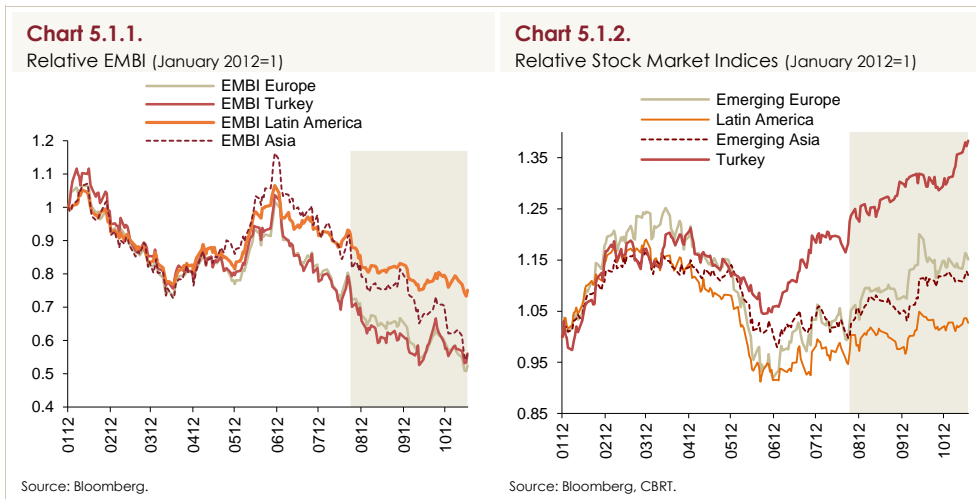


5. Financial Markets and Financial Intermediation

5.1. Financial Markets

Global Risk Perceptions

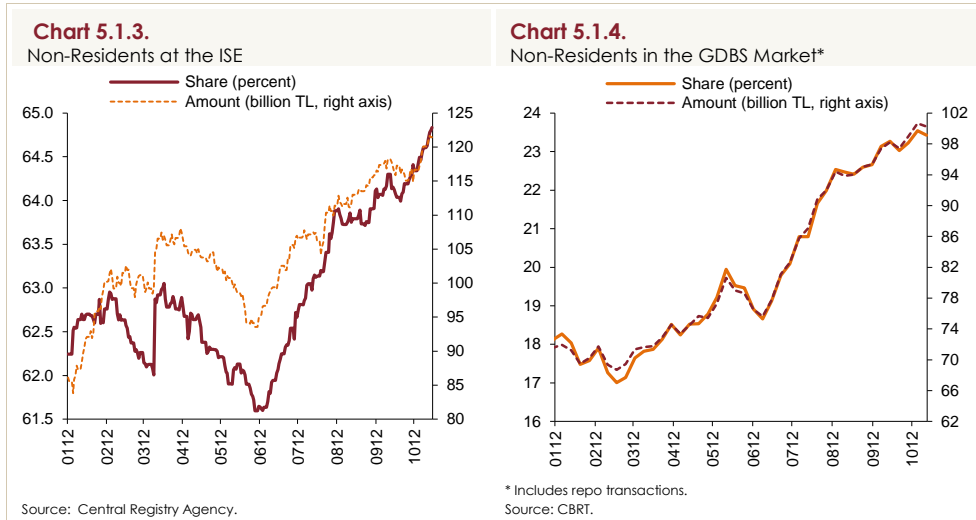
In the third quarter of the year, the slowdown in global growth led many countries, especially the advanced economies, to adopt expansionary monetary policies. Moreover, concrete measures taken to solve financial problems in the Euro Area have pushed up the risk appetite since June. In tandem with the rising global risk appetite, risk premiums also decreased in emerging economies (Chart 5.1.1). The recent announcement of new monetary policy packages in advanced economies brought about a re-acceleration of capital flows towards emerging economies. In this period, stock market indices of emerging economies trended upwards in line with the global risk appetite (Chart 5.1.2). Data on macroeconomic indicators, particularly the current account deficit, proved better than expected in October, which led the ISE to positively diverge from other emerging economies.



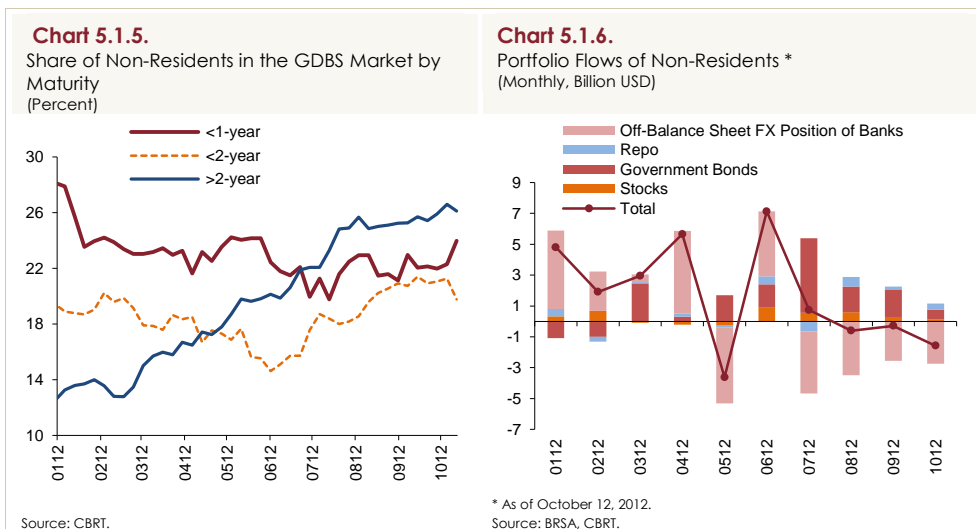
Portfolio Flows

In the third quarter, on account of the expansionary measures taken by major central banks, Turkey, similar to other emerging economies, experienced capital inflows towards public borrowing securities and stock markets. Accordingly, the share of non-residents in the ISE and GDBS markets has been

on an upward track since June (Charts 5.1.3 and 5.1.4). The rise in the amount of non-residents' investments in the ISE was also driven by price increases.

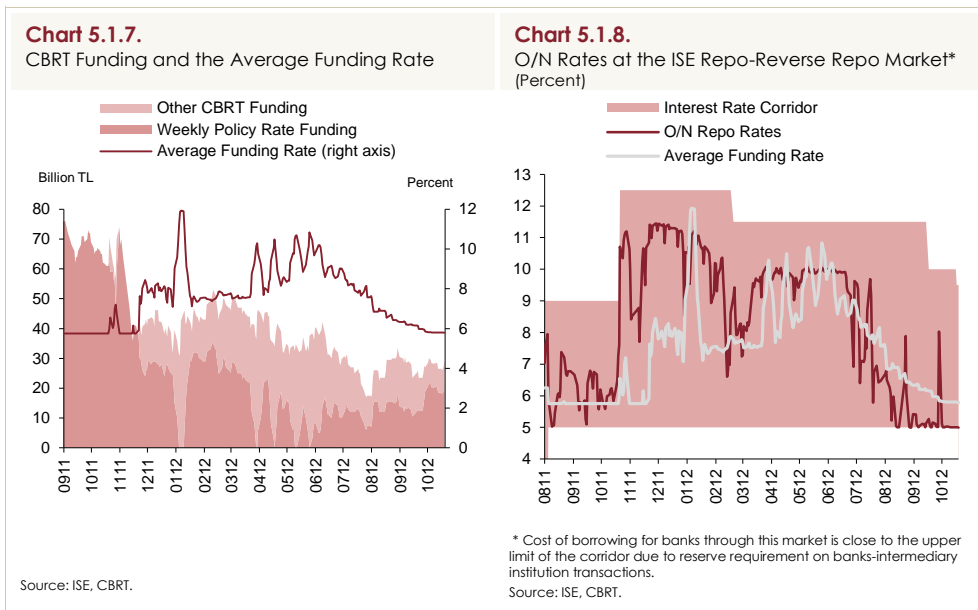


On account of positive expectations regarding Turkey's medium-term macroeconomic performance and the relatively low volatility of the long-term returns, investments by non-residents in the GDBS market have been concentrated in maturities longer than one year (Chart 5.1.5). Despite inflow of capital towards stock and GDBS markets, currency swap transactions posted decline. CBRT's stance towards bolstering short-term rates and liquidity conditions and the decline in banks' need for short-term liquidity amid the facilitation of the use of FX options have been effective on currency swap transactions (Chart 5.1.6). As a result, total portfolio flows by non-residents displayed a decline in the inter-reporting period.



Monetary Policy Implementation

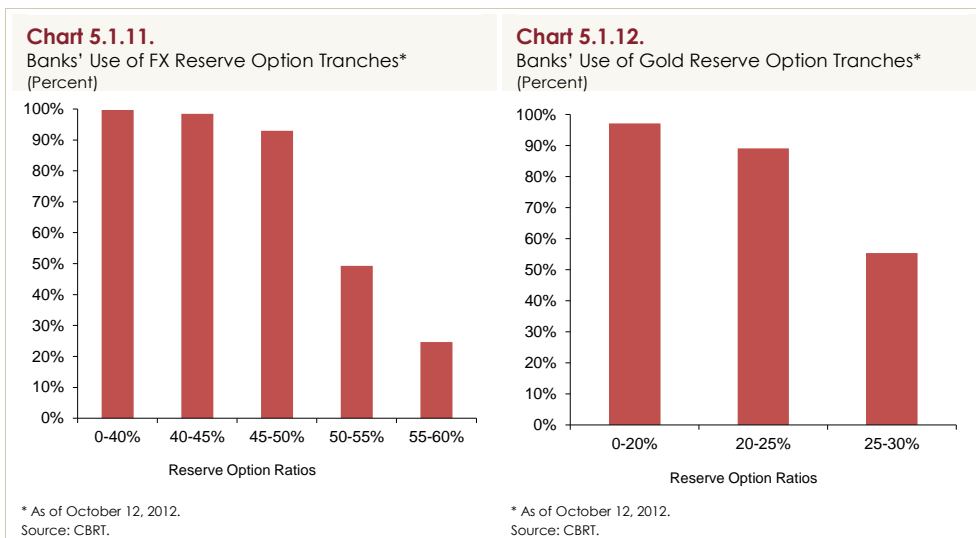
At the August meeting of the MPC, the CBRT shared with the public that inflation was estimated to be on a downward track in the forthcoming period; yet preserved its cautious stance in order to contain the risks to the pricing behavior that may be led by inflation, which would remain above the target for a while. On the other hand, considering the potential of additional monetary easing implemented by major central banks in September and October to accelerate capital flows, the interest rate corridor was narrowed by reducing O/N lending rate by 150 and 50 basis points, respectively. Nevertheless, persisting uncertainties in the global economy led the monetary policy to remain flexible. The mild recovery in final domestic demand in this period accompanied by the favorable data regarding other macroeconomic variables paved the way for the average funding rate to settle at low levels. Accordingly, the CBRT funded the market mostly through one-week repo auctions held under the quantity method besides monthly repo auctions held under the traditional method. Moreover, so as to ensure that money market rates settle at the O/N borrowing rate, which is the lower band of the CBRT's interest rate corridor, the financial system was overfunded and the excess liquidity was withdrawn at O/N maturity at the ISE money markets (Chart 5.1.7). In fact, due to the fall in average funding rate and the overfunding of the financial system, the O/N repo rates at the ISE rapidly declined to the lower bound of the corridor (Chart 5.1.8). Despite low O/N rates, the width of the corridor remained unchanged, highlighting the cautious stance of the CBRT.



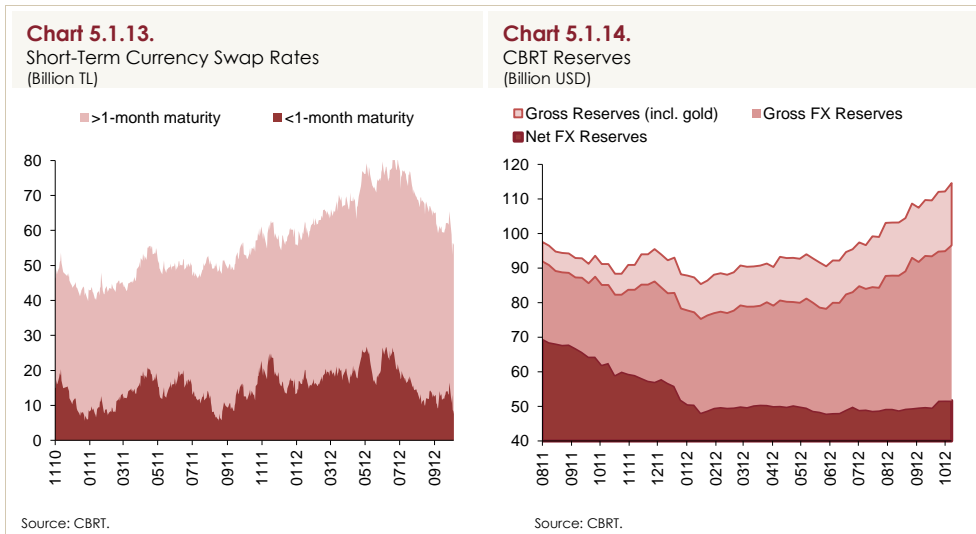
In the August meeting of the MPC, additional arrangements were introduced regarding the fulfillment of reserve requirement against TL liabilities in foreign exchange so as to reduce cost differentials between holding required reserves as TL or FX and also to enable banks to freely use the new facility in order to meet their liquidity needs. The flexibility of the facility was slightly increased from 55 percent to 60 percent. Moreover, the additional 5 percent tranche is to be multiplied by “2”, the reserve option coefficient (ROC) and the resulting sum was facilitated to be held in USD and/or euro. Furthermore, to bolster financial stability, the coefficient corresponding to the first 40 percent tranche of the TL required reserves was decided to be increased to “1.1” percent. For the same purposes, the upper limit for the fraction of gold reserves that can be held to fulfill Turkish lira reserve requirements, which was previously 25 percent, was raised to 30 percent and the additional 5 percent tranche was multiplied by the ROC so as to enable the corresponding amount to be maintained as gold (Chart 5.1.9). In order to support financial stability given the new monetary easing policies adopted by major central banks, reserve option coefficients for each tranche were increased by “0.2” and “0.1” percentage points in September and October MPC Meetings, respectively (Chart 5.1.10). Reserve option mechanism partly reduces the need for an interest rate corridor as it contains the adverse effects of excessive volatility in capital flows on domestic markets. Meanwhile, it should be noted that the interest rate corridor has different functions with regard to the credit channel and the effective liquidity management. Therefore, the interest rate corridor will remain as an active policy tool to achieve price stability and financial stability.



The reserve option mechanism provided banks with the facility to build TL required reserves at lower costs. In fact, it should be noted that banks make use of these facilities extensively. However, in upper tranches with higher reserve option coefficients, some banks use almost all or a certain portion of the facility, while some banks do not use the facility at all (Charts 5.1.11 and 5.1.12). This stems from the varying costs in banks' acquisition of FX and gold funds (for details on ROC, see Box 5.1).



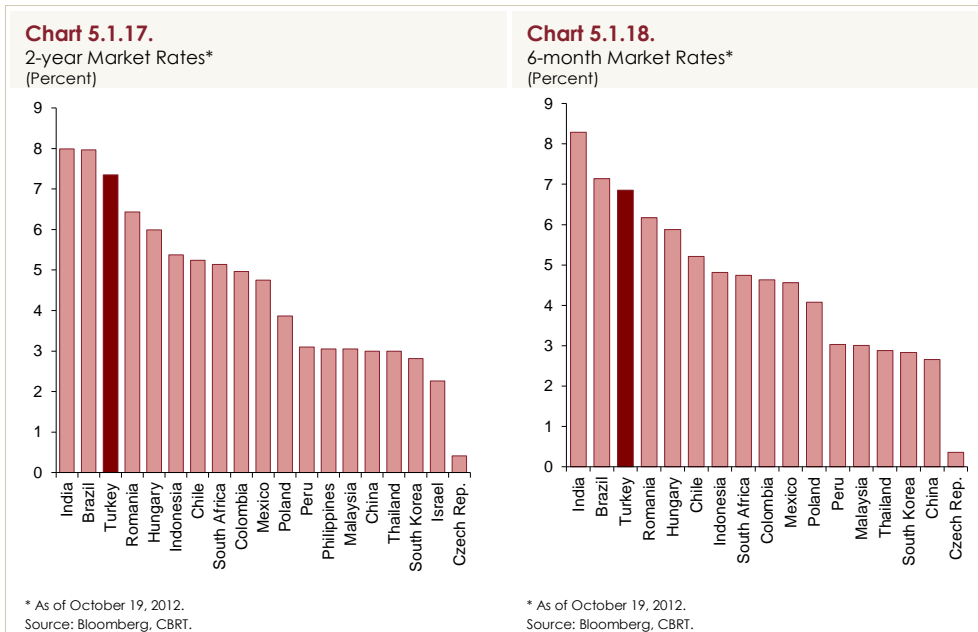
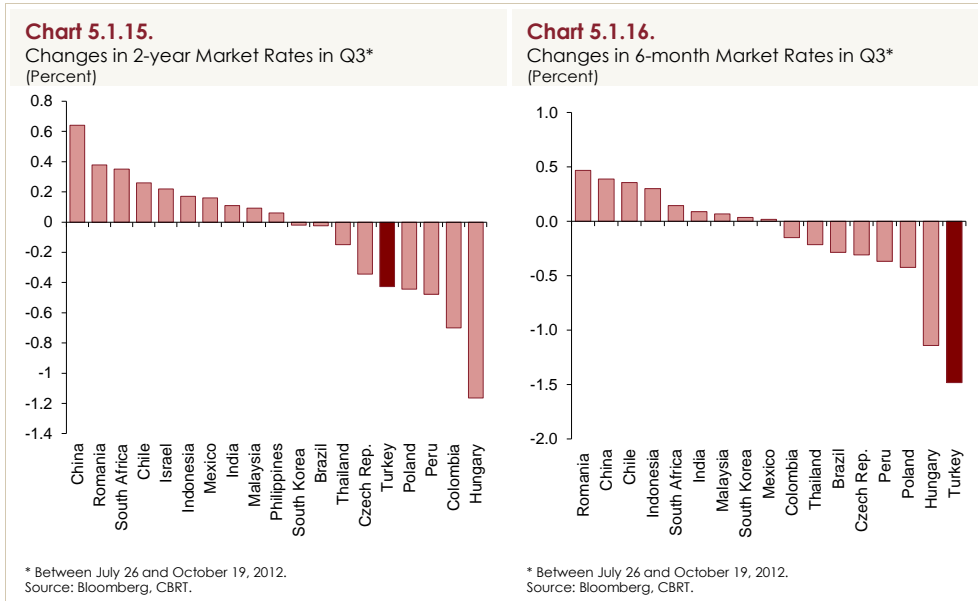
Active use of FX and gold reserve option facilities by banks has led to a decline in short-term currency swap transactions, particularly as of the third quarter of the year (Chart 5.1.13). This stems from the fall in short-term TL liquidity requirements of banks amid the facility. Moreover, owing to this facility, short-term capital flows obtained through currency swap transactions, which have high volatility, exhibit a waning outlook. Accordingly, this facility helps to keep FX volatility at low levels. On the other hand, owing to the reserve option mechanism, banks voluntarily accumulate FX reserves, while the CBRT's gross FX and gold reserves also continue to increase (Chart 5.1.14). However, gold and FX held under the scope of ROC belongs to banks, thus keeping CBRT's net FX reserves unchanged.



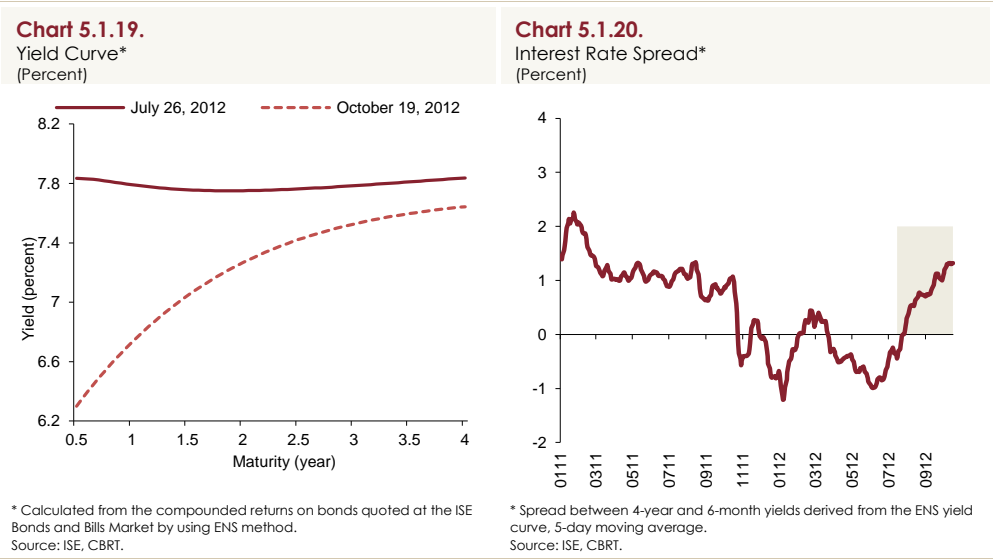
Moreover, in order to enhance liquidity management of banks and help them project their total funding costs, the CBRT continued to announce the funding amount on the days of quantity auctions besides the upper limit for the monthly repo auctions in the third quarter of the year. Under the scope of the TL liquidity projections, the lower limit for the July funding quoted at the policy rate was reduced to TL 0.5 billion and this amount was kept unchanged in August and September. The upper limit of funding was set as TL 6.5 billion in July, TL 7.5 billion in August and September, and TL 6.5 billion in October. The upper limit for the monthly repo auctions held under the traditional auction method was kept unchanged and the upper limit was reduced from TL 5 billion to TL 3 billion in September and increased to TL 4 billion in October.

Market Rates

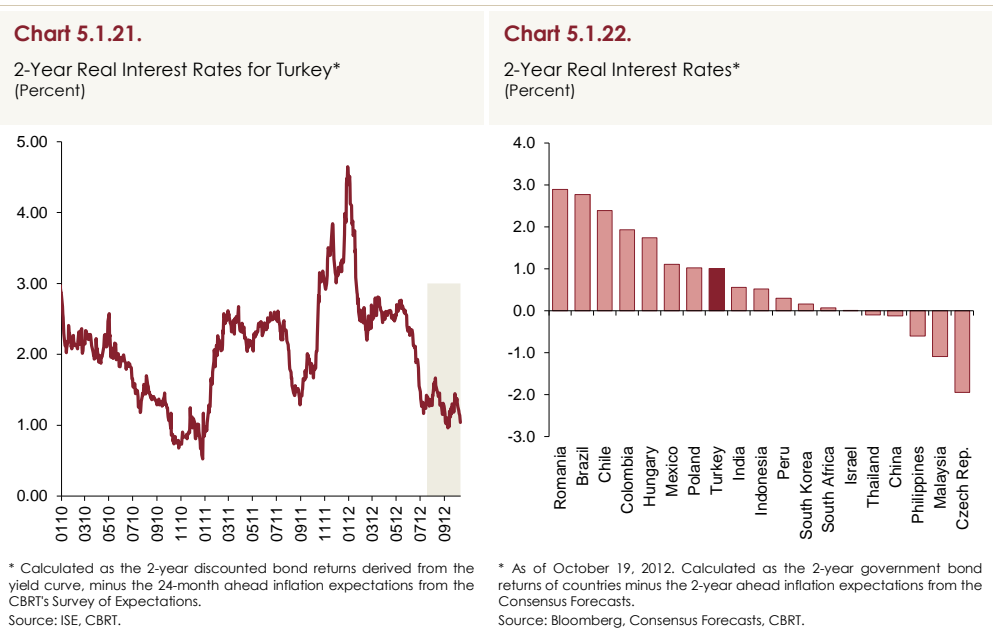
In the third quarter of the year, market rates in some emerging economies displayed a decline mostly upon the rise in the global risk appetite besides the policy rate reductions by major central banks that bolster economic growth (Charts 5.1.15 and 5.1.16). However, some emerging economies opted for policy rate hikes on concerns over inflation, which led market rates in these countries to increase. As for Turkey, market rates saw decreases mostly in short-term maturities, which were driven by the decline in average funding rate besides the narrowing of the interest rate corridor. Nevertheless, Turkey's nominal market rates still remain high compared to other emerging economies both in short and medium-term maturities (Chart 5.1.17 and 5.1.18).



In the third quarter of the year, above-mentioned developments led the short and medium-term GDBS rates to fall and the slope of the yield curve to turn positive (Chart 5.1.19). Due to the plunge in short-term rates, the spread between long and short-term became positive (Chart 5.1.20).

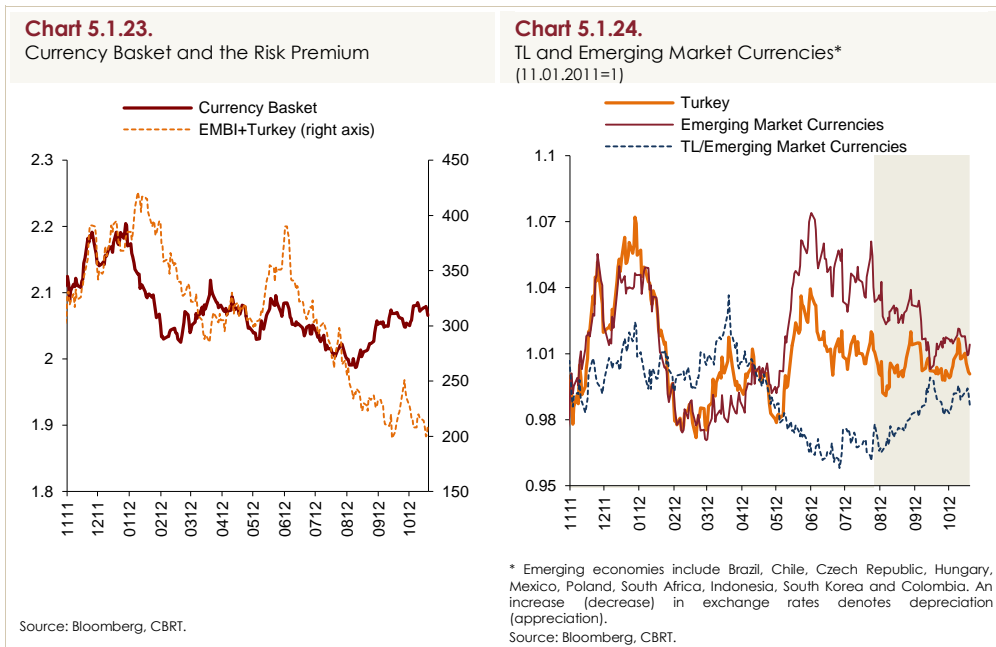


In spite of the plunge in short-term market rates, medium-term rates edged down in the inter-reporting period and 2-year ahead inflation expectations were almost unchanged, thus keeping 2-year real interest rates unchanged quarter-on-quarter (Chart 5.1.21). Having ranked above other emerging economies with respect to nominal interest rate, Turkey's real interest rate remained at the middle compared to other emerging economies (Chart 5.1.22). The lagging of Turkey's real interest rate behind others stems from the divergence of inflation expectations among countries.

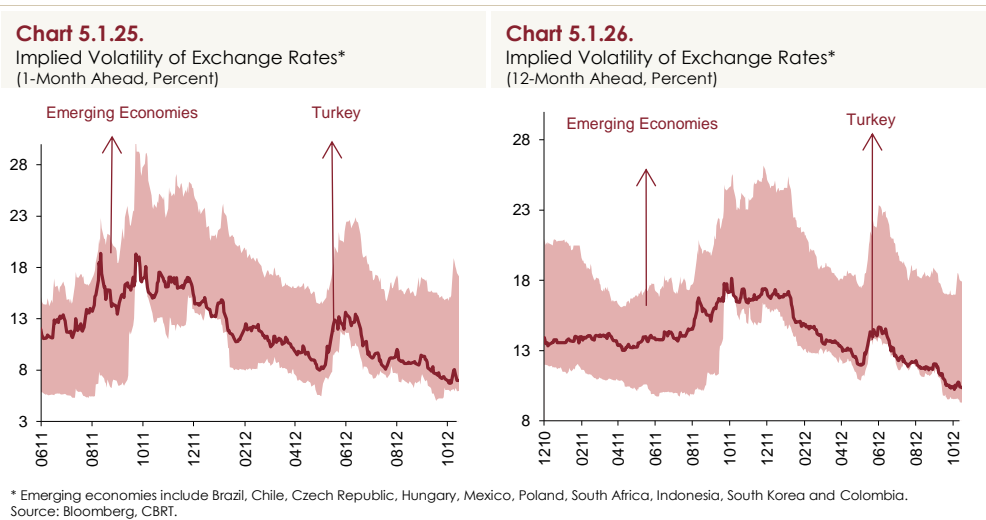


FX Markets

Concrete steps to solve problems in the Euro Area alleviated concerns over the future of the euro. Therefore, the euro rapidly appreciated both against the Turkish lira and other currencies. On account of this appreciation, the exchange rate basket trended upwards in the third quarter of the year (Chart 5.1.23). Due to the rise in global liquidity, currencies of other emerging economies appreciated. However, the decline in short and medium-term rates in Turkey coupled with the recently aggravating political unrest in the Middle East led to depreciation of the Turkish lira against currencies of other emerging economies in the third quarter of the year (Chart 5.1.24).

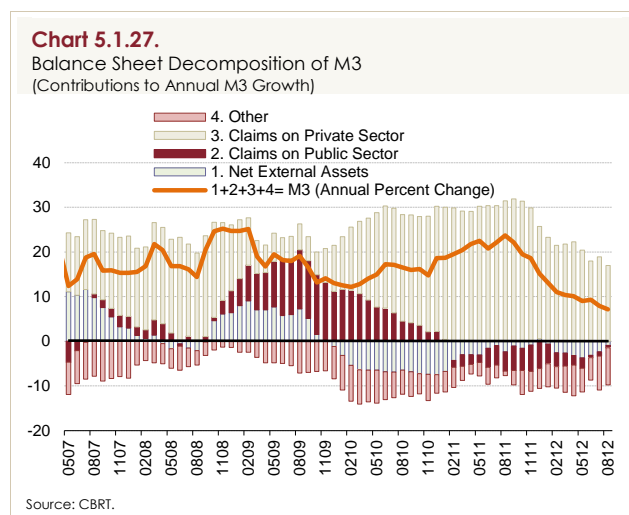


Owing to the fall in the risk premiums of emerging economies, exchange rate volatility declined in the third quarter. The recent favorable course of macroeconomic indicators, especially the current account deficit, as well as the CBRT's policies contributed to maintain the implied volatility of the Turkish lira at comparatively low levels among emerging economies (Charts 5.1.25 and 5.1.26).



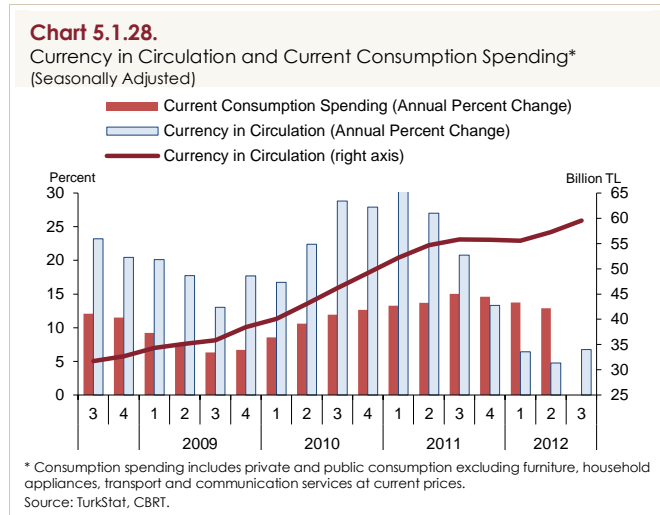
Monetary Indicators

Annual growth of M3, the broad measure of money supply, continued to decline amid the deceleration of the credit expansion to the private sector. On the other hand, Claims on the Public Sector sustained their negative contribution to M3 growth, albeit at a slower pace. The fall in the deceleration of Net External Assets is mainly attributed to the increase in the FX assets of the CBRT. Lastly, in tandem with the rising banking sector profits, the item Other continued to generate non-deposit resources to the banking sector (Chart 5.1.27).



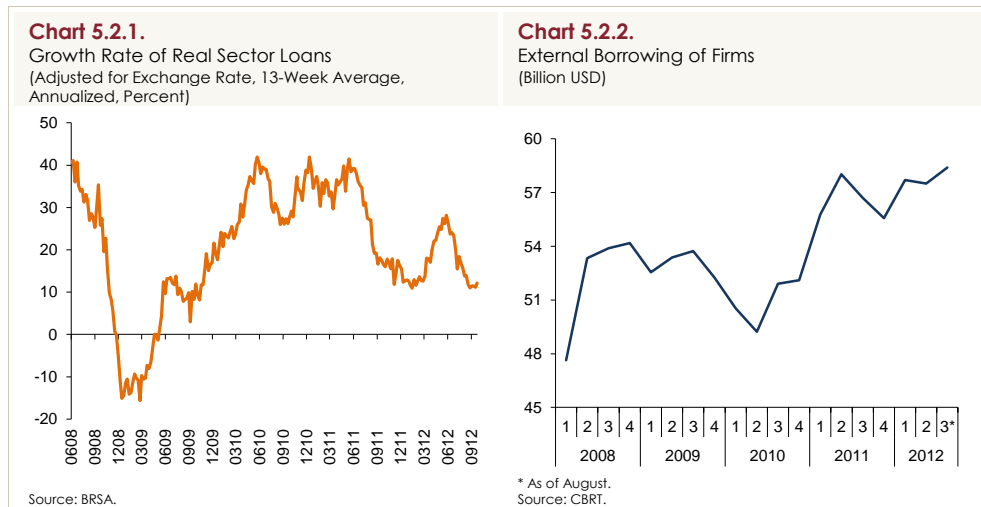
Although the growth of seasonally adjusted money in circulation edged up on a quarterly basis in the third quarter of 2012, it remained below the level implied by its robust course following 2009 (Chart 5.1.28). The weak course in the

rebound of the money in circulation, which is mostly employed as a means of payment in cash operations, indicates that current consumption spending remains sluggish in the third quarter of the year.

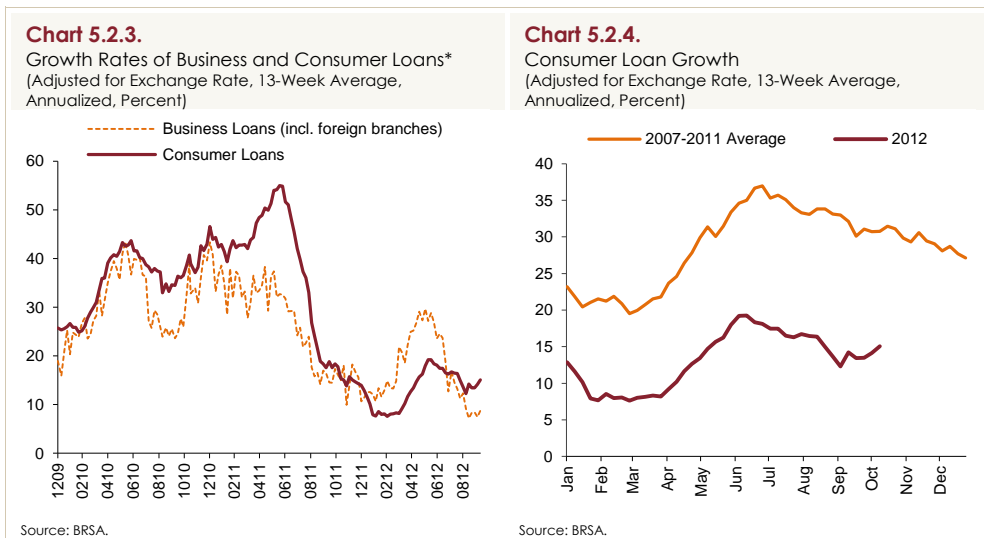


5.2. Financial Intermediation and Loans

Growth rate of loans extended to the corporate sector by domestic banks trended downwards as of June due to seasonal trends and the deceleration in economic activity as well as the slight tightening in lending standards of banks in the second quarter (Chart 5.2.1). Against these developments, loans extended to the non-financial sector posted a year-on-year increase by 16.2 percent in the third quarter, growing by 11.4 percent in annualized terms (Chart 5.2.1). Meanwhile, external borrowing by the corporate sector edged up in August (Chart 5.2.2).

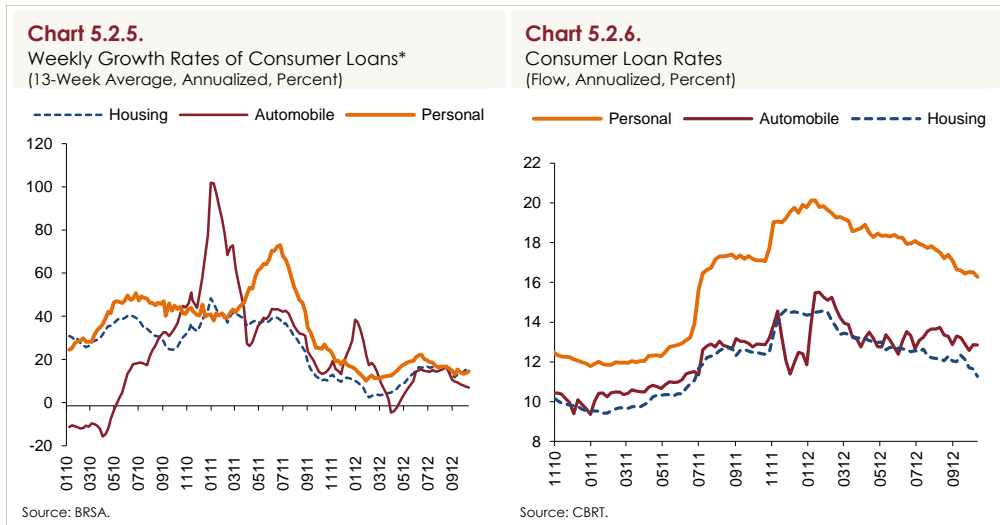


Although business loans grew far above consumer loans in the second quarter, this trend was reversed in the third quarter, and the growth of business loans lagged well behind consumer loans (Chart 5.2.3). The slowdown in investment expenditures recorded since the last quarter of 2011 proved more notable than consumption spending, bringing about a relatively faster deceleration in business loans. As the balancing between domestic demand and net exports became more pronounced in tandem with the rise in domestically manufactured products, firms' use of short-term business loans for working capital requirements increased considerably in the second quarter. However, uncertainties regarding global growth outlook and problems in the EU economy adversely affected domestic economic activity in the third quarter, thus weakening production and investment. Accordingly, business loans recorded a sizeable slowdown in the third quarter. As for consumer loans, the deceleration in the third quarter is largely attributed to seasonality, while the comparison of the deceleration trend with preceding years reveals a slightly increased divergence in the third quarter (Chart 5.2.4).



The rebound in growth rates of consumer loans, which became more evident in the second quarter also upon seasonal factors, was replaced by a limited slowdown in the third quarter parallel to the cyclical movements in past years. This trend is particularly apparent in personal loans, and partly in automobile loans (Chart 5.2.5). Cyclically adjusted growth rates of consumer loans followed a flat course in the third quarter of 2012. Subsequent to the monetary tightening, banks raised interest rates on housing, automobile and other consumer loans considerably at the end of 2011. Following this, the CBRT slightly narrowed the interest rate corridor from the upper bound in February,

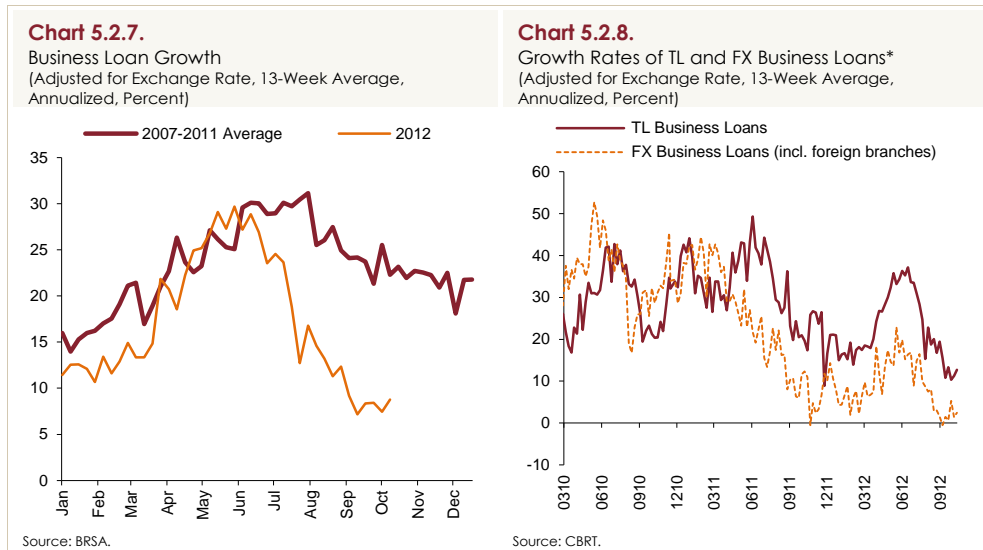
which led consumer loan rates to trend downwards. Furthermore, upon signals for a narrowing of the interest rate corridor in August, the decline in personal and housing loan rates partially accelerated (Chart 5.2.6). The upper bound of the interest rate corridor was pulled down in September and October and it was announced that the upper bound might be reduced further in the forthcoming periods. Following these developments, the fall in loan rates continued.



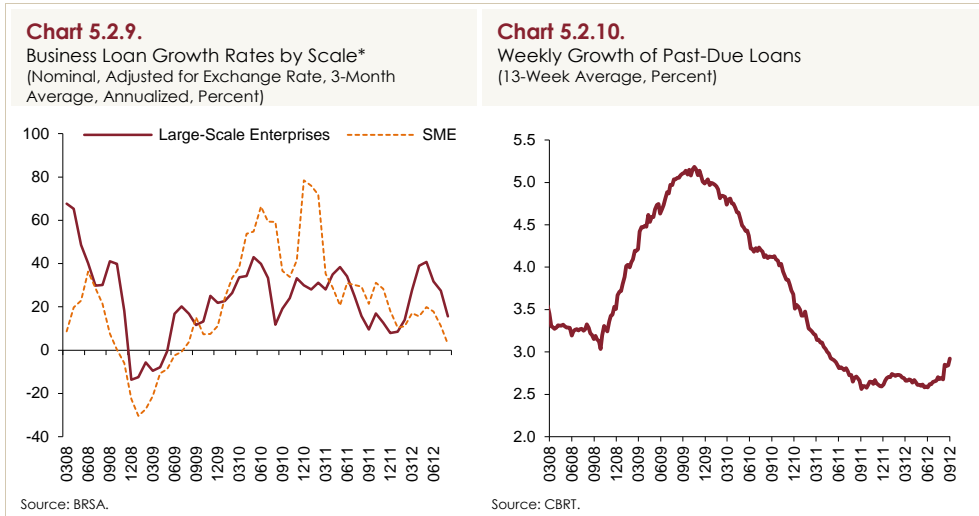
Loan Tendency Survey results for the April-June period suggest that housing and automobile loan standards were partially tightened, while personal loan standards were eased in the second quarter of 2012. Meanwhile, survey results regarding lending terms and conditions indicate that banks' profit margins in housing loans increased, while margins in personal loans remained virtually unchanged. Responses of banks to questions about retail loan show that loan demand recorded an uptick in the second quarter of 2012. Banks declared that developments in consumer confidence are the leading factors to boost loan demand. Accordingly, the Loan Tendency Survey released in July displayed that the loan demand of consumers would continue to increase in the third quarter; yet unfavorable developments in consumer confidence are estimated to influence loan demand in the third quarter.

Growth of business loans in the third quarter recorded a sharper deceleration than implied by seasonal trends in both TL and FX-denominated loans (Charts 5.2.7 and 5.2.8). Nevertheless, the sluggish trend in FX-denominated loans, which are estimated to be mostly used in financing investment expenditures in the third quarter, is also consistent with the

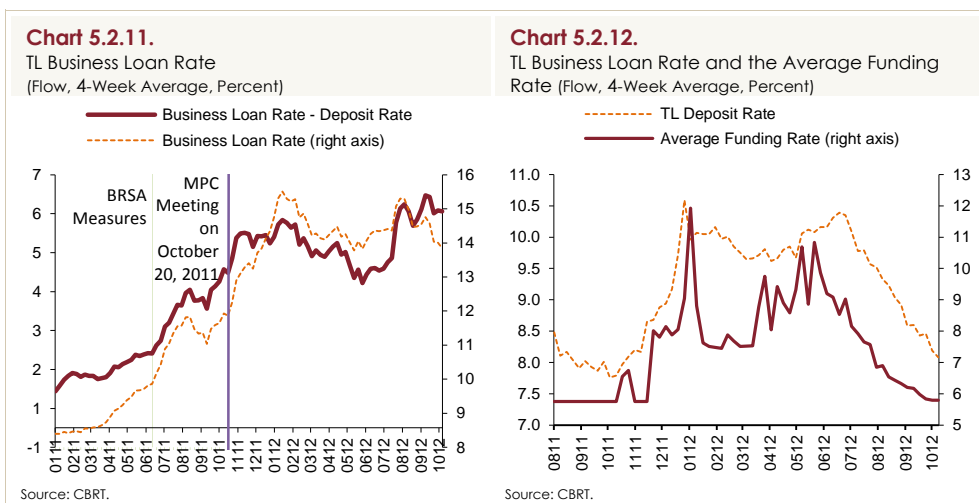
weakening in investment expenditures since the last quarter of 2011. Similarly, the growth trend of long-term business loans lagged well behind short-term business loans as of August. In fact, in the Loan Tendency Survey, banks stated that the demand of firms for long-term loans would follow a flat course in the third quarter of the year.



An analysis of business loans by scale reveals that growth rates of loans extended to large-scale enterprises and to SME diverged considerably, and growth in SME loans remained relatively weak (Chart 5.2.9). This stemmed from tighter lending conditions applied by banks for the SME, which have more fragile financial conditions than large-scale enterprises as of the last quarter of 2011, which was marked by aggravated concerns of banks on credit risk. Growth of loans extended both to SME and enterprises with larger scales have posted a notable slowdown since June. As per the implementation of Basel II, which was effected on 1 July 2012, SME loans proved more advantageous within the retail portfolios of banks. However, given the deteriorating expectations regarding economic activity coupled with capital adequacy constraints, banks opted for tightening lending standards particularly for SME as of the second quarter. Meanwhile, firms' non-performing loans against banks posted a mild increase in the June-August period and a sharp rise was seen in September due to the re-payment of a significant loan (Chart 5.2.10).



Following the increase in the upper bound of the interest rate corridor in October 2011, business loan rates surged, while a limited narrowing of the interest rate corridor from the upper bound in February was also reflected on loan rates (Chart 5.2.11). Business loan rates, which mostly remained flat in the February-September period, trended downwards upon the lowering of CBRT's O/N lending rate at the MPC meeting on September 18, 2012. Movements in the spread between loan-deposit rates have mostly been affected by changes in loan rates between early 2012 and May. Meanwhile, the rise in deposit rates in May and June besides the subsequent decline in deposit rates parallel to the gradual reduction of the average interest rates by about 300 basis points on funds provided from the CBRT were instrumental on the course of spread between loan-deposit rate (Chart 5.2.12).



In the third quarter of the year, liquidity policies implemented by the CBRT as well as external financing conditions bolstered banks' credit supply. However, the slowdown in domestic demand, particularly investment expenditures, and economic activity curtailed the loan demand. The recent plunge in average rates in funds provided by the CBRT besides the reduction of the O/N lending rate are thought to bring about a decline in banks' loan rates and the spread between loan-deposit rates in the forthcoming period. In this respect, loans are projected to gain pace, but remain on a mildly increasing track in the last quarter and loan growth is estimated to hover around 14 percent at the end of the year.

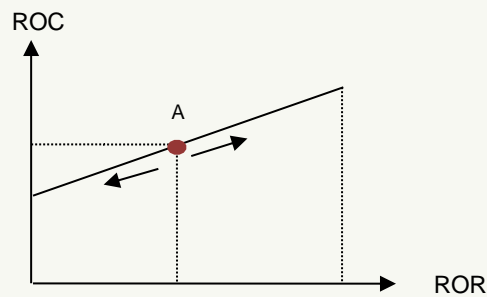
Box
5.1

Reserve Option Mechanism

This Box introduces the Reserve Option Mechanism (ROM) designed by the CBRT to restrict the adverse effects of the excessive volatility of capital flows on macroeconomic and financial stability. ROM is a facility enabling banks to hold a certain percent of their TL-denominated required reserves in FX and gold. The extent of the use of this facility is determined by the reserve option ratio (ROR). Coefficients determining the FX or gold equivalence to be maintained per unit TL-denominated required reserves are defined as Reserve Option Coefficient (ROC).

ROC as a Monetary Policy Tool

A simple graphical presentation will help to understand the operation of ROM. Let us assume that ROC increases linearly with respect to ROR and banks use this facility at point A in any period of time. During a period of rapid capital inflows, banks are more likely to use this facility given their easier access to external funds and the low cost of FX funding. Therefore, a portion of FX inflow will be transferred by banks to their accounts at the CBRT to be used in order to meet their reserve requirement, and thus will be withdrawn from the market. Consequently, use of reserve option will rise to the right of point A. Accordingly, the appreciation pressure on TL will be dampened and the conversion of FX inflow to loans will also be curtailed. Thus, the volatility on TL, FX liquidity and loans, in particular the FX loans, that might be caused by capital inflows will be limited. Furthermore, banks will obtain TL liquidity with the higher use of the facility. In that sense, ROM has a similar effect to an unsterilized FX purchase auction, but unlike an FX auction, higher FX liquidity can be withdrawn from the market per unit TL (Alper, Kara and Yörükoğlu, 2012).



Meanwhile, in case of a full use of the facility, the CBRT, with the aim to withdraw more FX liquidity from the market, may raise the current coefficients or add a new tranche to ROM. Should a new tranche be added, more TL liquidity will be provided to the market, while TL liquidity will remain constant should the current coefficients be raised. In an event of a rapid capital outflow, due to increased cost of FX funding and difficulties in access to external funds, banks are less likely to use the facility and will reduce their reserves at the CBRT. Accordingly, FX liquidity will be provided to the market and use of facility will decline towards the left of point A. However, it should be underlined that banks will have a higher need for TL liquidity in that case. So, ROM acts like an unsterilized FX sale auction, but the mechanism provides more FX liquidity to the market per unit TL.

This monetary policy tool will also help to limit credit expansion that may be driven by the surge of capital flows. In particular, loans in FX denomination will be restricted from the supply side. In cases of sudden capital outflows, banks will resort to their previously accumulated FX reserves. Thus, ROM is expected to lessen FX volatility. Moreover, ROM will also be used as a countercyclical monetary policy instrument that will both extend and contract loan growth. Thus, loans will have a lower sensitivity to capital flows.

Another significant factor that ROM will indirectly contribute is the lessening of volatility that may be caused by short-term capital flows through limiting banks' need for short-term cross currency swaps. Banks use short-term cross currency swaps in order to meet their TL liquidity need. On the other hand, the reserve option facility is expected to restrict banks' cross currency swap transactions. Accordingly, investors will be less attracted to cross currency swaps, and thus highly volatile short-term capital inflows driven by cross currency swaps will decline.

Lastly, as a consequence of implementing ROM, CBRT's gross FX reserves will soar. As FX and gold maintained within the context of ROC are not purchased by the CBRT, but belong to banks, the facility does not affect the CBRT's net FX position, but only increases the CBRT's gross FX reserves. The increase of gross reserves in favor of the private sector provides a more efficient use of reserves, and thus enhances the resilience and the productivity of the overall financial system. ROM enables reserves to be accumulated by the private sector rather than by the CBRT and also allows for shock-specific optimal use, thus improving the efficiency of the system.

The Comparison of the Cost of ROC Facility to Other Funding Sources

Given the lower cost of borrowing in FX denomination and gold under current circumstances, banks are able to meet their reserve requirement at lower cost via this facility. Meanwhile, the lowering (raise) of ROC by the CBRT will enhance (reduce) this cost advantage.

Several funding opportunities are available for banks in order to meet their TL reserve requirements. Hence, the use of ROM by banks will depend on the difference of cost between ROM and other funds. Accordingly, the estimation of the threshold ROC that leaves banks indifferent between ROM and other funding sources is crucial.

Under the assumption that the threshold ROC is x , the required reserve ratio for FX liabilities is RR_{FX} and the spot exchange rate is S_0 , banks will need to borrow $x/(1 - RR_{FX})$ in FX for meeting their S_0 units of TL reserve requirement. Let us further assume that banks hold a forward FX contract in order to avoid exchange rate risk. In that case, the cost of the facility in TL denomination will be as follows:

$$Total\ Cost = \frac{x}{1 - RR_{FX}} (LIBOR + p) F_{0,t} \frac{t}{365}$$

In the above equation, x is the threshold ROC, p is the additional interest on *LIBOR* paid by banks for borrowing in FX, RR_{FX} is the required reserve ratio for FX liabilities, $F_{0,t}$ is the forward FX contract entered at time 0 that will expire at the end of the reserve maintenance period. TL-denominated interest rates for cross currency swaps with similar maturities are used for the calculation of the forward exchange rate. The reserve maintenance period t is 14 days.

Meanwhile, another significant funding source for banks for maintaining their TL reserve requirement is funds obtained via ISE Repo and Reverse Repo Market. Banks are obliged to maintain required reserves on funds obtained through non-bank financial institutions at this market. Accordingly, the cost of obtaining S_0 units of TL will be as follows:

$$Total\ Cost = \frac{S_0}{1 - RR_{TL}} r_{ISE} \frac{t}{365}$$

In the above equation, RR_{TL} is the TL required reserve ratio, S_0 is the spot exchange rate for USD/TL, r_{ISE} is the overnight interest rate at the ISE Repo and Reverse Repo Market. Equating the cost of funding for both sources will yield x (the threshold ROC) that leaves banks indifferent between borrowing from ISE or using ROM such that:

$$x = \frac{(1 - RR_{FX})(1 + LIBOR \frac{t}{365})r_{ISE}}{(1 - RR_{TL})(LIBOR + p)(1 + swap_{TL} \frac{t}{365})}$$

The threshold ROC x depends on $LIBOR$, the additional borrowing interest p paid by banks, the cross currency swap rate $swap_{TL}$, the interest r_{ISE} at the ISE Repo and Reverse Repo Market and the TL required reserve ratio RR_{TL} . The threshold ROC can similarly be estimated for ROM and other funding sources (Küçüksaraç and Özel, 2012).

It should be underlined that the above estimation focuses on marginal cost. In other words, banks are assumed to use their obtained funding for TL reserve requirement. On the other hand, banks may also channel these funds to invest in other assets (extending loans, purchase of government bonds etc). In that case, the threshold ROC will differ from the above estimation.

Results and the Conclusion

Among similar other instruments, ROM stands out especially in dampening the adverse effects of capital inflows on exchange rate and FX-denominated loans by keeping TL interest rates marginally changed or even unchanged. Furthermore, ROM is also superior to discretionary tools like direct FX purchase or intervention such that the extent of the use of facility is determined by banks' optimization decisions, and thus, the risk of misperception regarding the level of the exchange rate and the monetary policy stance will be relatively limited.

The ROM has essentially been designed by the CBRT as an "automatic stabilizer". The enabling of optimization to banks via this facility also enhances efficiency of the financial system relative to the use of other tools. However, it should also be underlined that the parameters of the mechanism will be adjusted when deemed necessary. In other words, should the external and domestic cost factors change and a permanent or structural change occurs in the speed of capital flows, the coefficients may be reset.

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Küçüksaraç,D. and Ö. Özel, Yeni Bir Para Politikası Aracı: Rezerv Opsiyon Katsayısı (in Turkish), CBRT Working Paper to be published.

Box
5.2

Financial Conditions Index

Since the end of 2010, CBRT has implemented a new policy strategy and adopted financial stability as a supplementary objective besides price stability. This new framework, which jointly uses liquidity, credit and interest rate policies, has increased the need to develop and monitor a broad measure of “financial conditions” index that would complement the monetary policy analysis in assessing whether the overall set of policies are restrictive or accommodative. Accordingly, the study by Kara, Özlü and Ünalımsı (2012) develop Financial Conditions Indices (FCI) for Turkey using a range of monetary and financial indicators. This Box discusses the findings of the above study and evaluates the recent course of financial conditions.

The weighted sum-approach, one of the most commonly used methodologies in the FCI literature, is adopted in constructing the index.¹ The weights of each monetary and financial indicator reflect the relative importance of that variable in explaining the future output growth and are derived by using the impulse responses from an unrestricted VAR. Specifically, the weight for each financial variable, denoted by ω_j is calculated as the 4-quarter cumulative responses of GDP growth to a 1-unit shock to each variable y_j . Then the FCI is calculated as a weighted average of all variables in standardized form, which is shown in equation (1), where \bar{y}_j and σ_{y_j} are the mean and standardized deviation of $y_{j,t}$ respectively, over the sample period.

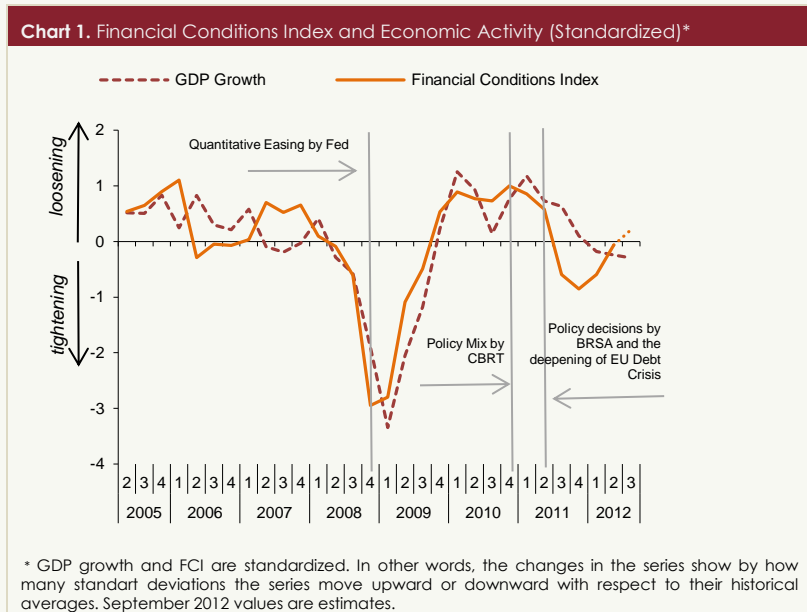
$$FCI_t = \sum_{j=1}^n \omega_j \frac{y_{j,t} - \bar{y}_j}{\sigma_{y_j}} \quad (1)$$

The variables used to explain the real annual GDP growth are the ratio of annual change in total credit stock to annual GDP, quarterly data for credit standards, the real effective exchange rate, real ex-ante benchmark rate, quarterly capital inflows, the spread between credit and deposit rates and the annual percentage change in real ISE-All equity return index.²

¹ Hatzius et al. (2010) provides a detailed survey of studies on financial conditions indices. Guichard and Turner (2008), Swinston (2008) as well as Osorio, Pongsaparn and Ünsal (2011) are recent studies adopting weighted sum approach in the context of a VAR.

² The starting date is constrained by the data availability on credit standards. Thus, the weights for each variable in the index are calculated using the data for 2005Q2-2012Q2.

Chart 1 presents the FCI estimated according to the methodology mentioned above. As depicted in the chart, an upward movement of the index implies more accommodative financial conditions, while a decline reflects tighter financial conditions. The index witnessed a trough during the global crisis, yet recovered since the last quarter of 2008 mostly driven by the policy rate cuts and quantitative easing implemented by the Fed. Even though the index remained flat amid the European debt crisis, financial conditions continued to stay loose until the end of 2010. The index shows that following the onset of the policy mix adopted by the CBRT, there is a marked tightening in financial conditions. The tightening becomes more significant with the restrictive credit policy measures taken by the BRSA by mid-2011 as well as the deepening of the EU debt crisis. However, the financial conditions have gradually eased as of the beginning of 2012. Rapid capital inflows and the rise in global risk appetite during this period were influential on the surge in the index. As of the third quarter of 2012, due to the accommodative policies adopted by the CBRT, the index is estimated to be slightly positive.



In sum, the active use of macroprudential tools in the aftermath of the global crisis necessitates to monitor broader measures of financial conditions. This preliminary attempt to construct a financial conditions index for Turkey provides a plausible view on the effect of the recent policy framework as well as the changing global environment on financial conditions. Hence, the index has the potential to provide important information on the overall stance of the financial sector policies.

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Box
5.3

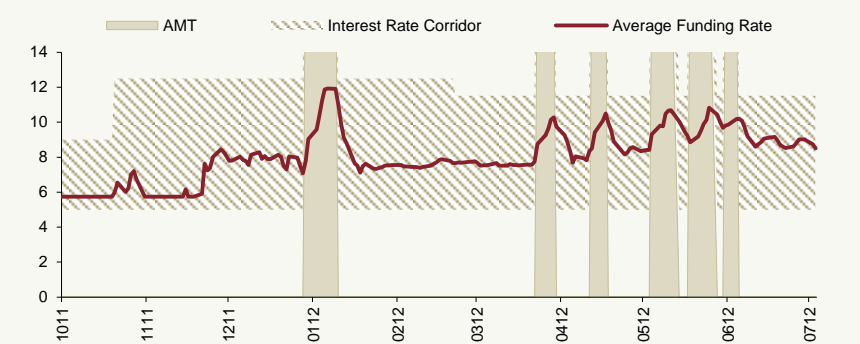
Effect of Additional Monetary Tightening on Exchange Rates

The global crisis in 2008-2009 proved the inefficiency of the monetary policies conducted without considering risks within the financial system and signified the need to observe financial stability along with price stability (Borio, 2011). To that extent, it was well understood that a policy rate that yields price stability may not necessarily provide financial stability, and therefore, short-term policy rate by itself fails to suffice maintaining price stability and financial stability simultaneously.

Accordingly, as of November 2010, the CBRT has started to implement its new policy mix. In this framework, required reserves and other macro prudential tools as well as weekly repo rates, interest rate corridor and funding strategy are jointly used as complementary tools for credit, interest rate and liquidity policy, respectively. In utilizing these tools, expectations, credit growth and exchange rate are monitored as key indicators for price and financial stability (Başçı, 2012).

As part of the liquidity policy, a pillar of the new policy mix, O/N interest rates are adjusted according to the course of economic and financial developments without changing the weekly repo rates, i.e. the policy rate (Başçı, 2011). Accordingly, the CBRT has occasionally delivered additional monetary tightening (AMT) in order to prevent temporary price movements from deteriorating the inflation outlook via expectations. On the days of AMT delivering, reduced or even no amount of funding is supplied via quantity auction method at the policy rate. Instead, market is funded via traditional auction method, and hence, O/N rates settle close to the upper bound of the interest rate corridor. AMT has been delivered 6 times so far, where the longest and the shortest duration were 8 and 3 days, respectively. In accordance with the policy design, AMT has been aimed to be strong, effective and temporary (Chart 1).

Chart 1. Additional Monetary Tightening



Source: CBRT.

This Box analyzes the effect of the abovementioned policy by the CBRT on exchange rates through a GARCH model. The study uses the daily change in the currency basket, which is $0.5*(TL/Euro)+0.5*(TL/USD)$. The data set covers the period between 20.10.2011 and 19.07.2012.³

The below GARCH (1,1) models are used to estimate the effectiveness of AMT on exchange rate volatility.⁴ In both models, the change in the currency basket is the dependent variable in the level equations, while AMT is present as a dummy variable both in the level and the variance equations. The change in VIX which well captures the fluctuations in capital flows is the control variable in both models, while the second model includes a dummy for FX interventions.^{5,6}

Model1:

$$R_t = \beta_0 + \beta_1 D_{AMT} + \beta_3 CVIX_t + \varepsilon_t \quad (1.a)$$

$$\varepsilon_t \sim N(0, h_t) \quad (1.b)$$

$$h_t = \alpha_0 + \alpha_1 \varepsilon_{t-1}^2 + \alpha_2 h_{t-1} + \alpha_3 D_{AMT} + \alpha_5 CVIX_t + u_t \quad (1.c)$$

Model2:

$$R_t = \beta_0 + \beta_1 D_{AMT} + \beta_2 D_{INT} + \beta_3 CVIX_t + \varepsilon_t \quad (2.a)$$

$$\varepsilon_t \sim N(0, h_t) \quad (2.b)$$

$$h_t = \alpha_0 + \alpha_1 \varepsilon_{t-1}^2 + \alpha_2 h_{t-1} + \alpha_3 D_{AMT} + \alpha_4 D_{INT} + \alpha_5 CVIX_t + u_t \quad (2.c)$$

³ At the MPC meeting on 20 October 2011, the upper bound of the interest rate corridor was raised, thus laying the ground for additional monetary tightening. At the MPC meeting on July 19, 2012, the disclosure on AMT was left out and no AMT was conducted starting from this date. Hence, these dates are selected as the starting and ending dates for the analysis.

⁴ GARCH(1,1) is selected over other GARCH specifications as it is the most frequently used model in describing volatility in the literature as well as in market analyses. Moreover, GARCH(1,1) also gives better results in terms of the AIC and SIC criteria.

⁵ During the period of AMT delivering from 29 December 2011 till 9 January 2012, FX interventions were also conducted between 30 December 2011 and 4 January 2012. Hence, the model has two versions where the alternative model includes a dummy for FX interventions in order to better capture the effectiveness of AMT.

⁶ VIX is included as a control variable in similar studies analyzing exchange rate volatility (Cairns et al., 2007; Chadwick et al., 2012). The significance of CVIX in model results show that not including this variable to the model may result in omitted variable bias. Even though other studies in the literature include interest rate spread between domestic and international rates, this study excludes this variable as the AMT directly affects interest rates, and so, including the interest rate spread may lead to multicollinearity problem.

Model variables are defined as below:

$$R_t = \ln(p_t/p_{t-1}) * 100, p_t = \text{value of the currency basket}$$

$$D_{AMT} = \begin{cases} 0, \text{other days} \\ 1, \text{days of AMT} \end{cases}$$

$$D_{INT} = \begin{cases} 0, \text{other days} \\ 1, \text{days of FX intervention} \end{cases}$$

$$CVIX_t = \ln(VIX_t/VIX_{t-1}) * 100, VIX_t = \text{value of the VIX}$$

Table 1 presents the model results. Accordingly, AMT is found statistically significant in lessening the volatility of the exchange rate. Furthermore, inclusion of the FX intervention dummy into the model does not change the result.

Table 1. Model Results

Level Equation			Variance Equation		
Dependent Variable: R_t			Dependent Variable: h_t		
	Model 1	Model 2		Model 1	Model 2
c	-0.046 (0.000)	-0.030 (0.006)	c	0.014 (0.000)	0.017 (0.000)
D_{AMT}	-0.103 (0.120)	-0.074 (0.300)	D_{AMT}	-0.020 (0.006)	-0.024 (0.019)
D_{INT}		-0.410 (0.038)	D_{INT}		0.045 (0.127)
$CVIX_t$	0.021 (0.000)	0.022 (0.000)	$CVIX_t$	0.003 (0.049)	0.003 (0.108)
			ε_{t-1}^2	-0.081 (0.000)	-0.091 (0.001)
			h_{t-1}	1.019 (0.000)	1.019 (0.000)
R^2	0.1020	0.1188			

In sum, this study finds that AMT is statistically significant in reducing the exchange rate volatility. Therefore, in addition to being an effective policy tool in preventing the temporary price movements from deteriorating the inflation outlook, AMT also helps to lessen exchange rate volatility fuelled by fluctuations in capital flows.

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