10% and 17% in 2005 to 36% and 22% in 2014, respectively.

Financial intermediation: The overall pattern of credit growth in South Africa has contradicted that seen in many other emerging markets (although it matches that of many advanced economies). Before the 2008 crisis, there was a large increase in private sector credit extension driven by mortgage lending, which in turn pushed up house prices. The state, by contrast, enjoyed buoyant revenues which permitted it to post small fiscal surpluses. Following the crisis, fiscal policy switched to running deficits, of about 5% of GDP. Private sector credit growth, by contrast, stagnated as banks raised lending standards and overstretched households consolidated their balance sheets. South Africa's shadow banking system expanded, growing from approximately 13% of financial assets of all financial intermediaries to 18% by the end of 2014. However, this is still a relatively small part of the financial system. Furthermore, more than half of the shadow banking system is made up of money market funds, which are regulated and therefore not markedly "shadowy".

South Africa is therefore exposed to global monetary shocks, but in old and familiar ways. As before the crisis, it has attracted capital inflows into a deep and liquid stock market. To this it has added significant sovereign borrowing. Its fragilities are large current account and fiscal deficits. These are significant vulnerabilities but they are not new or unfamiliar threats.

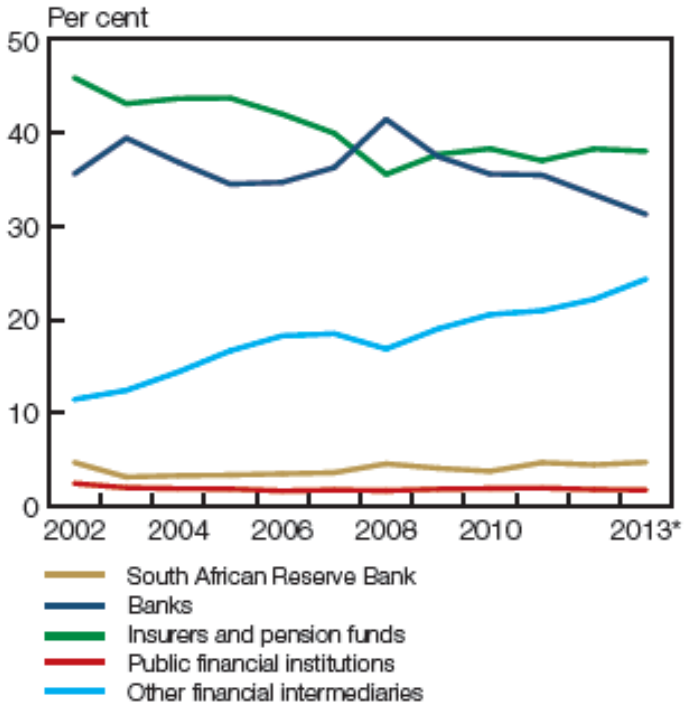
A. The role of banks

(1.) How did the relative importance of banks and market-based financing change in EMEs over the past decade?

Banks have continued to dominate financing in South Africa over the past decade. There has been quite strong growth in the share of financing from non-bank financial intermediaries, albeit from a low base.

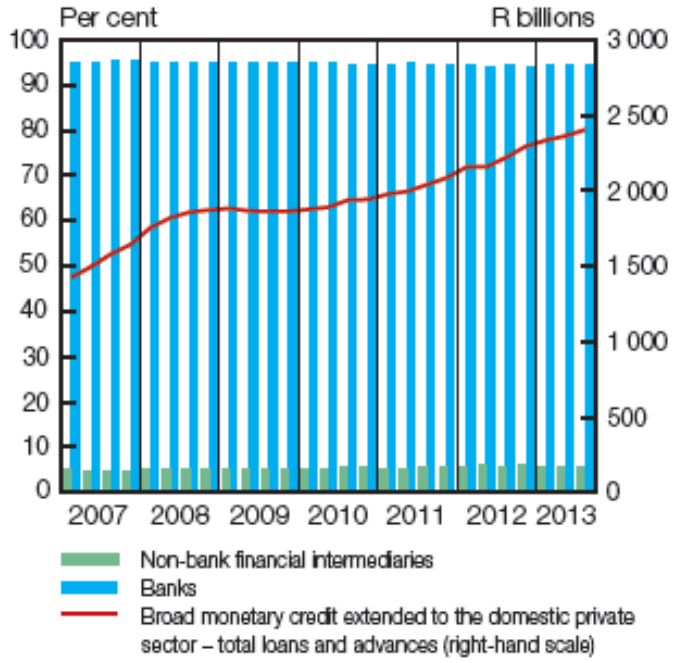
The share of banks' total assets relative to all financial intermediaries has been declining since 2008 and reached 31% in 2013 (see Graph 1). However, banks, insurers and pension funds still account for the largest share of total financial assets. Assets of other financial intermediaries, a proxy for the shadow banking system, continued to increase and reached 24% of total financial assets of financial intermediaries in 2013.

Distribution of total assets between financial intermediaries in South Africa — Graph 1



Non-bank financial institutions (NBFIs) play an important role in the financial system. They complement the commercial banking sector by addressing needs on which banks do not normally focus. Most NBFIs are actively involved in the securities markets and in the mobilisation and allocation of long-term financial resources. Examining the sources of credit extended, it would appear that credit extended by NBFIs continued to grow but remains relatively small in size, relative to total bank lending (see Graph 2).

Credit extension by banks and non bank financial intermediaries Graph 2



(2.) How has the composition of assets and liabilities of domestic banks changed? What does this imply for the liquidity, maturity and credit risks banks face, as well as their credit extension decisions (pricing, etc.)? In particular, what is the structure of their lending (eg (i) households vs corporates; (ii) fixed vs variable rate; (iii) collateral practices; (iv) domestic vs foreign currency) and how has it changed? How has the degree of competition evolved? And what has been the role of government-owned banks/financial intermediaries?

Composition of liabilities

Since 2008, domestic banks have reduced reliance on domestic currency deposits and increased funding from subordinated debt securities and foreign currency deposits and funding (see Graph 3). These changes have been made gradually since 2008 (see Table 1). However, foreign currency deposits and funding continue constitute less than 10% of total liabilities (see Graph 9).

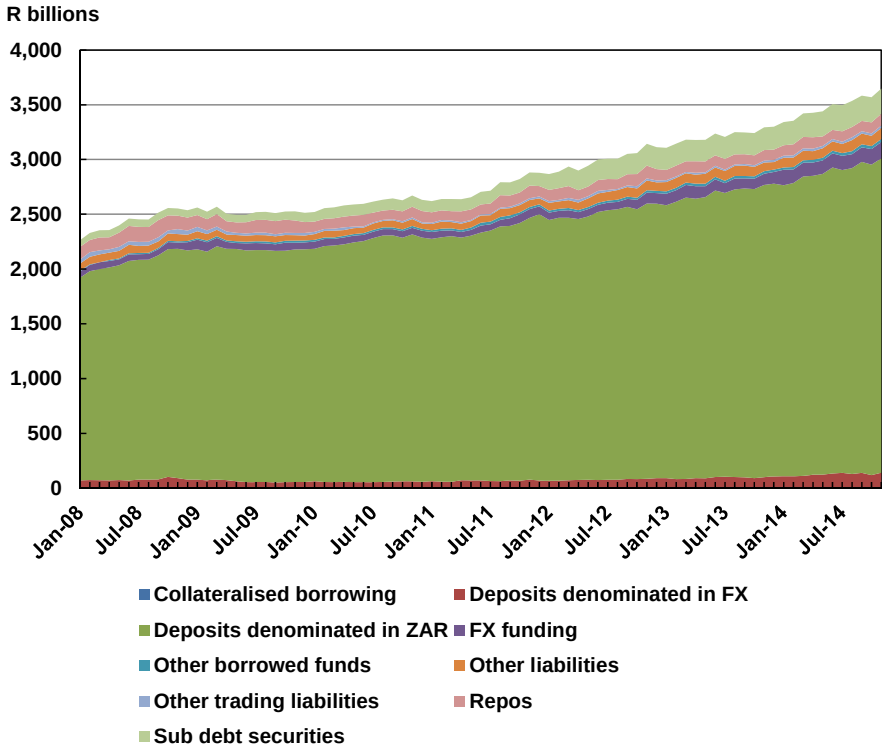
Year on year movement in domestic banks' liabilities (excluding derivative financial instruments)

Table 1

	Nov-08	Nov-09	Nov-10	Nov-11	Nov-12	Nov-13	Nov-14
	%	%	%	%	%	%	%
Collateralised borrowing	-	-	-	0.00	0.00	0.00	0.02
Deposits denominated in FX	3.55	2.20	2.29	2.68	2.71	3.04	3.85
Deposits denominated in ZAR	82.00	84.01	84.40	82.96	79.92	80.97	78.66
FX funding	2.27	2.48	2.22	2.78	3.20	3.11	4.07
Other borrowed funds	0.45	0.74	0.67	0.65	0.67	0.69	0.78
Other liabilities	2.55	1.93	2.33	2.24	2.83	2.41	2.74
Other trading liabilities	1.79	0.81	0.57	0.53	0.64	0.53	0.60
Repos	4.79	4.53	3.68	4.04	3.71	2.91	2.98
Sub debt securities	2.61	3.29	3.83	4.12	6.32	6.32	6.31
Total	**100.00**	**100.00**	**100.00**	**100.00**	**100.00**	**100.00**	**100.00**

Composition of South African banks liabilities

Graph 3



The maturity structure of domestic banks' liabilities indicates that there has been increasing reliance on short-term liabilities (with a maturity of up to one month) and less reliance on longer-term (more than six months) (see Table 2 and Graph 4).

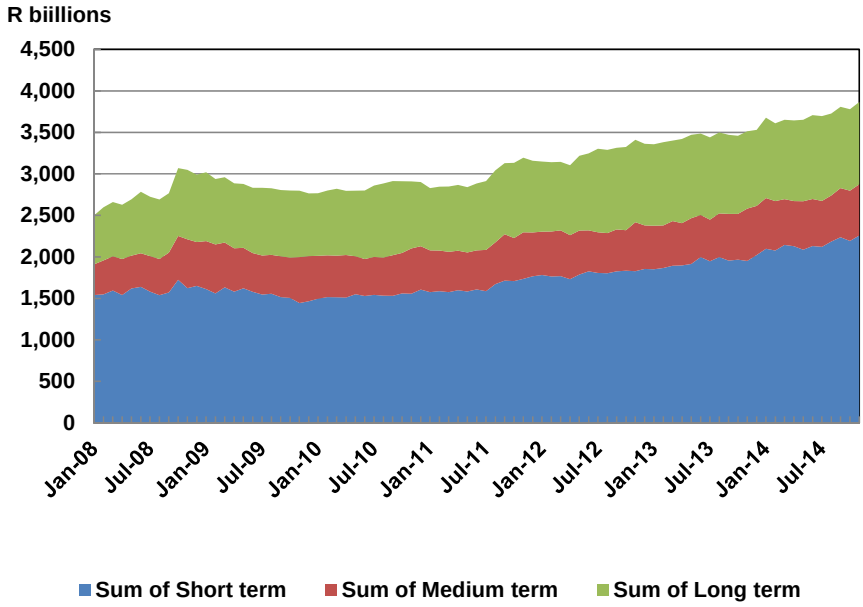
Term structure of domestic bank liabilities

Table 2

	Nov-08	Nov-09	Nov-10	Nov-11	Nov-12	Nov-13	Nov-14
	%	%	%	%	%	%	%
Short term	53.26	51.61	53.48	54.29	53.59	55.51	58.39
Medium term	19.27	19.72	18.76	17.55	17.32	17.96	15.99
Long term	27.46	28.66	27.76	28.16	29.09	26.53	25.62
Total	**100.00**	**100.00**	**100.00**	**100.00**	**100.00**	**100.00**	**100.00**

Term structure of the South African banking sector's liabilities

Graph 4



Composition of assets

The composition of South African banks' sector assets has changed marginally since 2008, with increases in gross loans and advances and decreases in investment and trading assets (see Table 3 and Graph 5).

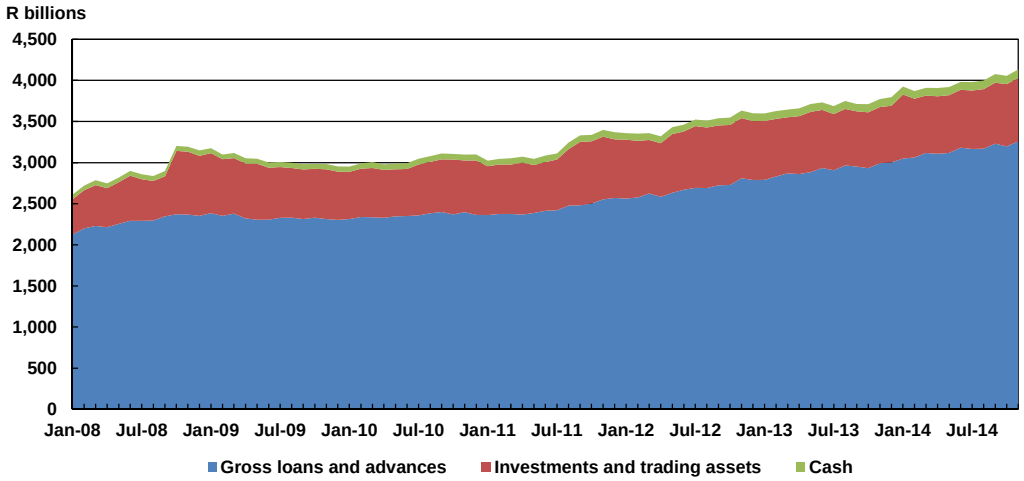
Composition of South African banking sector assets

Table 3

	Nov-08	Nov-09	Nov-10	Nov-11	Nov-12	Oct-13	Nov-14
	%	%	%	%	%	%	%
Cash	2	2	2	2	3	3	3
Gross loans and advances	74	78	77	75	77	79	79
Investments and trading assets	24	20	20	22	20	18	19
Total	**100**	**100**	**100**	**100**	**100**	**100**	**100**

Composition of South African banking sector assets

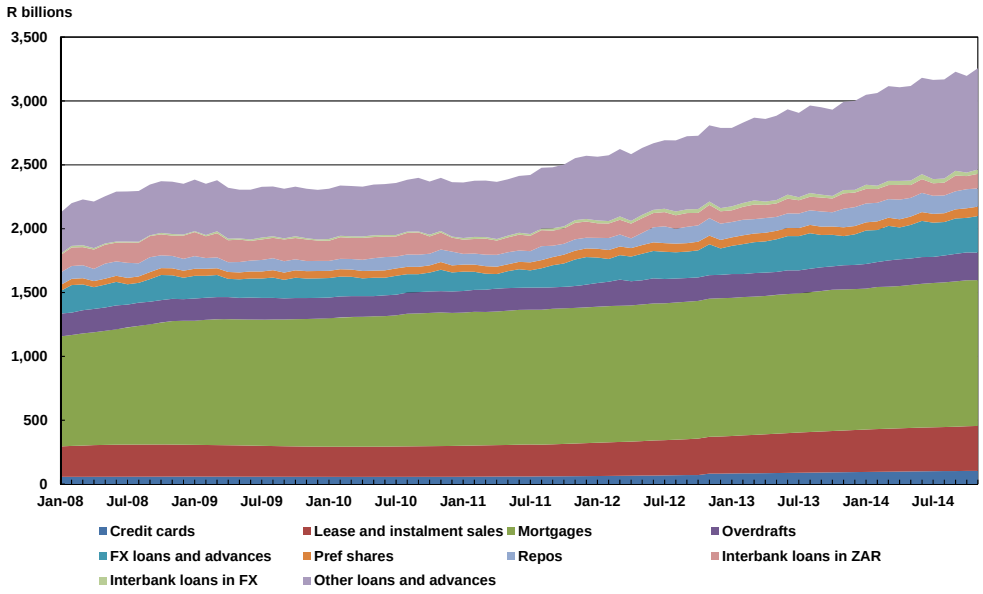
Graph 5



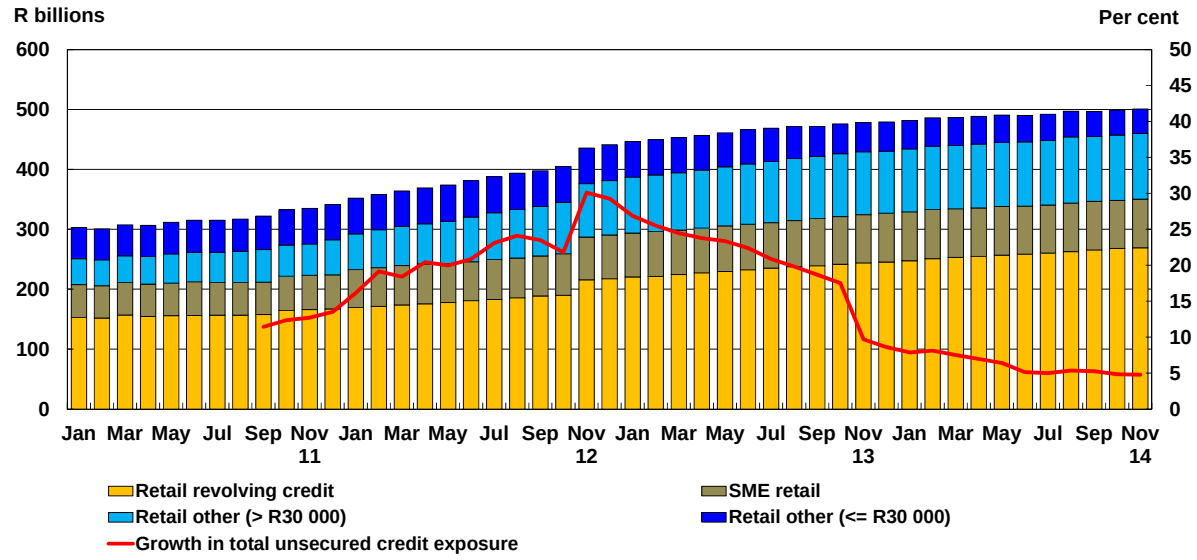
Since 2008, increases in gross loans and advances have been driven largely by increases in the other loans and advances category (which consists mainly of term loans. The category increased by ZAR 472 billion, of which ZAR 237 billion was to non-financial corporates and ZAR 138 billion was to households) and mortgages (mortgages to households have increased by ZAR 281 billion since 2008, largely to households and non-financial corporates) (see Graph 6). Unsecured retail lending (largely personal term loans) has shown significant amount of growth since 2008, but the strong growth trend has tempered since 2013 (see Graph 7).

Composition of gross loans and advances

Graph 6

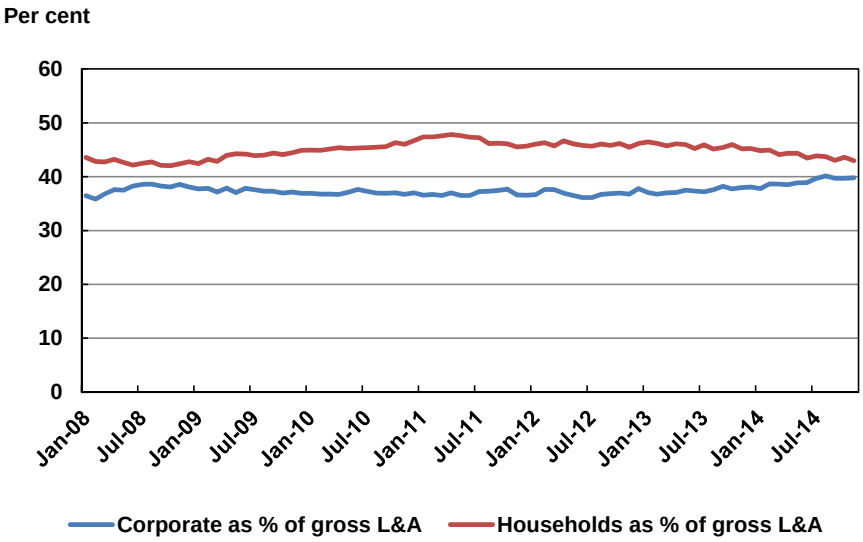


Gross unsecured retail credit exposure of the South African banking sector Graph 7



Lending to corporates and to households, as a percentage of total gross loans and advances, has not changed significantly since 2008 (see Graph 8). Lending to corporates increased from an average of 37.5% in the year to November 2008 to an average of 39.0% in the year to 30 November 2014. Lending to households decreased from an average of 43.7% in the year to November 2008 to an average of 44.0% in the year to 30 November 2014.

Corporate versus household lending to total gross loans and advances Graph 8



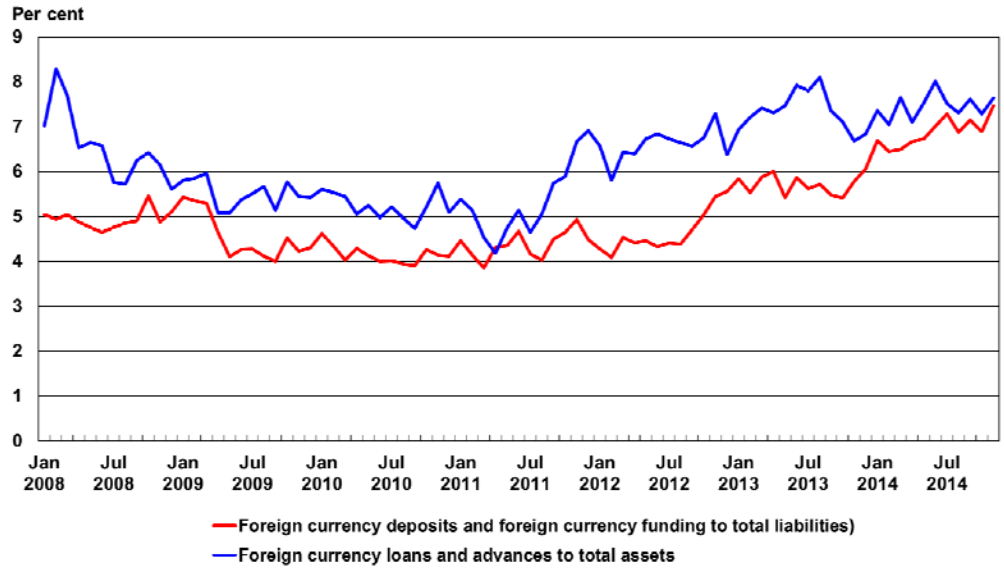
The majority of mortgages, instalment and leasing finance in South Africa to corporates and households are based on flexible rates. This trend has not changed

significantly since 2008 (in the year to 30 November 2008, on average, 88% of lending in mortgages, leasing and financing transactions was flexible rate. In the year to 30 November 2014, on average, 87% of lending in mortgages, leasing and financing transactions was flexible rate.)

The South African banking sector has steadily increased the amount of foreign currency lending since 2011 from a relatively low base. Foreign currency loans and advances to total assets have been increasing from a low of 3.85% in March 2011 to 7.47% in November 2014 (see Graph 9).

Foreign currency deposits and funding to total liabilities and foreign currency loans and advances to total assets

Graph 9



In the South African banking sector, the five largest banks dominate the sector (as measured by asset size, the five largest banks have held, on average, approximately 90% of banking sector assets since 2008). The sector has seen increasing competition from smaller banks in niche areas, such as unsecured retail lending, but this has not made significant changes to the composition of the total sector in terms of asset size.

The role of government-owned financial institutions has, to a large extent, been focused on development finance and financial inclusion. Their activities are mandated by the legislation supporting those entities (most government financial institutions have their own legislation which mandates the objectives and purpose of the institution (they fall outside the scope of the Banks Act, 1990). Examples of government financial institutions include the Land Bank (which is focused on the agricultural sector), the Development Bank of Southern Africa (to promote regional economic development), the Industrial Development Corporation of South Africa (a development finance institution) and the Post Office Savings Bank (a retail bank). *Note:* the responses to this questionnaire are based on entities registered in terms of the Banks Act, 1990.

(3.) How have international banks' business models (eg centralised vs subsidiary) evolved since the 2008 financial crisis? Does the nature of a bank's business model influence the supply of credit during periods of adverse external shocks?

The South African banking sector did not experience significant instability following the 2008 financial crisis. The major impact on the South African banking sector was largely due to indirect effects (for example, lower exports due to lower demand from European customers). South African banking groups have been focusing on expanding their activities onto the African continent (that is, expanding into Africa other than South Africa). The business models adopted for this expansion strategy differ between banking groups. The three most commonly followed strategies were to acquire existing in-country operations, to establish greenfield operations (usually subsidiaries) or to purchase minority stakes in existing African banking groups.

The nature of DSIB's business models have changed since the 2008 financial crisis from both a geographical and an asset class perspective. For example, certain banking groups have restructured their international operations by selling operations outside Africa and increasing their focus on African operations. There has also been a change in product mix, such that the growth in mortgages moderated following the crisis in 2008 and there has been increasing growth in unsecured retail exposures (see Graph 7 above). However, the aggregate level of gross loans and advances of the banking sector was not significantly influenced by any movements or changes in the supply of credit from branches of foreign banks operating in South Africa during the 2008 financial crisis (compared with, for example, the case in some developed market economies).

Note: No South African banking groups have been classified as Globally Systemically Important Banking institutions (G-SIBS). The response to the question on "international banks" is based on the Domestic Systemically Important Banking Institutions (DSIBs) that have banking operations outside the Republic of South Africa.

B. The role of debt securities markets

(4.) What is the structure of the debt held in the form of securities, both sovereign and corporate (size, maturity, fixed/flexible rate, collateral and currency) and how has it evolved?

Government is still by far the largest borrower in the domestic market, despite rising private sector issuance. National government's domestic debt has increased significantly since the global crisis, with a shift to Treasury bills and longer-term fixed interest bonds. National government's domestic debt increased 3.3 times in nominal terms, from ZAR 432 billion in 2005 to ZAR 1.4 trillion in 2014, of which almost 99% is on average marketable. Of the marketable portion, Treasury bills almost doubled between 2005 and 2014, reaching 14% of the total, while bonds decreased by 6 percentage points to 86% in 2014. From 2005 to 2014, the maturity composition of bonds changed with short-term bonds decreasing from 23% to 9% whilst long-term bonds increased to 91%. The average maturity of domestic bonds (mostly fixed interest) increased from 99 months in 2005 to 154 months in 2014.

National government's debt profile continues to be dominated by domestic rand-denominated debt. Rand-denominated domestic private sector debt (mostly flexible rate) in issue increased from ZAR 137 billion in 2005 to ZAR 450 billion in 2014. Foreign debt, meanwhile, has increased from ZAR 39 billion in 2005 to ZAR 144 billion in 2014. Over the same period, the average maturity of foreign currency-denominated bonds increased from 78 months to 95 months. The currency composition of this debt shifted in favour of dollars, rising from 44% of the total to 79%. Euro exposure declined sharply in 2014.

The domestic marketable debt of non-financial public enterprises increased by ZAR 141 billion from 2005 to ZAR 207 billion in 2014. Over the medium term, funding of state-owned companies will be contingent on restructuring with capitalisation funded from the sale of non-strategic state assets and not added to national government debt.

How has the relative importance of domestic and international debt issuance changed?

Government and private sector issuers favour domestic rand-denominated issuance. In the second quarter of 2014, South Africa's total foreign currency debt denominated in US dollars amounted to US$62 billion (of which 28% matures in 2020 and beyond), whereas rand-denominated debt amounted to ZAR 844 billion or US$80 billion. As a portion of total foreign debt, foreign currency-denominated debt decreased from 58% in 2005 to 44% in 2014.

South Africa's net worth (the net of foreign liabilities and assets) improved significantly, with net liabilities declining from ZAR 346 billion in 2005 to ZAR 153 billion in 2013.

(5.) In addition, a major development over the past five years has been the shift of borrowing by EME non-bank corporations away from banks to international debt markets. What are the implications of this for the financing of firms?

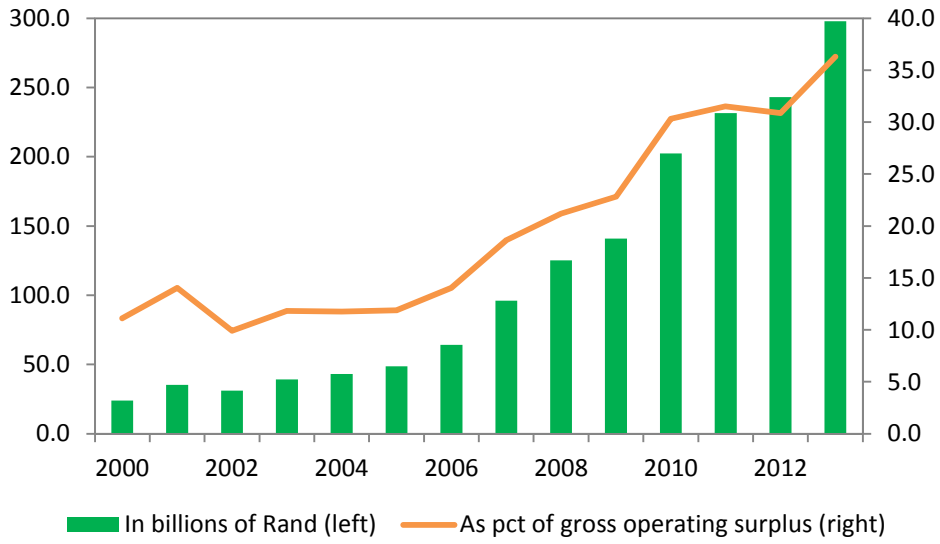
Recent BIS research has emphasised a new risk to global financial stability. EME corporates have exploited loose financial conditions in developed economies to issue offshore debt. This is used to finance real or financial investments, either domestically or in third countries.[1] The danger is that this creates large and perhaps invisible vulnerabilities to changes in advanced country monetary policies. South Africa, as an open economy with a relatively large number of multinational corporations, would be a likely candidate for this sort of exposure. The evidence, however, is mixed.

BIS research identifies three channels through which funds from offshore borrowing may flow into the local economy: (1) loans from a foreign subsidiary to the domestic parent, classified as debt FDI; (2) inter-company loans, classified as trade finance; or (3) deposits with a domestic bank (which would then appear, in the balance of payments, in "other investments – banking sector"). Analysis of South

[1] See, for instance S Avdjiev, M Chui and H S Shin, "Non-financial corporations from emerging market economies and capital flows", *BIS Quarterly Review*, December 2014, or M Chui, I Fender and V Sushko, "Risks related to EME corporate balance sheets: the role of leverage and currency mismatch", *BIS Quarterly Review*, September 2014)

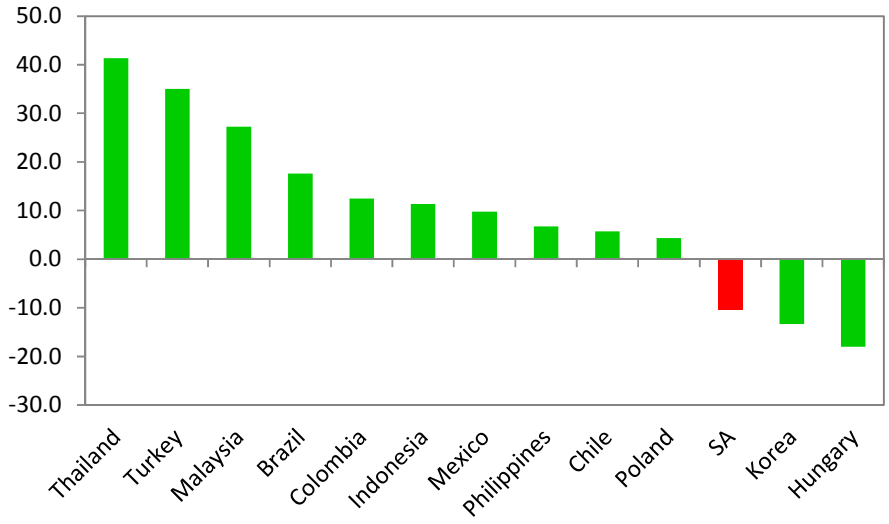
Africa's balance of payments and foreign liabilities suggests that most of the increase in foreign borrowing came through channel (1). "Debt FDI" liabilities for the private non-banking sector have more than doubled over the 2008–13 period (see Graph 1), rising to about a third of the non-financial corporate sector's gross operating surplus. Flow data, for the first three quarters of 2014, show the incurring of debt FDI liabilities worth ZAR 44 billion. Importantly, though, most of that "debt FDI" appears to reflect loans from foreign-based multinationals to their South African subsidiaries, rather than capital raising by South Africa-based firms through their foreign subsidiaries.

Debt FDI liabilities of the private non banking sector, 2000-13 Graph 10



Liabilities classified as "short-term loans and trade finance" have also increased in recent years – from ZAR 25 billion in 2010 to ZAR 55 billion in 2012 and ZAR 82 billion by end-2013, although flow data suggest this reflects in part valuation effects. These liabilities, however, remain small relative to debt FDI liabilities. The same observation applies to external liabilities in the form of bank deposits. While they rose to R103 billion by end-2013, from as low as ZAR 63 billion in 2010, their level has fluctuated over the years and remains similar to that seen at the end of 2008.

Change in private credit as a share of GDP in 2008–13 Graph 11



Higher private sector foreign debt has not fed into domestic credit creation or property price growth – contrary to what has been observed in some other EMEs – nor has it triggered a pickup in real gross fixed capital formation (GFCF) by the private sector. In fact, South Africa is one of only a few large EMEs where private credit has fallen as a share of GDP between 2008 and 2013 (see Graph 2). Equally, the ratio of GFCF to GDP remains well below pre-crisis levels, unlike in most Asian economies.

The fact that external debt financing is picking up from low levels, as well as the traditional reliance on equity (as opposed to debt) financing by South Africa's large corporations, probably explains why the trends described above have not had significant macro implications. In addition, South African corporates probably exploited cheaper foreign funding to finance investments abroad. Balance of payments data show that net outward FDI has increased significantly in recent years (ZAR 24.5 billion in 2012, ZAR 65.2 billion in 2013 and ZAR 65.9 billion in January–September 2014). As of end-2014, the stock of the non-financial corporate sector's FDI assets amounted to as much as 92% of its FDI liabilities, a much higher ratio than in earlier years.

(6.) What would be the impact on bank and non-bank corporations' balance sheets of a potential tightening of global financial conditions?

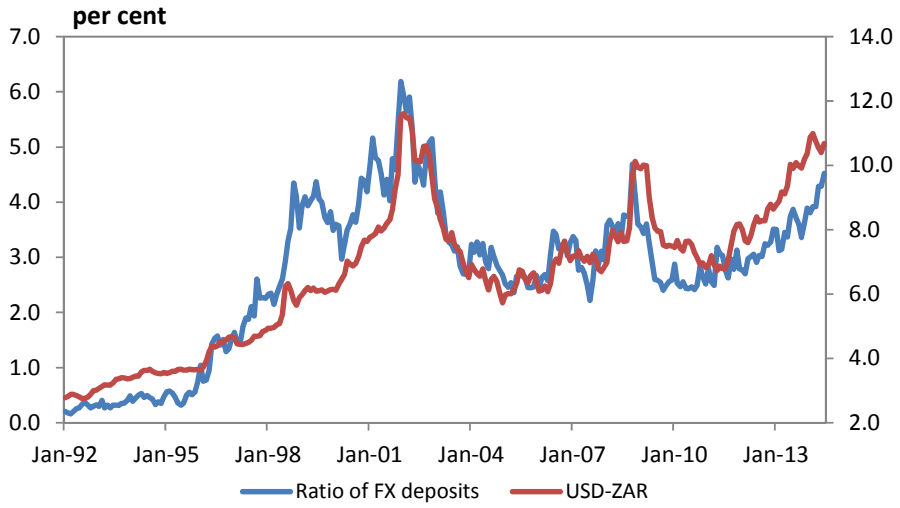
In an environment of greater cross-border exposure, tighter global financial conditions could damage corporates in several ways. Firms may find it more difficult and costly to refinance external debt. They may suffer valuation losses on their financial assets. Finally, FX asset-liability mismatches could affect their solvency. In South Africa, the banking sector's vulnerability is limited by: (1) the relatively low level of FX assets and liabilities; (2) the fact that they are reasonably well matched; and (3) the relatively low share of fixed income securities in their total assets.

While the FX deposit share of total bank deposits shifts in response to exchange rate fluctuations, it has never been higher than 6% over the past decade

(see Graph 3). In addition to FX deposits (ZAR 139 billion as of September 2014), South African banks received other foreign currency funding to the tune of ZAR 133 billion, representing altogether 6.6% of total liabilities. On the asset side, however, FX loans and advances totalled ZAR 314 billion, with an additional ZAR 163 billion of separate foreign investments. Hence, the South African banking sector's net external position is positive, meaning that the balance sheet should strengthen marginally in the event of rand depreciation – the latter being the likely consequence of a tightening in global financial conditions.

FX deposits with South African banks as share of total deposits and USD-ZAR exchange rate, 1992–Jun 2014

Graph 12



At the same time, South African banks do not have a high level of exposure to fixed income securities, which limits interest rate risk. Non-share financial investments, as of September 2014, amounted to ZAR 707 billion, or 17% of banks' balance sheets, the bulk of which consists of government bonds and Treasury bills, as well as derivative instruments issued by other South African banks. Banks would likely suffer some mark-to-market capital losses on their bond portfolios if global yields rise, particularly if domestic and US bond yields remain tightly correlated. Otherwise, South African banks benefit from very low exposure to higher-risk corporate bonds or asset-backed securities.

Corporate deposits with local banks remain elevated (see question 7), although these elevated cash holdings probably reflect domestic constraints on investment rather than a carry trade between cheap external funding and higher domestic interest rates. As for the risk of currency mismatches, the risk of higher FX debt servicing costs in the event of ZAR depreciation and higher global risk aversion is mitigated, in the case of commodity producers and manufactured goods exporters, by the FX denomination of most of their earnings.[2] At the same time, the relatively

[2] Indeed, Chui et al (2014) listed South Africa, together with Brazil, Mexico and Russia, as countries where the vulnerability of corporates should be reduced.

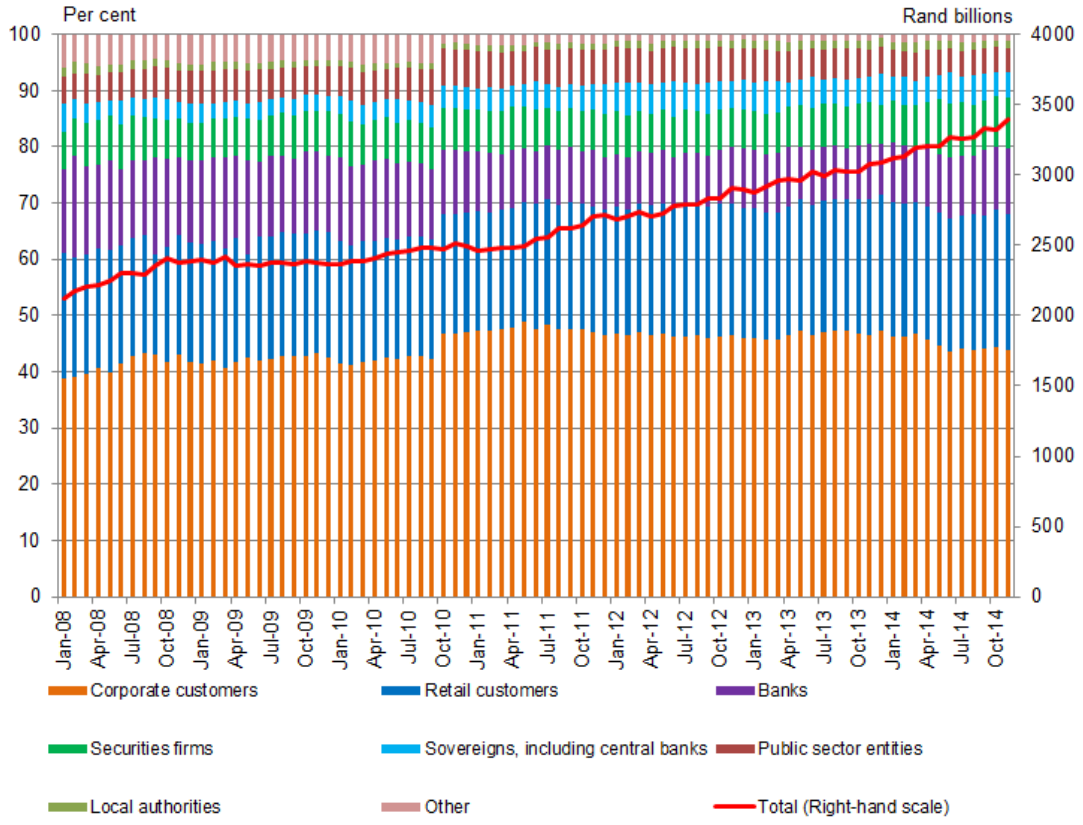
close match between FDI assets and the liabilities of the non-bank corporate sector (see question 5) is also a reassuring factor, even if some of these FDI assets are not in hard currencies (about 17%, for example, are in the rest of Africa).

(7.) What is the share of corporate deposits in total bank deposits? To what extent has it been affected by international debt issuance by non-financial corporations? What other interactions between banks and non-bank corporations' balance sheets are likely to be important from the viewpoint of monetary and financial stability?

Corporate deposits

As a percentage of total bank deposits, corporate deposits remained in a fairly narrow range. Adjustments made by one of the big banks in October 2010 to their classification of deposits elevated the level somewhat, but overall, prior to the global financial crisis and post the global crisis, the composition of total deposits remained fairly stable. According to the latest data available (October 2014), corporate deposits remained the largest component of banking sector deposits, accounting for 44.4% of total deposits.

Corporate deposits as percentage of total deposits — Graph 13

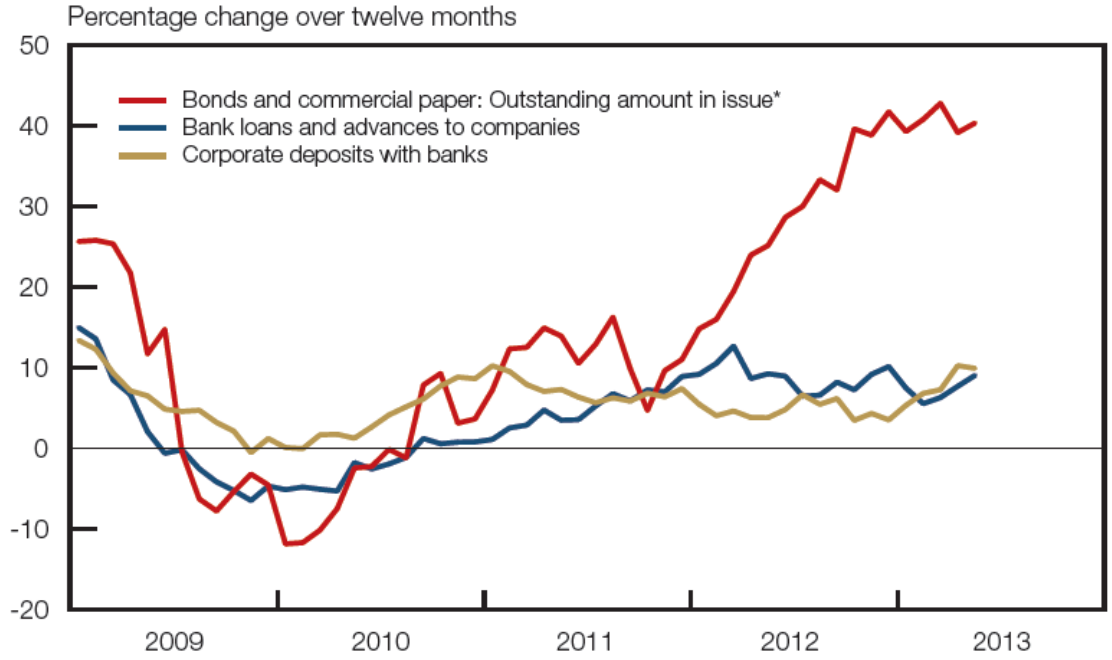


While growth in credit extended to corporates (by banks) has remained relatively constant (see Graph 2), the growth in bonds and commercial paper has increased rapidly in 2011 and 2012. Following this, however, the growth in the

corporate bond market[3] lost momentum in 2013 and 2014, with the nominal amount in issue increasing by only 9% in 2013, compared to 19% in 2012.

Bank loans and advances to companies compared to bond issuance and deposit growth

Graph 14



Excluding government bonds. Source: South African Reserve Bank, Annual Economic Report, 2013, p 66, JSE Limited

In 2014, lacklustre investor appetite and dwindling issuances were evident from August following the African Bank curatorship and bank credit rating downgrades. Some companies withdrew bond issuances in the wake of the above as borrowing costs were driven higher. Net issuances by the private sector of ZAR 12 billion in the first ten months of 2014 therefore fell short of the net issues of ZAR 20 billion recorded over the same period in 2014.[4]

[3] South African Reserve Bank, *Quarterly Bulletin*, September 2014.

[4] South African Reserve Bank, *Quarterly Bulletin*, December 2014.

Net issuances of bonds and commercial paper by issuer — Table 4

ZAR billions

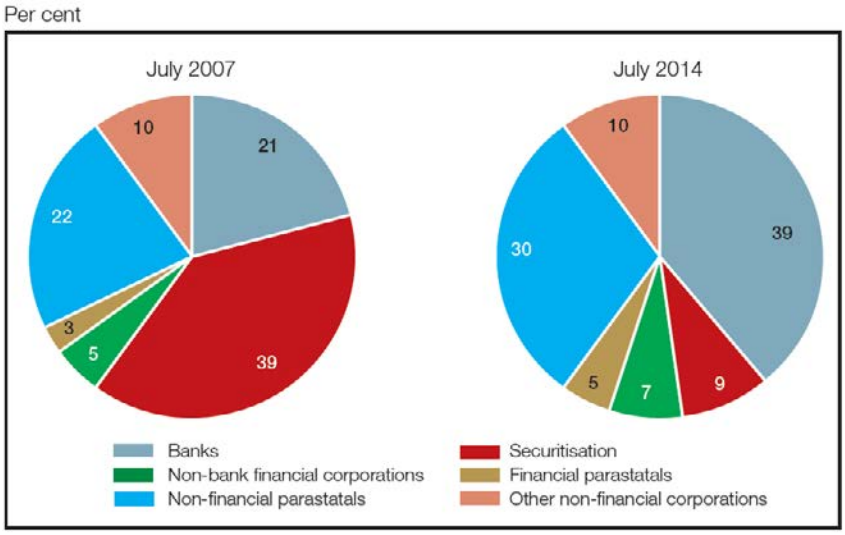
	2011	2012	January to June 2013	Amount in issue as at 30 June 2013
National government	149	176	63	1 089
Public enterprises	10	15	13	218
Local governments	-1	-0,3	2	16
Banks	31	55	-0,2	235
Non-bank private companies	7	28	9	103
Securitisation	1	-2	6	80
Non-residents	2	-2	-1	6
Total	199	269	92	1 747

Non-bank private companies in particular reduced their net issuances of bonds and continued with net redemptions of commercial paper, while funding through the issuance of securitised instruments also remained out of favour in 2014.

The banking sector, on the other hand, recorded higher net issuances, amounting to ZAR 21 billion in the first 10 months of 2014.

This trend is reflected in Graph 3, where by showing the share of amounts issued by type, it can be seen that in July 2014 banks accounted for almost 40% of the amount in issue in the corporate bond market, whereas seven years ago, prior to the financial crisis, securitisation issuances dominated with almost 40% of the amount in issue.

Corporate bond market amounts in issue by issuer type — Graph 15



Source: South African Reserve Bank, Quarterly Bulletin, September 2014.

International bond issuances

While corporate deposits as a share of total deposits remained more or less constant, and net bond issuances by the private sector slowed in the first 10 months of 2014 compared with 2013, offshore issuances of rand-denominated debt in the European bond markets grew rapidly in 2014. For investors, the attraction of Eurorand debt has been the combination of high yields and highly rated issuers. Investors have, therefore, been able to earn rand interest rates, but at lower perceived credit risk than if they had invested directly in South Africa. Eurorand debt has been extremely popular with retail investors who have been willing to accept rand exchange rate risk but preferred the lower credit risk of an investment-grade issuer. The attraction of the Eurorand market for issuers has been the low cost of funding. Interest in rand-denominated bonds in the Japanese uridashi bond market, however, continued to be subdued in 2014, with more redemptions than issues. As a result, the net issues in the Eurorand market were the key driver of the overall net issues of almost ZAR 21 billion in the first 10 months of 2014 across both markets, as shown in Table 2.

Rand-denominated bonds issued in international bond markets, January to October

Table 5

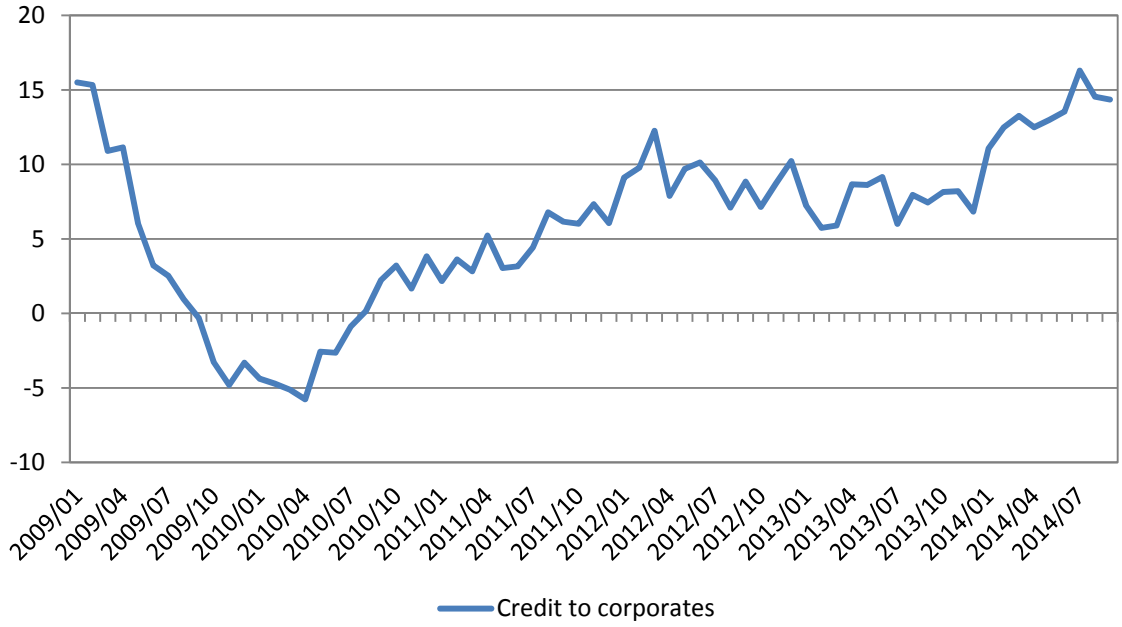
R millions

	Eurorand		Uridashi		Total	
	2013	2014	2013	2014	2013	2014
Issues	17 544	25 594	9 485	1 589	27 029	27 183
Redemptions	10 260	3 478	16 293	2 998	26 553	6 476
Net	7 284	22 115	-6 809	-1 409	475	20 707

There are several interactions on banks' and non-bank corporations that are likely to be important from the viewpoint of monetary and financial stability. Firstly, banks extend credit to corporates (see Graph 4). If the cost of this funding changes, it could result in corporates moving to the bond market for funding, or even to other non-bank financial intermediaries. The cost of bank funding appears to have increased recently[5] as a result of changed regulatory requirements relating to the implementation of Basel III, the impact of the bail-in of certain African Bank Limited creditors and the consequent rating action by Moody's Investors Service, all of which could result in tighter funding conditions. Therefore the cost of increased regulations and the effects it could have on credit demand should be taken into account.

[5] South African Reserve Bank, *Quarterly Bulletin*, December 2014.

Credit to corporates Graph 16



Also, even though banks hold almost 40% of the amount of bonds in issue in the corporate bond market, the share of non-bank financial corporations has also increased marginally over the past seven years. It should be taken into account that there are most likely overlaps in the holders of bank and non-bank financial bonds. Hence bank and non-bank corporations share common investors, in addition to investing in each other.

C. Implications for monetary policy

(8.) How have recent changes in financial intermediation affected the transmission mechanisms of monetary policy in EMEs (eg size and speed of pass-through of changes in policy rates, responsiveness of overall credit conditions and asset prices, impact on debt service ratios and through these, on the macroeconomy)?

Conventional wisdom holds that changes in monetary policy are transmitted more slowly in countries with greater bank intermediation than in those with high market intermediation. This reflects the fact that banks typically absorb part of the initial tightening in monetary policy via their margins, especially if (as is normally the case at the start of a tightening cycle) business conditions are buoyant and bank profitability is good. Equally, they may delay the pass-through of rate cuts if they feel the need to rebuild margins. By contrast, a market-based financing system can actually amplify a monetary policy decision, for instance if a rate hike not only is reflected through the whole yield curve but also results in wider corporate and mortgage bond spreads to governments, as well as weaker equities. The "taper

tantrum" of 2013 was a case in point. A financial system that shifts towards market intermediation should therefore become more skittish (or, as proponents might contend, nimble).

South Africa's financial system is a hybrid one in that banks provide most financing to households and small to medium enterprises (SMEs), whilst large companies mostly use equity markets. This system has not changed radically since the crisis. The private corporate bond market is growing, but it remains relatively small and banks still account for the bulk of outstanding issues. The non-bank financial sector has grown significantly over the past decade, but the bulk of its assets are in the hands of pension funds and life insurance companies, which are important buyers of government and state-owned enterprise (SOE) bonds, as well as equities, but play a more limited role in the financing of the rest of the economy. The shadow banking system, defined as all non-bank financial intermediaries other than insurance companies, pension funds and public financial institutions, now accounts for about 18% of financial intermediation, up from 13% before the crisis.

Since the 2008–09 recession, non-residents have been significant investors in local bond and equity markets. This has transmitted super-loose monetary policies to the domestic economy and should therefore also convey tightening. These developments primarily affect the bigger players: government, SOEs and large corporations. The rest of the economy should be affected more indirectly.

(9.) How [have recent changes in financial intermediation] changed the sensitivity [of monetary policy] to global monetary and financial conditions?

South African financial conditions have been strongly affected by global conditions since the 2008 crisis. For instance, the correlation between the yield on South African 10-year government bonds and US 10-year Treasuries jumped from 0.22 before the collapse of Lehmann Brothers to 0.84 afterwards. South Africa has also been one of the EMEs most exposed to changes in global conditions, as has been clear at least since the May 2013 "taper tantrum". But the reasons for this seem to have relatively little to do with financial intermediation. The causes are more likely the old-fashioned vulnerabilities of large twin deficits.

In all the countries rocked by the "taper tantrum", monetary policy has been tightened, although the responses varied in their pace and timing. In South Africa, the policy rate was raised by 50 basis points in January 2014 and by an additional 25 basis points in July 2014, despite a subdued outlook for economic growth.

(10.) How should monetary policy adapt to the changes in financial intermediation? For instance, to what extent should it react to sharp changes in risk premium in EME debt markets (through interest rate and/or balance sheet measures) and respond to broader vulnerabilities?

As the previous answer makes clear, for South African monetary policy, the traditional vulnerabilities – especially the twin deficits – are more significant than new risks from changes in financial intermediation. Markets have become apprehensive of EMEs with large current account deficits, which require financing that might become scarce as global monetary conditions tighten.

The immediate consequence has been currency depreciation, realised in bursts and interspersed with periods of relative calm. These conditions have coincided with

slowing growth. The difficulty for policymakers has been crafting an appropriate response. The risks are two-sided. Higher rates could depress output and widen an already negative output gap. However, it is also possible that, by moving too slowly, policymakers might ultimately allow a crisis to develop, perhaps in the form of a "sudden stop". Less dramatically, higher inflation from a depreciating currency could unhinge inflation expectations, eventually requiring a stronger monetary response. The recent collapse in oil prices has lent support to the inflation outlook, tempering this problem. But permanently lower oil prices cannot be guaranteed, and the benefits of cheaper oil would be diluted or possibly even nullified by additional currency depreciation.

To achieve the right balance, it is probably necessary not to deviate too far from changes in world policy rates. Within the context of the SARB's Quarterly Projection Model (QPM), a 100 basis point increase in international policy rates causes depreciation which ultimately leads to an increase in the repo rate of between 50 and 60 basis points (see Graph A.9.1). This calculation is rendered more difficult by policy divergence between major advanced economy central banks. The US Federal Reserve has tightened policy by tapering and recently ending quantitative easing, and is expected to raise its policy rate in the second half of 2015. However, other major central banks have shifted to easier monetary policies, perhaps offsetting some of the Fed's impact on global monetary conditions.

(11.) To what extent do macroprudential policies influence the transmission mechanism of monetary policy? How far do they complement or substitute for interest rate policies?

In contrast to a number of other economies, South Africa has not experienced a situation in the post-crisis period that has necessitated the implementation of conventional macroprudential policies in order to address risks in the financial sector. In general, both credit extension and asset prices have grown at fairly moderate rates since the depths of the financial crisis in 2009. For example, from the first quarter of 2010 to the third quarter of 2014, annual nominal credit and house price growth have averaged 6.6% and 5.7%, respectively, compared to nominal GDP growth of 8.8% over this period. In real terms, annual credit, house price and GDP growth have averaged 1.2%, 0.3% and 2.5%, respectively.

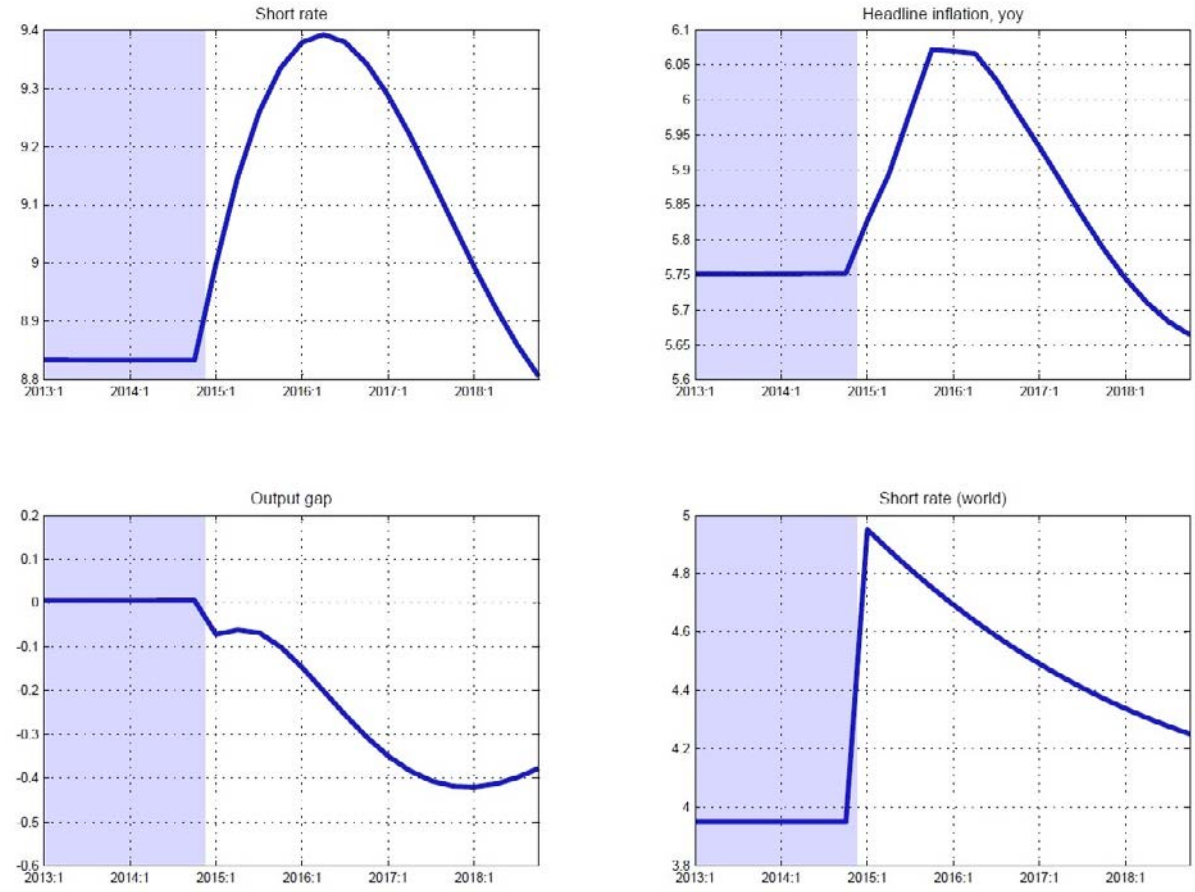
Nevertheless, the core forecasting model of the SARB has been modified to account for financial frictions that were not part of its structure before the global financial crisis of 2008 and 2009. These modifications include effective lending rates (which at times may be changing disproportionately to the policy rate, weakening the monetary policy transmission mechanism), credit extension by shadow banks (non-bank financial intermediaries), as well as certain balance sheet indicators such as banks' capital adequacy ratios, their distance-to-default and the Basel III net stable funding ratio (NSFR). Movements in any of these variables generally reflect changes in the behaviour of banks, which in turn affect the real economy through various income channels in the model. Moreover, the model's structure also accounts for the linkages between certain macroprudential policy tools and these financial variables, and therefore the ultimate impact of these tools on the real economy – were they to be implemented at any stage.

Although South Africa has not recently utilised a macroprudential policy tool, we can use the model to describe its effects. In the following example, we assume that a build-up of excessive credit extension in the South African economy

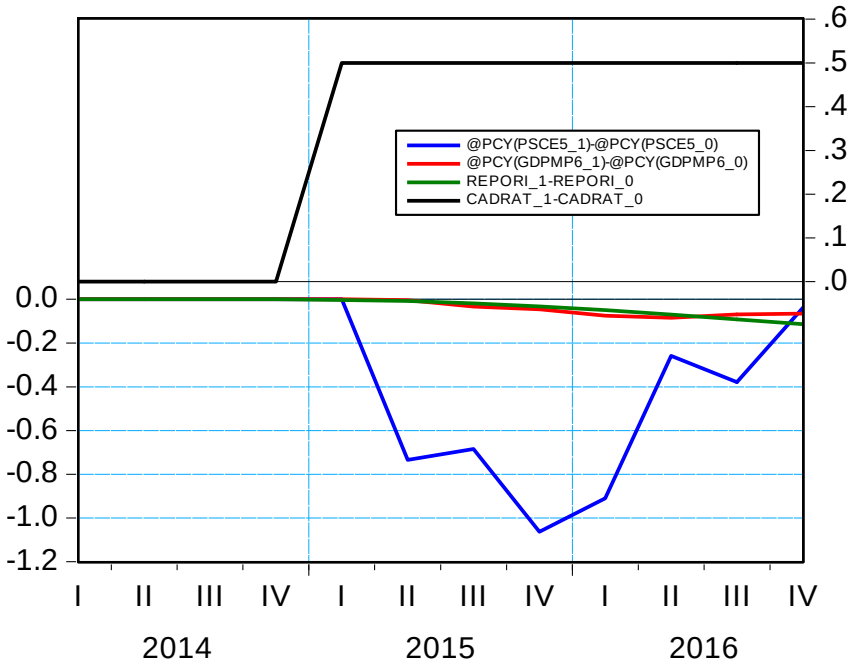
necessitates the implementation of the countercyclical capital buffer (CCCB). As advocated by the Basel III regulations, the CCCB acts as a macroprudential add-on to the banks' existing capital adequacy ratio.

Graphs 17–21 indicate the impact of a 50 basis point increase in the required capital adequacy ratio of banks following the implementation of the CCCB. The additional capital that needs to be raised by banks leads them to curtail their lending. This is reflected by a 1.05% decline in private sector credit extension after four quarters, which in turn slows down real economic activity by around 0.1% after eight quarters. Allowing monetary policy to react endogenously to the slowdown in the real economy (within the context of the model), enables measurement of the influence that macroprudential policy could have on monetary policy. Here, the 50 basis point increase in the countercyclical capital buffer leads to an eventual lowering of the repo rate by around 10 basis points after eight quarters.

Spillovers from global monetary policy to the South African economy — Graph 17-20



The response of credit and output to a countercyclical capital buffer Graph 21



Patterns of financial intermediation in Thailand: implications for central bank policy[1]

Monetary Policy Group, Bank of Thailand

Abstract

Over the past decade, the domestic bond market and specialised financial institutions (SFIs) have played a greater role in financial intermediation in Thailand.[2] The bond market's increasing importance in financial resource allocation is due mainly to a set of policies to promote the financial markets as an alternative source of financing for the banking sector in both the public and private sectors. Other contributory factors arise from the lengthy and unprecedented post-crisis monetary easing in advanced economies, which has led to increased foreign demand for domestic bonds. In addition, accommodative domestic financial conditions have recently incentivised Thai firms to participate more in the bond market to lock in low interest rates. Within the Thai banking sector, SFIs have gained more importance in credit extension, initially as a main part of the government's countercyclical policies during the global financial crisis (GFC), and to support the government's spending and stimulus measures in the subsequent periods.

In Thailand, risks to external vulnerabilities remain contained. Despite high global liquidity, Thai firms' offshore borrowing remains limited owing to the relatively lower costs of domestic funding. Following the GFC, commercial banks' foreign liabilities have continued to grow, but remain contained relative to their balance sheets.

Across the period, the degree of monetary policy effectiveness has been affected by the increasing importance of the domestic bond market and SFIs. Looking ahead, the monetary policy priority is to support an ongoing economic recovery against the backdrop of a subdued inflation outlook and impending global financial market volatility.

Keywords: Thailand, financial intermediation, financial stability, monetary policy transmission

JEL classification: E44, G10, G21, F34, E52, E58

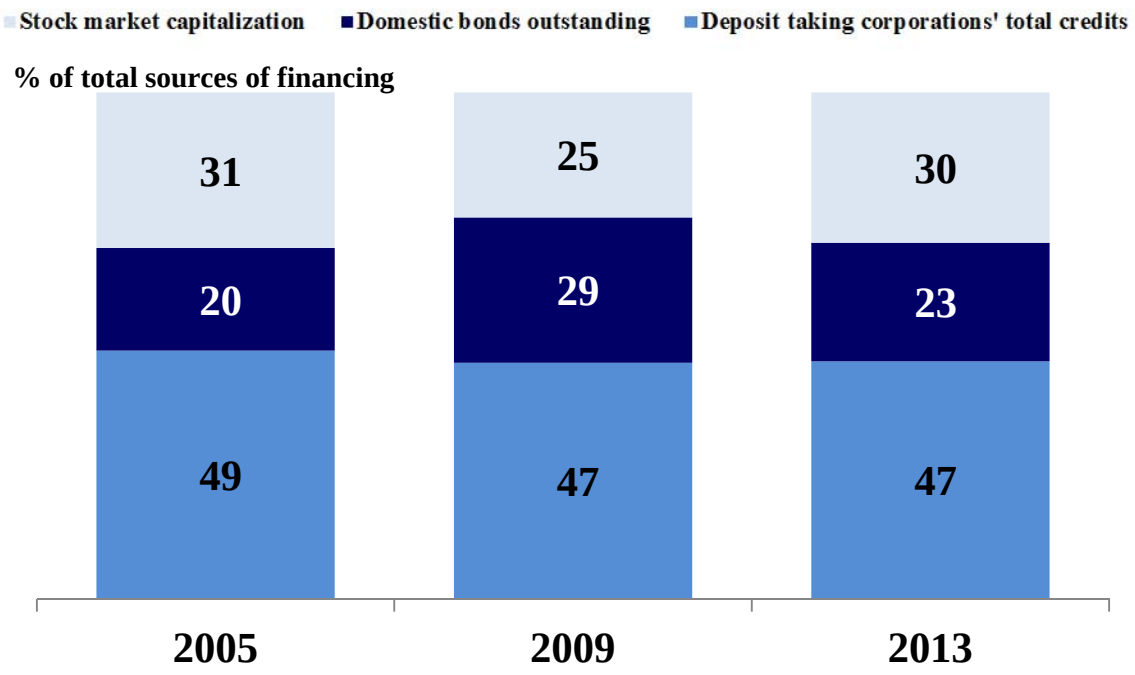
[1] Thailand's country paper for the BIS meeting of Deputy Governors of emerging economies' central banks on 25–27 February 2015.

[2] In this note, financial intermediation in Thailand encompasses (1) financing activities performed by domestic financial markets and by domestic banks operating both at home and abroad as well as (2) Thai firms and banks' overseas bond issuance and offshore borrowing.

Overview of the Thai financial landscape over the past decade

For the past 10 years, the banking sector[3] has remained the main channel of financial intermediation, especially for the private sector, by competing for most deposits and loan business. At the end of 2013, total credits extended by all deposit-taking corporations (excluding the central bank) accounted for 47% of total sources of financing[4] (Graph 1). In terms of participants, the four largest domestic commercial banks have maintained their dominance as financial intermediaries for households and firms, and thus have maintained their strong influence on the pass-through of monetary policy to the economy. Unlike the 1997 Asian economic crisis, the GFC did not directly bring significant changes to the Thai financial landscape due to the country's sound economic fundamentals and banking system.

Structure of financial intermediation in Thailand — Graph 1



Note: 1. Stock market capitalization is the size of the Stock Exchange of Thailand (SET); 2. Domestic bonds outstanding issued by residents; 3. Deposit-taking corporations include commercial banks, SFIs, cooperatives etc. (excluding a central bank)

Source: The Stock Exchange of Thailand; Bank of Thailand; BOT staff calculation

[3] The Thai banking sector consists of domestic commercial banks, foreign commercial banks, SFIs, cooperatives and other deposit-taking corporations. When used in isolation, banks refer to deposit-taking corporations (excluding the central bank) in general. Domestic (foreign) banks refer to domestic (foreign) commercial banks.

[4] Total sources of financing are represented by a summation of stock market capitalisation, domestic bond outstanding and total credits extended by all deposit-taking corporations (excluding the central bank).

However, changing economic and financial conditions, in part arising from exceptionally low global interest rates following the GFC, and a prolonged period of accommodative domestic monetary policy as well as government policy have induced changes in the Thai financial system. Some are transient while others reflect a longer-term structural adjustment. Among these changes, two important adjustments have affected the effectiveness of monetary policy transmission. First, the domestic financial markets have gained more importance as alternative places for the private and public sectors to save and raise funds. This is evidenced by a rise in the financial markets' share to total sources of financing from 51% in 2005 to 53% in 2013. The financial markets have also progressed in terms of the diversity of participants and liquidity in the secondary market, despite a temporary plunge in the stock market's capitalisation during the subprime crisis. Second, SFIs, which are effectively instruments for government policy implementation that facilitate and support fiscal policy, have been as active in loan extension and deposit mobilisation as the commercial banks. While their growing importance supported the Thai economy during the GFC, this has in turn affected the interest rate adjustments made by commercial banks in the following period.

The rest of this note is structured as follows: Section 3 explores the role of the banking sector and banks' external exposure; Section 4 presents development in the domestic bond market as well as Thai firms' sensitivity to global monetary conditions. Implications for monetary policy are discussed in the last section.

The role of the banking sector

Over the past decade, the Thai banking sector has maintained its predominance in intermediating financial resources to the real economy. Government policies have played a part in influencing the degree of competition within the sector. In addition, changes in economic and financial conditions at home and abroad have altered banks' balance sheets and business operations. In this note, the development of the Thai banking sector is surveyed in terms of participants, banks' business models and factors affecting bank balance sheets.

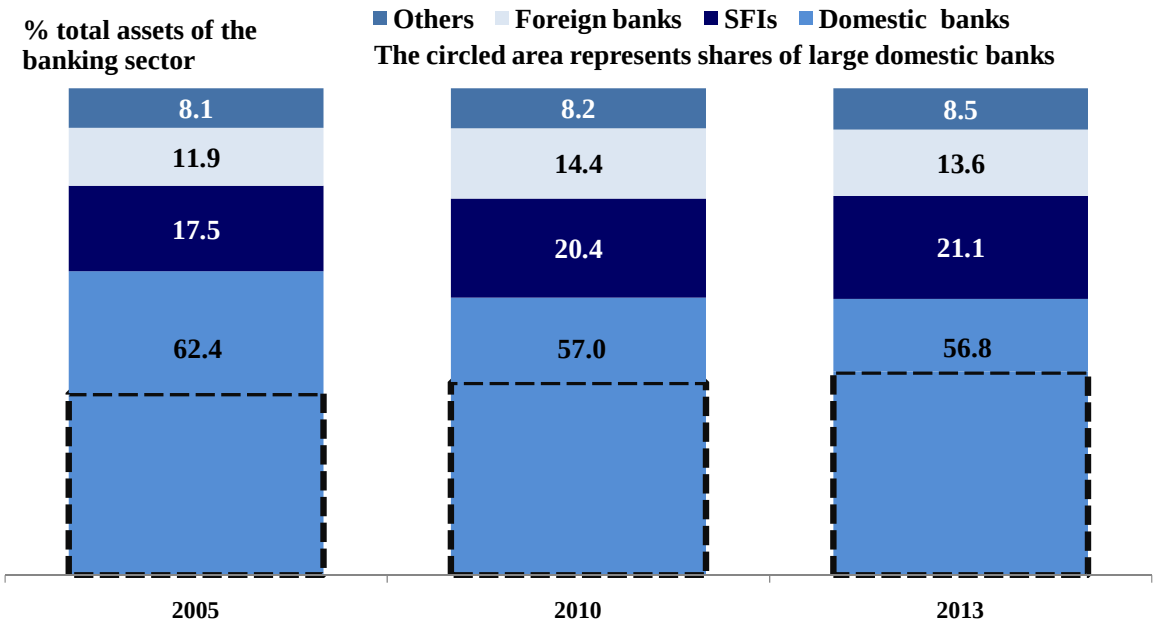
Relative importance of participants

Graph 2 provides a snapshot of each participant's relative importance in the banking sector, proxied by their asset sizes as a percentage of total banking sector assets. Domestic commercial banks, dominated by a small number of large institutions,[5] remain dominant, accounting for approximately 60% of the sector in 2013. SFIs and foreign commercial banks[6] had moderate shares of 21% and 14%, respectively.

[5] The largest four domestic commercial banks, comprising Bangkok Bank, Kasikorn Bank, Siam Commercial Bank and Krungthai Bank, made up 61% of commercial banks' total assets at the end of 2013.

[6] Foreign banks are defined as commercial banks with foreign control of 50% or more of total ownership. They are categorised as either branches or subsidiaries. Graph 4 shows the number of operating branches of both branches and subsidiaries.

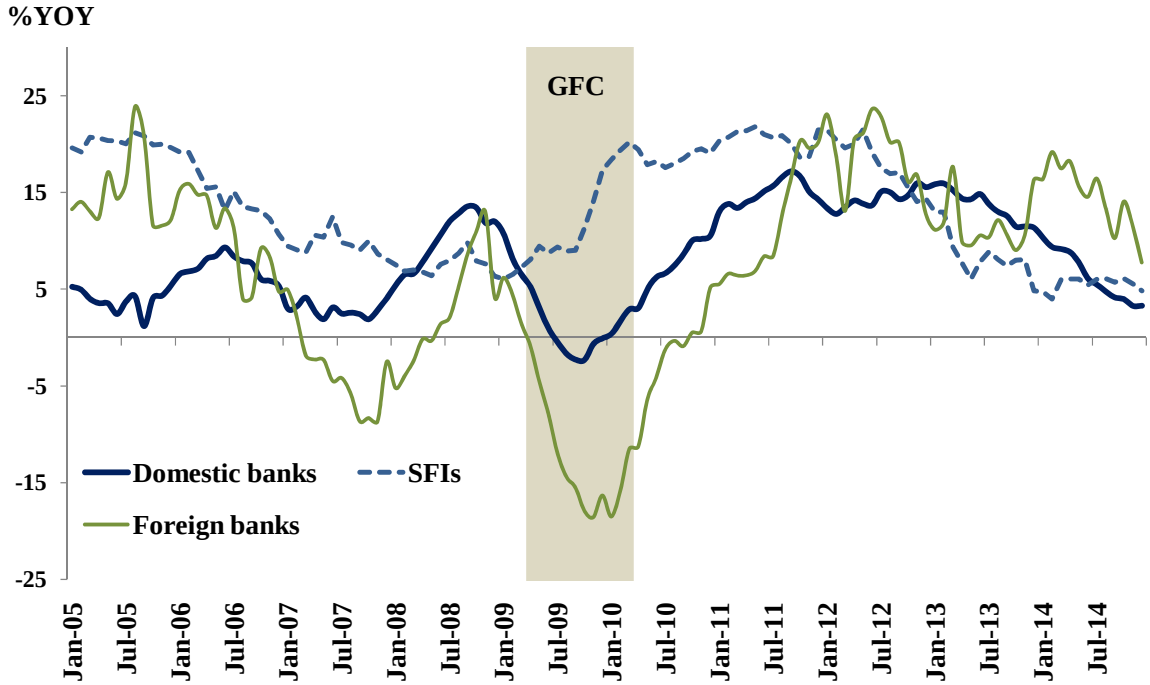
Relative importance of players in the Thai banking sector Graph 2



Note: 1. Others include cooperatives, credit unions etc; 2. Calculated from end-of-period outstanding of total assets

Source: Bank of Thailand; BOT staff calculation

Growth of private credits Graph 3



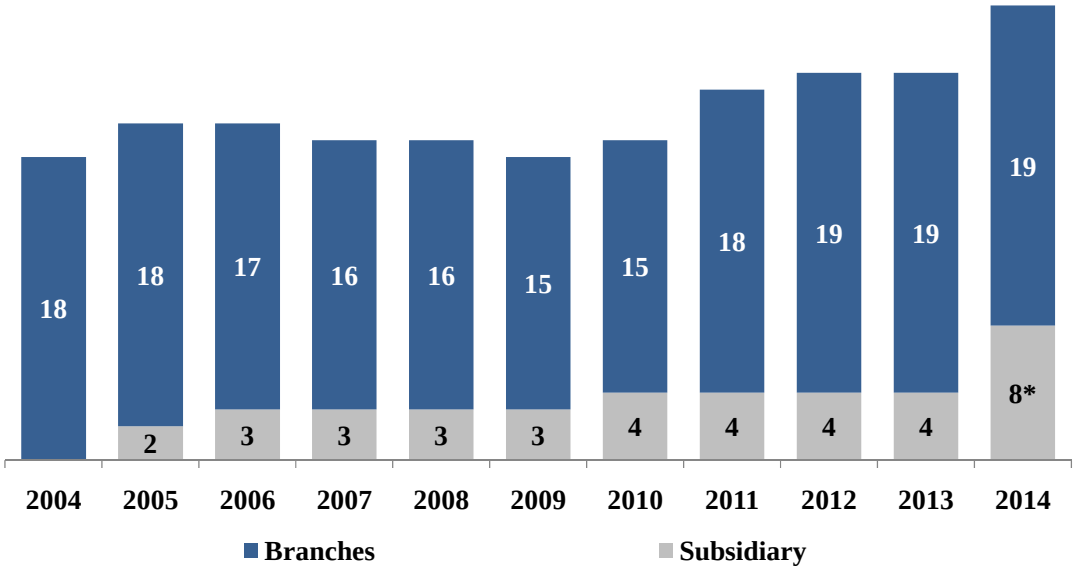
Note: Private credits refer to credits extended by the banking sector to the corporate, non-depository corporations and household sectors

Source: Bank of Thailand; BOT staff calculation

Despite the dominance of commercial banks, it is evident that SFIs have managed to increase and maintain their market share, from 18% in 2005 to 21% at the end of 2013. The change took place in 2010 when SFIs significantly expanded loans to households and firms, some of whom had been rejected by commercial banks, which had tightened credit standards in response to global economic uncertainty. During the GFC, SFIs' private credits sharply accelerated, compensating for a sharp contraction in loans extended by domestic and foreign banks (Graph 3). SFIs' lending during this period helped to mitigate some of the negative impacts the Thai economy endured from the GFC. .

Following the GFC, partly in support of the government's policies and stimulus measures, the SFIs continued to extend their business by aggressively competing with commercial banks for deposits and extending loans to borrowers who already had access to commercial banks. More intense competition from SFIs resulted in a reluctance on the part of commercial banks to adjust their lending and deposit rates following monetary policy easing. Nevertheless, the extended domestic economic slowdown since 2013 and the subdued outlook for lending business have reduced competitive pressure across the banking sector. As a result, commercial banks have been more responsive to the recent policy rate cut.

Number of foreign banks' branches in Thailand — Graph 4



Note: *The opening of four new branches in 2014 were owned by Bank of China and Mega International Commercial Bank. Bank of China was upgraded from branch into subsidiary in August 2014

Source: Bank of Thailand; BOT staff calculation

Foreign banks remain of limited importance, accounting for just 14% of the banking sector's total assets. In contrast to SFIs and domestic banks, foreign banks participate in retail lending and deposits, the major areas of Thai bank business, only to a small extent. With only a small number of branches to facilitate retail lending, foreign banks tend instead to focus on areas where they can bring more expertise and comparative advantage to bear, such as wholesale funding, investment banking and trading services, as well as credit extension to affiliated foreign firms. Despite the second phase of the Financial Sector Development Plan

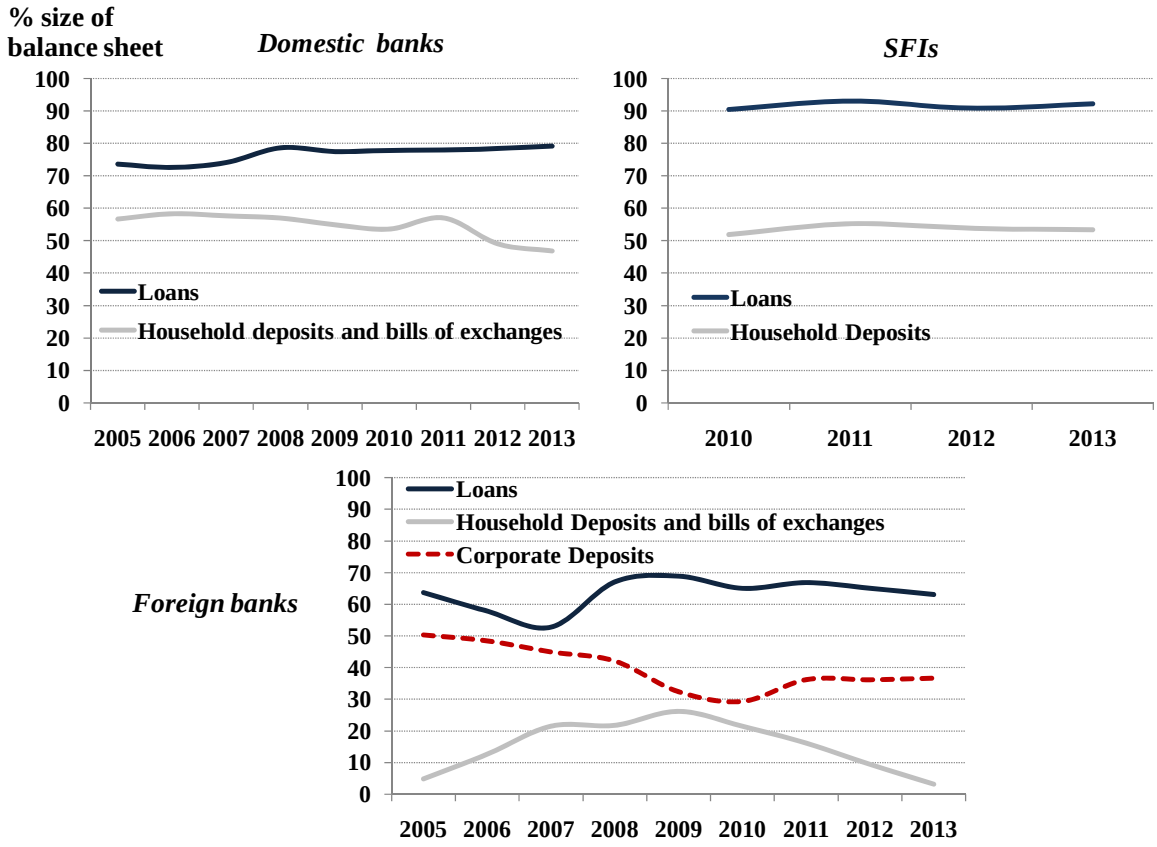
(2010–14), which aimed to enhance the level of competition within the banking sector partly via promoting greater foreign participation,[7] competition from foreign banks remains small-scale, with only a marginal increase in the number of foreign bank branches (Graph 4).

Banks' business models

Like most banks domiciled in emerging market economies (Roengpitya, Tarashev and Tsatsaronis (2014)), Thailand's domestic banks and SFIs have continued to follow the retail funded business model, categorised by a high share of loans on the balance sheet and high reliance on stable funding sources including household deposits and bills of exchange. Domestic loans and stable funding made up 80% and 50% of bank balance sheets at the end of 2013 (see Graph 5), while the loans and household deposits[8] of SFIs comprised 90% and 50% of their balance sheets. The declining share of domestic banks' stable funding since 2011 could be

Banks' business models

Graph 5



Source: Bank of Thailand; BOT staff calculation

[7] by permitting foreign banks' branches to request opening of up to three additional operating branches and a status upgrade from branches to subsidiaries.

[8] SFIs are not allowed to issue bills of exchange.

explained by a sharp drop in bills of exchange, after their regulatory cost advantage expired, as well as by a continued slowdown in household deposits.[9]

The business model of foreign banks could be classified as wholesale-funded, as reflected in a much lower reliance on retail deposits and bills of exchange, despite the strong growth of bills of exchange between 2006 and 2010 owing to their regulatory advantages in that period. At the end of 2013, loans and household deposits constituted 63% and only 3% of their balance sheets, respectively. Even the main source of deposits from businesses made up only 36% of foreign banks' balance sheets. In terms of funding, foreign banks generally rely on their parent banks operating abroad. On the asset side, foreign banks' share of loans has been lower than that of domestic banks as their income generation is more reliant on a wider range of more sophisticated financial products and services. During the GFC, the foreign banks' supply of loans contracted more sharply than that of domestic banks, mirroring the more widespread and pronounced effect of the crisis on their global parent banks.

Factors affecting banks' balance sheets

Following the GFC, the source of banks' deposits has gradually shifted away from households to businesses, especially for domestic banks (Graph 6). The main reason is a continued deceleration in household deposits as households have switched to other savings products with higher returns than historically low deposit rates. As a result, total deposit growth has been outpaced by loans, resulting in a rise in the loan-to-deposit ratio. On the other hand, domestic banks have managed to maintain a portion of liquid assets close to its historical average, suggesting that liquidity might not be a major constraint on their capacity to extend loans, which generally depends more on the economic outlook and borrower creditworthiness. Moreover, the subsidiary companies of domestic banks have also engaged in competition for funds through alternative saving products such as money market funds.[10] This to a certain extent has assured banks' access to liquidity for extending credit as needed.

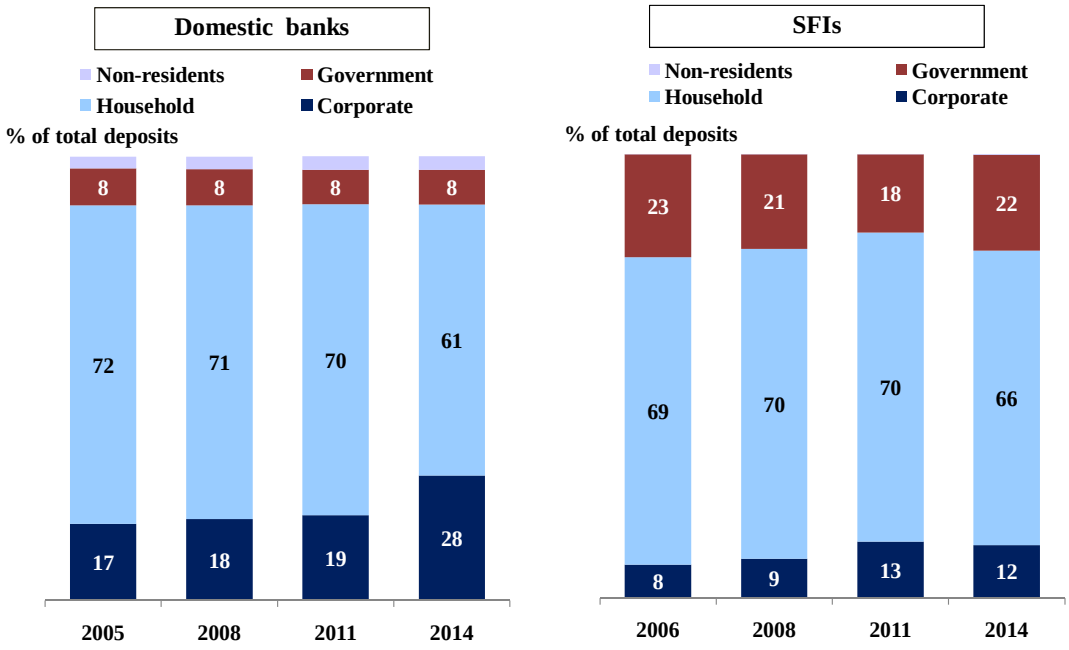
Banks' lending structures have developed in an opposite way to that of deposits. As shown in Graph 7, domestic bank loans extended to households have increased their share of total lending since 2009. During the GFC, household credit kept expanding at a low rate, in contrast with the sharp contraction in business credits, given that banks were more concerned over the financial health of businesses, particularly those relying on exports. Until 2013, household loan growth continued to be elevated, particularly for auto leasing and mortgages, buoyed by a strong economic recovery as well as stimulus measures such as a tax rebate scheme for first-time car buyers (2011–12) and property sector stimulus measures (2010).

[9] Until 2012, funds raised through bills of exchange were not subject to the regulation that required commercial banks to allocate 0.46% of their deposits to the Financial Institutions Development Fund (FIDF), making bills of exchange more attractive for fundraising during this period.

[10] Commercial banks' subsidiaries have expanded their business to include services related to asset management, securities, life insurance and non-life insurance.

Structure of banks' deposits

Graph 6

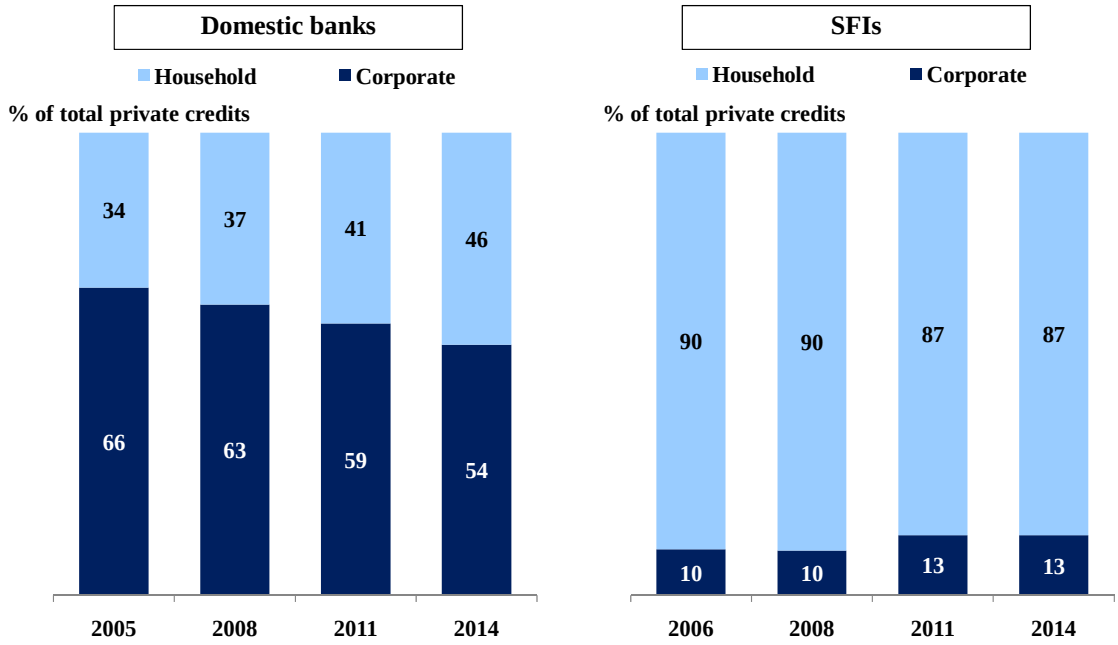


Note: 1. Percents of total deposits excluding those of deposit-taking corporations; 2. SFIs' data beyond 2006 is not available

Source: Bank of Thailand; BOT staff calculation

Composition of credits extended to the private sector

Graph 7



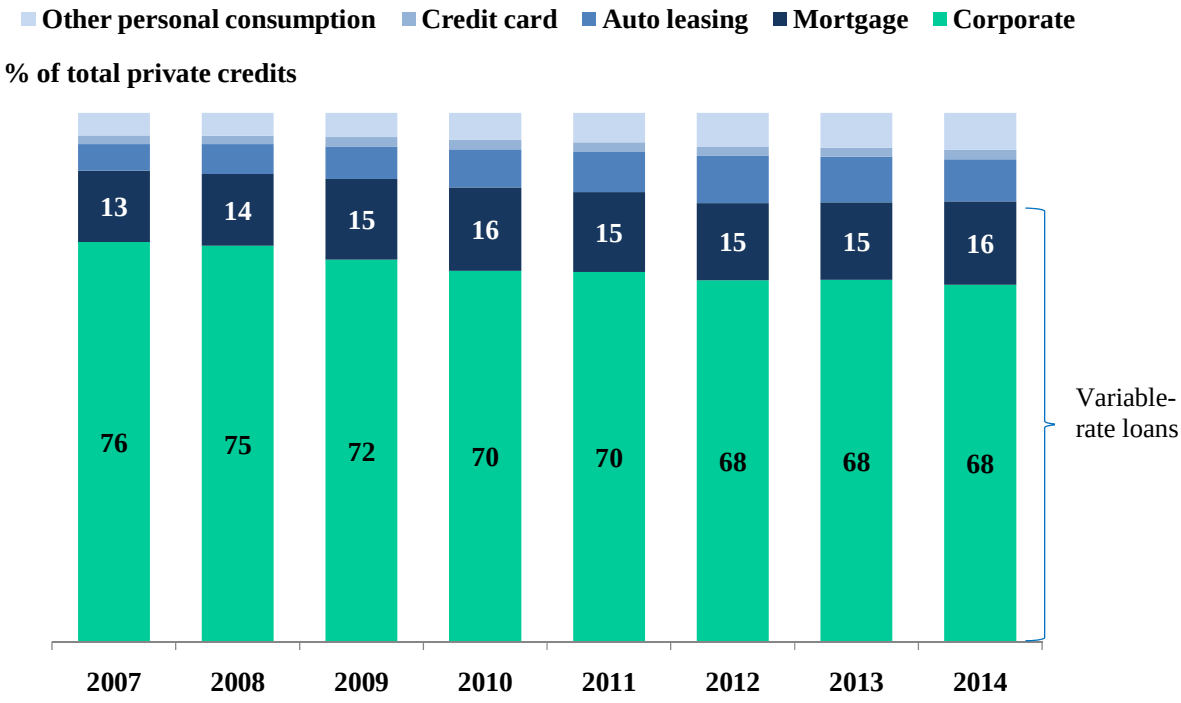
Note: 1. Percents of total loans extended to the private sector, including households, businesses and other financial institutions; 2. Data of SFIs beyond 2006 is not available

Source: Bank of Thailand; BOT staff calculation

SFIs have also been a major contributor to credit growth since the GFC due in part to state-imposed commercial incentives. Since the GFC, SFIs have rapidly expanded their lending to household and business credits both expanded, and a spectacular growth in business credit for rebuilding after the 2011 floods increased their overall share. Variable-rate lending, broadly represented by mortgage and business loans, accounted for 84% of commercial banks' total lending at the end of 2014.[11] The remaining 16% of loans was mainly fixed rate. The structure has been more or less stable over the period (Graph 8).

Over the past 10 years, the business outlook and cash flow of potential borrowers have been key considerations in domestic banks' credit decisions. Domestic banks are quick to adjust their lending standards in line with changing economic conditions. This was evident during the GFC, when they significantly tightened credit standards, particularly for businesses, leading to a marked drop-off in business loans. More recently, elevated household indebtedness and slow income growth have induced domestic banks to reduce their lending particularly to low-income households and to small and medium businesses. On the other hand, the case for SFIs may differ from that of domestic banks, as their credit standards have appeared to be looser across time, in part owing to their mandate to promote greater access to the formal financial system, particularly for low-income households and small firms.

Composition of commercial banks' private credits — Graph 8



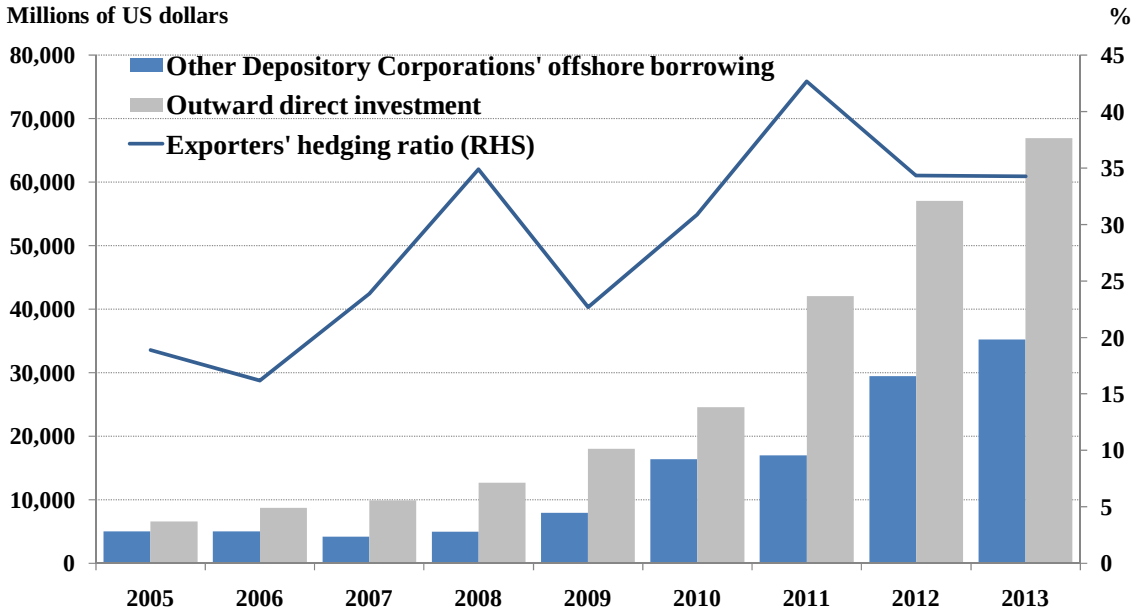
Source: Bank of Thailand; BOT staff calculation

[11] SFIs' loans categorised by lending purpose are for internal use only.

With regard to banks' external exposure, following the GFC, commercial banks' foreign liabilities have continued to grow, mainly due to the funding requirements of Thai firms investing abroad, an increase in non-residents' demand for bank equities, and the response of banks to an increase in demand for currency hedging from exporters. Offshore borrowing[12] has increased (see Graph 9), mainly as foreign banks have borrowed foreign currencies from their headquarters to meet increased demand from domestic banks for foreign currencies. Foreign currencies are used by domestic banks to square their foreign currency forward contracts with exporters and to fund outward direct investment by Thai corporations, which has significantly expanded since 2010. The latter resulted in an increase in foreign currency loans to the Thai corporate sector.

Other Depository Corporations' external loans*, Thai outward direct investment*, and Thai exporters' hedging ratio

Graph 9



Note: * International Investment Position data (Outstanding), while outward direct investment was made by all residents

Source: Bank of Thailand; BOT staff calculation

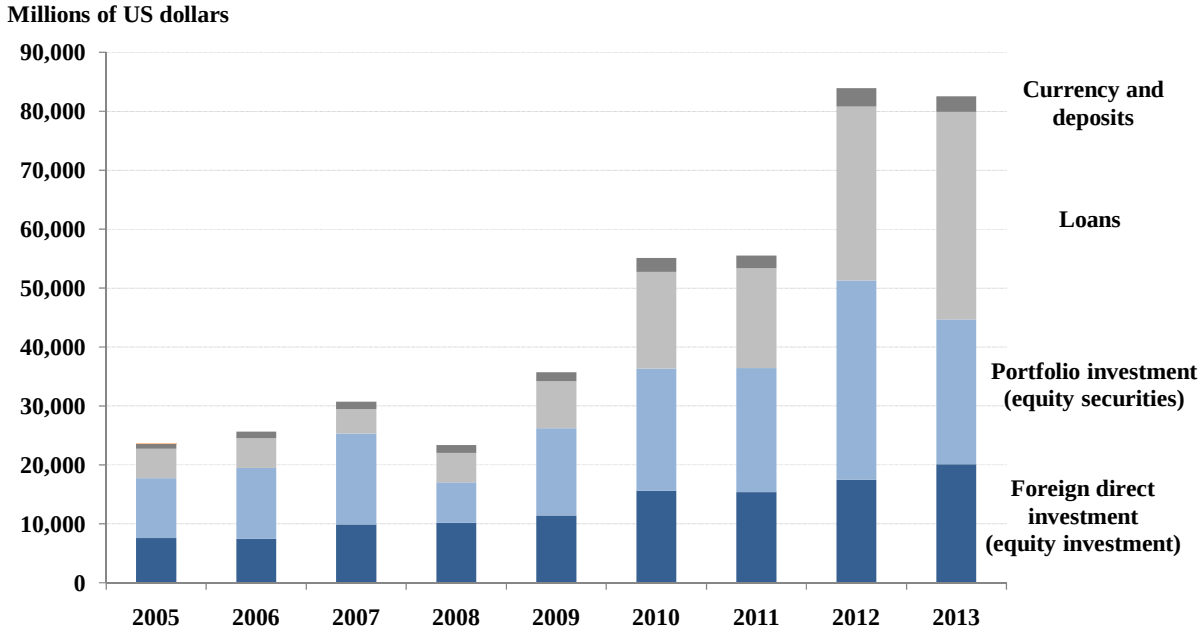
Greater investment abroad by Thai firms can be attributed to a combination of factors, including slow domestic demand growth, tightening in the Thai labour market, a rise in minimum wages and business relocation after the 2011 flood. Regulations also supported this change. In its Capital Account Liberalisation Master Plan announced in October 2010, the Bank of Thailand deregulated outward direct investment by Thai firms seeking to expand their business base and enhance their competitiveness.

Another noticeable change is a marked increase in equity securities investment (Graph 10), arising partly from non-residents' demand for bank equities in search-for-yield behaviour driven by the exceptionally low returns in advanced economies.

[12] Data on International Investment Position (IIP) is on a residency basis.

This foreign demand has coincided with an increase in banks' equity issuance in conformity with the Basel III regulations. Last, foreign direct investment by banks has also risen, reflecting greater foreign ownership of domestic banks mainly via mergers.[13] Higher foreign control of domestic banks might have future implications for banks' business models toward the wholesale funded type, though the change has not been evident to date.

Other Depository Corporations' foreign liabilities* Graph 10



Note: * International Investment Position data (Outstanding)

Source: Bank of Thailand; BOT staff calculation

During the GFC, the limited international exposure of commercial banks helped them weather the crisis. Only marginal losses were sustained, owing in part to the banks' low holdings of subprime-related assets. Since the GFC, commercial banks have increased their foreign assets and liabilities, but only to a moderate 5.6% and 8.4% of their balance sheets at the end of 2013, respectively. Moreover, risks to banks' solvency arising from maturity and currency mismatches have not been evident. Future tightening in global monetary conditions might have implications for bank balance sheets. But thanks to their limited external exposure and strong financial positions, the commercial banks should be able to absorb changes in monetary conditions and continue to effectively perform their role of financial intermediation.

[13] In 2014, Bank of Ayudhya (the fifth largest domestic bank in Thailand) was taken over by Mitsubishi UFJ (MUFG) and integrated into the Bank of Tokyo-Mitsubishi (BTMU), a foreign branch under the MUFG umbrella.

The role of the bond market

Representing as it does an additional source of financing for both the public and private sectors, the development of the bond market has been a priority for the Thai authorities since the 1997 crisis, as reflected in the Bond Market Development Plan I (1998–2004), Plan II (2005–08) and the Capital Market Development Master Plan that ran until 2014.[14] High levels of global liquidity and an extended period of accommodative domestic monetary policy have contributed to the Thai bond market's growing relevance in financial intermediation. This, nevertheless, poses a set of challenges for domestic policymakers in dealing with any future changes in the monetary policy of major central banks.

In this note, we highlight two main issues regarding the development of the bond market including: market structure and linkages with the global financial markets.

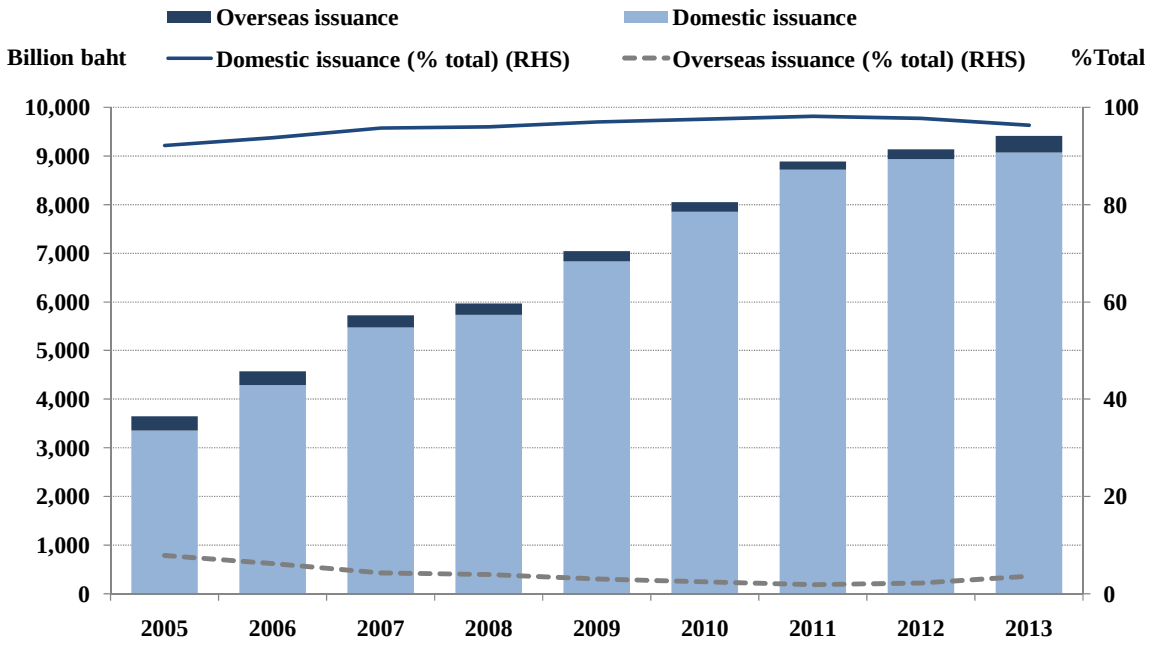
Structure of the bond market in Thailand

Post-crisis, the Thai bond market[15] has continued to grow at an average annual growth of 10% during 2009–13 (Graph 11). This was partly spurred by continued capital inflows in the wake of the ultra-loose monetary policies of advanced economies. Foreign investors have thus continued to increase their bond holdings, which currently comprise about 10% of domestic bonds outstanding at the end of 2013. A prolonged period of low domestic interest rates has also contributed to the market's expansion. New issuance of Thai corporate bonds increased remarkably in 2014, totalling THB 308 billion, up from THB 134 billion in 2013, as large firms locked in low interest rates in part to refinance banking loans with the aim of cutting debt servicing costs.

[14] The Bond Market Development Plan I focused mainly on building sound market infrastructure such as enhancing the role of market-makers (primary dealers) and establishing a longer yield curve benchmark. Plan II went further by enhancing market breadth and depth. The Capital Market Development Master Plan (Measure 8) was aimed primarily at increasing liquidity in the market, developing more diverse products, and establishing risk management tools such as interest rate futures and bond futures.

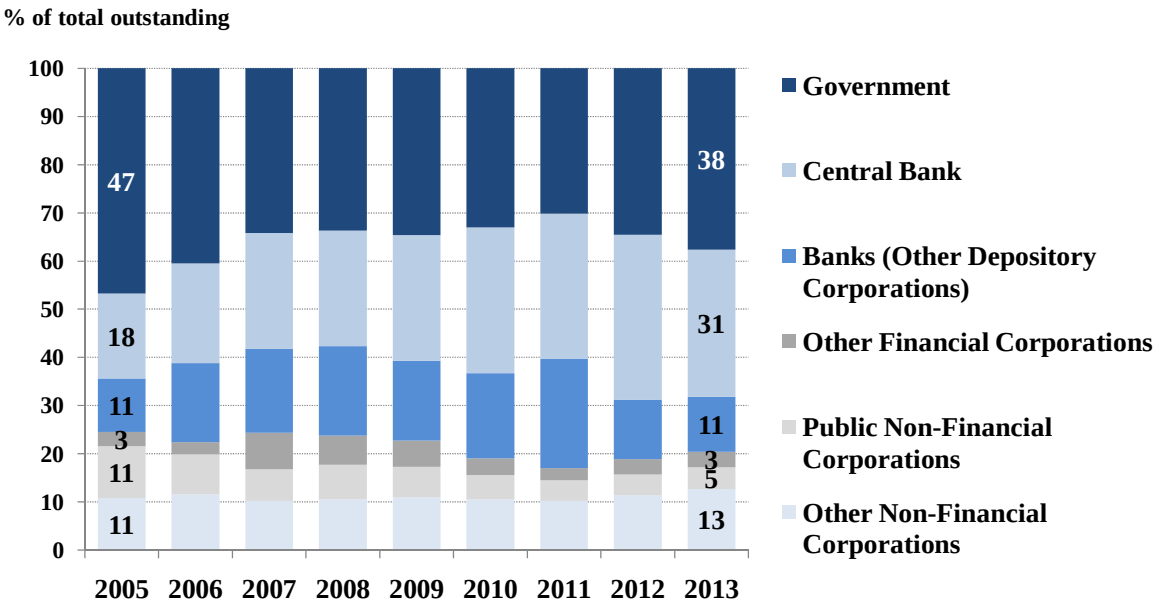
[15] We focus only on bonds issued by Thai residents, as those issued by non-residents have made up only a very small proportion of total bonds issued in Thailand.

Debt securities outstanding (by residency of borrower) Graph 11



Source: Bank of Thailand; BOT staff calculation

Debt securities outstanding classified by sectors (by residency of borrower and domestic issuance) Graph 12

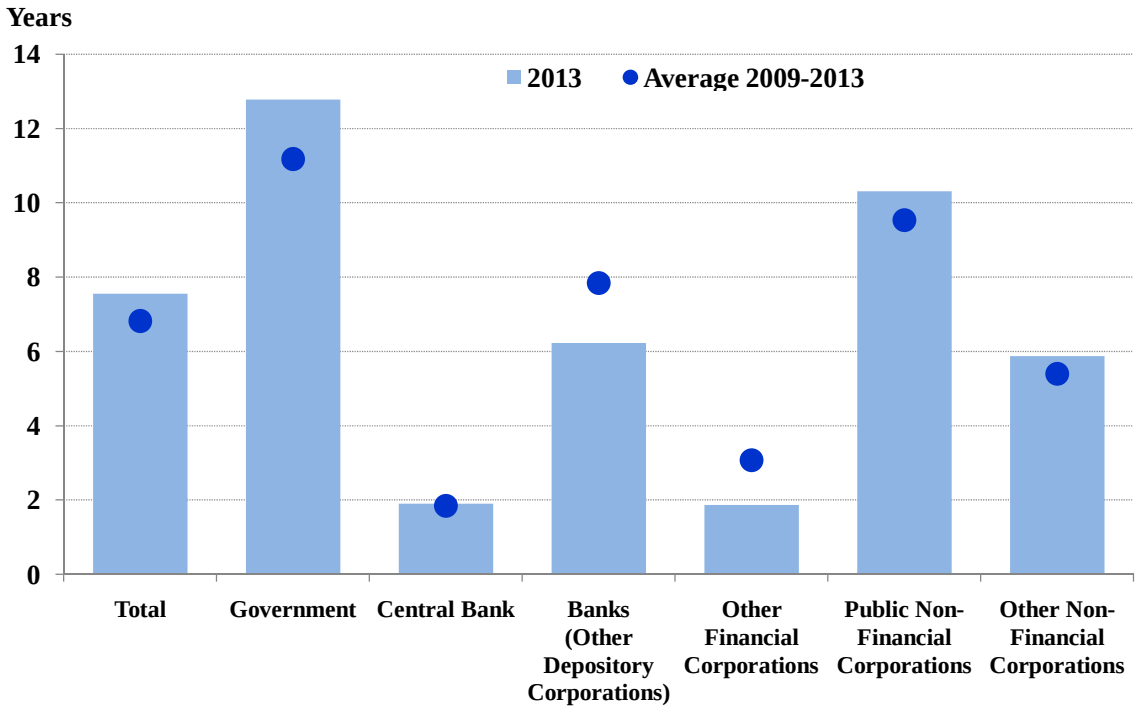


Source: Bank of Thailand; BOT staff calculation

Overall, the bond market's structure has not changed significantly over the past decade. In terms of borrowers, the government has continued to be the main issuer (Graph 12), in order to finance public expenditures, particularly large-scale programmes. Meanwhile, Thai corporate issuance[16] has remained relatively small – it does not yet amount to a "spare tyre" for the banking system – making up about 16% of total domestic bonds outstanding in 2013. In term of lenders, domestic banks and contractual savings institutions are the largest holders of domestic bonds. With regard to maturity, bonds have been issued at medium- to long-term maturities, currently at an average of 13 and six years for the government and non-financial corporations, respectively. This is consistent with the aims of most issuers, namely to fund long-term projects[17] (Graph 13). In addition, fixed rate bonds still account for the largest share of bonds outstanding (Graph 14). Regarding the choice of currency, 99% of domestic bonds outstanding were issued in the Thai baht.

Average maturity at issuance

(by residency of borrower and domestic issuance) Graph 13



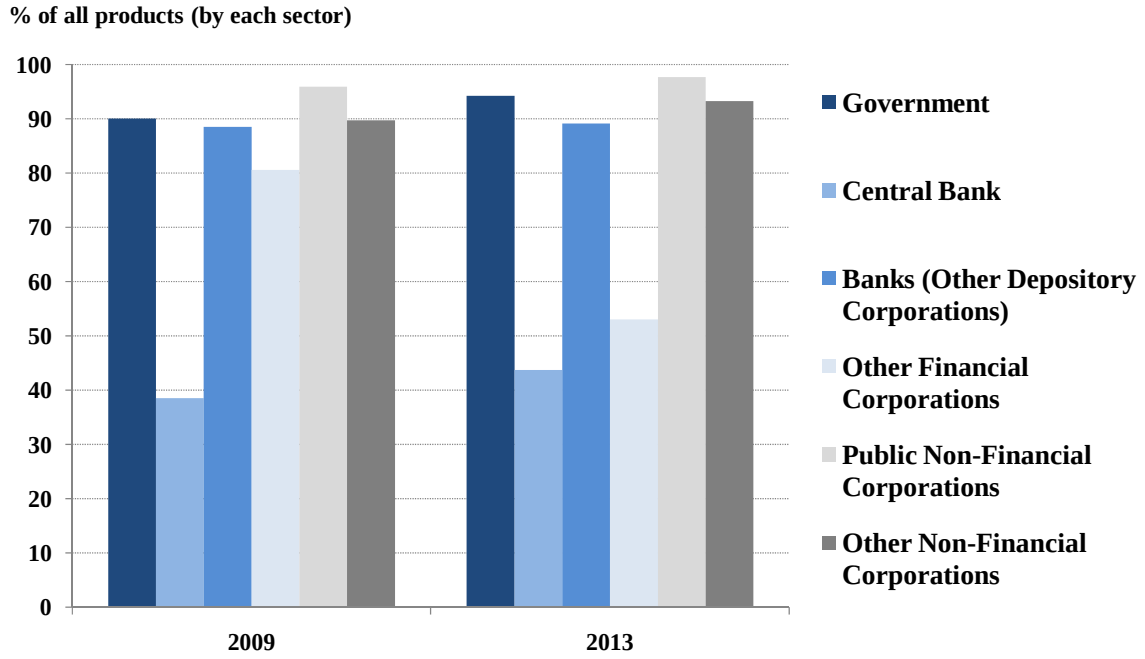
Source: Bank of Thailand; BOT staff calculation

[16] The corporate sector includes other financial corporations and other non-financial corporations.

[17] Other financial corporations are the only issuers who reduced their share of fixed interest rate products significantly, from 81% in 2009 to 53% in 2013. However, as their size of issuance remains relatively low, risks from higher interest rates are likely to be limited.

Share of fixed interest rate products*

(by residency of borrower and domestic issuance) Graph 14



Note: * Share of fixed interest rate products divided by all fixed, floating, and non-interest rate products of each sector

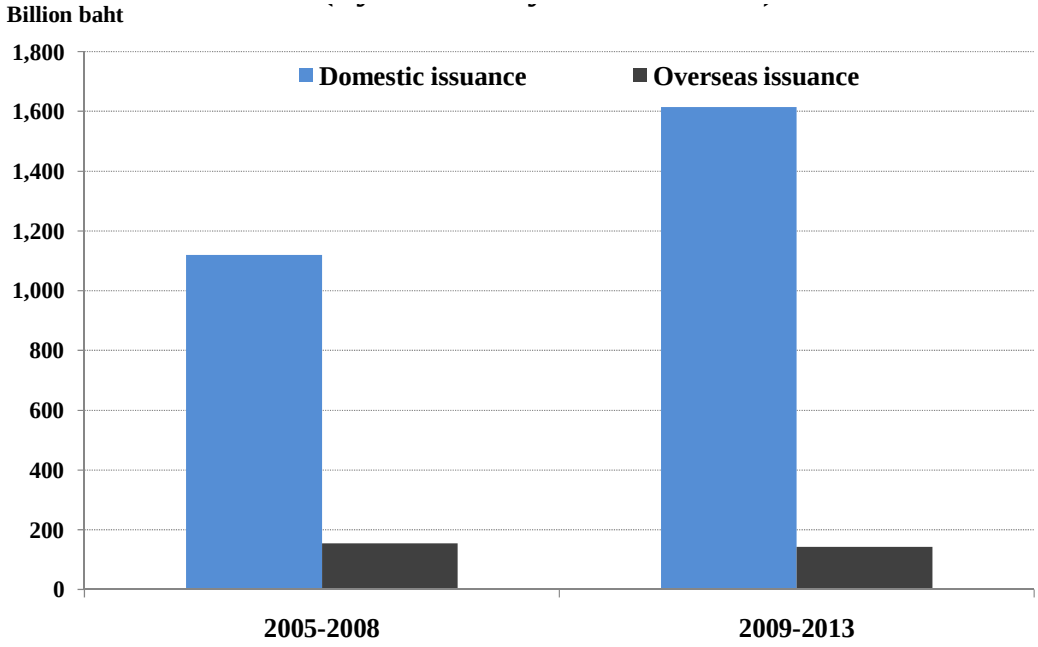
Source: Bank of Thailand; BOT staff calculation

Global financial linkages

Notwithstanding the greater participation of Thai firms in the domestic bond market, a prolonged period of exceptionally low global interest rates and compressed risk premium have not significantly increased overseas bond issuance by Thai firms. As shown in Graph 15, issuance of overseas bonds by Thai firms has been relatively low, making up about 2% of total bonds outstanding over the past five years, due mainly to lower borrowing costs at home. Most of the Thai firms intending to raise funds abroad bear higher costs in large part from the higher risk premium required by foreign investors. Firms that use foreign currency-denominated funds to finance domestic activities also need to absorb additional costs from currency hedging, making it less attractive overall to raise funds abroad. In addition, a large number of Thai firms remain unable to access cross-border finance due to the difficulty of obtaining an international credit rating, thus compromising their creditworthiness from the foreign investors' perspective. Typically, Thai corporations access international markets by borrowing from offshore banks, although this funding method remains minimal in size compared to loans extended domestically (Graph 16).

Bonds outstanding of the corporate sector and public non-financial corporations*

(by residency of borrower) Graph 15

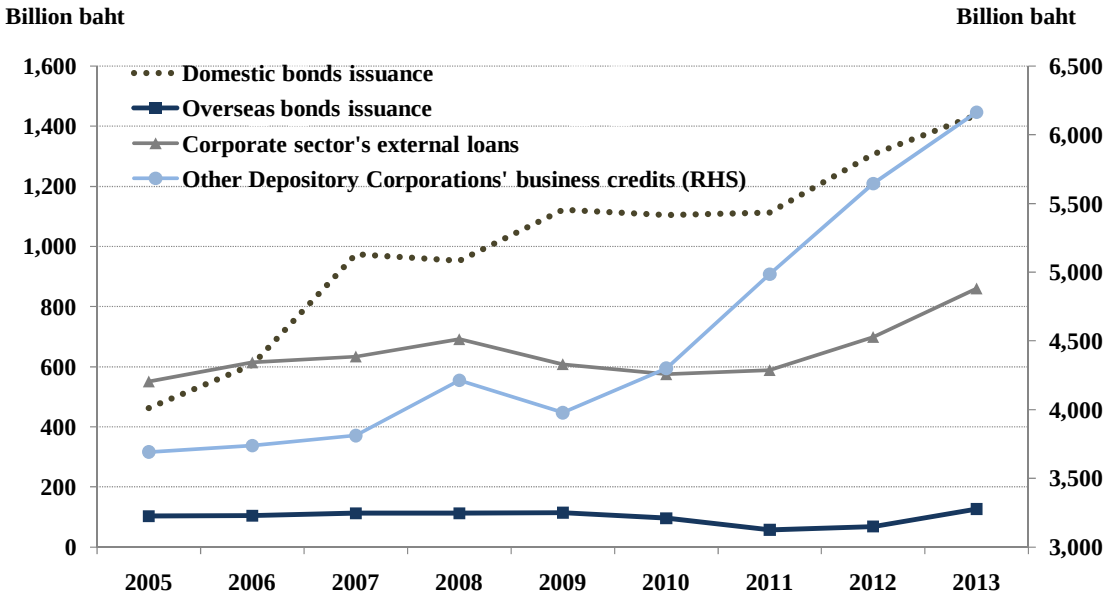


Note: * The corporate sector includes Other Financial Corporations and Other Non-Financial Corporations

Source: Bank of Thailand; BOT staff calculation

The corporate sector* debt outstanding

(by residency of borrower) Graph 16



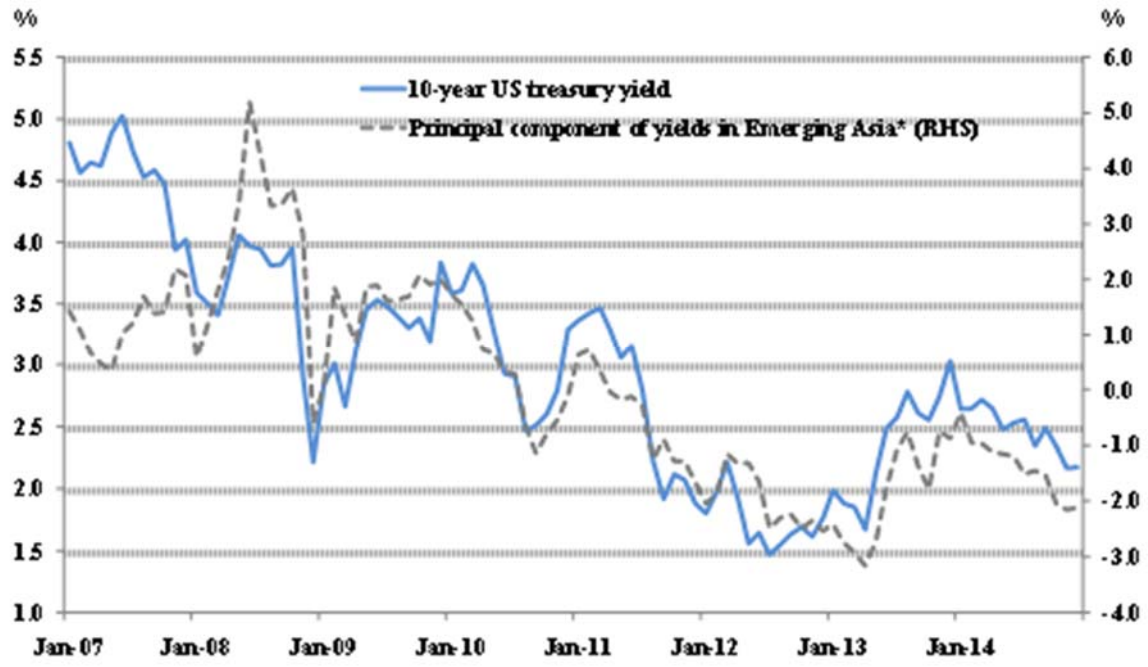
Note: * The corporate sector includes Other Financial Corporations and Other Non-Financial Corporations

Source: Bank of Thailand; BOT staff calculation

Any anticipated tightening in global financial conditions could have implications for the Thai economy, but risks to financing, economic and financial stability should be contained. Among the possible channels, the most significant impact is likely to be transmitted through bond returns. Particularly post-crisis, monetary conditions in the advanced economies have influenced those in emerging markets via domestic bond yields, as reflected in the more synchronous term spreads in the US and Asian economies (Graphs 17 and 18). In addition, the adjustments during the taper tantrum episodes have not brought risk premiums back to their pre-crisis level, and long-term interest rates remain low. The impending US policy normalisation is therefore likely to bring about further market adjustments, potentially pushing up US treasury and Thai government bond yields, with repercussions for Thai firms through higher financing costs and tighter funding conditions. Overall, the degree of capital flight from emerging country bond markets will depend to a high degree on foreign investors' perceptions towards fundamentals and the economic outlook for specific economies. For Thailand, foreign holdings of domestic bonds have been relatively small to date, thus mitigating asset price adjustment effects triggered by foreign investors.

10-year sovereign yields

Graph 17

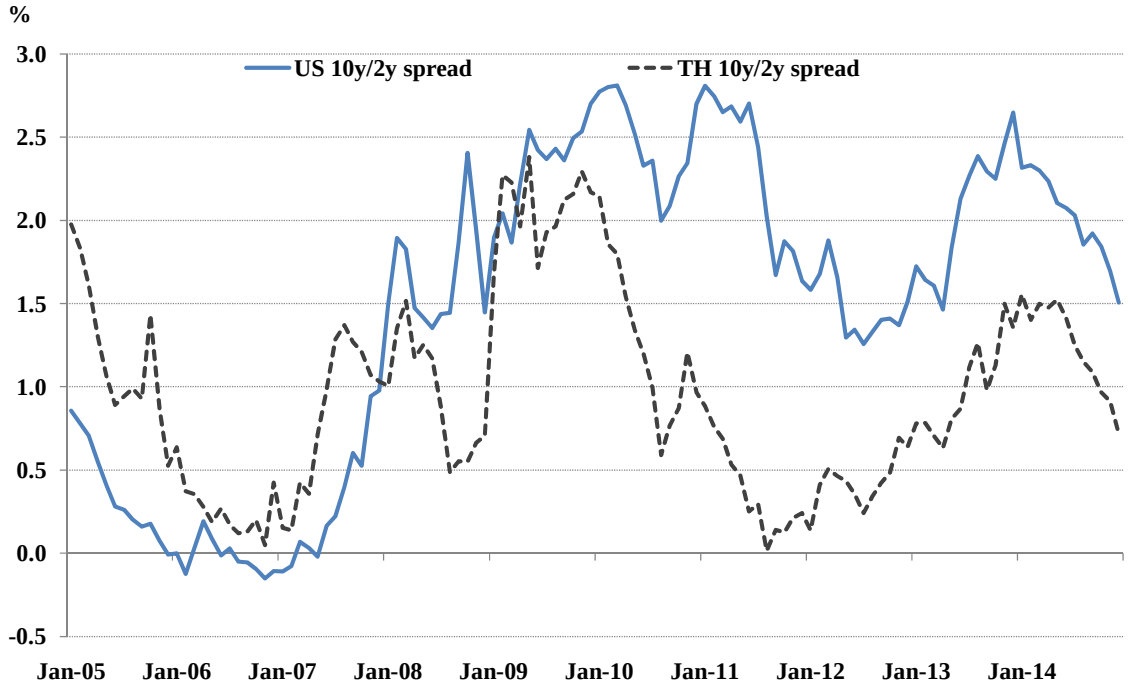


Note: * The principal component of 10-year sovereign yields of Indonesia, South Korea, Malaysia, the Philippines, and Thailand

Source: Bloomberg; BOT staff calculation

Other possible channels work directly through firms' and banks' balance sheets. First, borrowers that have issued foreign currency-denominated debt or have borrowed abroad could be exposed to an increase in global interest rates and foreign exchange volatility. Unless full hedges are in place, corporate debt service capacity might be weakened by a rise in the debt burden and accelerated currency depreciation. Weaker corporate balance sheets could trigger negative spillovers to domestic banks from deteriorating credit quality and the possible withdrawal of deposits to repay debt.

US and Thailand term spread Graph 18

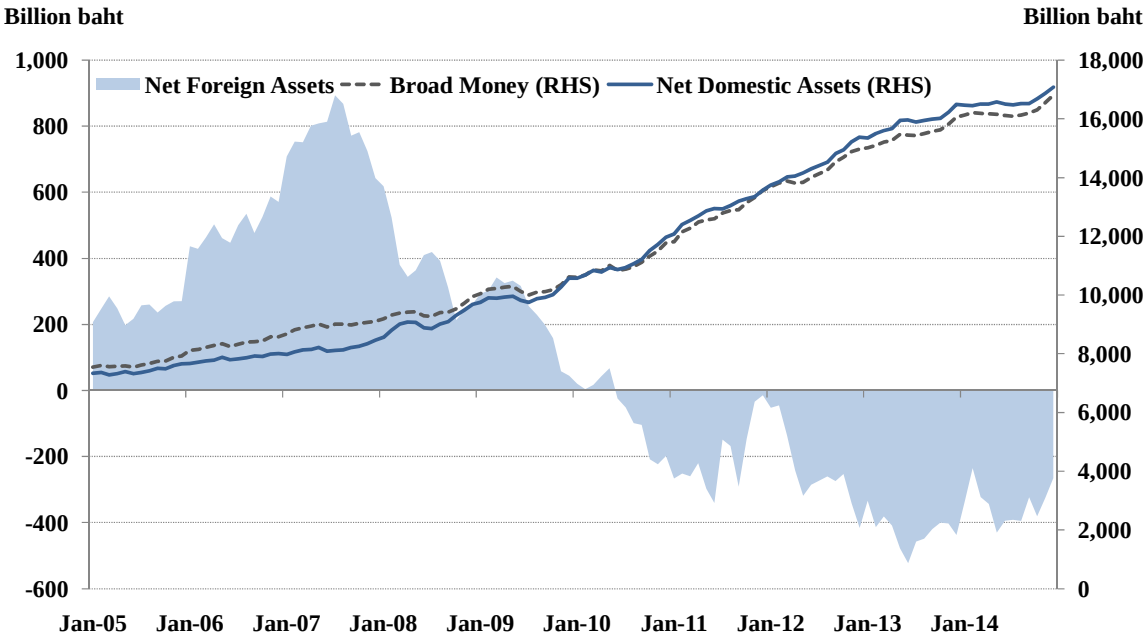


Source: Bloomberg; Thai Bond Market Association (Thai BMA); BOT staff calculation

The second channel concerns the liquidity of commercial banks, particularly those relying on deposits from firms that have raised funds via offshore borrowing. Provided that commercial banks are willing to increase their foreign asset positions, deposits originating from offshore borrowing to take advantage of international rate differentials should lead to an increase in domestic liquidity. Hence, the unwinding of such positions when interest rate differentials narrow might create difficulties for banks' liquidity management. For instance, firms' exposure to rollover and foreign currency risks could subject banks to volatile and sudden deposit withdrawals. Nonetheless, this impact is unlikely to be significant as commercial banks in Thailand seem to merely play a role in facilitating exchange of currencies between counterparties rather than taking foreign asset positions themselves. As evidenced in Graph 19, strong post-crisis capital inflows have not accelerated broad money growth as the banks did not take foreign asset positions. Moreover, the offshore borrowing and overseas bond issuance of Thai firms have remained low.

Overall, since the international exposure of Thai firms is fairly limited, the impact of these possible scenarios is expected to be manageable. Unless markets adjust abruptly, an increase in domestic financing costs should be gradual and well anticipated. Nevertheless, as uncertainties surrounding the global financial markets abound, developments in the financial markets warrant close monitoring as well as appropriate and timely policy responses as the situation unfolds.

Liquidity in the financial system Graph 19



Note: net foreign assets data for Other Depository Corporations

Source: Bank of Thailand; BOT staff calculation

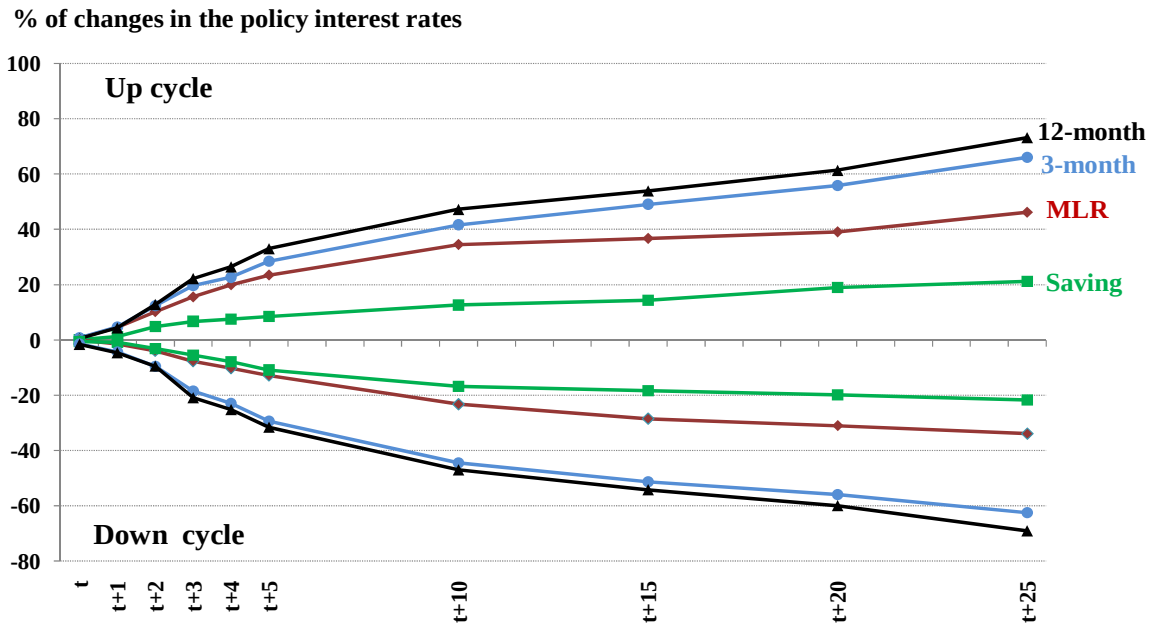
Implications for monetary policy

Since the private sector's sources of financing are highly dependent on the banking sector, monetary policy is mainly passed on to the real economy through the bank interest rate channel. To a large extent, policy effectiveness depends on the size and speed of commercial banks' rate adjustments as well as the sensitivity of credits and deposits to changes in policy rates. Overall, the interest rate channel has been effective since the adoption of the inflation targeting framework in 2000. An event-based study reveals that, within one month after the Monetary Policy Committee announces a policy rate change, commercial banks on average adjust their deposit and lending rates with a magnitude of 50–80% of the change in the policy rate[18] (Graph 20). The size of banks is relevant here. Smaller banks tend to adjust more slowly, as they wait for the leaders to make their rate adjustments, but smaller banks change their rates to a larger degree, reflecting their need to compete with the big banks (Graph 21). In addition, foreign banks are much less responsive to changes in the policy stance than their domestic counterparts (Graph 22), in part as their business models are less tied to domestic factors.

18 During monetary policy's tightening cycles, fixed deposit rates are normally adjusted more than lending rates as they are used to compensate for savings rates which make up a large share of banks' total deposits but are much less responsive to policy rates. Long-term fixed deposit rates, which embody an expected future path of policy direction, are more responsive than those with shorter maturity.

Reactions of domestic bank rates

Graph 20

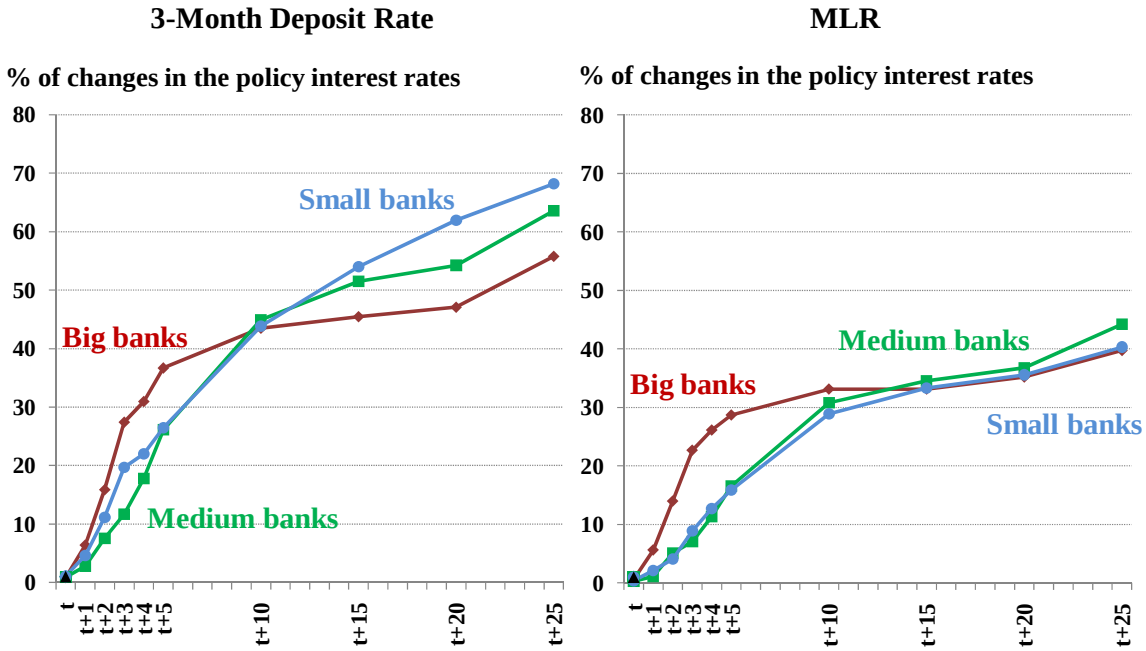


Note: t = MPC meeting date

Source: Bank of Thailand; BOT staff calculation

Banks' rate adjustment by size of banks

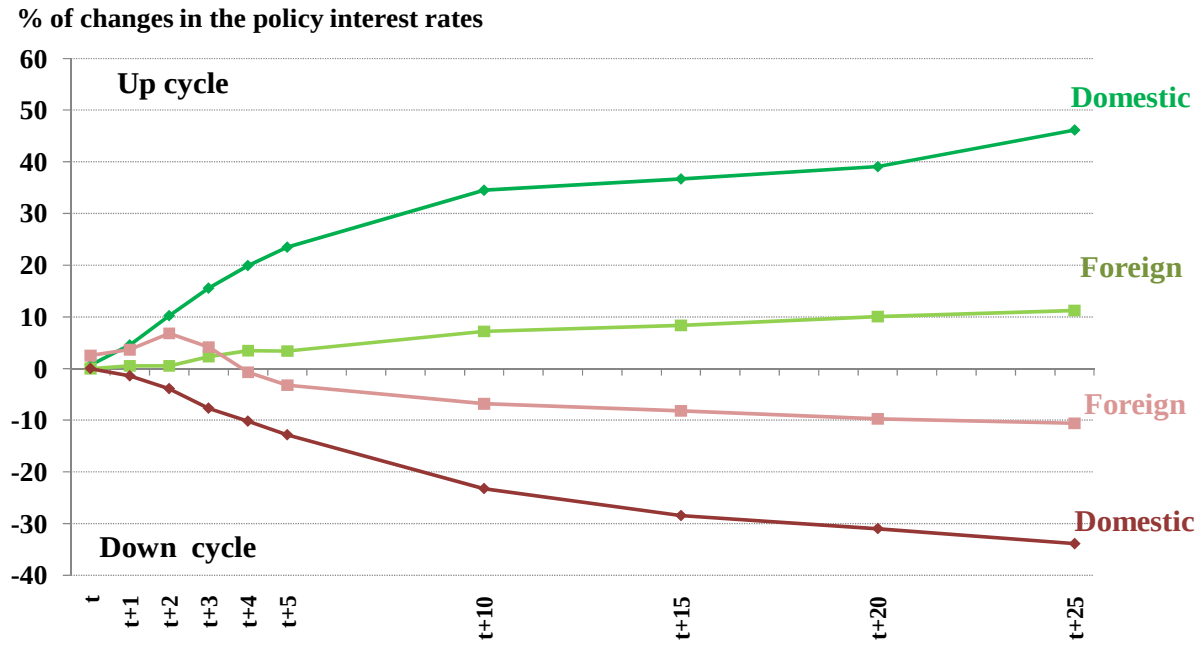
Graph 21



Note: t = MPC meeting date

Source: Bank of Thailand; BOT staff calculation

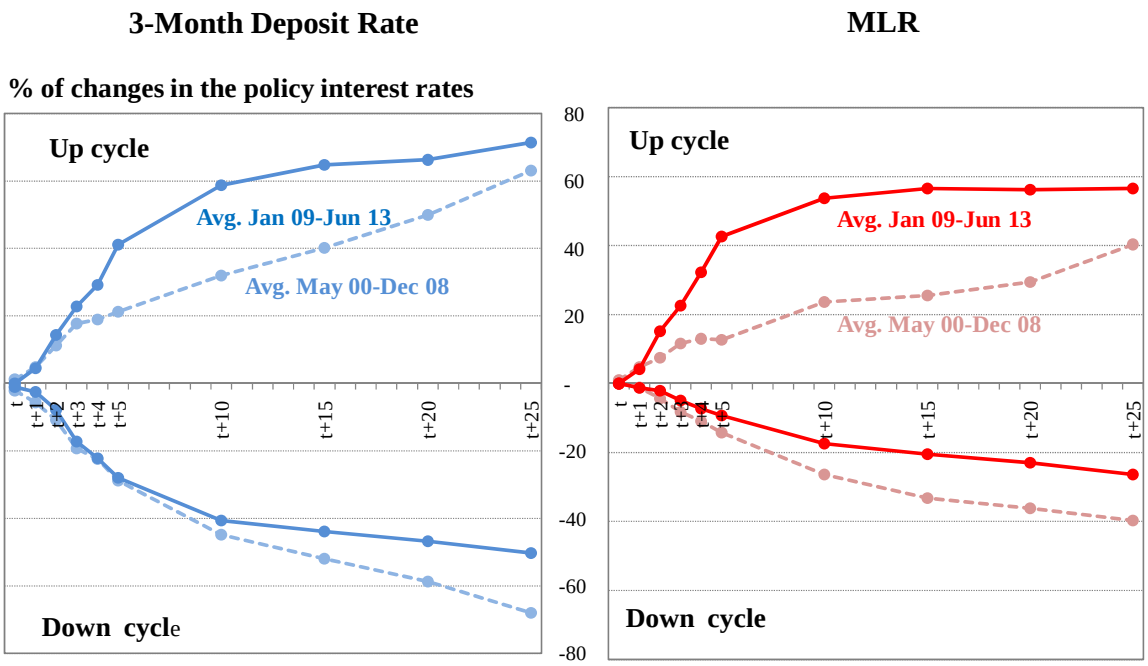
MLR Reaction between domestic and foreign banks — Graph 22



Note: t = MPC meeting date

Source: Bank of Thailand; BOT staff calculation

SFIs' impact on domestic bank rate adjustment — Graph 23



Note: t = MPC meeting date

Source: Bank of Thailand; BOT staff calculation

Domestic bond yields, particularly short- and medium-term, normally adjust in response to changes in the policy interest rates. As to business and household debt service capacity, since a large proportion of loans are made on a variable rate basis, changes in banks' rates might have implications for the private sector's debt service ratio. Nevertheless, the magnitude of any change in the policy rate would have to be significant if it were to make a material impact on the ratio.

Developments in the financial sector have affected the effectiveness of monetary policy transmission. First, the increasing relative importance of SFIs caused banks to respond asymmetrically to policy rate changes. During 2010–12, when SFIs were aggressive in mobilising deposits and extending loans in part to support the government's large-scale investment plans, domestic banks tended to respond more to an increase than a decrease in policy rates[19] as they were competing with SFIs to retain and attract deposits (Graph 23). The lower responsiveness of domestic banks to policy easing was taken into account in policy formulation during that period. This concern, however, has been mitigated as the economic slowdown since 2013 has reduced competition across the banking sector, albeit with a slight pickup in line with the economic upturn since the second half of 2014.

Monetary policy transmission has also been affected by the growing domestic bond market, in two opposite ways. On the one hand, monetary policy can exert a greater influence on the financial system through policy communication and by signalling to influence market expectations for future short-term rates and bond yields. On the other hand, domestic monetary conditions may have become less susceptible to monetary policy measures at home as Thai bond yields are closely linked to yields in the main financial centres, especially the United States.

Under the flexible inflation targeting framework, the policy interest rate is still the Monetary Policy Committee's main policy tool for maintaining price and economic stability as well as for signalling the policy stance to the public. Currently, the monetary policy priority is to ensure adequate support for the incipient economic recovery amid a subdued outlook for inflation. As in the case of many central banks, rising global financial market volatility has posed challenges for policymakers, who are giving additional weight to the potential repercussions of global factors on Thai financial markets and domestic financial stability. Risks to financial stability have been contained so far. Policy tools need to be carefully evaluated for the trade-off between their effectiveness and potential side effects.

Macroprudential policy is considered as complementary to rather than a substitute for interest rate policy in the pursuit of price, output and financial stability aims. Introduced in Thailand following the 1997 crisis, macroprudential tools were used to address domestic financial imbalances, predominantly through the imposition of the loan-to-value (LTV) ratio.[20] Most measures were narrowly targeted on risks in specific sectors so that overall monetary transmission tended not to be materially altered. As financial stability considerations gain importance in monetary

[19] Apart from adjustments to their standard rates, banks also use special deposit campaigns (eg deposits on non-standard terms with specific maturities) to compete for deposits. This may strengthen policy pass-through during the tightening cycle.

[20] The latest LTV measure took place in 2013, with the aim to limit speculative buying in the housing market.

policymaking, the use of macroprudential measures should become increasingly relevant in the future, especially if a growing amount of international experience underscores the effectiveness of such tools.

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Monetary policy transmission and shifts in financial intermediation

Koray Alper, Mustafa Kılınç and Mehmet Yörükoğlu[1]

Abstract

Financial deepening and increases in the private sector's credit-to-output ratio are expected to strengthen the monetary policy transmission mechanism in Turkey. However, shifts in the structure and composition of financial intermediation are also important for the transmission mechanism. From the perspective of emerging countries, shifts in financial intermediation between domestic and foreign currency funding or shifts between domestic and foreign sources are important challenges for monetary policy. Shifts to foreign currency funding from domestic sources in terms of dollarisation impair monetary policy effectiveness, given that only domestic currency interest rates can be used to influence the financial sector. That said, foreign currency funding from domestic agents can be considered to be as stable as other domestic funding sources. However, shifts in financial intermediation to foreign sources constitute a major challenge for monetary policy as such funding may be more sensitive to global liquidity conditions and less responsive to domestic monetary policy. Designing structural policies to increase the shares of domestic funding sources in domestic currency, as well as cyclical policies that reduce the sensitivity of financial intermediation to global liquidity/risk cycles, have become important for financial stability purposes and for increasing the effectiveness of domestic monetary policy.

Key words: monetary policy, transmission mechanism, financial intermediation, macroprudential policy, Turkey

JEL classification: E44; E52; E58

[1] Central Bank of the Republic of Turkey.

1. Introduction

Pre-crisis, the financial sector was considered as an intermediary that channelled funds from savers to borrowers. Even though the sector was far from characterised by perfect competition, it was widely regarded as working efficiently. Therefore, no direct policies that regulate or restrict the sector were recommended or discussed in most of the economics literature or policymaking circles.[2] Post-crisis, however, this perception has changed. The financial sector is now viewed as a source of frictions and externalities, and as a mechanism by which shocks coming from other parts of the economy are propagated and amplified. As a result, identifying such mechanisms as well as proposing related policies has been a major policy research area in recent years.

From the perspective of monetary policy, the pre-crisis efficiency of the financial markets meant that this sector simply transmitted monetary policy changes, mostly in terms of short-term interest rates, directly to the real sector, so that the financial sector itself hardly influenced the transmission.[3] This view has also changed after the global financial crisis, when financial stability issues and their interaction with monetary policy came to the foreground of academic and policy makers' attention.

In this new approach to the relationship between financial stability and monetary policy, one real-life challenge for emerging countries has been the question of how to deal with the quantitative easing policies of advanced countries. With abundant but short-term and volatile global liquidity in the financial markets, the structure of financial intermediation has shifted considerably in emerging countries. For example, as cross-border bank flows and portfolio flows are important funding sources for these countries, domestic economic conditions have become more sensitive to global financial conditions (Bruno and Shin (2014)). Hence, devising countercyclical policies that can contain financial stability risks have become even more crucial in these countries (IMF (2013)).

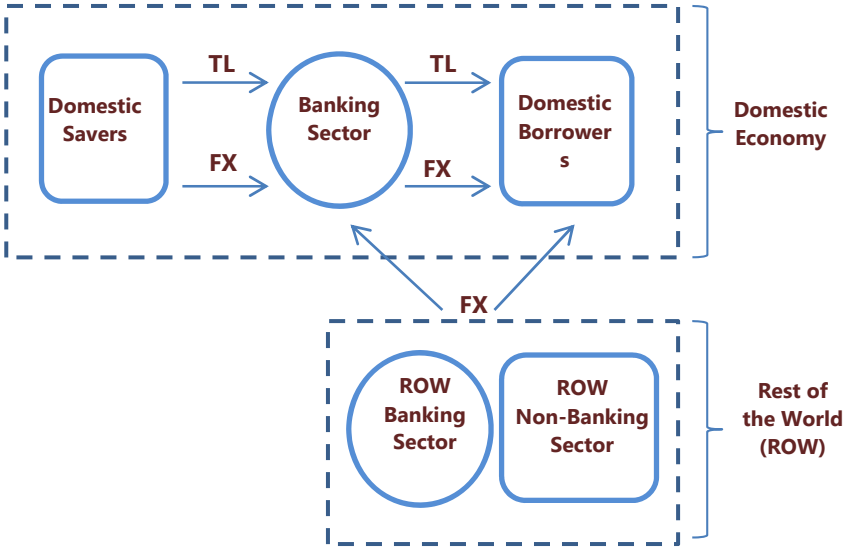
One major factor that can change the effectiveness of monetary policy transmission is a shift in the financial intermediation structure. From the perspective of a small emerging country, Graph 1 presents a simplified picture of financial intermediation in the economy. Inside the country, savers place their domestic currency (TL) and foreign currency (FX) savings with their banking sector, which channels the funds to borrowers (households, firms and government). Inside the country, shifts between domestic and foreign currency funding can change the effectiveness of policy rates, as policy rates will be effective mainly vis-à-vis domestic currency assets and liabilities. However, if a preference for FX assets is a structural phenomenon in the economy, for example, in the form of persistent

[2] This case was mostly for the advanced countries. Emerging countries experienced problems and crisis related to financial markets in 1980s and 1990s. However, the main recommendations for these countries were to liberalise their financial markets and reduce government intervention so that financial institutions would work as efficiently as their counterparts in advanced countries.

[3] Some studies have looked at financial frictions. But these were mostly in the real sector, stemming from frictions such as costly state approvals, information asymmetries and moral hazard problems. Problems and frictions related to the banking sector itself have not been widely studied.

dollarisation, then these assets can be stable sources of funding similar to domestic currency funding but possibly less sensitive to monetary policy.

Financial intermediation in an emerging country Graph 1



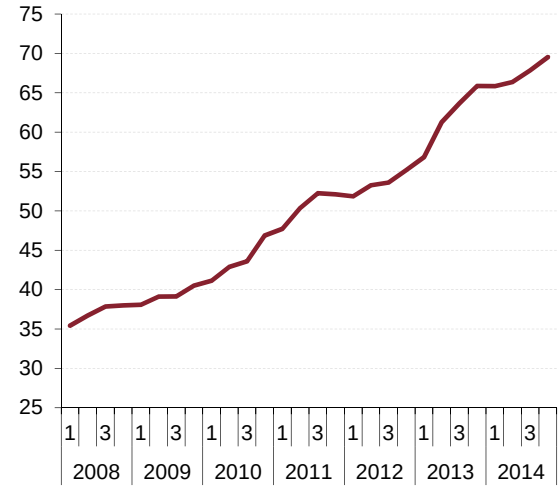
The domestic economy can also raise funding from the rest of the world. Foreign sources can be in foreign currency and from both the banking and non-banking sectors. Overall, such foreign funding will be more sensitive to global financial conditions than is domestic funding. As a result, shifts in financial intermediation to foreign sources can create major challenges for domestic monetary policy. Short-term policy rates alone would not be sufficient to deal with such volatilities, and there would be an important role for macroprudential policies.[4]

2. Size and composition of financial intermediation in Turkey

Bank lending to the private sector has increased significantly in Turkey in recent years. At the beginning of 2008, private credit to GDP ratio stood at 35% (Graph 2). This ratio doubled by the end of 2014 and reached to 70%. In Graph 3, we see that funding of the real sector from the rest of the world as a ratio of GDP stayed stable and, for the banking sector, this ratio has increased over time. Overall, in recent years Turkey has witnessed a significant financial deepening. The expansion of the credit markets is expected to positively affect the strength of the monetary policy transmission. As credit markets expand, policy rates exert a stronger effect on the economy through credit. As both savers and borrowers have a higher share of assets and liabilities relative to their income, their behaviour becomes more sensitive to interest rate movements.

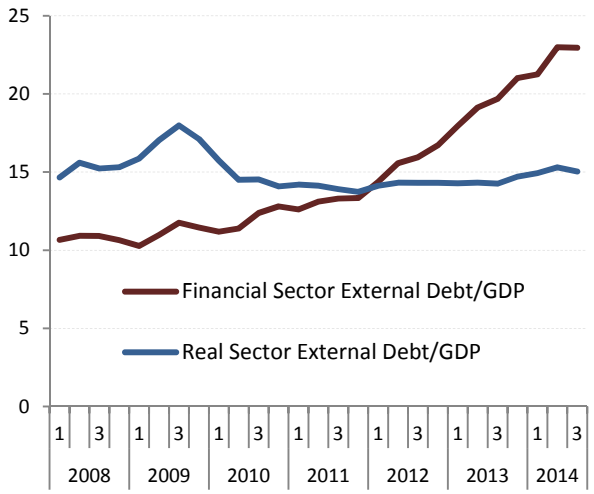
[4] For some studies on unconventional and macroprudential policies in general and in Turkey, see Goodhart (2013), Başçı and Kara (2011), Alper et al (2013), Aysan et al (2014 and 2015).

Credit to non-bank private sector from domestic banks/GDP (Percent) Graph 2



Source: CBRT

External borrowing: financial and real sector/GDP (Percent) Graph 3



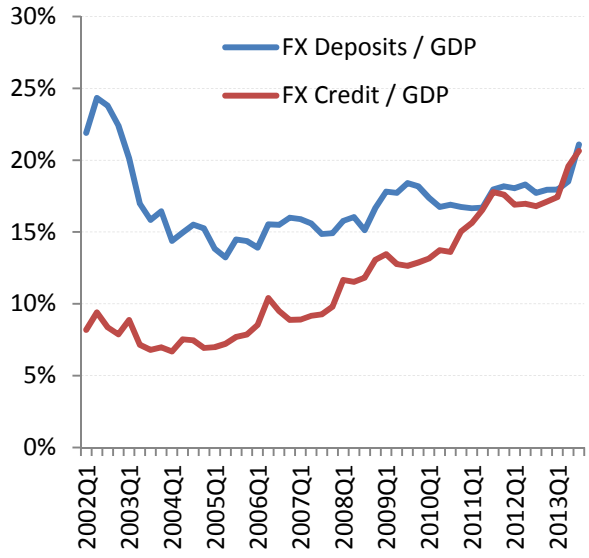
Source: CBRT

2.1. Composition in terms of currency denomination from domestic sources

One important characteristic of overall financial intermediation in a small open emerging country is the currency denomination of assets and liabilities. Preference for FX can arise in the economy due to several factors and this preference can be a persistent feature of the economy in the form of dollarisation. Graph 4 shows that, in the early 2000s, Turkey witnessed a high level of dollarisation in banking assets and liabilities, with the share of FX above 50%. Later, there was a significant de-dollarisation and the share of FX deceased to around one third.

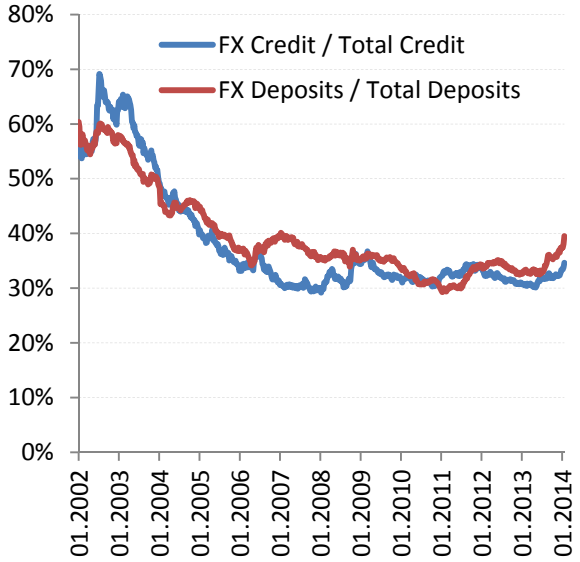
Several major issues are related to dollarisation from the perspective of monetary policy, such as the extent of dollarisation, the stability of FX funds from domestic and external sources and related balance sheet effects. If dollarisation is very pervasive, then the effectiveness of interest rate policy will be greatly restricted as the economy uses mostly FX currency in its credit relations. There is also a probability that extensive dollarisation in credit markets is associated with the wide use of FX in daily transactions too. In this case, both the inflationary dynamics and credit conditions in the economy can be very sensitive to exchange rate developments, restricting the effectiveness of domestic monetary policy. Another issue relates to the stability of FX-denominated financial intermediation from domestic sources. In Turkey, both FX deposits and credit as a ratio of GDP have increased since 2005 (Graph 4). We also see that their shares have been mostly stable within the banking sector's balance sheet (Graph 5). As long as the overall banking system is stable and dollarisation in the economy is structurally at some given level, then the stability of FX funds can be very similar to domestic currency funds. In Turkey, there has been volatility in the share of FX funds during times of stress or strong exchange rate movements, but changes in the shares were limited.

FX credit and deposits of domestic banks/GDP (Percent) Graph 4



Source: CBRT

Liability and asset dollarisation in banking sector Graph 5



Source: CBRT

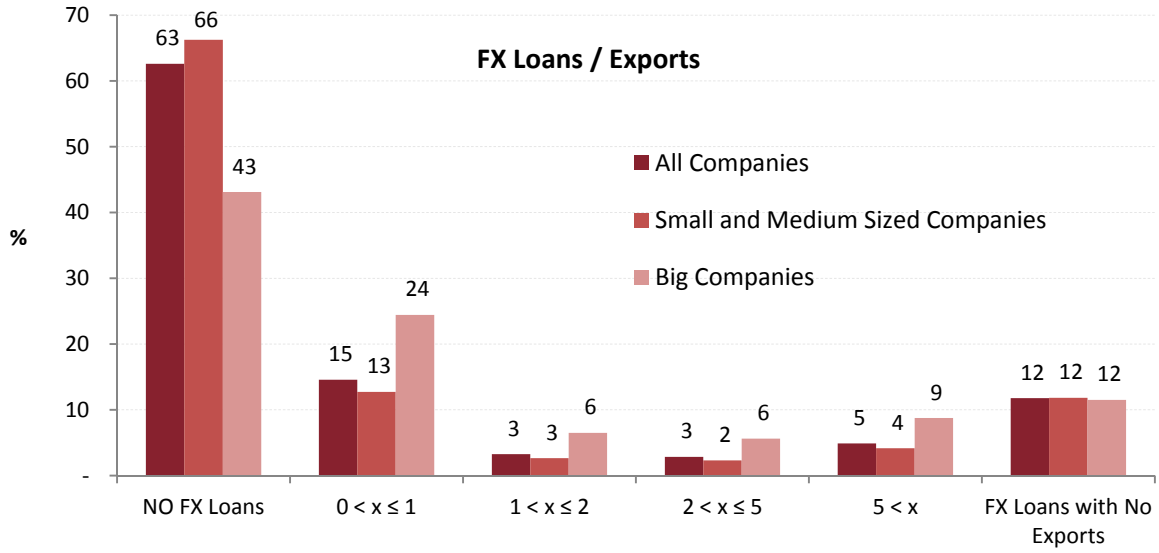
Another major issue related to financial intermediation in FX is the related balance sheet effects. Domestic agents can have symmetrical positions in the sense that each aggregate agent (households, firms, banks and government) can have similar levels of FX assets and liabilities in their balance sheets. But, at a more micro level, agents will have asymmetries in their FX positions, so that balance sheet effects will arise from exchange rate movements. In Turkey, individual banks are regulated so that they cannot maintain large open positions. Households are not permitted to have FX or FX-linked credit, but they do have large FX deposits. However, firms can access FX credit on certain conditions. If firms have export revenues, they can draw on FX credit; and if they do not have export revenues then the maturity of FX credit should be longer than one year and the amount must be more than USD 5 million. Thus, government and banks do not have open FX positions, but households have a long position and firms have a short position. Overall, Turkey is a net debtor in international markets so that the country as a whole has open position.

Balance sheet effects can be a major constraint on monetary policy transmission and can even change the direction of the policy response in turbulent times. When there is a crisis-like situation in the economy and the domestic currency loses value, with large currency mismatches in the economy, the central bank can be forced to increase interest rates to defend the currency and contain the negative balance sheet effects. If, however, currency mismatching effects are limited, then the central bank could cut interest rates to support the economy during the crisis. This difference in policy reactions was observed in the Asian crisis in 1997 and the Turkish crisis in 2001, where domestic interest rates had to increase. However, after improving their balance sheets significantly in the early 2000s, emerging country central banks were able to cut their interest rates to support the economy during the financial crisis. Therefore, balance sheet effects from the FX positions of

various agents in the economy can significantly affect monetary policy transmission and can be a major constraint on the policy response.

After the global financial crisis, global liquidity conditions and risk appetite have been very volatile, affecting exchange rates in emerging countries and raising concerns raised about possible balance sheet effects. In the case of Turkey, firms have an open position in terms of FX holdings. Graph 6 shows the distribution of FX loans to export income ratio for the non-financial sector. It is shown that 63% of firms had no FX loans while 15% of firms had more export revenue than debt. Overall, the balance sheet effects have been limited in recent times; and most firms had some type of natural hedge (Hulagu and Yalcin (2014)).

Distribution of (FX loans/exports) ratio of non-financial companies — Graph 6



Total net sales of all firms in the sample are 71% of GDP in 2012. Figures show the percentage of firms with different FX loans to exports ratio.

Sources: CBRT, company accounts data set. Date: 31.08.2013. Number of firms is 9,468.

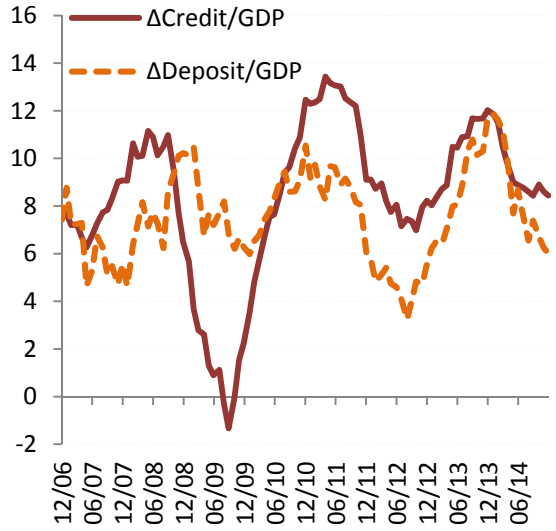
2.2. Composition in terms of funding from domestic and foreign sources

2.2.1. Macroeconomic implications of FX funding from abroad

In addition to FX funding from domestic sources, another important part of financial intermediation is the direct external financing of domestic banks and borrowers. As shown in Graph 2, the real sector's debt-to-GDP ratio has been stable, while for the financial sector this ratio increased from 10% in 2008 to above 20% in 2014. Turkey has experienced an important financial deepening in the 2000s and, with the support of strong economic fundamentals, credit demand remained robust. As a result, net credit use (yearly change in the credit stock divided by GDP) has been persistently above net deposit supply (yearly change in the deposit stock divided by

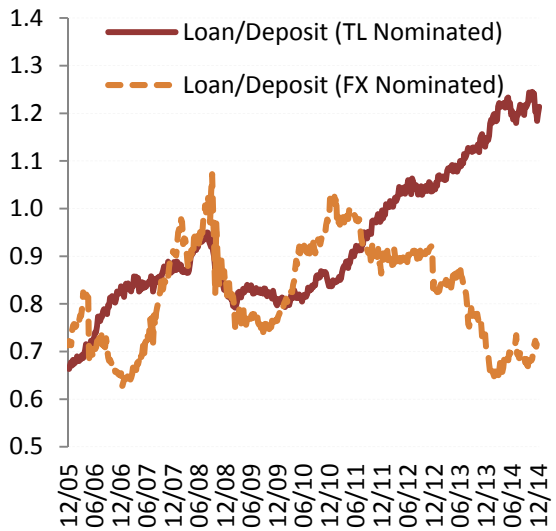
GDP) in recent years (Graph 7). To satisfy credit demand and to fill the savings gap in the economy, banks have made active use of external financing. Actually this funding gap is strongly correlated with Turkey's current account, in the sense that higher credit use relative to deposit supply is associated with increases in the current account deficit. Higher use of external funds in the banking sector is also reflected in loan-to-deposit ratios. In recent years, this ratio has increased from 80% to around 120% (Graph 8). This shift to external financing means that the share of non-core liabilities in the economy increases. Movements in non-core liabilities are crucial for the health of the banking sector as the dependence on global financial markets might increase volatility in the sector.

Yearly change in credit and Deposits/GDP (Percent) Graph 7



Source: CBRT

Loan-to-deposit ratio for TL and FX in the banking sector Graph 8



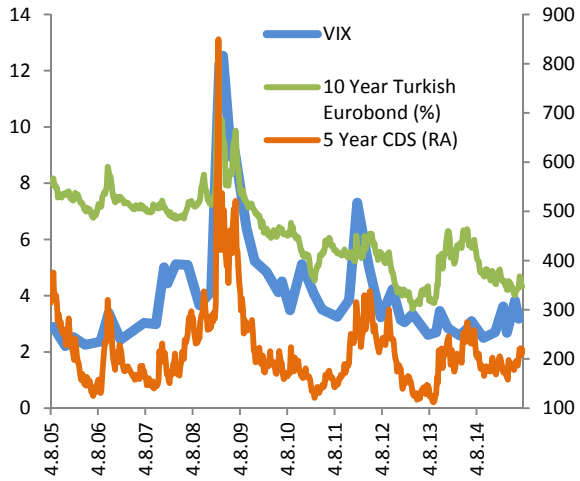
Source: CBRT

External FX-denominated financing in FX has significant implications for the transmission of monetary policy. Similar in effect to FX funding from domestic sources, the larger is the share of this funding the more it curbs the effectiveness of policy rates. This funding can also create balance sheet effects in the economy and create acute stability issues relative to domestic currency or domestic FX funding. Portfolio flows also heavily influence domestic financial conditions and bank balance sheets. As foreigners begin to buy government bonds from domestic banks, banks tend to replace those assets by increasing their loans. Besides, foreign demand for domestic currency assets directly affects medium- and long-term interest rates, as well as short-term interest rates in both the bond and credit markets. Furthermore, portfolio flows are usually very sensitive to global liquidity conditions and risk perceptions. This sensitivity seems to have increased in the wake of the post-crisis quantitative easing policies (Bruno and Shin (2014)). As a result, these flows can transmit the volatility in global financial markets to the domestic economy, creating financial stability risks. Monetary policy, using mainly domestic interest rates, would have only a limited ability to contain such risks. Especially in this part of the financial intermediation chain, the need for macroprudential policies seems to be very crucial.

Along with borrowing from abroad, improvements in the cost and the maturity of these funds are important indicators for financial conditions, and these improvements are, to a large extent, channelled through the banking system to the domestic real sector. They reflect mainly the expansionary policies of major central banks and elevated risk appetites on the part of lenders/investors. In other words, the improved terms for increased borrowing have at times reflected global financial conditions rather than progress in the recipient country's macroeconomic prospects. Graph 9 provides some evidence for this argument, showing that VIX, which is supposedly exogenous to Turkey-specific factors, is substantially correlated with CDS spreads and returns on 10-year Turkish sovereign bonds.

Risk appetite, CDS and the interest rates on Turkish sovereign bonds

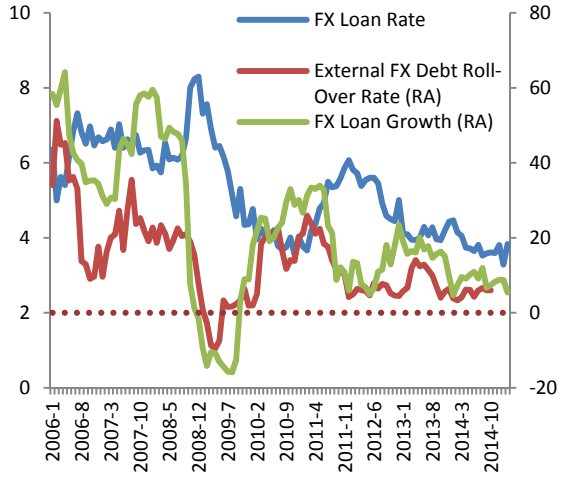
Graph 9



Source: Bloomberg

Foreign borrowing and FX loans

Graph 10

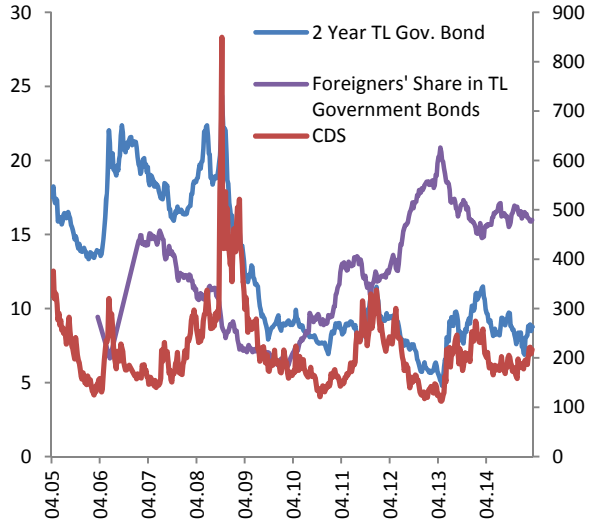


Source: CBRT

Despite adverse developments in global economy and volatility in the risk appetite of global investors, banks experienced no significant problems in rolling over their FX denominated debt in Turkey (Graph 10). In addition to the robust structure of the system, this was also to do with the fact that domestic banks were borrowing from institutional investors such as global banks, which are less sensitive to domestic and global developments than other types of investor (see next section). Hence, after 2009, domestic banks did not experience any significant difficulty in supplying FX funds to the domestic real economy. As a result, FX loans to the real sector have remained buoyant post-crisis.

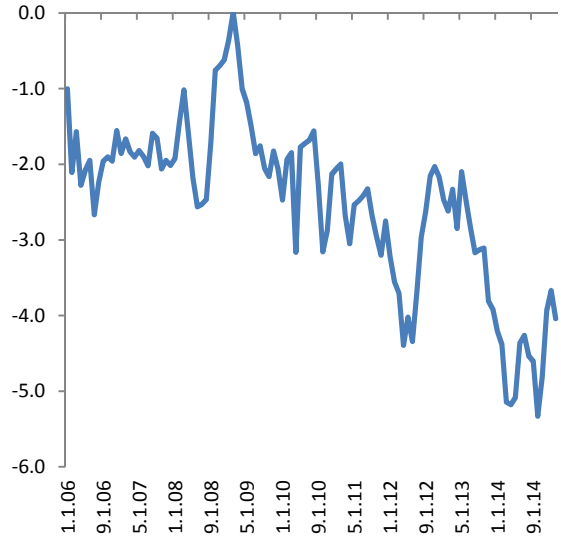
Portfolio investments represent another important component of capital flows. Portfolio flows are allocated almost entirely to TRY-denominated government bonds and listed equities. Unlike the FX borrowings of domestic banks, foreign holdings of these assets have displayed a quite volatile pattern. Together with currency and cross-currency swap agreements, the foreign appetite for TRY-denominated assets has exerted a decisive influence on medium- and long-term domestic currency interest rates (Graph 11). Besides, as the domestic banks are the dominant buyers of domestic government bonds, increased foreign purchases of these assets have created a crowding-in effect for domestic credit. That is, banks have altered their asset composition in favour of real sector credits.

CDS, TRY government bond rates and foreign share in holdings of domestic government bond stock (%) Graph 11



Source: CBRT, Bloomberg

On-balance sheet open positions as a ratio of total liabilities (%) Graph 12



Source: BRSA

The compression of medium- and long-term TRY rates in the government bond market and swap markets affects the TRY credit market through several channels. As implied in Graph 12, only part of the foreign FX borrowing by banks was transformed into FX loans; a significant portion of these funds was extended as TRY credit by using swap agreements with foreign counterparties. These derivatives let banks convert FX funds into TRY loans without taking a currency position, which is restricted by legislation.[5] Hence, lower TRY interest rates and longer maturities in those contracts were translated into cheaper long-term TRY credits. Lower government bond returns had also reduced banks' demand for these assets and were pushing banks to lend more to the real sector.

A simplified illustration of hedging an on-balance sheet FX open position with currency swaps* Graph 13

Assets	Liabilities
On-balance sheet items	
150 TRY loans (in TL)	100 TRY deposits (in TL)
50 TRY loans (in USD)	100 TRY due to foreign bank (in USD)
Off-balance sheet items	
50 TRY currency swap (in USD)	50 TRY currency swap (in TRY)

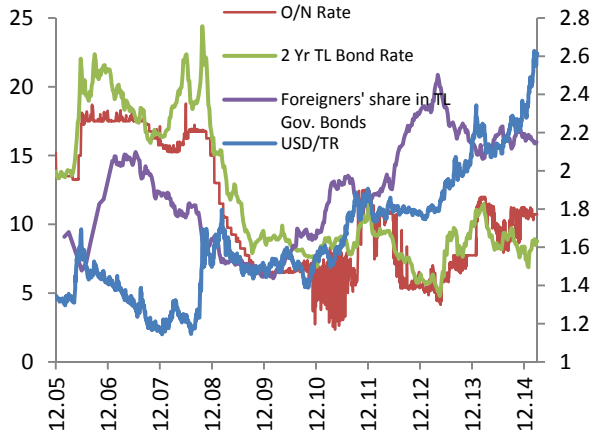
Note: * Domestic bank takes FX long position with currency swaps to offset the short position created on-balance sheet.

[5] In Turkey, the maximum total TRY long or short position that banks can assume is limited to 20% of their total equity.

Another important effect of portfolio flows on domestic financial conditions has worked through their effect on the appreciation of domestic currency. Real appreciation is a justified concern for emerging countries with a current account deficit. Central banks come under pressure to alleviate a large appreciation in the real exchange rate. In addition, the currency's appreciation may depress domestic inflation via the substantial exchange rate pass-through effect, hence justifying lower policy rates. Thus, in cases where central bank responds to real appreciation of the currency and its effect on inflation, portfolio flows will depress the yield curve, which fuels the domestic currency credit market. Therefore, global financial conditions can affect domestic financial conditions through their effect on yield curves through the above-mentioned channels.

Policy rate, exchange rate and foreign investors demand for domestic government bonds

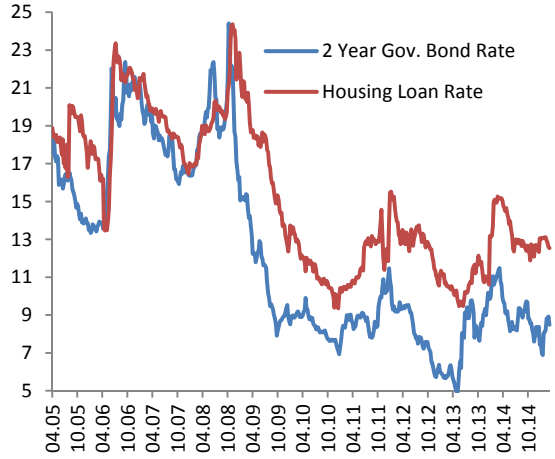
Graph 14



Source: CBRT, BIST

Government bond rates and housing loans (%)

Graph 15



Source: CBRT, BIST

2.2.2. Cross-country analysis on yield curves

As mentioned in the previous section, advanced country interest rates and global liquidity conditions could have an important effect on the yield curves of emerging countries. In such a case, global financial conditions could move the yield curve and hinder the management of domestic financial conditions via short-term domestic policy rates. To support this statement, we perform a simple cross-country analysis of two-year interest rates for government bonds in a number of countries.[6] We estimate a simple fixed panel regression of interest rates as follows:

$$\Delta r_{i,t}^{2Year} = c + \Delta r_{US,t}^{2-or-10-Year} + PortfolioFlows_t^{EM} + PortfolioFlows_{t-1}^{EM} + \Delta inf_{i,t} + \Delta cds_{i,t} + growth_{i,t} + growth_{i,t-1} + \vartheta_i + \varepsilon_{i,t}$$

[6] Countries are Brazil, Chile, Hungary, Indonesia, Korea, Mexico, the Philippines, Poland, Russia, Thailand and Turkey. Data sources are IMF and Bloomberg.

Interest rates in emerging countries: global and domestic factors Table 1

Dep. variable: difference of two-year government bond yields : $\Delta r_{i,t}^{2Year}$

Variables	1	2	3
$\Delta r_{i,t-1}^{2Year}$	0.018	-0.013	-0.033
	0.90	0.93	0.84
$\Delta r_{US,t}^{2Year}$	1.489***	1.564***	
	0.00	0.005	
$\Delta r_{US,t}^{10Year}$			0.559**
			0.012
$PortfolioFlows_t^{EM}$	-0.0015	-0.0012	-0.0017
	0.43	0.53	0.42
$PortfolioFlows_{t-1}^{EM}$		-0.0019***	-0.0023**
		0.02	0.015
$\Delta inf_{i,t}$	0.085	0.080	0.074
	0.12	0.16	0.13
$\Delta cds_{i,t}$	0.007***	0.007***	0.007***
	0.00	0.00	0.00
$growth_{i,t}$	0.039**	0.034***	0.030**
	0.03	0.008	0.014
$growth_{i,t-1}$		0.016	0.016
		0.32	0.44
R^2	0.257	0.261	0.286
# of observations	194	194	194
# of countries	11	11	11
Country fixed effects	Yes	Yes	Yes

P-values are below the coefficients.

In the equation we take US interest rates ($\Delta r_{US,t}^{2-or-10-Year}$) and portfolio flows to emerging countries ($PortfolioFlows^{EM}$) as the global variables and inflation, CDS and GDP growth as the domestic variables. For the price variable, we assume that effect happens contemporaneously in the quarter and, for the quantity variables of flows and GDP, we also put a one-quarter lag as these might take some time to show their effect. Table 1 presents the results of the estimation. We use quarterly data for the period of Q1 2005–Q4 2014. We see that both US interest rates and portfolio flows significantly affect the two-year interest rates in emerging countries.[7] The US two-year interest rate affects the yields in emerging countries whereas an increase in portfolio flows reduces the yields with a lag of one quarter. Thus, with the low levels of global long-term interest rates and abundant but volatile global liquidity mainly due to the accommodative policies of advanced countries, the management of domestic financial conditions can be difficult in emerging countries.

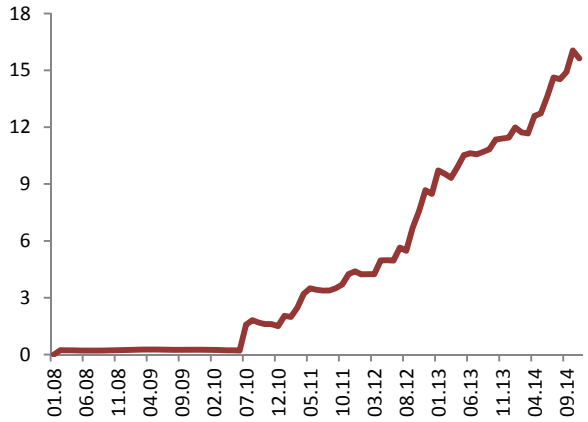
[7] For a more detailed analysis of the effects of global interest rates on emerging country yields, see Turner (2014).

These developments present new important challenges for the monetary transmission mechanism.

2.3. Composition of foreign funding in terms of banks and non-banks

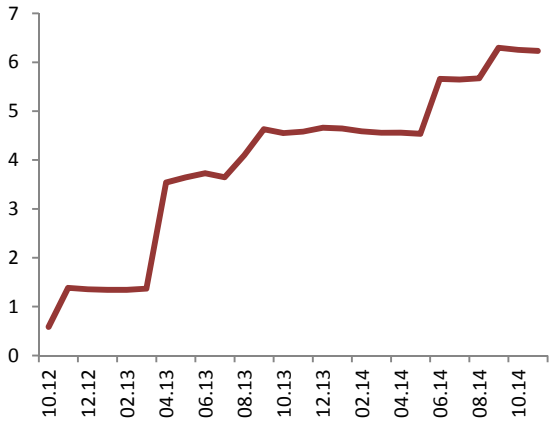
So far we have discussed the effects and the potential problems of utilising foreign currency funds in Turkey. Recent experiences have suggested that the characteristics of the borrowing and lender involved may play a critical role in whether the potential risks arising from foreign funding actually materialise. In several recent studies, it has been documented that, starting from around 2010, both banks and especially non-banks in EM countries are increasingly opting for bond markets for their financing needs (Shin (2013)). The tendency towards international bond markets as a funding method is viewed as undesirable for four reasons: (i) the cost of borrowing becomes more sensitive to external developments; (ii) currency mismatch problems could be aggravated; (iii) if corporate foreign borrowing increases corporate deposits, it could create liquidity problems in stress times; and (iv) corporate debt is mainly held by asset managers, who have proved to be quite sensitive to economic indicators.

Banks' international securities issuance as a share of total foreign borrowings (Percent) Graph 16



Source: CBRT

Firms' international securities issuance as a share of total foreign borrowings (Percent) Graph 17

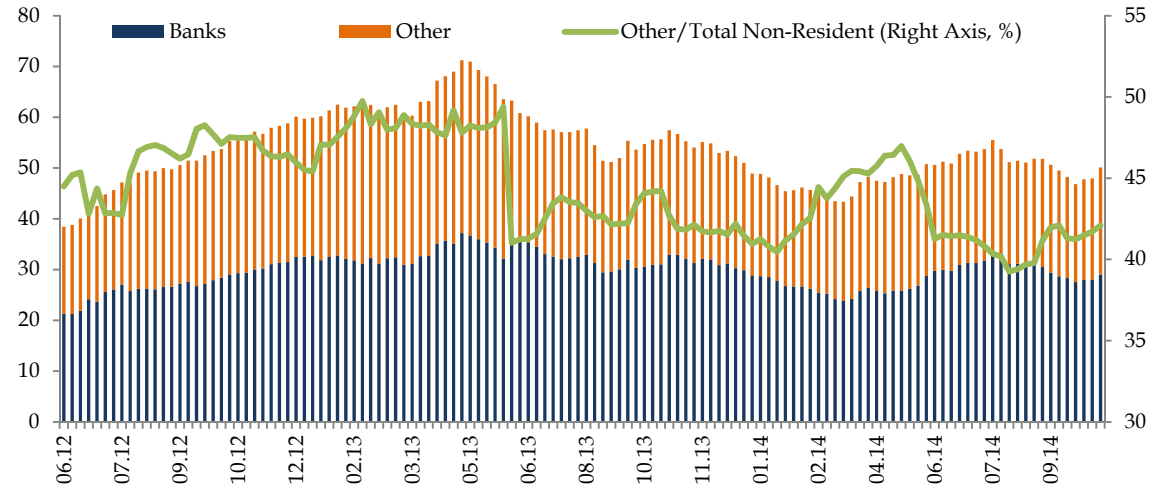


Source: CBRT

In the Turkish case, bond issuance by banks started to pick up in 2010, while corporate borrowings in the debt market revived in 2012. However, the pace of debt issuance slowed down especially for the non-bank corporate sector after the taper tantrum in May 2013 (Graphs 16 and 17). As the amounts outstanding of that type of borrowing constitute no more than a small fraction of the total liabilities of banks and non-banks, it is not yet a concern for the Turkish economy. However, the developments in the government domestic debt market in and after May 2013 supported the assessment that asset managers, as the most important buyers in the debt markets, are quite sensitive to economic indicators and hence they could indeed amplify any volatility in EM assets. Immediately after the tapering announcement in May 2013, foreign investors sold down their Turkish government bond holdings. A closer look at the data shows that those investors were mainly

non-bank foreign investors (ie, to a large extent, asset managers). Compared with those of non-bank foreign investors, however, the bond holdings of foreign banks declined only moderately (Graph 18).

Composition of non-residents' holdings by institution (USD billions, percent) Graph 18



Source; CBRT

3. Conclusion

Shifts in financial intermediation are important for the transmission of monetary policy in various ways. For example, as the total amount of FX-denominated assets increases in the financial sector, interest rate policy tends to lose its effectiveness. Similarly, if there are large currency mismatches in the economy, significantly constraining the supportive role of interest rates during an economic slowdown, then the optimal settings for monetary policy may have to change. Moreover, an increased share of foreign funding in financial intermediation would imply that volatility in global liquidity conditions and risk perceptions will be transmitted more strongly to the domestic economy. Another key point concerns the yield curve. In times of abundant global liquidity, the search for yield can drive the long end of the domestic yield curve to very low levels, possibly limiting the scope for monetary policy to control domestic credit conditions. All these factors can reduce the influence of interest rate policy alone, thus posing important challenges for monetary policy in emerging countries. In this case, the formulation of structural and cyclical macroprudential policies can become very crucial in managing the domestic economy and containing the risks to financial stability.

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Changing patterns of financial intermediation: Implications for central bank policy

Central Bank of the United Arab Emirates

Abstract

Within the UAE, banks play a major role in financial intermediation, so that the bank lending channel accounts for a very large portion of the monetary policy transmission mechanism. Securities markets, on the other hand, constitute a relatively new source of funding, thereby playing a relatively minor role. Within this context, the growth of the banking sector over recent years has facilitated financial intermediation and enhanced monetary policy transmission. Similarly, the central bank has proactively dealt with changes in financial intermediation to ensure an efficient and productive financial system that best serves the needs of the UAE.

Keywords: monetary policy, central bank policies, banks and financial institutions

JEL classification: E52, E58, G21

A. The role of banks

1. How did the relative importance of banks and market-based financing change in EMEs over the past decade?

Efficient financial intermediation has helped to support economic growth in the UAE, since the non-oil sectors rely primarily on bank financing.

Securities markets are a relatively new source of financing within the UAE, with equities markets introduced only in the early 2000s (eg the Dubai Financial Market, Abu Dhabi Securities Market). Consequently, capital and debt markets remain relatively shallow, illiquid and dominated by retail investment. Similarly, other sources of funding, such as fixed income debt instruments, meet only a relatively small proportion of the financing needs of UAE corporates and the government. Reflecting the dominance of bank loans, total debt securities issued by resident corporates and the government, and held by banks operating in the UAE reached AED 57.6 billion[1] at the end of 2013, compared with loans granted by banks of AED 1275.5 billion.

2. How has the composition of assets and liabilities of domestic banks changed? What does this imply for the liquidity, maturity and credit risks banks face as well as their credit extension decisions (pricing etc)? In particular, what is the structure of their lending (eg (i) households vs corporates; (ii) fixed vs variable rate; (iii) collateral practices; (iv) domestic vs foreign currency) and how has it changed? How has the degree of competition evolved? And what has been the role of government-owned banks/financial intermediaries?

During the period 2004 through 2009, the total assets of banks operating in the UAE grew by 247.3%: assets of state-owned banks grew by 242.5%, assets of local private banks grew by 396.6%, and assets of foreign-owned banks grew by 180.6%. This increase indicates significant growth in financial intermediation in support of economic activity. At the end of 2009, state-owned banks held 63.0% of total assets in the banking system, compared with 18.9% for foreign banks and 17.9% for private banks

Starting in 2009, the impact of the global financial crisis, combined with the corrections that took place in the domestic real estate and securities markets, led to a slowdown in bank activity. As a result, during the period 2009 to 2013, bank assets grew at a slower pace, by 32.8% for foreign banks, 34.0% for private domestic banks, and by 37.4% for state-owned banks. The slower growth was a function of more stringent oversight and regulation by the central bank and more prudential management by banks of portfolio options and available liquidity.

Banks' total equity (capital and reserves) increased fivefold between the end of 2004 to the end of 2009, reflecting a continued drive to strengthen the capital adequacy ratio, while high profitability led to a large increase in retained earnings. Nonetheless, banks' liquidity and profitability indicators took a turn for the worse at the outset of the international financial crisis, prompting the Central Bank of the UAE, in cooperation with the Ministry of Finance, to make a deposit at banks in the amount

[1] Arab Emirates Dirham (AED) exchange rate: 3.6725 Dirhams per US Dollar.

of AED 50 billion (USD 19.1 billion) to support banks' liquidity. The resulting "subordinated loans" boosted banks' capital and reserves.

During 2004–09, bank loans to the private domestic non-financial corporations grew by 293.1%, compared to 285.1% increase in loans to domestic government and public sector corporations. In the period between end-2009 to end-2013, however, loans to private sector non-financial corporations remained roughly flat, while loans to the government and the public sector grew by 81.6%, which reflects a more prudent banking sector lending strategy towards the private sector, and the leading role of the government and government-related entities (GREs) in the credit market in line with the countercyclical stance of fiscal policy.

Meanwhile, the share of bank loans to domestic households remained in the range of 6–8% during the whole period. This indicates that bank activity in the UAE is geared towards corporates and government sectors, and that there is a potential to further develop retail banking activities in the country.

B. The role of debt securities markets

3. How have international banks' business models (eg centralised vs subsidiary) evolved since the 2008 financial crisis? Does the nature of a bank's business model influence the supply of credit during periods of adverse external shocks?

The business model of foreign retail banks operating in the UAE has remained unchanged, and is limited to the activity of the branches of these banks. Total loans granted by these branches increased steadily to reach AED 201.7 billion at the end of 2013. However, in the light of the growing share of national banks in intermediation, the share of foreign banks in total bank loans decreased from 23.0% at the end of 2004 to 15.8% in 2009, and has remained at this level until the end of 2013.

As the UAE has only branches of foreign banks (no foreign subsidiaries), we cannot comment on the impact of the banks' business model on the supply of credit in periods of stress.

As regards wholesale banks, licenses were granted in recent years to allow these banks to collect deposits from corporates only. Currently, the five wholesale banks operating in the UAE are:

Deutsche Bank AG – Abu Dhabi

Industrial & Commercial Bank of China – Abu Dhabi

The Bank of Tokyo – Mitsubishi UFI, Ltd – Abu Dhabi

Korea Exchange Bank – Abu Dhabi

Bank of China Limited – Abu Dhabi

4. What is the structure of the debt held in the form of securities, both sovereign and corporate (size, maturity, fixed/flexible rate, collateral, currency) and how has it evolved? How has the relative importance of domestic and international debt issuance changed?

Banks have increased their holdings of debt securities over time, which grew by 271.5% from 2004 to 2013, reaching AED 135.6 billion. This was mainly due to the issuance of bonds by the governments of Dubai and of Abu Dhabi and their related entities. Nevertheless, it remains significantly lower than loans made to governments and corporates (including government-related corporates), which reached over AED 1 trillion at the end of 2013. It is worthwhile to note that there are no federal government debt securities as the current law does not allow the federal government to borrow.

The smaller share of these securities, relative to cash holdings and deposits at the central bank, reflects the shallow securities markets in the UAE, emphasising the need to develop a domestic market for bonds and Islamic sukuks issued in AED to diversify the range of assets in the banking system and increase the central bank's capacity to manage liquidity.

5. In addition, a major development over the past five years has been the shift of borrowing by EME non-bank corporations away from banks to international debt markets. What are the implications for the financing of firms?

This question does not apply to the UAE since the AED-denominated corporate bond market is not developed.

6. What would be the impact on bank and non-bank corporations' balance sheets of a potential tightening in global financing conditions?

Credit granted by branches of foreign banks operating in the UAE is about 16% of total bank credit at the end of 2013; therefore, any deleveraging by international banks is expected to have only a minor impact in the UAE.

The UAE banking system is liquid with its holding of central bank certificates of deposit, which is demand-driven by banks, amounting to AED 101 billion as at mid-December 2014. We have also seen a limited inflow of non-resident deposits, which remain at around their historical long-term average of 10% of total deposits. As such, we do not expect any significant impact on UAE banks from tightening.

C. Implications for monetary policy

7. What is the share of corporate deposits in total bank deposits? To what extent has it been affected by international debt issuance by non-financial corporations? What other interactions between banks and non-

bank corporations' balance sheets are likely to be important from the viewpoint of monetary and financial stability?

Corporate deposits (including deposits from majority or partially government-owned corporates) represent around 42% of total deposits, reaching AED 543.5 billion at the end of 2013, of which around 53% represented time deposits.

Retail deposits, including those of SMEs and high net worth individuals, reached AED 482 billion at the end of 2013, which represents 37.7% of total deposits.

Non-bank financial corporate (NBFI) deposits reached around AED 75 billion, representing 6% of total deposits as at the end of 2013, of which 24% was demand deposits.

We believe that the increase in debt securities issued by non-financial corporations does not significantly impact the deposits at banks, due to the limited amount of such issuances after 2008 and the fact that the proceeds are being used to redeem existing debt.

8. How have recent changes in financial intermediation affected the transmission mechanism of monetary policy in EMEs (eg size and speed of pass-through of changes in policy rates, responsiveness of overall credit conditions and asset prices, impact on debt service ratios and, through these, on the macroeconomy)?

The UAE operates a pegged exchange rate system, whereby the AED is allowed to trade within a very narrow band around the official rate of 3.672–3.673 USD/AED. Consequently, a key goal of monetary policy within the UAE is to maintain credibility of the currency regime while ensuring monetary stability through adequate provision of liquidity to the banking sector. Given the limitations imposed by the Impossible Trinity, this implies that short-term interest rates within the UAE tend to closely follow the US federal funds rate.

Under these conditions, the main aim of the transmission channel of monetary policy is to manage liquidity in the banking system with a view to influencing bank lending.

With respect to the effect of growing financial intermediation on the transmission mechanism of monetary policy, data limitations make it impossible to quantify this impact in the UAE's case.

The banking sector's growth over time has increased its role in financial intermediation, thereby increasing the effectiveness of the monetary policy transmission mechanism, which aims at managing liquidity in the banking sector. This is particularly important in the UAE given the relatively underdeveloped nature of the capital markets, as characterised by the lack of an AED-denominated yield curve in the absence of an adequate supply of government bonds at varying maturities. Given such limitations and the lack of available funding substitutes for UAE corporates, bank lending plays a very important role in monetary transmission. As such, the UAE banking sector's expansion over the past decade is likely to have strengthened the monetary transmission mechanism over time via credit growth in support of private activity and non-energy output growth.

9. How has financial intermediation changed the sensitivity to global monetary and financial conditions?

Financial intermediation in the context of a growing banking sector that is well integrated with the global capital market has increased the sensitivity and vulnerability of the financial system and, in turn, that of the real economy to global monetary and financial conditions. This exposure increases the role of monetary policy in managing banking system liquidity to ensure efficient intermediation and prevent overheating. As evident during the global financial crisis, banks' liquidity suffered a severe setback, which called for the intervention of the monetary authority to ease liquidity constraints. Further, oversight prudential measures should be in place and closely monitored to ensure the soundness of the financial system. Against the backdrop of limited exchange rate flexibility and scope for adjusting the policy rate to stem the risk of financial flows, prudential measures need to be taken to counter the risk of a bubble building up, mitigate financial vulnerability and align banking resources with objectives to sustain growth in a diversified economy.

10. How should monetary policy adapt to the changes in financial intermediation? For instance, to what extent should it react to sharp changes in risk premium in EME debt markets (through interest rate and/or balance sheet measures) and respond to broader vulnerabilities?

Given the potential for changes in financial intermediation to impact the transmission mechanism of monetary policy, policymakers should take into account the capacity and efficiency of the banking system when setting policy. With respect to the UAE, this involves maintaining the credibility of the exchange rate peg through the maintenance of adequate liquid foreign reserves. At the same time, ensuring effective tools in the form of standing facilities and open market operations are required to drain and inject liquidity when the need arises. Such tools should be sufficiently flexible to respond to emerging needs as they arise.

The UAE appears to be well equipped to deal with sharp changes in financial intermediation and to withstand vulnerability in the banking system. The credibility of the exchange rate peg is supported by available foreign reserves accounting for well over 100% of the monetary base. Moreover, the central bank can issue certificates of deposits to absorb excess liquidity at banks. Further, a number of standing facilities (such as the repo, swaps and interim marginal lending facilities) are held ready to inject emergency liquidity during times of crisis.

In the event of a sharp increase in the credit risk premium, policy intervention is warranted to monitor credit growth and ease liquidity constraints. With the increasing importance of financial intermediation, tighter oversight over the financial system is needed to ensure stability. In addition, further development of the debt market would help the monetary authority manage liquidity effectively and increase its capacity to respond to broader vulnerabilities.

In support of these goals, the central bank has injected capital to increase capital adequacy ratios in order to increase confidence and liquidity in the banking sector and counter the cyclical downturn. Subsequently, the central bank has enforced thresholds to stem mortgage lending risks and the risk of a real estate bubble by enforcing a loan-to-value (LVT) ratio of 80% for first purchases of less than AED 5 million by UAE nationals and 75% LTV for expatriates, while the debt-service-

to-income ratio was fixed at 50% of borrower's gross salary and any regular income from a defined and specific source.

These guidelines, along with the cap on lending to stable resources of banks (currently set at 100%), can be applied by the central bank as a countercyclical tool to ensure effective intermediation while safeguarding financial stability.

The use of macroprudential policies could be further enhanced to increase the scope for meeting the goals of monetary stability, providing the central bank with further tools to manage liquidity and credit growth as it continues to abide by the constraints of the fixed peg of the exchange rate of the AED to the US dollar.

11. To what extent do macroprudential policies influence the transmission mechanism of monetary policy? How far do they complement or substitute for interest rate policies?

The UAE has a fixed exchange rate regime. As such, the use of monetary policy is limited.

The macroprudential tools available in the UAE are basically the same as the micro supervision tools: capital adequacy ratios, reserve requirements and liquidity ratios for banks. However, these tools are not explicitly used to stem cyclical pressures.

The transmission of monetary policy could be enhanced via the use of prudential policies which aim at releasing more liquidity during cyclical downturns and at restraining overheating and the possibility of bubble formation, particularly in the real estate sector, which was hard hit during the global financial crisis.

Macroprudential tools could complement the use of monetary policy tools (such as standing facilities and liquidity draining facilities) in achieving the goals of monetary stability. It should also be noted that the use of macroprudential tools should not be seen as a panacea to imbalances as they emerge, but rather as tools that strengthen the ability of the financial system to cope with external pressures and looming crises.

More importantly in the context of the UAE, the use of macroprudential policies should complement interest rate policies, providing the central bank with further tools to manage liquidity and credit growth, where interest rate policies are constrained by lack of independent monetary policy in the context of a pegged exchange rate regime. This is a relatively new area and the use of macroprudential tools to lean against the cycle requires further practical evidence in order to achieve the correct calibration of such tools.

List of participants

Central banks

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Central Bank of Brazil	**Caio Ferreira** Head of Regulation Department
Central Bank of Chile	**Sebastián Claro** Member of the Board
People's Bank of China	**Xuechun Zhang** Chief Representative, Frankfurt Representative Office
Bank of the Republic (Colombia)	**Hernando Vargas Herrera** Deputy Governor
Czech National Bank	**Vladimír Tomšik** Vice Governor and Member of the Board
Hong Kong Monetary Authority	**Vincent Lee** Executive Director
Bank Indonesia	**Perry Warjiyo** Deputy Governor
Bank of Israel	**Nadine Baudot-Trajtenberg** Deputy Governor
Bank of Korea	**Jin Ho Huh** Director General of the Financial Markets Department
Central Bank of Malaysia	**Muhammad bin Ibrahim** Deputy Governor
Bank of Mexico	**Manuel Ramos-Francia** Deputy Governor
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