

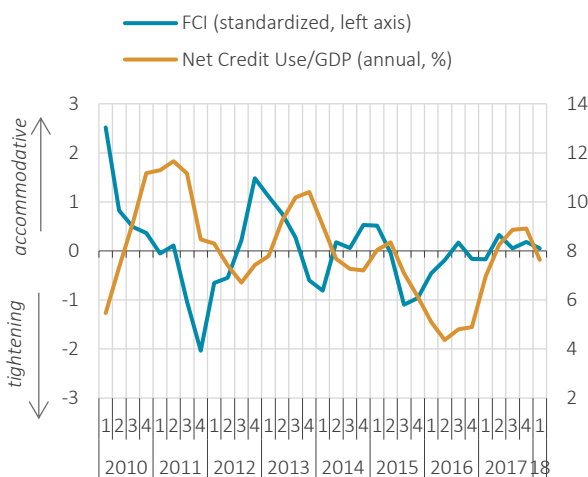
5. Financial Conditions and Monetary Policy

In the first quarter of 2018, global risk volatility increased amid stronger signals for normalization of global monetary policies and geopolitical tensions, causing risk premiums to rise and currencies to fluctuate across emerging economies. Portfolio flows destined for these markets experienced a short-lived hiccup due to the turbulence across global financial markets in the beginning of February, but regained momentum thanks to a stronger macroeconomic outlook. In this period, financial markets exhibited volatility in Turkey as well. However, the CBRT’s ongoing tightening helped maintain a negatively sloped yield curve during the reporting period.

The pace of loan growth converged to historical averages in the first quarter of 2018. According to the Bank Loans Tendency Survey, loan standards remained virtually unchanged for businesses in the first quarter, while the demand for commercial loans increased. Nevertheless, banks foresee slightly tighter loan standards and lower demand for commercial loans in the second quarter.

Due to the base effect from the first quarter’s commercial loan growth, the ratio of net credit use to GDP declined (Chart 5.1). Despite the support from stock returns and loan standards, the FCI tightened slightly (Chart 5.2).

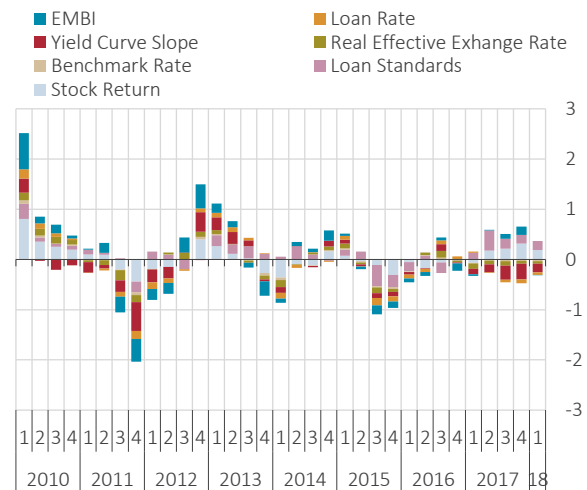
Chart 5.1: Financial Conditions and Credit Growth*



Source: CBRT.

* For further details on measuring FCI, see the CBRT Working Paper No. 15/13. Net Credit Use is defined as the annual change in the credit stock and adjusted for exchange rate. First-quarter GDP data for 2018 is forecast.

Chart 5.2: Contributions to FCI



Source: CBRT.

5.1 Relative Performance of Financial Markets

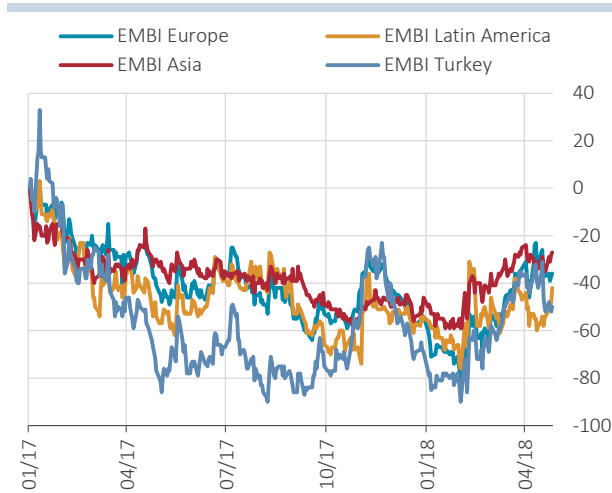
Risk Perceptions and Portfolio Flow

Although the monetary policy tightening continues as expected in advanced economies, the upside risks to global inflation have fueled expectations of faster monetary tightening. In fact, the early February concerns over accelerated inflation in the US, and thus the possibility for a tighter-than-expected Fed monetary policy led to volatility in global financial markets and caused stock markets to tumble. In addition, the ongoing steps toward protectionist trade policy between the US and China helped weaken the risk appetite. As a result, risk premiums increased across emerging economies, including Turkey (Chart 5.1.1).

The strong and steady portfolio flows to emerging economies in 2017 continued at a strengthening pace in January 2018. However, with the financial market volatility driven by the early February deterioration

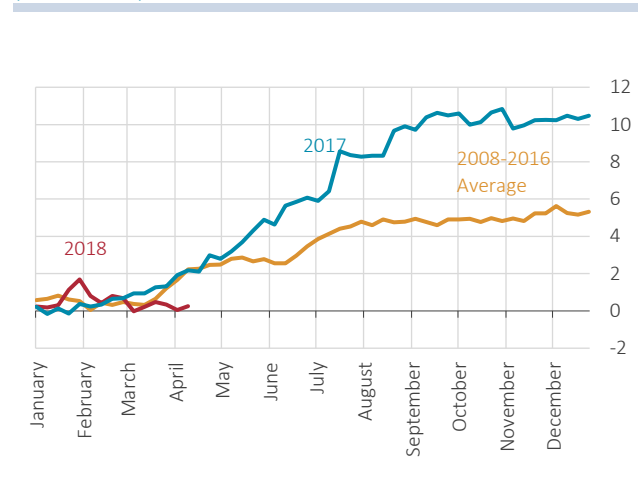
in the global risk appetite, emerging markets attracted less portfolio flows. In this period, Turkey also saw a decline in portfolio inflows, which remained below historical levels (Chart 5.1.2). Portfolio inflows were mostly destined for the government bonds market while portfolio outflows primarily occurred in the stock market.

Chart 5.1.1: Regional Risk Premium* (Basis Points)



Source: Bloomberg.
* Denotes changes since 2 January 2017.

Chart 5.1.2: Cumulative Portfolio Flows to Turkey* (Billion USD)

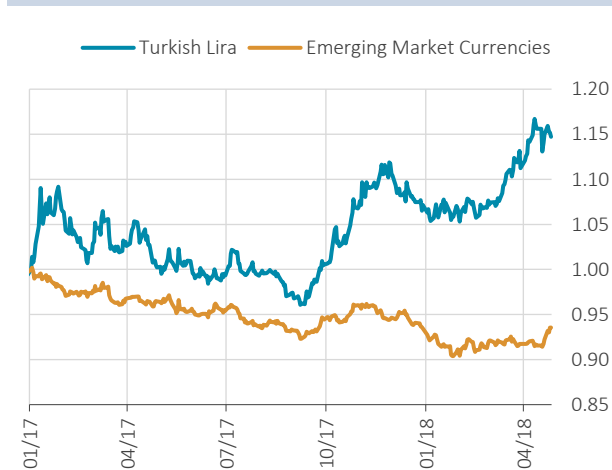


Source: CBRT.
* Includes stocks, bonds and repo.

Exchange Rates

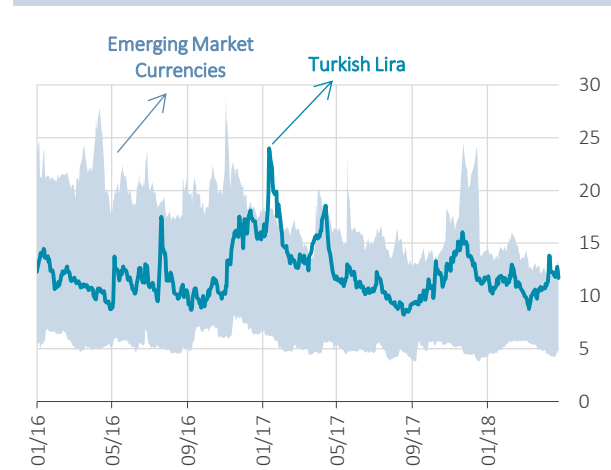
Amid a volatile global risk appetite, emerging-market currencies depreciated in the first quarter, with the Turkish lira diverging negatively due to mounting geopolitical risks and also the credit rating downgrade in March (Chart 5.1.3). Thus, the implied volatility of the Turkish lira increased as well (Chart 5.1.4).

Chart 5.1.3: Turkish Lira and Emerging Market Currencies against US Dollar* (2 January 2017=1)



Source: Bloomberg.
* Emerging market currencies include those of Brazil, Chile, Colombia, Hungary, India, Indonesia, Malaysia, Mexico, Philippines, Poland, Romania and South Africa.

Chart 5.1.4: Implied FX Volatility against US Dollar* (1-Month-Ahead, %)

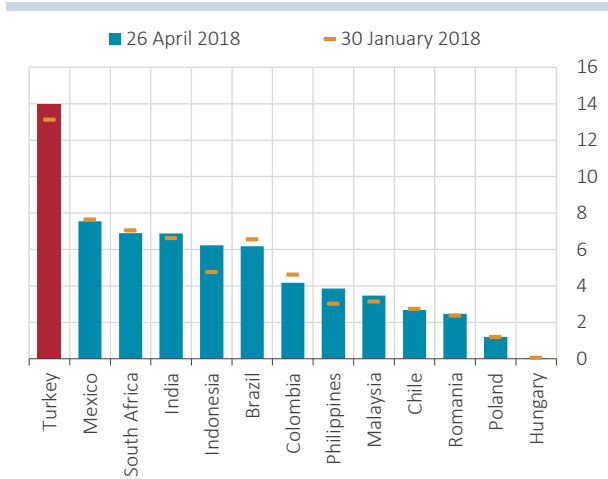


Source: Bloomberg.
* Emerging market currencies include those of Brazil, Chile, Colombia, Hungary, India, Indonesia, Malaysia, Mexico, Philippines, Poland, Romania and South Africa.

Market Rates

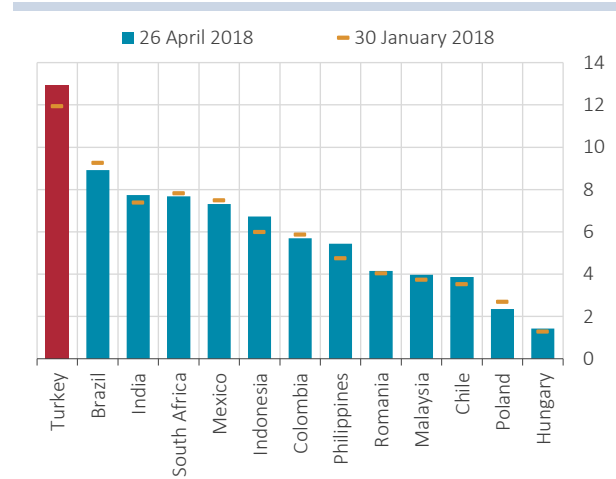
In the current reporting period, short and long-term interest rates were largely flat in emerging economies, while short-term market rates went slightly up in Turkey on the back of the ongoing monetary policy tightening (Chart 5.1.5). On the other hand, long-term interest rates also remained mostly unchanged across emerging economies, whereas long-term market rates were elevated in Turkey (Chart 5.1.6).

Chart 5.1.5: 6-Month Market Rates (%)



Source: Bloomberg.

Chart 5.1.6: 5-Year Market Rates (%)



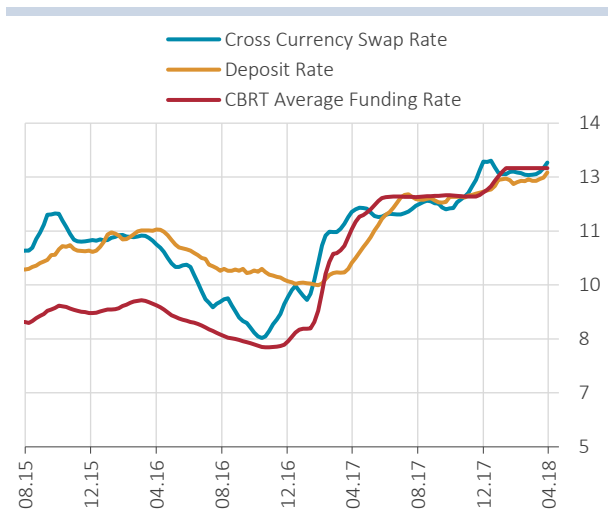
Source: Bloomberg.

5.2 Credit Conditions

Loan Rates, Funding Costs and Interest Rate Spreads

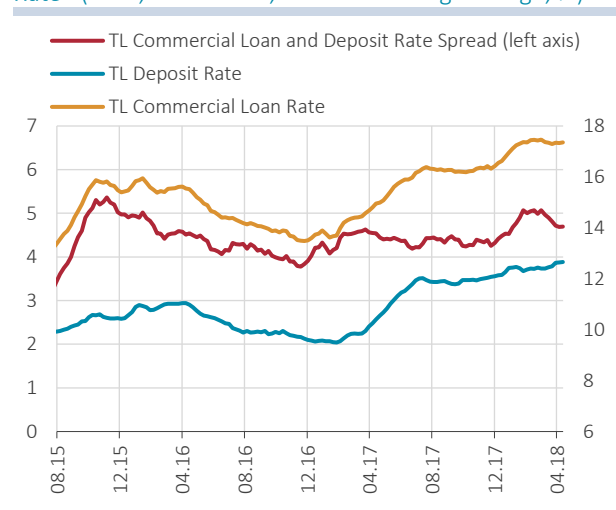
In the first quarter of 2018, the CBRT average funding rate remained unchanged, but swap rates increased amid the rising risk premium and exchange rate developments. On the other hand, the moderate loan growth boosted the need for Turkish lira funding, and thus the pressure on deposit funding pushed deposit rates slightly higher. Commercial loan rates were flat in the first quarter, and accordingly the spread between loan rates and deposit rates declined closer to the relatively flat levels of 2017 (Charts 5.2.1 and 5.2.2).

Chart 5.2.1: Indicators on Banks' Funding Costs (%)



Source: Bloomberg, CBRT.

Chart 5.2.2: TL Commercial Loan Rate and TL Deposit Rate* (Flow, Annualized, 4-Week Moving Average, %)

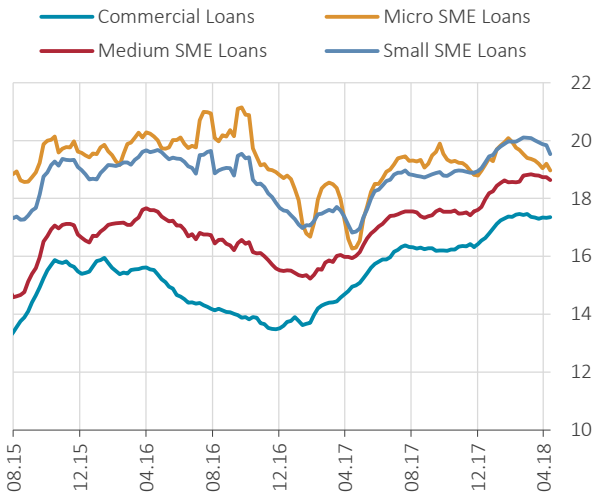


Source: CBRT.

* TL commercial loans excluding overdraft accounts, credit cards and non-zero interest rate loans.

Across firms, commercial loan rates were lower for micro and small-scale enterprises in the current reporting period (Chart 5.2.3), largely owing to eased standards for SME loans, as suggested by the Bank Loans Tendency Survey. Moreover, consumer loan rates were down in line with lower personal loan rates. The results of the survey show that lower loan rates were caused by bank competition. Meanwhile, with long-term loans being more sensitive to inflation expectations than short-term loans, mortgage rates remained on the rise (Chart 5.2.4).

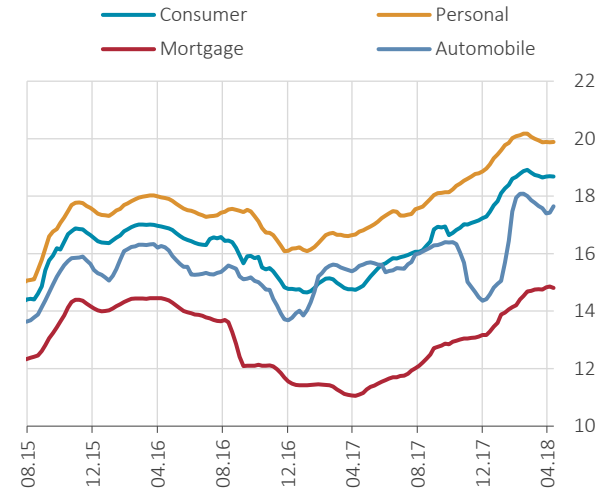
Chart 5.2.3: TL Commercial Loan Rates*
(Flow, Annualized, 4-Week Moving Average, %)



Source: CBRT.

* Excluding overdraft accounts, credit cards and non-zero interest rate loans.

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

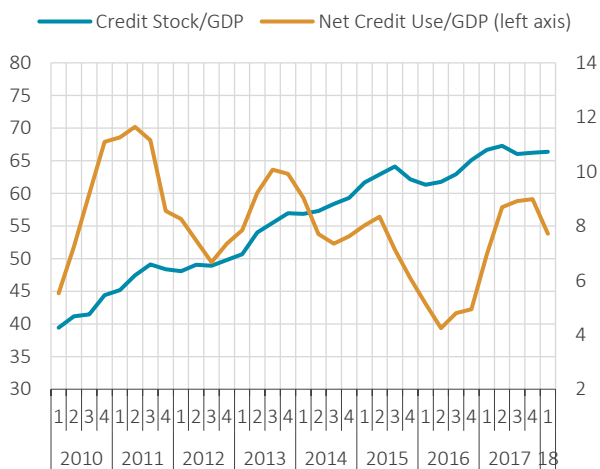


Source: CBRT.

Credit Volume

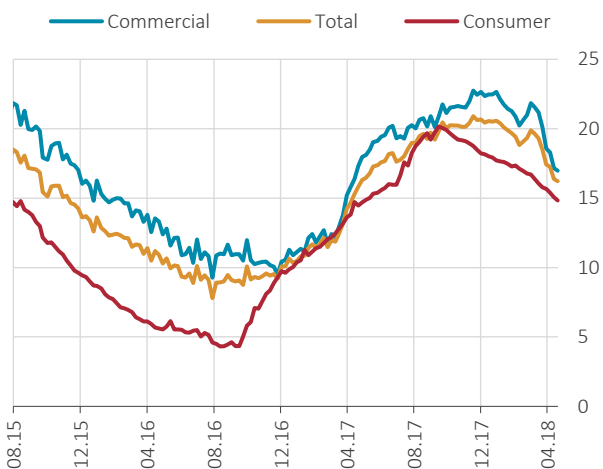
In the first quarter of 2018, the base effect from commercial loan growth caused a deceleration in the net credit use to GDP ratio (Chart 5.2.5). The decline in total loan growth mostly reflects the base-effect-driven slowdown in commercial loan growth. In addition, with mortgages and personal loans having decelerated since the fourth quarter of 2017, total loan growth continued to slow (Chart 5.2.6).

Chart 5.2.5: Domestic Credit Stock and Net Credit Use*
(%)



Source: CBRT.

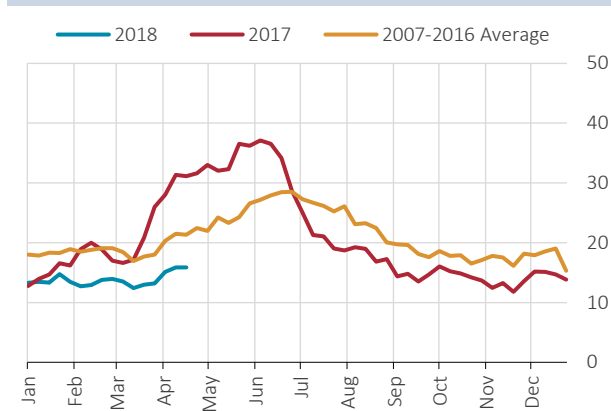
Chart 5.2.6: Annual Loan Growth
(Adjusted for Exchange Rate, Y-o-Y % Change)



Source: CBRT.

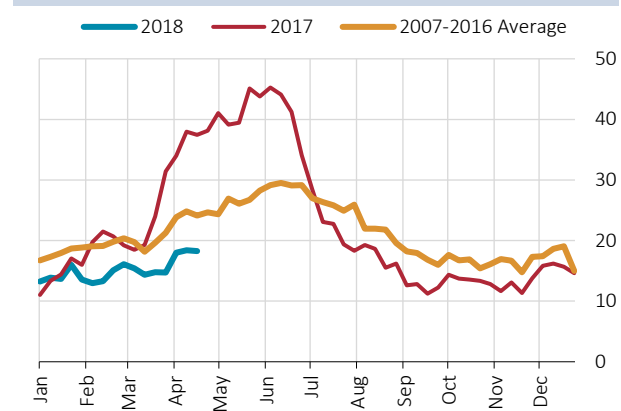
Compared with historical averages, commercial loans and total loans grew at past averages as per the re-balancing process (Chart 5.2.7 and 5.2.8).

Chart 5.2.7: Annualized Total Loan Growth
(Adjusted for Exchange Rate, 13-Week Moving Average, %)



Source: CBRT.

Chart 5.2.8: Annualized Commercial Loan Growth
(Adjusted for Exchange Rate, 13-Week Moving Average, %)

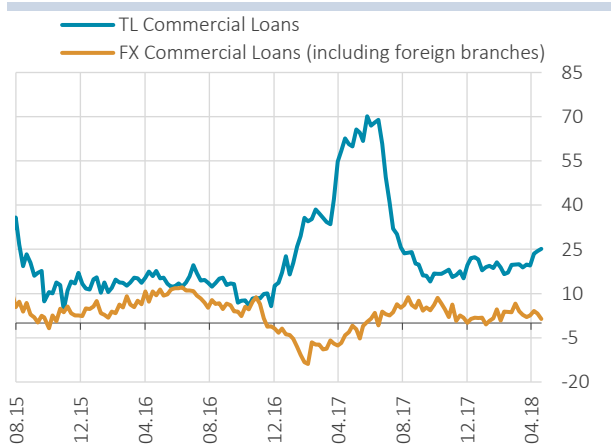


Source: CBRT.

FX-denominated commercial loans were flat in the first quarter of 2018. This is mainly due to possible spillovers to the banking sector from rising FX borrowing costs, exchange rate developments and adjustments to FX risk management (Chart 5.2.9). Likewise, according to the first-quarter results of the Bank Loans Tendency Survey, banks tightened standards for FX-denominated commercial loans and the demand for FX-denominated commercial loans continued to decline.

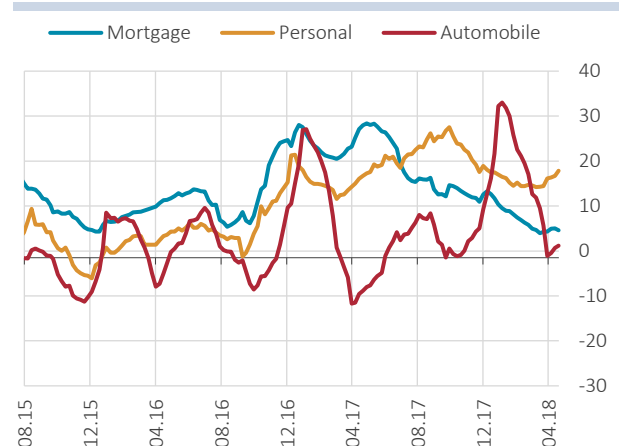
The rise in deposit rates, the main funding source of banks, which is mostly short term, was passed through to pricing behavior, causing consumer loan rates to increase and loan growth to slow (Chart 5.2.10). The supply of mortgages decreased relative to other consumer loans amid expectations of higher inflation, while housing investments, the opportunity cost of which increased due to developments in the housing market and the rising alternative investment products, pulled mortgage demand down. The Bank Loans Tendency Survey also indicates that mortgage demand was down due also to housing market prospects and consumer confidence. Meanwhile, personal loan rates were slightly down recently, yet still remained elevated, causing a slowdown in personal loans.

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



Source: CBRT.

Chart 5.2.10: Annualized Consumer Loan Growth
(13-Week Moving Average, %)



Source: CBRT.

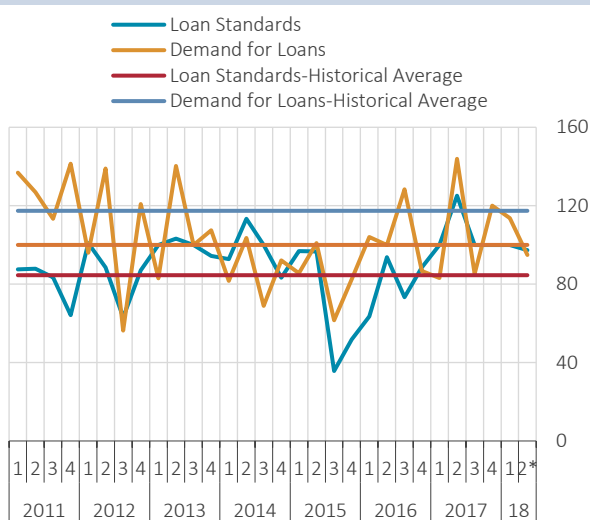
Loan Standards

According to the results of the Bank Loans Tendency Survey, commercial loan standards remained constant in the first quarter yet were favorable relative to historical averages (Chart 5.2.11). In terms of scale, maturity and currency denomination, standards eased for SME loans and TL-denominated loans but tightened for FX-denominated loans. Among factors affecting loan standards, prospects for general economic activity helped ease the standards while collateral risks led to tightening. Other factors had no effect on loan standards in this quarter. Regarding rules and conditions applied to commercial loans, profit margins on average loans were lowered while collateral requirements and maturity-related conditions were tightened.

Survey respondents reported an increase in the demand for commercial loans in the first quarter of 2018 (Chart 5.2.11). In terms of maturity and currency denomination, the demand for short-term loans remained on the rise while the demand for TL-denominated loans continued to grow substantially. The demand for FX-denominated loans, however, declined further. The demand and supply-driven contraction in FX-denominated loans can be attributed to the shift toward TL-denominated loans due to exchange rate developments. The demand for long-term loans also contracted in this quarter. The need for debt restructuring and inventory buildup gave impetus to commercial loan demand whereas fixed investments continued to have a dampening effect in the first quarter.

Commercial loan standards are expected to be slightly tighter in the second quarter of 2018 (Chart 5.2.11). In terms of scale, standards are likely to remain unchanged for SME loans, while in terms of currency denomination and maturity, standards are expected to be eased for short-term loans and TL-denominated loans and tighter for FX-denominated commercial loans. The demand for commercial loans is expected to be slightly down in this quarter. In terms of scale, maturity and currency denomination, the demand may only increase for TL-denominated loans while large enterprises might have significantly less demand for short-term loans and FX-denominated loans.

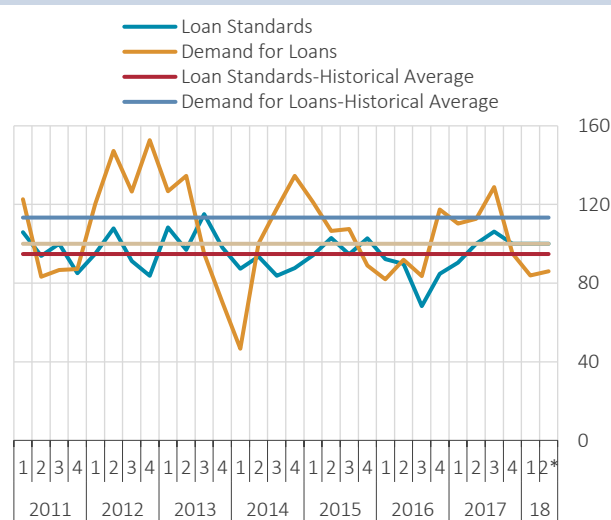
Chart 5.2.11: Commercial Loan Standards and Demand*



Source: CBRT.

* Index values above 100 indicate easing in loan standards and increased loan demand. The second-quarter data for 2018 is forecast.

Chart 5.2.12: Consumer Loan Standards and Demand*



Source: CBRT.

* Index values above 100 indicate easing in loan standards and increased loan demand. The second-quarter data for 2018 is forecast.

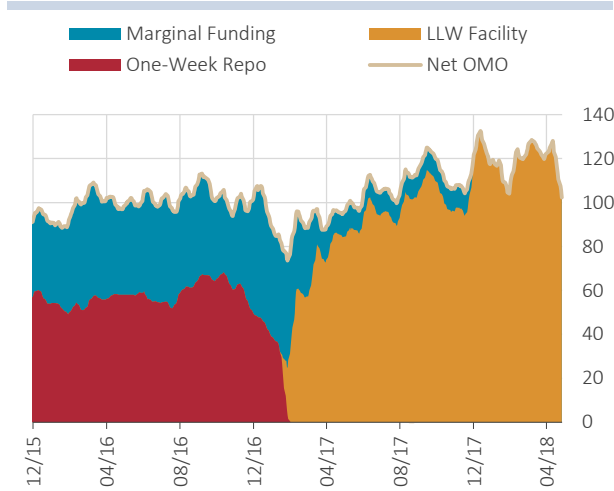
Survey responses about consumer loans indicate that loan standards remained unchanged in the first quarter of 2018 (Chart 5.2.12). The demand declined further for mortgages but continued to rise for personal loans in this period. On the personal loans front, the increased demand was mainly stimulated by taxes and similar expenses on loans. In the second quarter of 2018, standards for consumer loans are likely to remain constant whereas the demand for consumer loans is expected to decrease due to the mortgage demand (Chart 5.2.12).

5.3 Monetary Policy

Market Developments

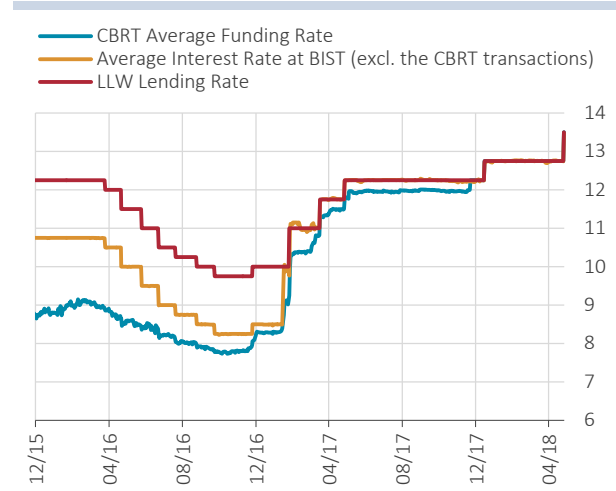
All CBRT funding continued to be based on a single rate in the first quarter (Chart 5.3.1). The average rate at the BIST Interbank Repo and Reverse Repo Market excluding CBRT transactions has been hovering close to the CBRT average funding rate since January 2017. This is mainly because the CBRT adopted a more predictable liquidity policy to avoid abrupt changes in the funding composition. As a result, overnight market repo rates and the CBRT funding rate have settled at the same level since late 2017 (Chart 5.3.2), which is a positive indicator for the increased effectiveness of the monetary policy stance on market rates.

Chart 5.3.1: CBRT Funding (2-Week Moving Average, Billion TL)



Source: CBRT.

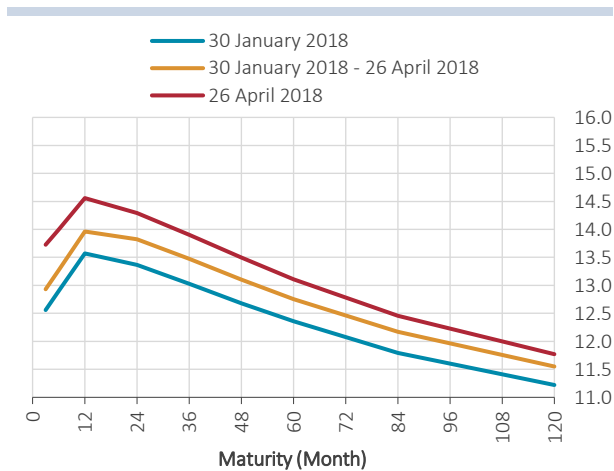
Chart 5.3.2: Short-Term Interest Rates (%)



Source: BIST, CBRT.

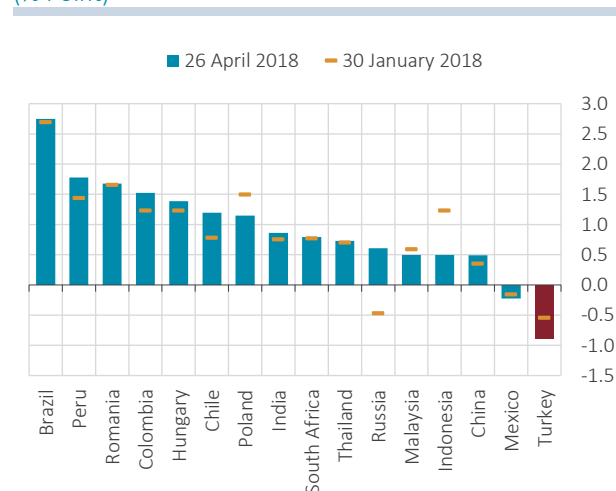
Due to the rise in Turkey’s risk premium, currency swap rates increased for all maturities in the inter-reporting period. Thus, short-term currency swap rates continued to hover above those on long-term currency swaps (Chart 5.3.3). Owing to the tight monetary policy stance, Turkey’s yield curve slope remained the most negative among emerging economies in the current reporting period (Chart 5.3.4).

Chart 5.3.3: Swap Yield Curve (%)



Source: Bloomberg.

Chart 5.3.4 Yield Curve Slopes in Emerging Economies* (% Point)

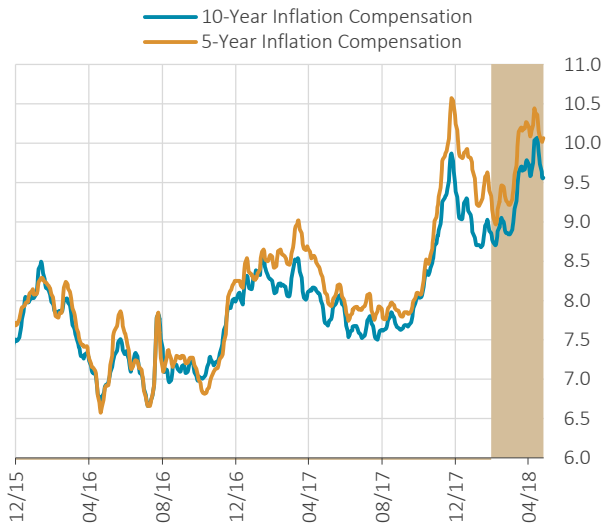


Source: Bloomberg.

* Yield curve slope is calculated as the difference between 5-year bond yields and 6-month bond yields. Swap rates are used instead of bond yields to calculate the yield curve slope for Turkey.

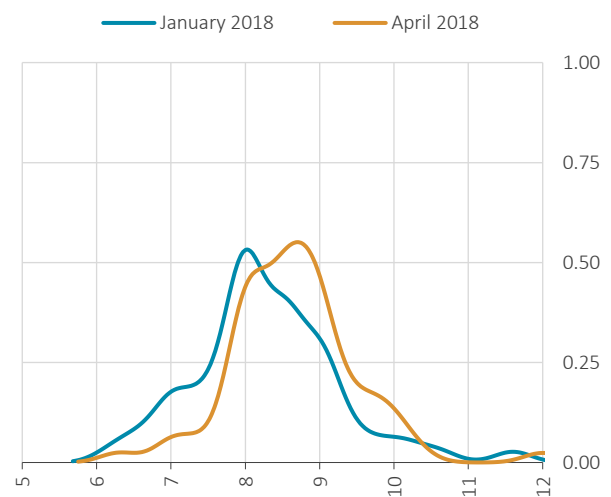
Even though the CBRT continues to implement a tight monetary policy stance, inflation compensation increased in the current reporting period amid geopolitical tensions, volatile exchange rates and high inflation (Chart 5.3.5). Despite the considerable increase in inflation compensation, the distribution of 24-month-ahead inflation expectations obtained from the CBRT Survey of Expectations indicates a limited uptick in April compared to January (Chart 5.3.6).

Chart 5.3.5: Inflation Compensation* (5-Day Moving Average, %)



Source: Bloomberg.
* Shaded area denotes the current reporting period.

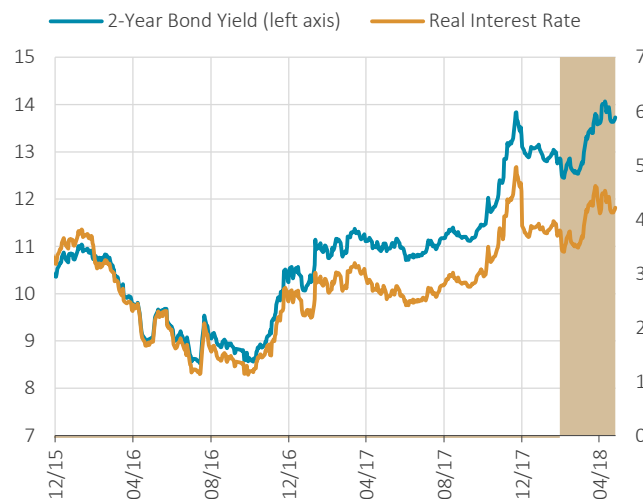
Chart 5.3.6: Distribution of 24-Month-Ahead Inflation Expectations* (%)



Source: CBRT.
* Kernel probability density functions are constructed using CBRT Survey of Expectations.

Two-year real interest rates, calculated using inflation expectations data from the CBRT Survey of Expectations have risen largely in tandem with nominal interest rates (Chart 5.3.7).

Chart 5.3.7: 2-Year Bond Yields and the Real Interest Rate in Turkey* (%)



Source: Bloomberg, CBRT.
* Real interest rate is calculated as the difference between 2-year bond yield and the 24-month-ahead inflation expectations derived from the CBRT Survey of Expectations. Shaded area denotes the current reporting period.

Monetary Policy Reaction

The CBRT maintained a tight policy stance against the inflation outlook in 2017 and implemented a policy mix designed to be stabilizing for the FX liquidity and supportive of financial stability. The CBRT delivered a gradual and strong monetary tightening in 2017 to offset the possible negative effects of inflation on pricing behavior. However, economic activity followed a robust course through 2017 on the back of accommodative incentives and measures. The historically higher loan growth boosted domestic demand, leading to an increased demand pressure on inflation and delaying the effects of the tight monetary policy stance in 2017.

The MPC statements of January and March emphasized that the tight stance in monetary policy will be maintained decisively until the inflation outlook displays a significant improvement, independent of base effects and temporary factors, and becomes consistent with the targets.

At its April MPC meeting, the CBRT underlined that current elevated levels of inflation and inflation expectations continue to pose risks to the pricing behavior and opted for a measured monetary tightening by highlighting that upside movements in import prices have increased such risks. Accordingly, the LLW lending rate was raised by 75 basis points to 13.50 percent.

To enhance flexibility and diversity of instruments in the FX liquidity management, the CBRT launched the Foreign Exchange Deposit Market against Turkish Lira Deposits in January 2017. Auctions held at this market improve banks' liquidity management and also establish a benchmark level for TL interest rates at foreign currency swap markets. These transactions have led to significantly lower volatility in short-term currency swap rates and facilitated the liquidity management of banks, especially in times of heightened stress in FX markets (Box 5.1). Additionally, in November 2017, the CBRT began to hold TL-settled forward FX sale auctions to provide the real sector with an effective FX risk management and to balance excessive fluctuations in the exchange rate. The auction calendar was announced publicly on 31 March 2018. One-month auctions are now held every day instead of three times a week according to the announced calendar for the second quarter.

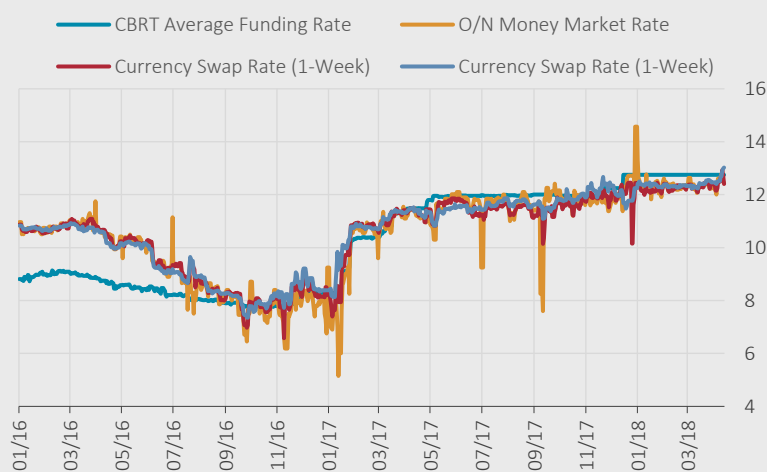
Box 5.1

The Effects of the CBRT’s Foreign Exchange Deposits against Turkish Lira Deposits Auctions

On 17 January 2017, the CBRT announced the opening of the foreign exchange deposits against Turkish lira deposits auctions and held the first auction on 18 January 2017. The aim of these auctions is to help banks improve their Turkish lira and FX liquidity management and inject FX liquidity without any permanent loss of reserves. Another objective is to contribute to a well-functioning foreign swap markets by providing a reference rate for currency swaps. Put differently, these auctions are a target-oriented policy instrument that facilitates banks’ liquidity management and provides a benchmark for Turkish lira interest rates at swap markets abroad. This box analyzes how these auctions perform as a reference for USD/TL rates at foreign swap markets and how much support they provide for banks’ FX liquidity management.

In the pre-auction period, foreign short-term USD/TL swap rates were particularly volatile due to supply and demand conditions (Chart 1). As a result, USD/TL swap rates deviated from the CBRT’s short-term interest rates and FX market volatility increased. Regarding the impact of auctions, short-term swap rates have become substantially less volatile following the initiation of the auctions (Table 1).

Chart 1: CBRT Average Funding Rate and Currency Swap Rates (%)



Kaynak: Bloomberg, CBRT.

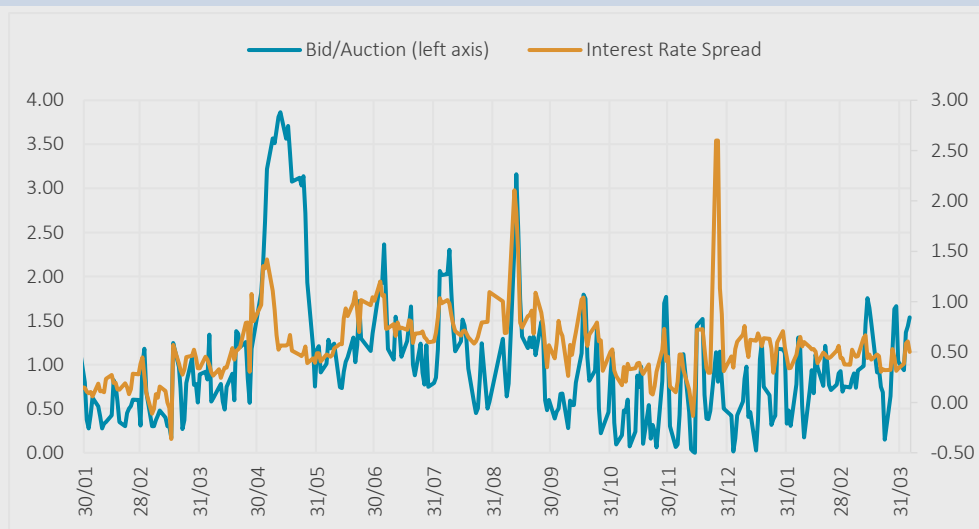
Table 1: Volatility in Currency Swap Rates

	O/N	1-Week	1-Month
Volatility (September 2015-December 2016)	1.39	1.26	1.15
Volatility (January 2017-April 2018)	0.77	0.58	0.57

* Volatilities are computed by standard deviations.

A threshold model¹ is estimated to analyze the transmission of the impact of foreign exchange deposits against Turkish lira deposits auctions on foreign currency swap rates. In the model, the demand for auctions is defined as “the total bid to auction amount ratio”² (Chart 2) and this variable is explained by the spread between the Turkish lira interest rate for foreign exchange deposits against Turkish lira deposits and the foreign weekly swap rate (interest rate spread) and by exchange rate volatility. Estimation results show higher demand as the interest rate spread passes the threshold (45.4 basis points) (Table 2). Higher demand for auctions increases the funding requirement of the system by as much as the amount of TL deposits in the auctions, which creates a TL demand at foreign swap markets and keeps TL interest rates from tumbling, thus helping to limit volatilities.

Chart 2: Total Bid to Auction Amount Ratio and Interest Rate Spread (%)



Source: CBRT.

As mentioned above, another objective of these auctions is to improve banks' FX liquidity management and enhance its effectiveness. In order to test the performance of auctions with regards to this objective, the bank demand for auctions is analyzed in times of increased FX market stress. In the model, the 1-week implied volatility of USD/TL rate is used as the FX market stress indicator. The findings indicate higher demand for auctions in times of increased implied exchange rate volatility. This impact is much stronger when the interest rate spread is above 45.4 basis points.

Table 2: Determinants of the Total Bid to Auction Amount Ratio at TL-settled Forward FX Sale Auctions

	Interest Rate Spread < 0.454	Interest Rate Spread ≥ 0.454
Interest Rate Spread	0.271 (0.248)	0.372** (0.003)
Implied Volatility (t-1)	0.015* (0.067)	0.033** (0.003)
Bid/Auction (t-1)	0.596** (0.001)	0.827** (0.001)
R ²	0.80	0.80
Number of observations	123	183

*, ** denote statistical significance at 10 percent and 1 percent, respectively, and values in parenthesis denote p values.

¹ Based on the equation: $Bid/Auction = \alpha + \beta_1(Spread_t) + \beta_2(Volatility_{t-1}) + \beta_3(Bid/Auction_{t-1}) + \varepsilon_t$, where ε_t represents the error term.

² The bidding limit imposed on foreign exchange deposits against Turkish lira deposits auctions on 15 May 2017 is adjusted by applying it to bank-level bids on previous dates.

In sum, the results obtained from 15-month data following the introduction of auctions reveal that the auctions are aligned with their objectives. The level of the auction rate has become a benchmark for the foreign currency swap market and the volatility of short-term interest rates has thus declined. Moreover, FX injections through auctions remain a supplemental tool for banks' FX liquidity management.

Box 5.2

Global Liquidity Conditions, Domestic Credit Supply and Firms' Access to Credit

Global liquidity is a major source of funding for domestic banks. Thus, a larger-than-expected global liquidity squeeze might cause banks to reduce their credit supply. This box analyzes the effects of a stronger-than-expected tightening in global liquidity on banks' credit supply and what type of firms were affected more severely by this squeeze during the period from September 2008 to September 2009. For an accurate and complete identification of these effects, data is matched across bank, firm and type of credit level.

Our first main hypothesis is that relatively more optimistic banks about external financial conditions and banks with a higher non-core FX liability to total assets ratio, shorter-term external debt and paying a higher premium for external financing, therefore, with higher exposure to global liquidity and possibly facing more severe constraints on external debt in the pre-crunch period would be affected more negatively and shrink their credit supply more strongly in the post-crunch period.

To test this hypothesis, the following equation is estimated:

$$\Delta C_{bfi,after} = \beta_1 FXliabilities_{b,before} + \beta_2 FXliabilities_{b,before} * Maturity_{b,before} + \beta_3 FXliabilities_{b,before} * Premium_{b,before} + \beta_4 FXliabilities_{b,before} * Expectations_{b,before} + \beta_5 FXliabilities_{b,before} * X_{b,before} + \xi_{bf} + \mu_b + \nu_f + \vartheta_i + \varepsilon_{bfi,after} \quad (1)$$

Here, $\Delta C_{bfi,after}$ represents the logarithmic difference of credits lent by bank b to firm f from pre- to post-crunch. $FXliabilities_{b,before}$ is the pre-crunch FX liability to total assets ratio of bank b; $Maturity_{b,before}$ denotes the average maturity of the pre-crunch non-core FX liability of bank b; $Premium_{b,before}$ is the pre-crunch premium paid by bank b for the non-core FX liability (the weighted average of the external debt interest rate relative to the same currency and the LIBOR rate with the closest time to maturity); $Expectations_{b,before}$ represents the logarithmic difference between the expected and actual year-end (December 2008) USD/TL parity in the pre-crunch period. September 2008 is defined as the pre-crunch period (before) while September 2009 is the post-crunch period (after).

$X_{b,before}$ stands for the capital adequacy, liquidity, total assets (in logarithm), profitability (net profits/total assets), and the non-performing loans ratio (non-performing loans/total loans) of bank b. Given that external borrowing conditions (amount, maturity or premium) would vary across different types of banks, $FXliabilities_{b,before}$ is also interacted with bank-specific variables $X_{b,before}$ in order to control/avoid this variation. Moreover, the change in credit supply also depends on how strong the credit relationship between the bank and the firm is, which is controlled with ξ_{bf} showing the bank-firm credit relationship. ξ_{bf} indicates the share of pre-crunch credits that firm f borrowed from bank b in total credits borrowed by the firm. Lastly, the type of bank (state, private, foreign, investment), μ_b , the unobserved characteristics of the firm, ν_f , and the type of loan (local/foreign currency, cash/non-cash), ϑ_i , are controlled.

The results are summarized in Table 1.

Table 1: Change in Credit Supply After Global Liquidity Crunch*

	Pre-crunch			
	Banks with high external debt (relative to banks with low debt; 25-75 percentiles)	Banks with an external debt due one year earlier (relative to banks with longer-term debt)	Banks with an external borrowing premium higher by 1 percentage point (relative to banks with lower premium)	Banks optimistic about external financing conditions (relative to banks less optimistic; 25-75 percentiles)
Post-crunch % change in credit supply	- %9.1 ***	- %10.5 ***	- %9.0 ***	- 9.2% ***

* The results are obtained by ordinary least squares estimation to equation (1). *** denotes statistical significance at 1 percent.

According to the results regarding the pre-crunch period, the credit balance of a firm borrowing from a bank that borrows high amount of short-term and high-premium loans or is relatively more optimistic about external financing conditions decreases at a stronger pace than the firm’s credit balance at a bank that borrowed small amount of long-term and low-premium loans or is less optimistic about external financing conditions. The coefficients are both statistically significant at the 1 percent level and notable in size. For example, a bank with a one-year shorter external debt shrinks its credit supply by an additional 10.5 percent or a bank relatively optimistic about external financing conditions reduces its credit supply by an additional 9.2 percent in the post-crunch period.

Our second main hypothesis is that banks tend to reduce their credit supply to small, young, indebted or non-exporting firms that are likely to be more vulnerable to economic contraction and have a higher asymmetrical information problem.

To test this hypothesis, the following econometric equation is estimated:

$$\Delta C_{bfi,after} = \beta_1 FXliabilities_{b,before} I(Bigfirm_{f,before}) + \beta_2 FXliabilities_{b,before} * I(Smallfirm_{f,before}) + \beta_3 FXliabilities_{b,before} * X_{b,before} + X_{b,before} + \xi_{bf} + \mu_b + \nu_f + \vartheta_i + \varepsilon_{bfi,after} \tag{2}$$

Here, $I(Bigfirm_{f,before})$ is the dummy variable that equals 1 for firms with a larger total asset size relative to the median and 0 for the remaining firms, while $I(Smallfirm_{f,before})$ is the dummy variable that equals 1 for firms with a smaller total asset size relative to the median and 0 for the remaining firms. Since these dummy variables are interacted with bank’s external borrowing, equation (2) will show how banks with larger pre-crunch external debt change their credit supply to firms of different sizes (relative to banks with smaller debt). Based on equation (2), we also examined the firm’s total number of employees, age, total debt to total equity ratio, short-term debt to total debt ratio and exports to total sales ratio. In addition, the interaction of bank’s external debt maturity with premium and expectations for external financing conditions are also included in equation (2).

The results are summarized in Table 2.

Table 2: The Impact of the Global Liquidity Crunch on Firms' Access to Credit*

	Bank Characteristics→			Banks with an external borrowing premium higher by 1 percentage point	Banks optimistic about external financing conditions
	Firm Characteristics↓	Banks with high external debt	Banks with an external debt due one year earlier		
Percentage change in post-crunch credit supply	Small	-%7.5**	-%5.4**	-%4.1**	-%10.0**
	Large	-%1.6	-%4.3**	+%1.1	-%9.0**
	Few employees	-%3.9**	-%5.5**	-%1.2	-11.1**
	Many employees	-%2.6**	-%4.4**	-%0.5	-9.0**
	Young	-%3.5**	-%4.9**	-%2.5	-9.4**
	Old	-%3.0**	-%4.6**	-%0.2	-9.4**
	High total debt to equity ratio	-%3.9**	-%4.9**	-%1.1	-10.5**
	Low total debt to equity ratio	-%2.6**	-%4.5**	-%0.9	-%8.9**
	High short-term debt to total debt ratio	-%5.0**	-%4.2**	-%2.2	-%10.6**
	Low short-term debt to total debt ratio	-%2.6**	-%5.0**	-%0.1	-%8.3**
	Low exports/total sales	-%3.6**	-%4.8**	-%2.3	-%9.7**
	High exports/total sales	-%3.1**	-%4.7**	+%0.1	-%9.6**

* The results are obtained by ordinary least squares estimation to equation (2). ** denotes statistical significance at 5 percent.

Table 2 shows that small, young, indebted and non-exporting firms that have a shorter-term debt find it particularly difficult to access credit in the post-crunch period. More specifically, banks with larger pre-crunch external debt put more credit constraints on similar firms. This impact is much stronger for banks that have a shorter-term external debt or are relatively more optimistic about external financing conditions and fail to see their expectations realized. In other words, having worked with banks that had a shorter-term external debt or were more optimistic in the pre-crunch period puts additional credit constraints on such firms.

In sum, measures designed to lower the bank demand for external debt, lengthen the maturity of banks' external borrowing or reduce the premium for their external borrowing are likely to cushion the economy against global financial turbulences. Moreover, our analysis concludes that a global liquidity crunch would have a larger impact on small, young, indebted or non-exporting firms. Thus, economic resilience can be strengthened by measures that will reduce the asymmetric information between banks and firms, enhance firms' debt management and boost their export potential.

