# Monetary policy transmission and shifts in financial intermediation

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## 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

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# 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)).

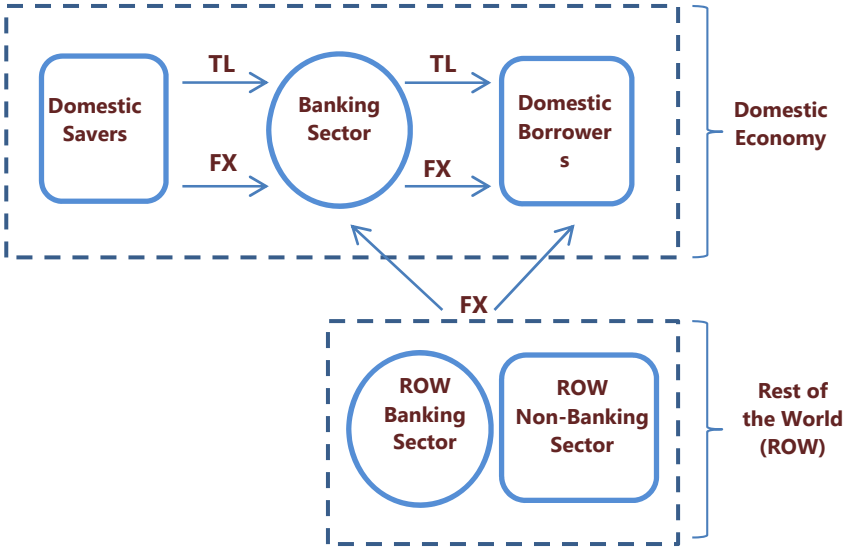
One major factor that can change the effectiveness of monetary policy transmission is a shift in the financial intermediation structure. From the perspective of a small emerging country, Graph 1 presents a simplified picture of financial intermediation in the economy. Inside the country, savers place 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



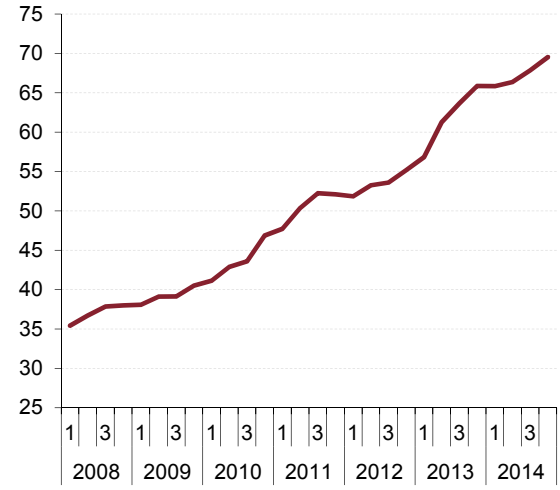

The domestic economy can also raise funding from the rest of the world. Foreign sources can be in foreign currency and from both the banking and non-banking sectors. Overall, such foreign funding will be more sensitive to global financial conditions than is domestic funding. As a result, shifts in financial 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.

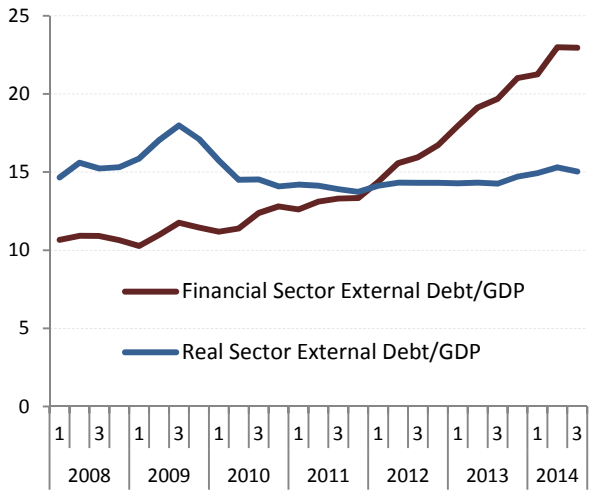
[4] For some studies on unconventional and macroprudential policies in general and in Turkey, see Goodhart (2013), Başçı and Kara (2011), Alper et al (2013), Aysan et al (2014 and 2015).

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



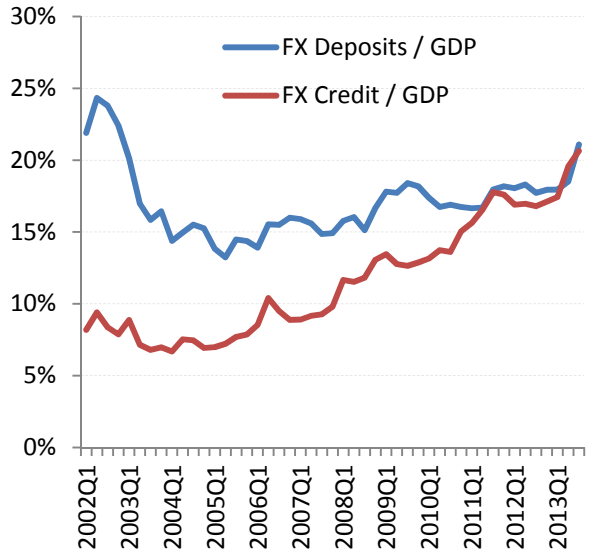

Source: CBRT

## 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.

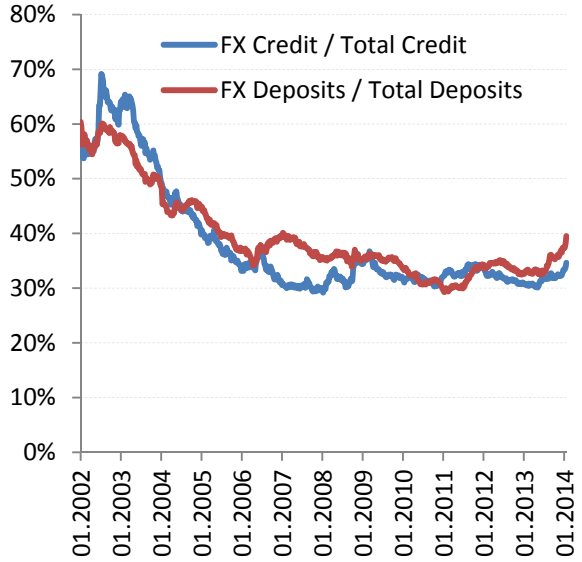
Several major issues are related to dollarisation from the perspective of monetary policy, such as the extent of dollarisation, the stability of FX funds from domestic and external sources and related balance sheet effects. If dollarisation is very pervasive, then the effectiveness of interest rate policy 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

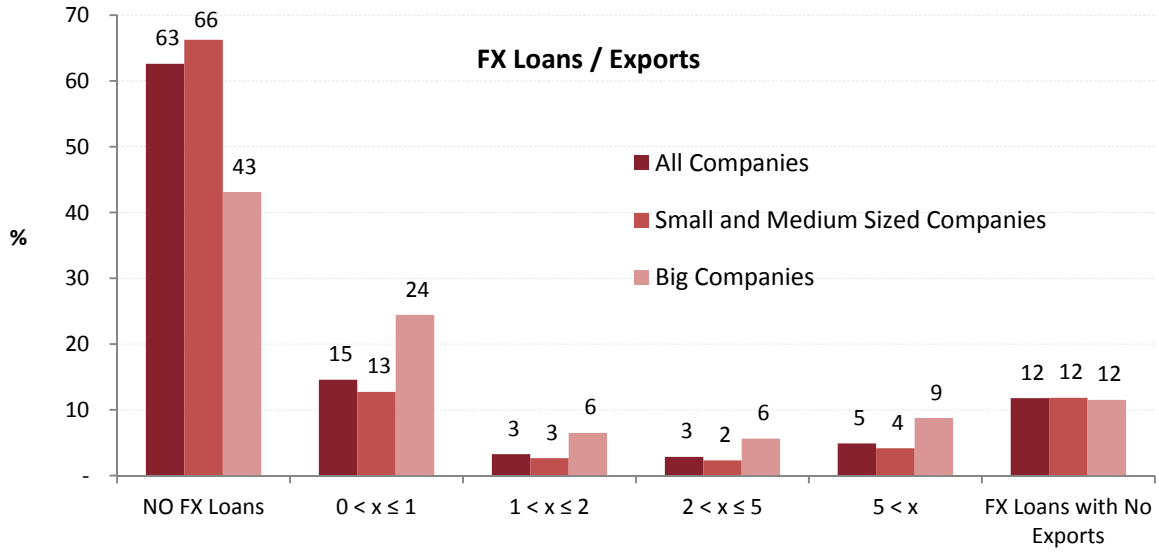
Another major issue related to financial intermediation in FX is the related balance sheet effects. Domestic agents can have symmetrical positions in the sense that each aggregate agent (households, firms, banks and government) can have similar levels of FX assets and liabilities in their balance sheets. 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.

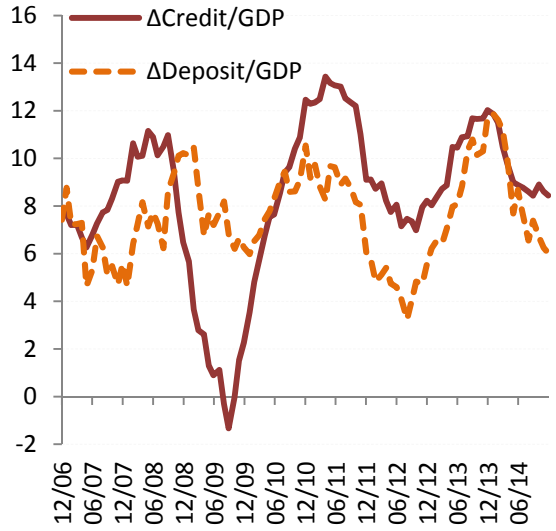
## 2.2. Composition in terms of funding from domestic and foreign sources

### 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

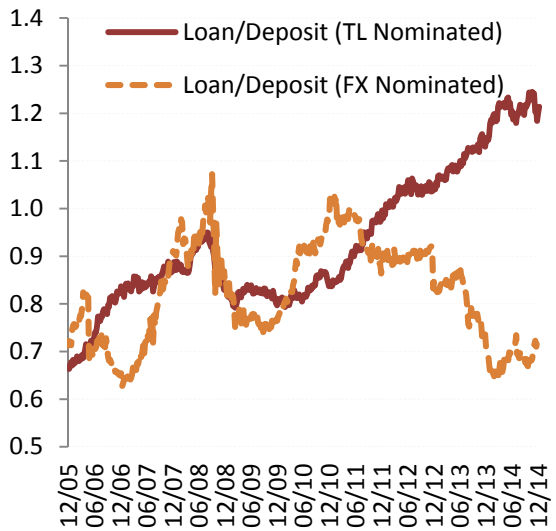
GDP) in recent years (Graph 7). To satisfy credit demand and to fill the savings gap in the economy, banks have made active use of external financing. Actually this funding gap is strongly correlated with Turkey's current account, in the sense that higher credit use relative to deposit supply is associated 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



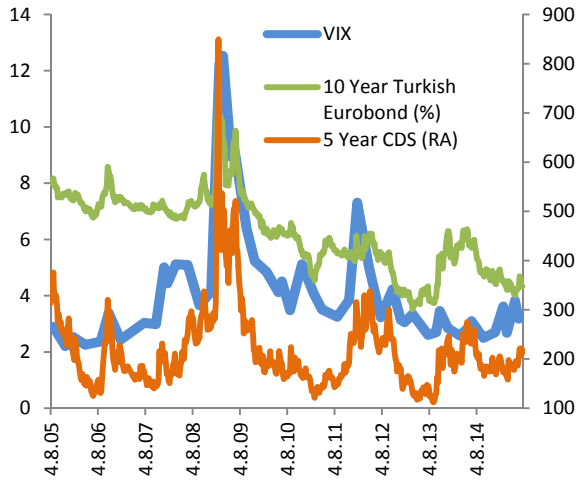

Source: CBRT

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

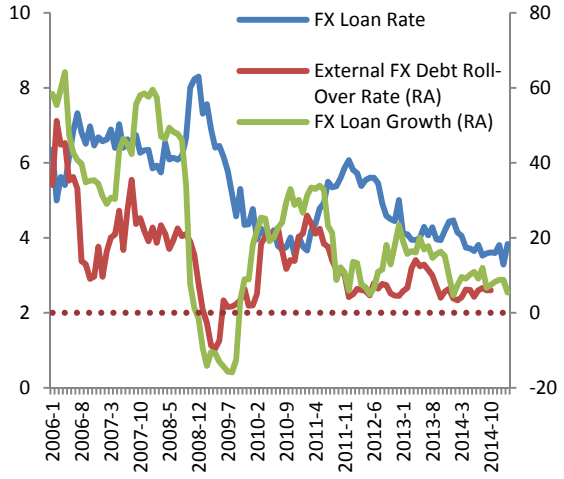
Graph 9




Source: Bloomberg

Foreign borrowing and FX loans

Graph 10

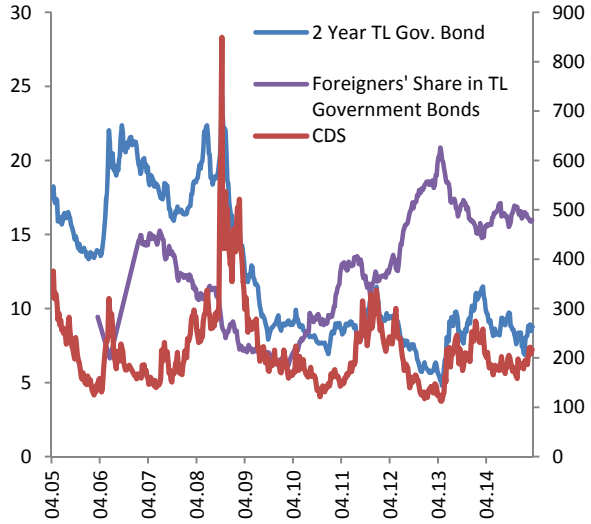



Source: CBRT

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.

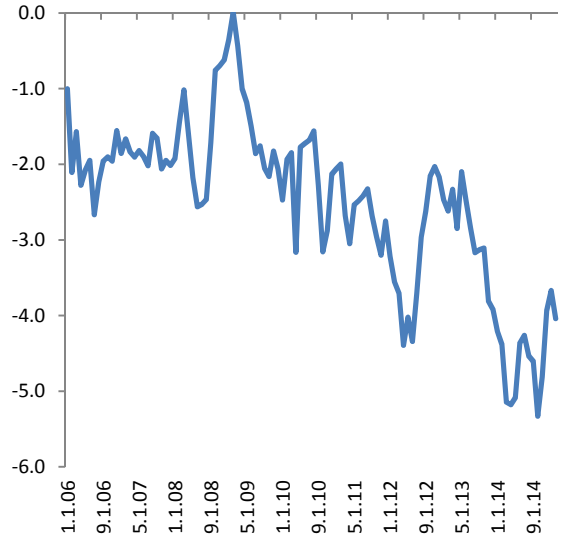
Portfolio investments represent another important component of capital flows. Portfolio flows are allocated almost entirely to TRY-denominated government bonds and listed equities. Unlike the FX borrowings of domestic banks, foreign holdings of these assets have displayed a quite volatile pattern. Together 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) |

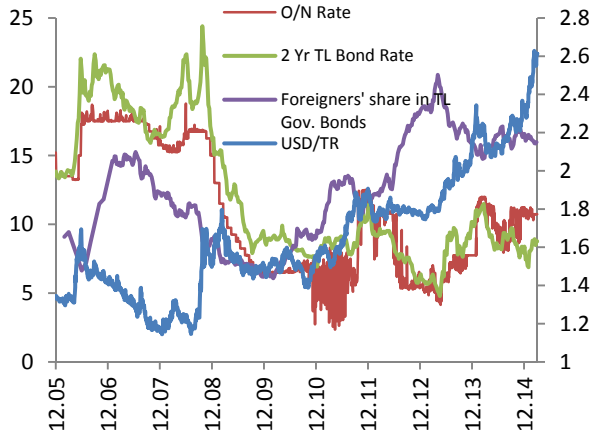
Note: * Domestic bank takes FX long position with currency swaps to offset the short position created on-balance sheet.

[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

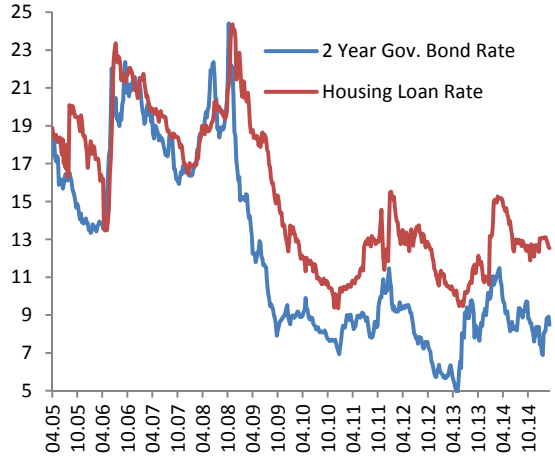
Graph 14




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.

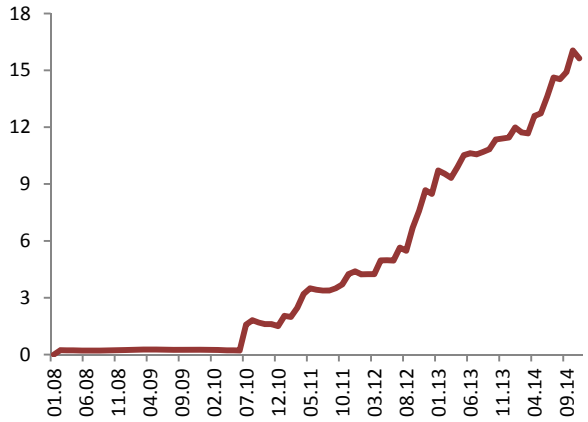
[7] For a more detailed analysis of the effects of global interest rates on emerging country yields, see Turner (2014).

These developments present new important challenges for the monetary transmission mechanism.

## 2.3. Composition of foreign funding in terms of banks and non-banks

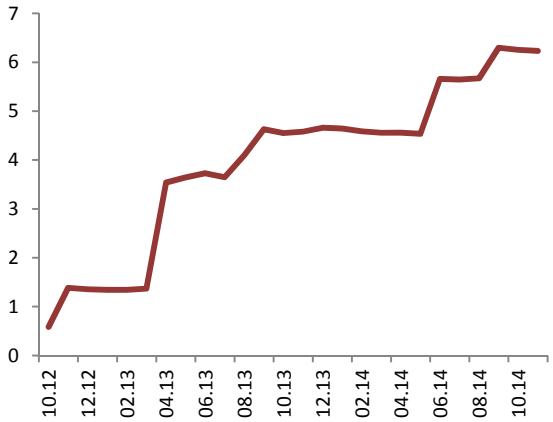
So far we have discussed the effects and the potential problems of utilising foreign currency funds in Turkey. Recent experiences have suggested that the characteristics of the borrowing and lender involved may play a critical role in whether the potential risks arising from foreign funding actually 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

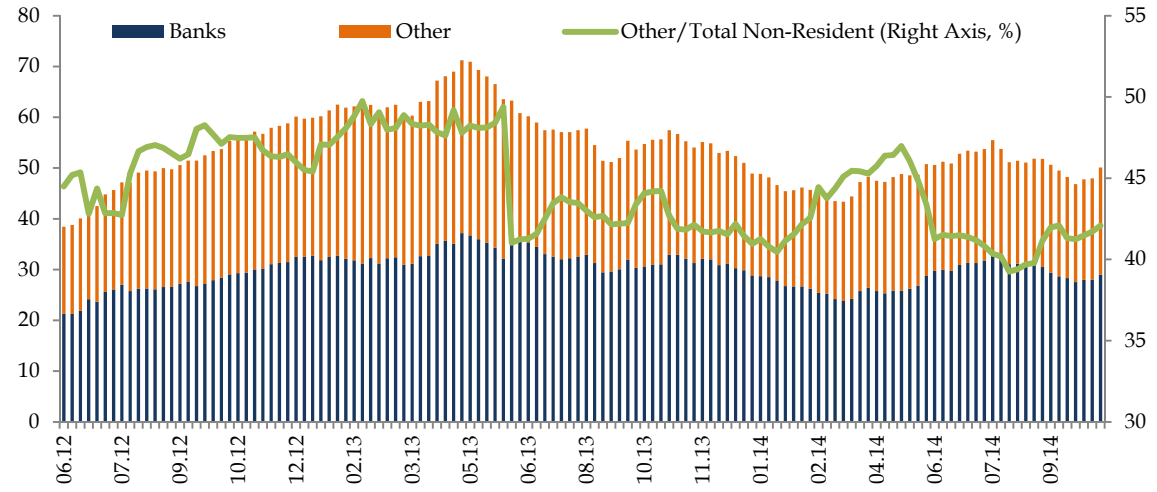



Source: CBRT

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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