

5. Financial Conditions and the Monetary Policy

While global economic activity continued to slow down in the third quarter of 2019, global risk appetite weakened in the current reporting period marked by increased geopolitical risks and international trade-related concerns. The country risk premium that rose in August as a result of this development declined slightly in September and followed a fluctuating course in October amid geopolitical developments. However, market rates fell across all maturities due to positive developments in macroeconomic indicators with the inflation outlook and the current account balance in the lead.

Emerging market economies witnessed portfolio outflows in the current reporting period, most notably in August. Turkey posted portfolio outflows driven by equity markets in August, while portfolio flows slightly recovered in September followed by a reverse trend in October. In the past three-month-period, although the Turkish lira diverged negatively from peer EME currencies in line with the course of the country risk premium, the depreciation remained limited.

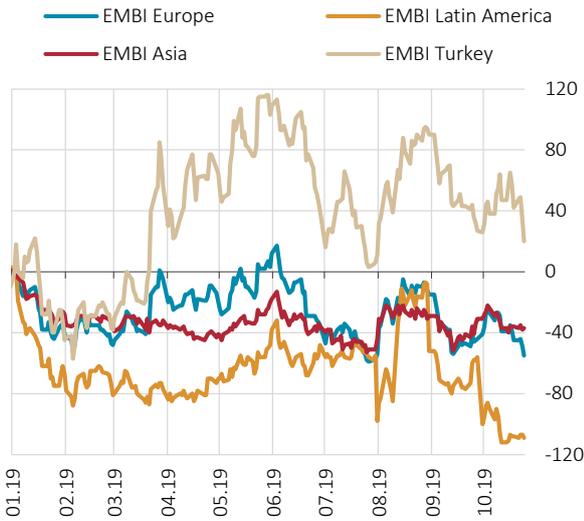
Loan rates decreased in response to the effect of the policy rate cuts on banks' funding costs and to the decline in inflation expectations. While growth rates of consumer loans have gained momentum since August due to the fall in loan rates and the recovery in domestic demand, commercial loans have posted a more moderate growth.

5.1. Financial Markets and the Monetary Policy

In the third quarter, the easing in advanced economy monetary policies became discernible due to the weakening in global economic activity. However, lingering geopolitical problems and uncertainties over international trade drove global risk appetite down in the current reporting period. This decline reached a significant level amid mounting concerns over international trade in August. Emerging economy risk premiums also soared in August parallel to the developments in global risk appetite but began to trend down again in September. Although Turkey's risk premium diverged negatively from other emerging economy risk premiums due to the falling global risk appetite in August, it fell quickly in September. However, on account of geopolitical developments in October, the country risk premium followed a fluctuating course (Chart 5.1.1).¹ Emerging market economies witnessed portfolio outflows in the current reporting period, most notably in August. While Turkey posted portfolio outflows in the same month, it received inflows, mostly in equity markets, in September. News flows regarding geopolitical risks determined the portfolio flows in October (Chart 5.1.2).

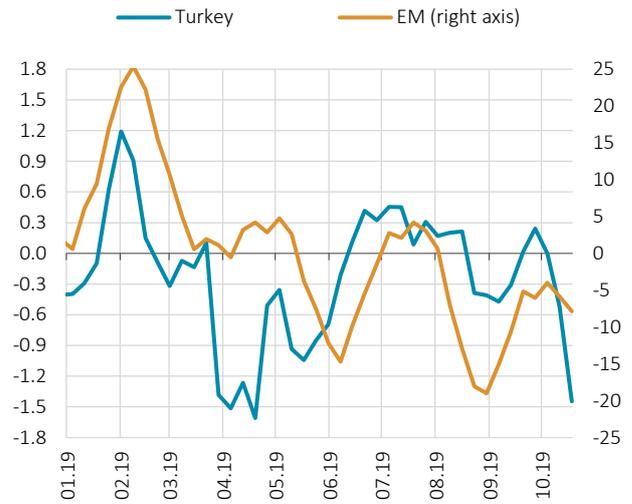
¹ Risk premium, as discussed in Box 5.1, is among the main determinants of Turkey's external borrowing rate.

Chart 5.1.1: Regional Risk Premiums* (2 January 2019 = 0, Basis Point)



Source: Bloomberg.
* Shows cumulative change since 2 January 2019.

Chart 5.1.2: Portfolio Flows in Emerging Economies* (4-Week Cumulative, Billion USD)



Sources: EPFR, CBRT.
* Turkey data includes portfolio inflows to equity and GDDS markets. Repo is included in the GDDS data. Emerging Economy data is from the EPFR database. It includes all the database-covered funds' weekly net investments in equity and GDDS markets in emerging economies.

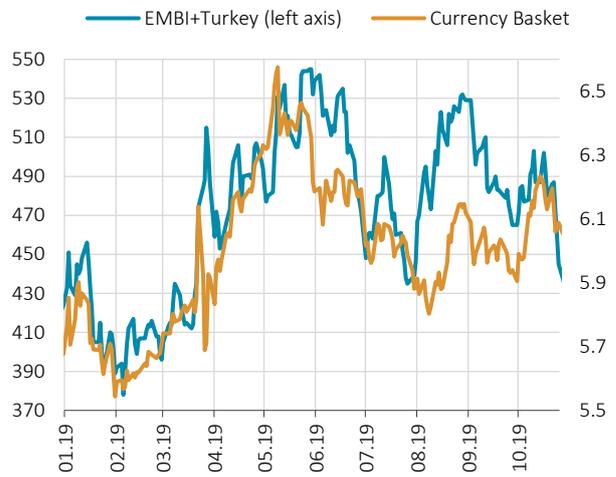
In the current reporting period, emerging market currencies depreciated slightly against the US dollar amid developments in global risk appetite. Whereas, the Turkish lira diverged negatively from other emerging market currencies due to domestic uncertainties and geopolitical risks but started to trend in a similar direction with its peers by the end of October (Chart 5.1.3 and Chart 5.1.4).

Chart 5.1.3: Turkish Lira and Emerging Market Currencies against US Dollar (02.01.2019=1)



Source: Bloomberg.
* Emerging Economies: Brazil, Chile, Colombia, Hungary, Malaysia, Mexico, Poland, Romania, S. Africa, India, Indonesia, the Philippines and Turkey.

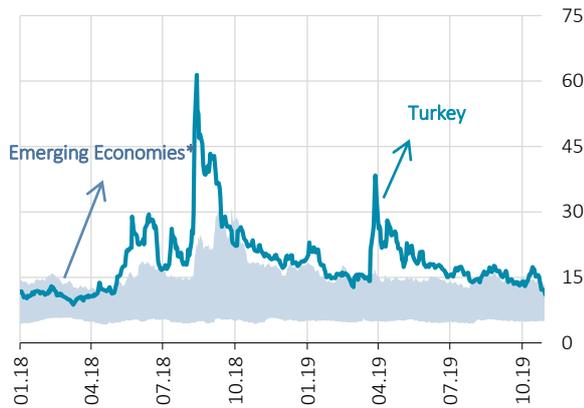
Chart 5.1.4: Exchange Rate Basket* and EMBI Index of Turkey



Source: Bloomberg.
* Exchange rate basket represents the value of the Turkish lira against 0.5*USD+ 0.5*euro.

The implied volatility of the Turkish lira remained flat in the current reporting period (Chart 5.1.5 and Chart 5.1.6). In this period, the volatility in the Turkish lira implied by 12-month forward options remained high, signaling that markets expect the volatility in the Turkish lira to continue in the year ahead (Chart 5.1.6).

Chart 5.1.5: FX Volatilities Implied by Options (1-Month Forward)



Source: Bloomberg.
 * Emerging Economies: Brazil, Indonesia, the Philippines, S. Africa, Colombia, Hungary, Malaysia, Mexico, Poland, Romania and Chile.

Chart 5.1.6: FX Volatilities Implied by Options (12-Month Forward)

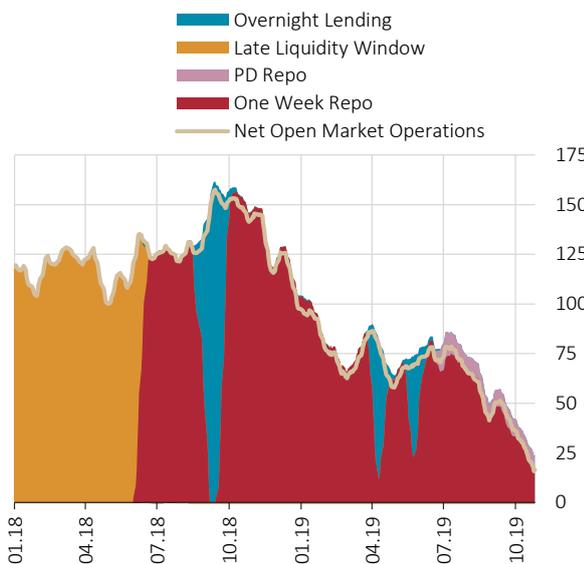


Source: Bloomberg.
 * Emerging Economies: Brazil, Indonesia, the Philippines, S. Africa, Colombia, Hungary, Malaysia, Mexico, Poland, Romania and Chile.

Monetary Policy Response

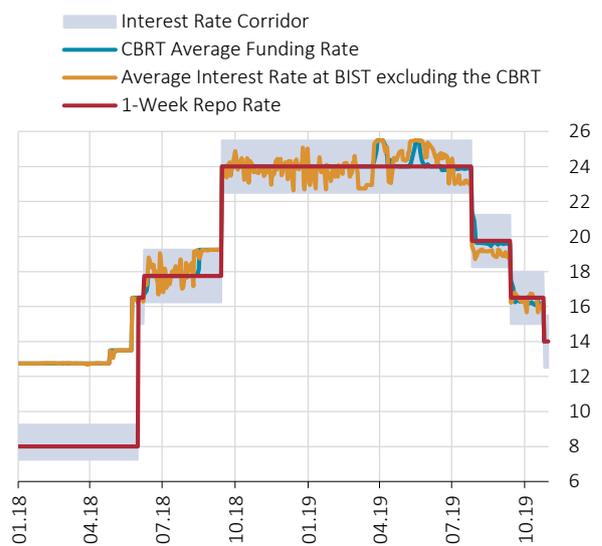
The CBRT reduced the policy rate by a total of 10 points in the MPC Meetings of July, September and October (Chart 5.1.8). Compared to the previous reporting period, the funding need of the system decreased significantly due to rediscount credits, the CBRT’s Turkish Lira currency swaps and the Treasury’s TL-exchanged operations with the market. Open market operations were largely funded by one-week repo auctions and the Primary Dealer repo facility was used to a limited extent (Chart 5.1.7). On 17 June 2019, following the Bank’s decision to provide primary dealer banks with an overnight liquidity facility at an interest rate 100 basis points below the policy rate, the BIST overnight repo rates started to form slightly below the policy rate.

Chart 5.1.7: CBRT Open Market Operations (2-Week Moving Average, Billion TL)



Source: CBRT.

Chart 5.1.8: Short-Term Rates (%)

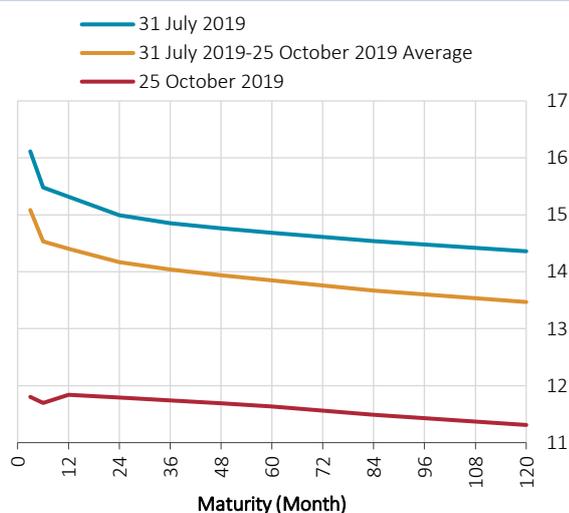


Sources: BIST, CBRT.

In addition to the decisions on the policy rate, some revisions were made to reserve requirements to support financial stability. On 5 August 2019, the Bank raised reserve requirement ratios for FX deposits/participation funds for all maturity brackets, thereby withdrawing FX liquidity from the market. Moreover, the remuneration rate for US dollar-denominated required reserves held at the CBRT was decreased by 100 basis points to 1%. In its press release of the same date, the CBRT also introduced some arrangements related to the maturity and the method of its Turkish Lira Currency Swap Market opened on 31 August 2018. Accordingly, the Bank decided to execute Turkish lira currency swap transactions, which had been conducted with one-week maturity via quotation method, also with one, three and six-month maturities via the traditional auction method. The CBRT also introduced some changes to the reserve requirement facility with the intention of using it more flexibly and effectively as a macroprudential tool to support financial stability. In this context, on 19 August 2019, the Bank changed the ratio and the remuneration applied to Turkish lira required reserves and linked these variables to banks' annual loan growth rates. On 20 September 2019, reserve requirement ratios for FX deposits/participation funds were increased for all maturity brackets, thereby withdrawing FX liquidity from the market. Finally, on 1 October 2019, the CBRT decided to open its own Foreign Exchange Gold Swap Market to increase banks' efficiency in liquidity management.

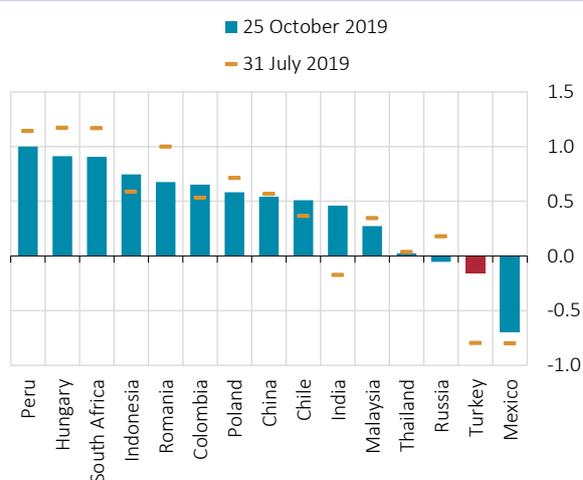
In the current reporting period, currency swap yield curves trended downwards compared to the previous reporting period driven by, in addition to the policy rate cuts, receding inflation expectations and the contribution of the country risk premium (Chart 5.1.9). Owing to the tight monetary policy stance, Turkey is among emerging economies with a negative yield curve slope (Chart 5.1.10).

Chart 5.1.9: Recent Currency Swap Yield Curve (%)



Source: Bloomberg.

Chart 5.1.10: Yield Curve Slopes in Emerging Economies* (% points)



Source: Bloomberg.

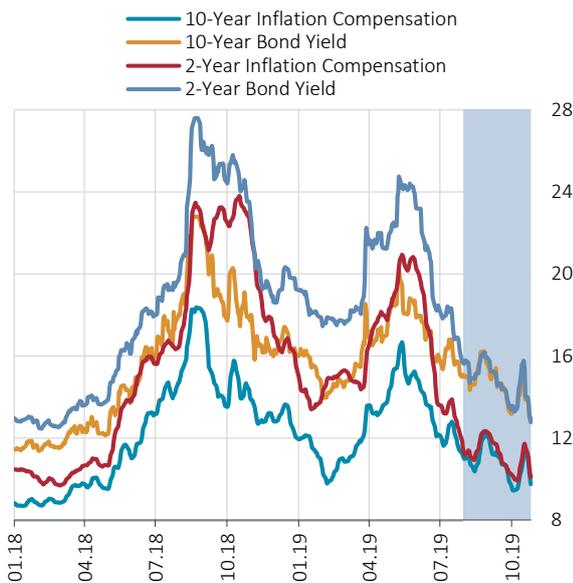
* Slope of the yield curve is calculated as the difference between the 5-year bond yields and 6-month bond yields. For Turkey, currency swap rates are used instead of GDDS yields.

Consumer inflation decreased significantly in 2019. Waning cumulative exchange rate effects on the back of the decline in import prices in US dollars and policy efforts coordinated with the tight monetary policy became the key drivers that supported disinflation. In addition to the stable course of the Turkish lira, improvement in inflation expectations and mild domestic demand conditions supported disinflation. At the MPC meeting of July, the Bank reduced the policy rate by 425 basis points in view of an improving inflation outlook amid upbeat indicators for underlying inflation, supply-side factors and import prices. At the September meeting, the policy rate was cut by 325 basis points given that inflation dynamics remained positive and the current monetary policy stance, to a large part, was considered to be consistent with the projected disinflation path. At its October meeting, the MPC reduced the policy rate

by 250 basis points indicating that the inflation outlook continued to improve and that inflation was likely to materialize notably below the projections of the July Inflation Report by the end of the year. The Bank emphasized in the MPC decision that keeping the disinflation process on track with the targeted path required the continuation of a cautious monetary policy stance, and underlined that the monetary tightness would be determined by considering the indicators of the underlying inflation trend to ensure the continuation of the disinflation process.

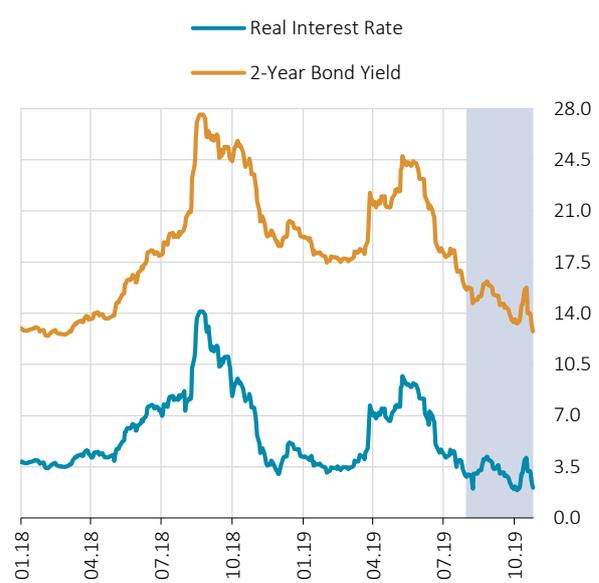
In the current reporting period, the decline in long-term bond rates continued and bond yields fell significantly (Chart 5.1.11). Among the components of long-term rates, this effect was mainly driven by the noticeable decline in inflation compensation that is a common indicator of inflation expectations and inflation premium. The decline in inflation compensation calculated from bond prices was largely consistent with the fall in inflation expectations obtained from surveys. The cautious stance of monetary policy, the stable course of exchange rates and the faster disinflation than projections are the main contributors of the decline in inflation expectations and hence inflation compensation. On the other hand, developments in the country risk premium and maturity premium that are among the determinants of long-term bond rates also contributed moderately to the decline in bond yields. Due to nominal interest rates that declined more compared to inflation expectations, the two-year expected (ex ante) real interest rate fell significantly until early October. This was followed by a fluctuating and flat course in interest rates due to geopolitical risks in the subsequent period (Chart 5.1.12).

Chart 5.1.11: Bond Yields (%) and Inflation Compensation (5-Day Moving Average, %)



Source: Bloomberg.

Chart 5.1.12: Two-Year Bond Yield and the Expected Real Interest Rate in Turkey* (%)



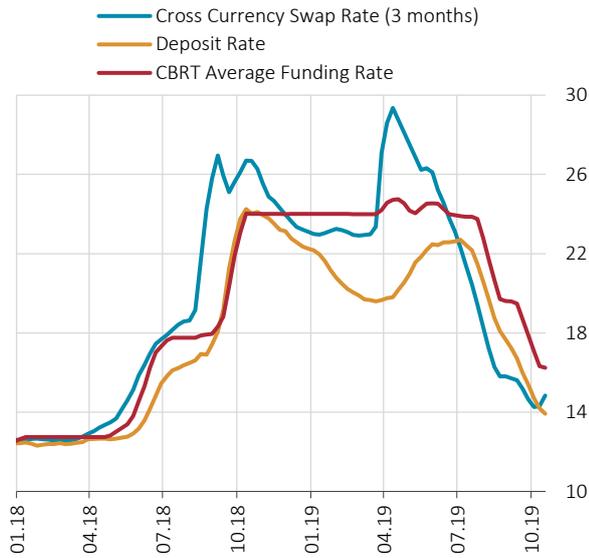
Sources: Bloomberg, CBRT.

* Real interest rate is calculated as the difference between two-year bond yield and the 24-month-ahead inflation expectations derived from the CBRT Survey of Expectations.

5.2 Credit Conditions

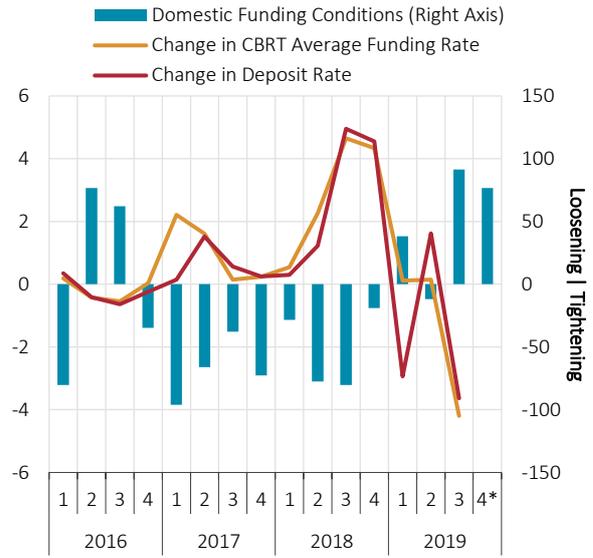
The CBRT's weighted average funding rate that fell in response to the CBRT's rate cuts, led also to a decline in deposit and swap rates (Chart 5.2.1). The downtrend in banks' funding costs seems consistent with the easing seen in the third quarter in domestic funding conditions cited in the Bank Loans Tendency Survey (BLTS) (Chart 5.2.2). Banks expect that funding conditions will ease further also in the upcoming period due to the favorable inflation outlook and the arising decline in inflation expectations.

Chart 5.2.1: Indicators of Banks' Funding Costs (4-Week Moving Average, %)



Sources: Bloomberg, CBRT.

Chart 5.2.2: Banks' Domestic Funding Conditions



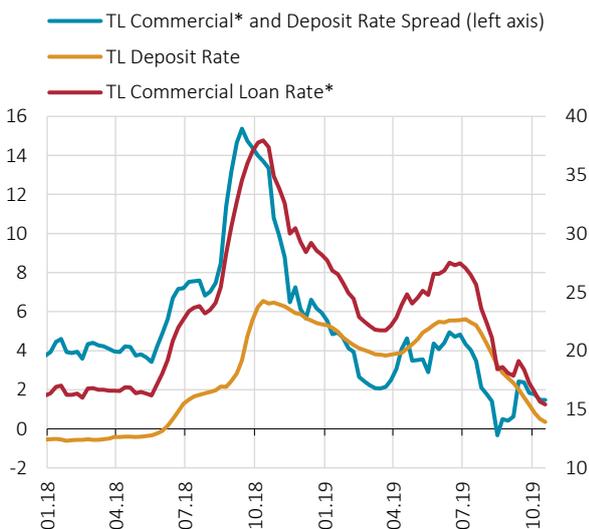
Source: CBRT.

* 2019 fourth quarter data indicate banks' expectations regarding what value those variables will take in that quarter.

Note: Changes in the CBRT average funding rate and deposit rates indicate the difference relative to the previous quarter. The series on domestic funding conditions obtained from the Bank Loans Tendency Survey show the direction in which domestic funding conditions contribute to credit standards.

Following the policy rate cuts, both TL commercial and consumer loan rates fell significantly (Chart 5.2.3 and Chart 5.2.4). Having said that, the spread between TL commercial loan and deposit rates declined noticeably after the CBRT's rate cuts, in addition to an easing credit standards (Chart 5.2.3).

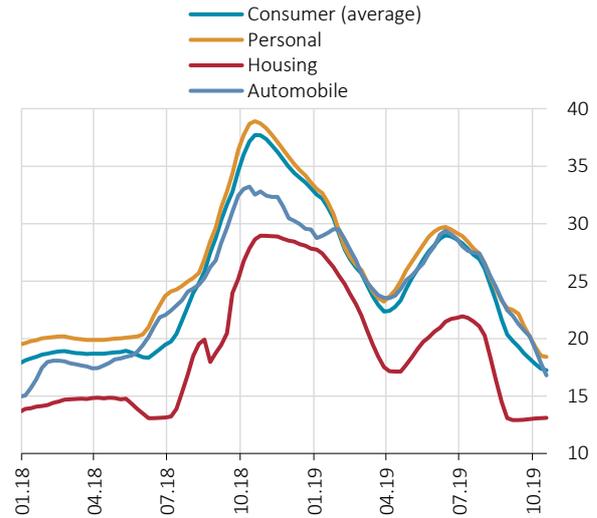
Chart 5.2.3: TL Commercial Loan and TL Deposit Rates (Flow Data, Annual, 4-Week Moving Average, %)



Source: CBRT.

* Overdraft accounts and credit cards excluded.

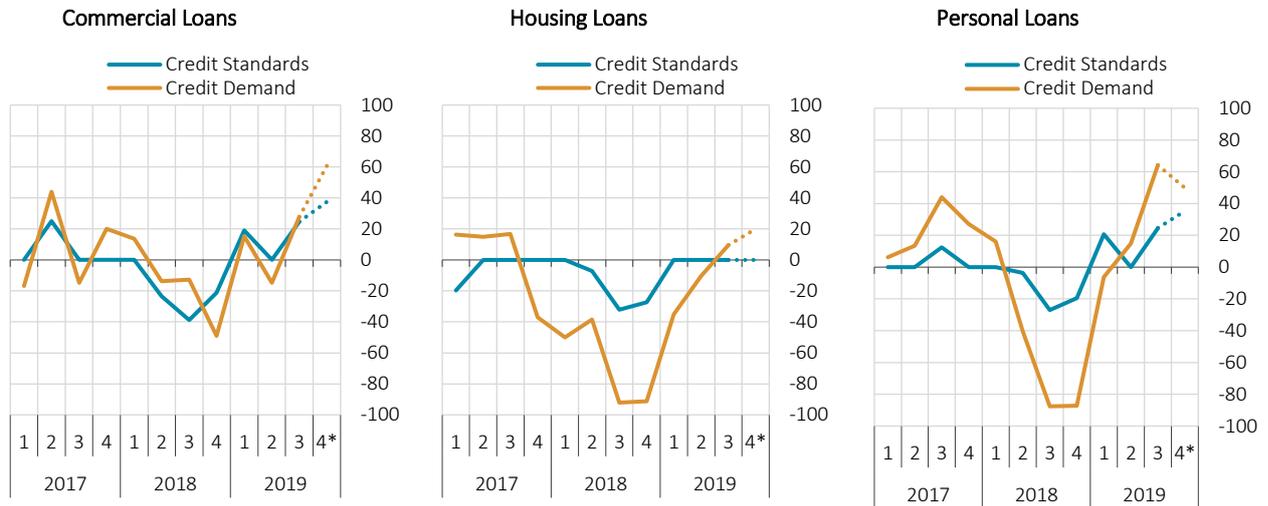
Chart 5.2.4: Consumer Loan Rates (Flow Data, Annual, 4-Week Moving Average, %)



Source: CBRT.

According to the Bank Loans Tendency Survey, while standards on enterprise loans and personal loans eased compared to the previous quarter, housing loan standards remained flat in the third quarter of 2019. Banks expect this to continue also in the fourth quarter. Meanwhile, loan rates that had declined in the third quarter pulled the demand up for both commercial loans and consumer loans. Banks expect that the rise in demand will continue with further strength (excluding personal loans) in the fourth quarter as well (Chart 5.2.5).

Chart 5.2.5: Credit Standards and Credit Demand



Source: CBRT.

* 2019 fourth quarter data indicate expectations regarding what value those variables will take in that quarter.

Note: To calculate Loan Standards (Demand) Index, banks are asked how their loan standards (loan demand) have changed over the past three months. Net tendencies calculated based on response percentages indicate the direction of the change in credit supply (demand). The index is calculated as, (Ease Somewhat + Ease Considerably)-(Tighten Somewhat + Tighten Considerably). Index values above 0 indicate easing in loan standards (increase in loan demand).

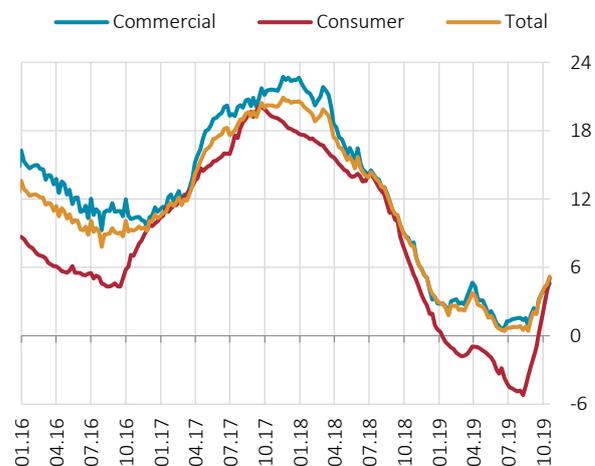
The increase in credit demand due to the easing in credit standards, the fall in interest rates and the recovery in domestic demand have added significant momentum to consumer loans since early August (Chart 5.2.6 and Chart 5.2.7). In that period, the recovery in commercial loans was more modest and growth rates continued to hover below historical averages.

Chart 5.2.6: Loan Growth (13-Week Moving Average, Adjusted for Exchange Rates, %)



Source: CBRT.

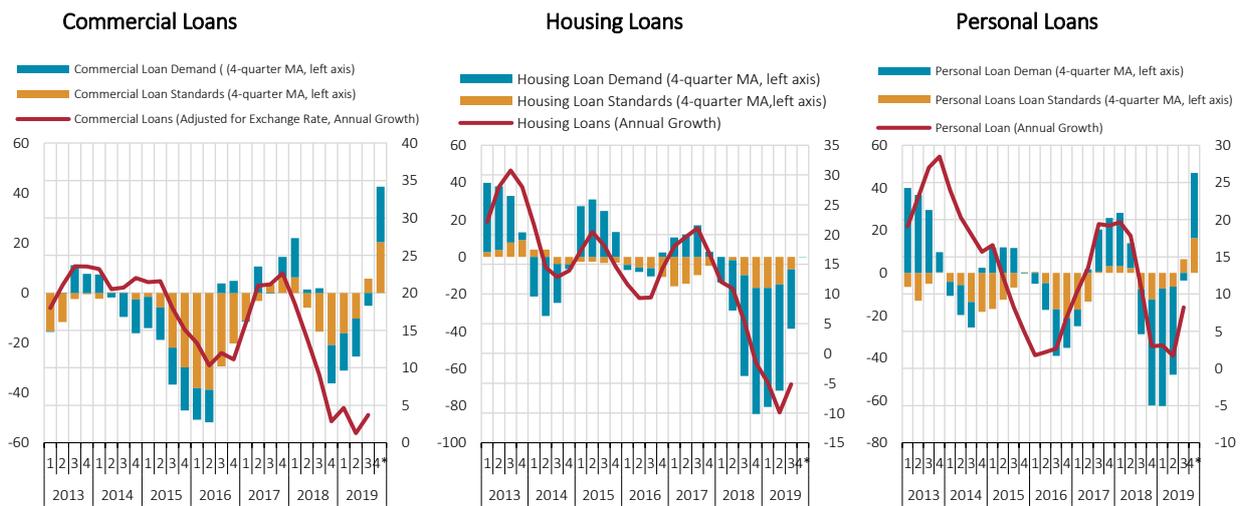
Chart 5.2.7 Annual Loan Growth (Adjusted for Exchange Rates, % Change)



Source: CBRT.

After the CBRT's rate cut in July, the reduction of TL reserve requirement ratios for banks whose TL loan growth rate is between 10% and 20%, and the increase in the remuneration rate applied to TL reserve requirements on 19 August 2019 contributed to the boost in credits. Additionally, campaigns offering housing and personal loans at low interest led by public banks in August also supported consumer loans. The decline in loan rates became more apparent on the back of the rate cut in September, and credit growth –particularly in housing and personal loans– gained more pace. This is also attributed to delayed loan demand becoming active due to expectations of a further lowering in rates. As anticipated in the BLTS, the continued boost in credit demand while credit standards were eased in the fourth quarter indicates that the credit growth may accelerate in the upcoming period (Chart 5.2.8).

Chart 5.2.8: Credit Standards, Credit Demand and Annual Credit Growth



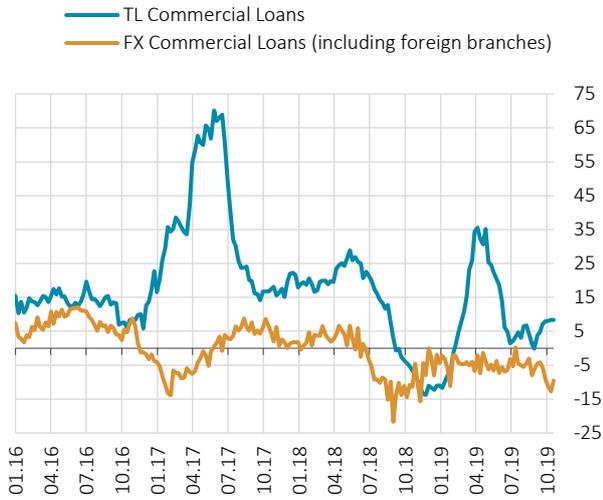
Source: CBRT.

* 2019 fourth quarter data indicate banks' expectations regarding what value those variables will take in that quarter.

Note: To calculate credit standards (demand), banks are asked how their credit standards (credit demand) have changed over the past three months. For calculation method, see the note below Chart 5.2.5.

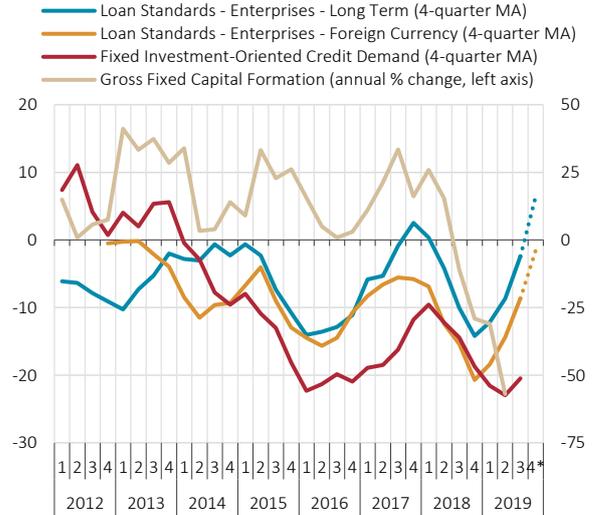
A breakdown of commercial loans by currency suggests that while TL commercial loans grew moderately, FX loans continued to contract (Chart 5.2.9). In the third quarter, standards on FX loans and long-term commercial loans used generally for investment purposes remained largely tight. Additionally, the continued decline in fixed investment-oriented credit demand caused the contraction in those credits to continue (Chart 5.2.10). Reflection of the weak investment expenditures on credit demand is considered as a major factor that limits commercial loan growth (Chart 5.2.10).

Chart 5.2.9: TL and FX Commercial Loan Growth (13-Week Annualized Moving Average, Adjusted for Exchange Rate, %)



Source: CBRT.

Chart 5.2.10: Effect of Fixed Investments on Credit Demand and Fixed Capital Formation*



Source: CBRT.

* Fixed Investment-Oriented Credit Demand is among the factors that affect credit demand. Gross Fixed Capital Formation is calculated from chained index values in GDP.

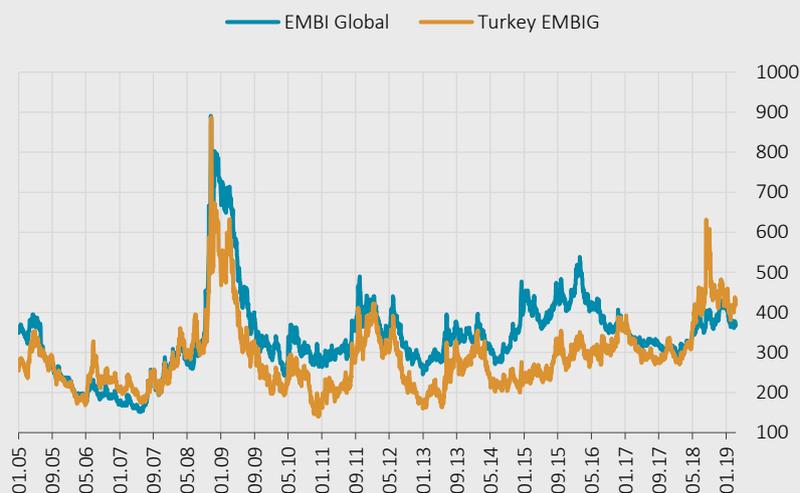
Note: For calculation of net percentage changes of factors, see the note below Chart 5.2.5.

Box 5.1

Determinants of Turkey’s External Borrowing Rate

In cross-country comparisons of external borrowing costs, the yield spread, which refers to the difference between the yields on bonds issued abroad and the yields on similar borrowing instruments in the same currency, provides significant information. The majority of government external borrowing by emerging market economies is in US dollars. In this regard, the interest rate spread of US dollar borrowings is obtained by subtracting the US Treasury bond yield from the yield on external debt of the related country (Hilscher and Nosbusch, 2010). When we analyze the evolution of interest rates on public external borrowings of emerging market economies and Turkey, we observe both a co-movement and a divergence of external borrowing costs from time to time. This implies that a global common factor (US Treasury bond yield, global risk appetite, etc.) and also country-specific conditions (macroeconomic variables, country risk premium, etc.) play a role in the evolution of external borrowing costs of emerging market economies (Chart 1).

Chart 1: JP Morgan Emerging Markets Bond Index (Basis Points)



Source: Bloomberg.

Identifying the determinants of the yield on public external borrowing is an important research topic because the yield affects both the budget balance and balance of payments through external debt interest payments. In addition to the interest rate, the level of the external debt stock also plays a role in the calculation of the external borrowing interest burden. In Turkey, the relatively high level of public external debt stock declined to low levels from 2002 to 2007, and this trend continued until 2017. The ratio of public external debt stock to GDP moderately increased in 2018 (Chart 2). Currently, this ratio is slightly above the average of peer countries. Even though there is a significant surge in the yields on new external borrowings, US dollar-denominated interest payments in the current account balance are low due to the fact that the stock is predominantly composed of previously-issued long-term bonds with low interest rates. On the other hand, the depreciation trend in the Turkish lira has led to a significant increase in interest payments in the central government budget (Chart 3).

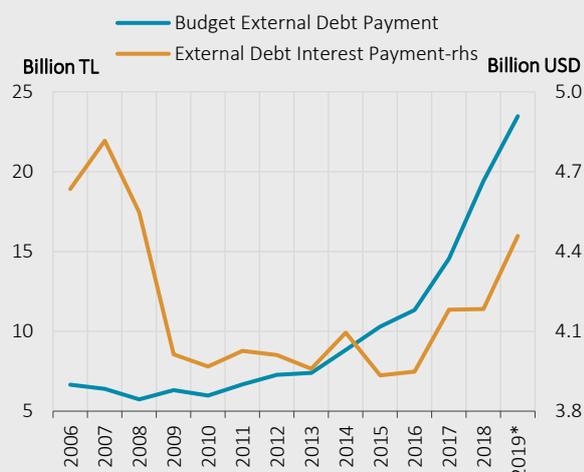
In addition, determining the impact of the factors affecting the yield on external borrowing is important to guide policy makers on the conditions under which external borrowing would be more optimal.

Chart 2: Public Sector Gross External Debt Stock/GDP (%)



Source: Republic of Turkey Ministry of Treasury and Finance.

Chart 3: Budget External Debt Payments and External Debt Interest Payment (Billion TL, Billion USD)



Source: Republic of Turkey Ministry of Treasury and Finance.
(*) Forecast for 2019.

Against this background, this box seeks to explain “the realized yield in US dollar-denominated eurobond auctions” since the external borrowing cost affects both the government budget balance and the balance of payments through interest burden. In the economic literature, country-specific factors and variables such as US interest rates and risk premium indicators are largely used as the determinants of the yield on external borrowing. In emerging market economies such as Turkey, there are many academic studies that emphasize the importance of global factors.¹ These studies generally use the 10-year US Treasury bond yield, the implied volatility of the S&P 500 index (VIX), and the difference between the 3-month Libor rate and the 3-month US Treasury bond rate (Hilscher and Nosbusch, 2010). In addition, according to the findings of Bellas et al. (2010), the global risk appetite (VIX) and the US Treasury bond rate stand out as the two prominent determinants of external borrowing costs of emerging market economies in the short term. In the long run, in addition to countries’ debt payment capacities and political risks, macroeconomic factors also play a determining role in the external borrowing cost.

As a country-specific risk criterion, Credit Default Swap (CDS) premiums are used in general (Akçelik and Fendoğlu, 2019). Akçelik and Fendoğlu (2019) feature reserve adequacy, current account deficit, foreign currency indebtedness level, and budget balance as the determinants of the CDS premium in emerging market economies.

On the other hand, JP Morgan EMBI spread indices are generally used as the indicators of external borrowing costs (Hilscher and Nosbusch, 2010). The EMBI indices provide information on the current interest rate and do not provide sufficient information on the external debt burden as there is no external borrowing on a daily basis. Therefore, the analysis of the external borrowing interest rate in the Treasury’s eurobond auctions is significant as it determines the interest payment to be made in the future periods depending on the maturity of the borrowing instrument.

¹ For a detailed discussion, see Calvo et al. (1993), Calvo (2002), Herrera and Perry (2002), Diaz Weigel and Gemmill (2006), García-Herrero and Ortiz (2006), Longstaff et al. (2007), González-Rozada and Levy Yeyati (2008).

In accordance with the literature, we have employed the maturity of the external debt instrument, the US dollar Libor rate, Turkey's CDS premium, 10-year US Treasury bond yield and the VIX index as potential variables to explain the yield on the Treasury's eurobond issuance in international capital markets. As explained before, the CDS premium is closely related to country-specific macro variables such as reserve adequacy, external debt level and current account deficit. Accordingly, the CDS premium has been employed in this study both for direct control of the country-specific risk premium and as a reflection of other macro variables. The US Treasury bond yield and the VIX index represent the global factors.

Determinants of the Yield on Turkey's External Borrowing

The complete form of our regression equation to be estimated is as follows:

$$\Delta dbf_t = \alpha_1 + \alpha_2 * \Delta USTR_t + \alpha_3 * \Delta CDS_t + \alpha_4 * \Delta libor_t + \alpha_5 * \Delta VIX_t + \alpha_6 * \Delta term_t + \varepsilon_t \quad (1)$$

Here, dbf_t is the yield on Treasury's external bond issuance at time t , $USTR_t$ is US Treasury bond yield; $libor_t$ is US dollar Libor rate, CDS_t is Turkey's CDS premium, VIX_t is the volatility index derived from S&P 500 index options, and finally $term_t$ is the maturity of Treasury's US dollar-denominated eurobonds. The symbol Δ shows the logarithmic difference between the value of the relevant variable at time t and its value on the day of the previous auction.

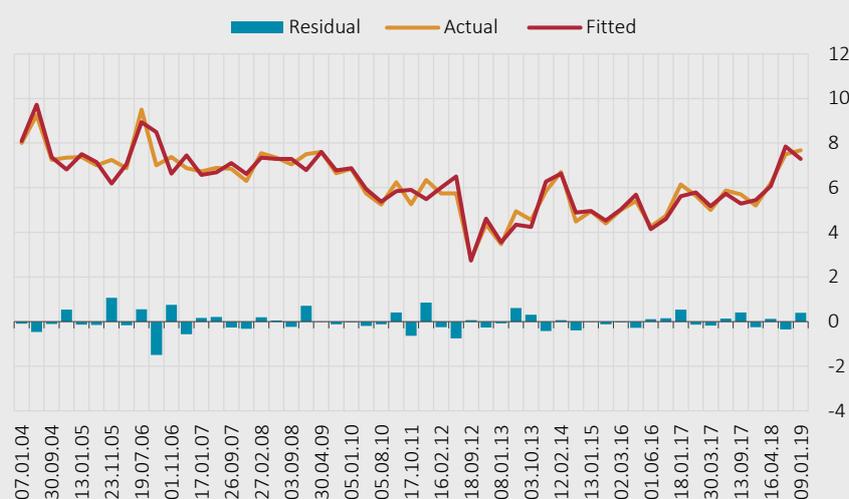
The equation is estimated using the least squares (OLS) method for the days when the auction was held between 17.09.2003 and 09.01.2019, and four different sets of variables by adding the other variables to the US Treasury bond yields and CDS variables sequentially. Estimation results are presented in Table 1.

Table 1: OLS Regression Results

Dependent Variable: Δdbf	Coefficients			
	(1)	(2)	(3)	(4)
<i>Constant</i>	0.0029 (0.0066)	0.0025 (0.0067)	0.0020 (0.0068)	0.0016 (0.0068)
$\Delta USTR$	0.3976** (0.0203)	0.3984** (0.0214)	0.4030** (0.0247)	0.3615** (0.0463)
ΔCDS	0.3496** (0.0305)	0.3460** (0.0346)	0.3197** (0.0427)	0.3468** (0.0568)
$\Delta libor$		0.0239 (0.0577)	0.0316 (0.0511)	0.0515 (0.0454)
ΔVIX			0.0638 (0.0788)	0.0484 (0.0818)
$\Delta term$				0.0254 (0.0203)
<i>Adj. R²</i>	0.8648	0.8626	0.8650	0.8678
Number of Observations: 52				
* and ** denote statistical significance of 10% and 5%, respectively. Standard deviations are indicated in parentheses.				

The regression results reveal that the US Treasury bond yield and the CDS premium are statistically significant and the signs of these coefficients are in the expected direction. According to the equation in the fourth column, a one-percentage point rise in the 10-year US Treasury bond yield and Turkey's CDS premium increases the yield on external borrowing by 0.36 and 0.35 percentage points, respectively. Chart 4 demonstrates the actual interest rates and the estimated rates from the equation in the fourth column of Table 1. It can be seen that the equation predicts the auction yields quite well in most of the periods. According to these results, the 2-2.5 points of surge in the external borrowing costs in 2018 was mainly due to the increase of CDS premium to 370 basis points from the historical average of 220 basis points.

Chart 4: Actual and Estimated Yield on Turkey's External Borrowing



Source: Authors' calculations.

To sum up, the US Treasury bond yields and Turkey's CDS premium are found to be the main determinants of external borrowing costs in Turkey. In this context, considering the recent fall in US Treasury bond yields, an expected gradual decline in Turkey's CDS premium due to the decline in financial volatility and a more favorable macroeconomic outlook will reduce external borrowing costs, and thus contribute positively to Turkey's balance of payments and budget balance in the upcoming period.

References

- Akçelik, F., & Fendoğlu, S. (2019). *Country Risk Premium and Domestic Macroeconomic Fundamentals When Global Risk Appetite Slides* (No. 1904). Research and Monetary Policy Department, Central Bank of the Republic of Turkey
- Bellas, D., Papaioannou, M. G., & Petrova, I. (2010). Determinants of Emerging Market Sovereign Bond Spreads: Fundamentals vs Financial Stress: IMF Working Paper. № 10/281. *International Monetary Fund*.
- Calvo, G.A., Leiderman, L., Reinhart, C.M., (1993). Capital inflows and real exchange rate appreciation in Latin America: the role of external factors. *IMF Staff Papers* 40 (1), 108–151.
- Calvo, G.A.,(2002). Globalization hazard and delayed reform in emerging markets. *Economia* 2 (2), 1–29.
- Diaz Weigel, Diana and Gordon Gemmill, (2006), "What Drives Credit Risk in Emerging Markets? The Roles of Country Fundamentals and Market Co-Movements," *Journal of International Money and Finance* 25, 476-502.

A García-Herrero, A Ortíz, K Cowan (2006). The role of global risk aversion in explaining sovereign spreads, *Economía* 7 (1), 125-155.

González-Rozada and Levy Yeyati (2008). Global Factors and Emerging Market Spreads. *Economic Journal*, vol. 118, Issue 533, 1917-1936.

Herrera S., Perry G. (2002). Determinants of Latin Spreads in the New Economy Era: The Role of U.S. Interest Rates and Other External Variables, 2002 unpublished working paper, World Bank

Hilscher, J., & Nosbusch, Y. (2010). Determinants of sovereign risk: Macroeconomic fundamentals and the pricing of sovereign debt. *Review of Finance*, 14(2), 235-262.

Longstaff, Francis A., Jun Pan, Lasse H. Pedersen, and Kenneth J. Singleton, (2007), “How Sovereign is Sovereign Credit Risk?” unpublished paper, UCLA Anderson School, MIT Sloan School, NYU Stern School, and Stanford Graduate School of Business.