

V. Special Topics

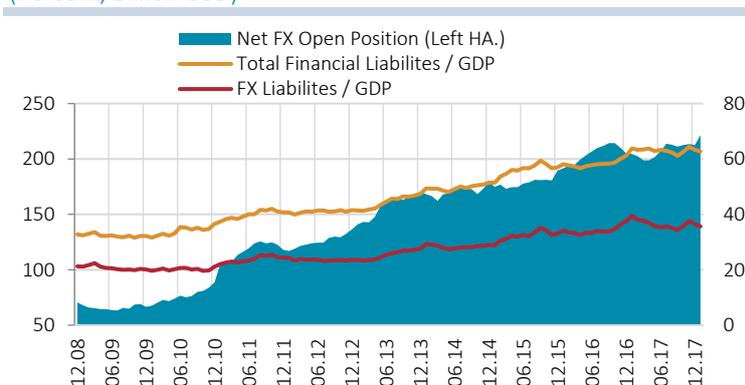
V.1 Regulations on FX Loan Borrowing

Firms with direct access to global financial markets are able to get FX funding from abroad in the form of financial or commercial debt. When it comes to domestic funding, firms may also prefer FX borrowing under certain conditions. However, in case of a lack of natural or financial hedging against the exchange rate risk, in times of high FX volatility, firms' overall financing costs may increase due to the foreign exchange expenses¹.

Therefore, a set of measures have been taken to achieve more effective management of the exchange rate risk that the financial sector, households, and the non-financial corporate (NFC) sector bore due to exchange rate movements. After the banking crisis in 2001, the ratio of the banking sector's foreign exchange net general position (FXNGP) to its equities was restricted to a maximum of 20 percent in 2006. Following the regulation, this ratio stabilized around 1 percent due to the contribution of banks' use of derivatives. With an amendment to the Decree No. 32 on the Protection of the Value of the Turkish Currency in 2009, FX borrowing by the household sector was deterred, thus hedging it against the exchange rate risk. Accordingly, the household sector's exposure to exchange rate risk was largely contained after this regulation. The same amendment stipulated that NFCs without any FX income could essentially borrow in FX only if the FX loan amount was over USD 5 million and its maturity was longer than one year. Moreover, the corporate sector's use of FX-indexed loans, which are reported in terms of TL but valuated at the spot exchange rate, was made conditional on borrowing for business purposes.

Due to increased liquidity after the global crisis and low leverage base, the corporate sector's borrowing, both domestic and foreign, accelerated and the ratio of firms' financial debt to GDP increased to 60 percent in 2018 from 30 percent in 2008. FX loans, which were predominantly long-term loans used for investment purposes during this period, accounted for 57 percent of NFCs' financial liabilities. With loans making up 90 percent, the total FX debt of corporate sector is USD 337 billion and its net FX open position is USD 222 billion. Approximately two thirds of the total FX financial debt have been obtained from domestic financial institutions. Due to the long-term nature of FX liabilities at an average maturity of 4.5 years, the NFCs hold an FX long position in the short term. However, the FX open position held in the long term makes the corporate sector's exchange rate risk management crucial.

Chart V.1.1: Non-Financial Companies' Borrowing
(Percent, Billion USD)



Source: CBRT

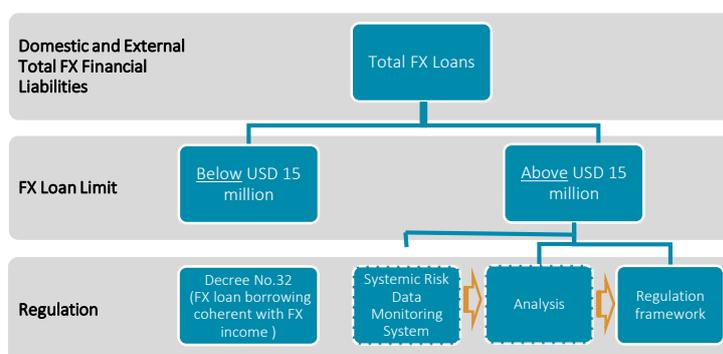
Latest Data: 03.18

In this framework, focusing on the objective of contributing to prudential borrowing, effective management of the exchange rate risk, and financial stability, studies on effective exchange rate risk

¹ [Borrowing Dynamics of the Corporate Sector: TL Borrowing or FX Borrowing?](#), CBRT Blog, 2017

management are being carried out gradually under the umbrella of the Financial Stability Committee, also taking into account the changing international economic and financial environment of FX borrowing by NFCs. In the first stage, firms with FX loans of less than USD 15 million were included in the scope of the regulation under Decree No. 32. In the second stage, data collection, analysis, and regulation studies for firms with FX loans of USD 15 million and above are under way.

Figure V.1.1: Regulations on NFCs' FX Borrowing



V.1.1 Amendments to Decree No. 32 Regarding FX Borrowing

On 25 January 2018, an amendment regarding the use of FX loans was made in Decree No. 32, and it took effect as on 2 May 2018. With this amendment, firms with an outstanding overall FX loan balance below USD15 billion obtained from domestic and foreign financial institutions as well as from partners abroad were included in the scope of the regulation. Within the prescribed time before the effective date of this amendment that addressed the firms with high risk of and vulnerability to exchange rate shocks, work on the supportive regulation was concluded with the participation of related public institutions as well as the financial and corporate sectors. This work aimed at introducing uniform implementations in the overall financial sector and ensuring an orderly transition by the corporate sector to the new regulation. Accordingly, the following rules have been stipulated for the use of domestic and external FX loans:

- A direct relation has been established between FX income and loan utilization where firms' outstanding FX loan balances are limited with the sum of their FX income in the last three fiscal years.
- The FX-indexed loan facility has been abolished.
- The regulation covers only the new loans; the current credit stock will not be affected.
- Restructuring of FX loans will not be considered as loan renewal whereas FX-indexed loans cannot be restructured as FX-indexed loans².
- If the amount of FX loans obtained exceeds the total amount of FX income earned in the last three fiscal years, the exceeding amount of the respective loan will not be allowed to be used in FX.
- Start-up firms or firms that plan to engage in export business have been allowed to get FX loans based on their potential FX income to be certified, regardless of their current FX income status.
- Loans from abroad will continue to be obtained with the intermediation of domestic banks with a few exceptions.
- Although FX income and FX loan balances of holding companies are declared on a company basis, to be effective until the regulation on firms with an outstanding overall FX loan balance of more than USD 15 million enters into force, the sum of FX loan balances and FX income of all

² Capital Movements Circular, CBRT, 2 May 2018

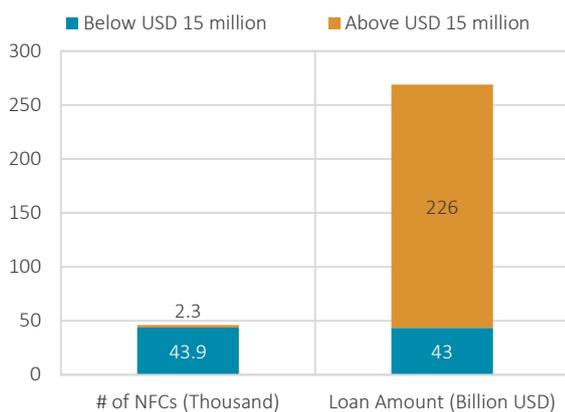
subsidiaries of a holding company will be taken into account in the assessment of FX loan applications by a holding company and its subsidiaries.

On the other hand, FX loans used within the scope of an investment incentive certificate, and FX loans used for the financing of certain machines and devices, for domestic tenders that have been announced internationally, for defense industry projects, and for public-private partnership (PPPs) projects have been exempted from the scope of the amendment. In addition, the Ministry approved that in the financing of investments under the Renewable Energy Sources Support Mechanism (RESSM/YEKDEM) Project, FX loans for transactions regarding privatization tenders and public tenders priced in FX, and FX loans used by firms that have been established to purchase a new company share and do not have any activity other than such purchases would not be subject to the FX income restriction. These exception clauses are believed to be supportive of economic growth.

Composition of Loans Affected by the Amendment to Decree No. 32

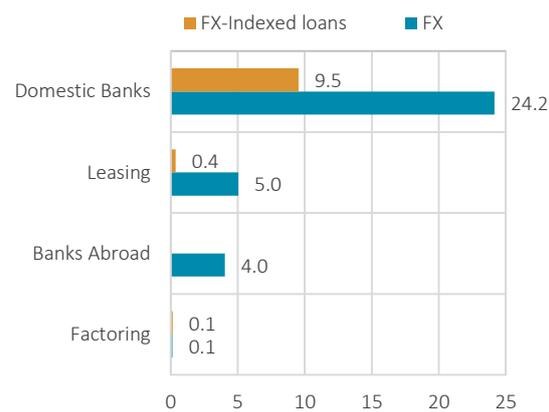
According to March 2018 data, a total of 44 thousand firms using FX loans are subject to this regulation, and approximately 25 thousand of these firms have obtained FX loans from the domestic banking sector. These firms account for 16 percent of the real sector’s FX borrowing with a total of USD 43 billion worth of FX loans, USD 10 billion of which consist of FX-indexed loans.

Chart V.1.2: Breakdown of FX Loans by the Number of Firms
(Thousand, Billion USD)



Source: BAT Latest Data: 03.18

Chart V.1.3: Breakdown of FX Loans by Creditors
(Loans of NFCs with a Loan Balance Below the USD 15 Million Limit, Billion USD)

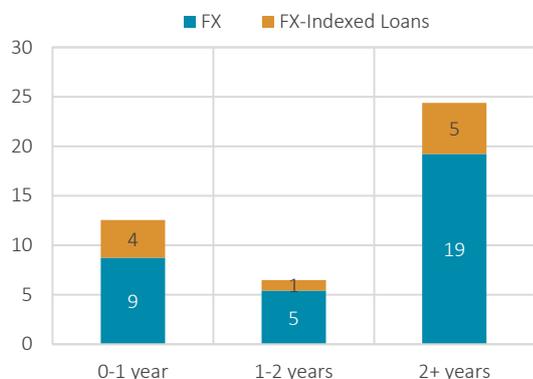


Source: BAT Latest Data: 03.18

Note: Includes FX and FX-indexed loans.

With the enforcement of the regulation, some firms may shift to TL corporate loans as the FX-indexed loan facility ceases and as these firms may not have sufficient FX income to roll over their FX loans. To assess the impact of this amendment on banks’ TL funding in an environment where banks’ TL loan/deposit ratio is converging to 145 percent, we have analyzed the maturity of these FX loans. Approximately 30 percent of loans of firms with an FX loan balance of less than USD 15 million have an original maturity of up to 1 year. On the other hand, the maturity breakdown of loans extended by domestic banks is available in more detail. Of the USD 33 billion worth of FX loans extended by domestic banks to firms with an FX loan balance of less than USD 15 million, USD 6.9 billion (excluding FX-indexed loans) will be due until end-2018.

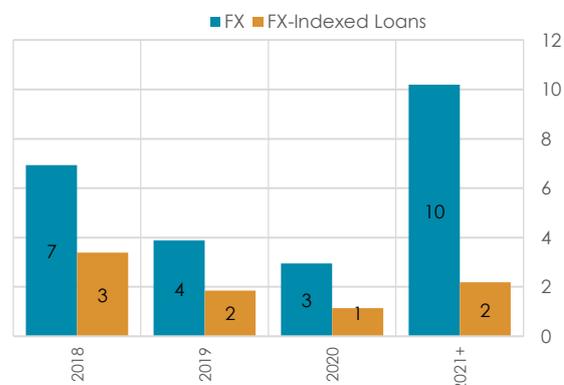
Chart V.1.4: Breakdown by Original Maturity
(Corporate Loans with a Loan Balance Below the USD 15 Million Limit, Billion USD)



Source: BAT

Latest Data: 03.18

Chart V.1.5: Breakdown by Remaining Maturity
(Domestic FX Loans of Firms with a Loan Balance Below the USD 15 Million Limit, Billion USD)

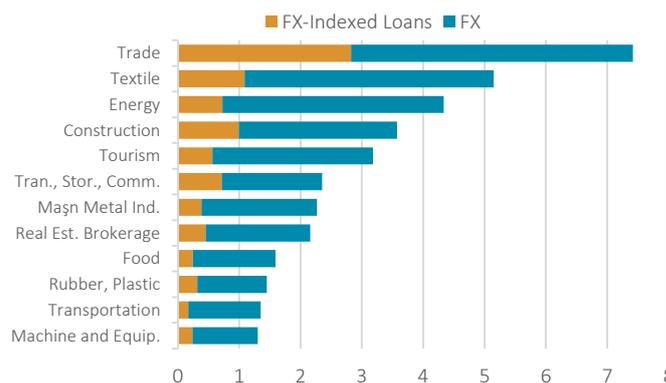


Source: BAT, CBRT

Latest Data: 03.18

Trade, textile, energy, construction, and tourism sectors account for 54 percent of the FX liabilities of NFCs with an FX loan balance below USD 15 million. The share of FX-indexed loans, which ceased to be extended as of 2 May 2018, in overall FX loans is 38 percent in the trade sector, 28 percent in the construction sector, and 30 percent in the transportation, storage and communications sector. It is assessed that the shift to TL loans may be stronger in these sectors that predominantly generate TL income. On the other hand, the share of textile firms in FX loans stands at 5 percent when the loan limit is ignored, whereas the share of textile firms with an FX loan balance below USD 15 million in FX loans ranks the second among other sectors at 12 percent.

Chart V.1.6: Breakdown by Sectors
(Loans of Firms with a Loan Balance Below the USD 15 Million Limit, Billion USD)



Source: BAT

Latest Data: 03.18

V.1.2 FX Borrowing within the Framework of the Systemic Risk Data Monitoring System

The second stage of the studies regarding exchange rate risk management focuses on NFCs with an FX loan balance of USD 15 million and above. Accordingly, starting from end-March 2018, quarterly data is gathered from firms with a total FX loan balance above USD 15 million to create a comprehensive database that facilitates the CBRT's monitoring of NFCs' FX positions, cash flows, and use of derivatives,

pursuant to the legal framework set in December 2017. After the data gathering phase, it is aimed to make a detailed financial assessment of FX borrowing by large-scale firms, and to prepare a regulatory road map by getting the views of corporate and financial sector representatives as was the case in the first stage. Taking international examples, market practices, and Turkey-specific needs, opportunities and constraints into account, the second stage of effective exchange rate risk management is projected to be concluded within a reasonable timetable with a comprehensive, dynamic, and market-friendly approach, without creating room for regulatory arbitrage. These regulations are intended for an effective management of the exchange rate risk without blocking the firms' access to financing and disturbing the market balances. All these studies are expected to shore up macroeconomic balances through banking sector and corporate sector channels, and contribute to price stability and financial stability.

V.2 Finalizing Basel III Framework

Globalization has increased the diversity of financial products and services but it has at the same time diversified the risks to which the banking sector is exposed. The Basel banking regulations have been drawn up to manage the current and impending risks and to set international banking standards, including a stronger capital structure.

V.2.1 Basel Accords

The rapid advancement in the financial sector, fueled by accelerated globalization and technological progress has brought about the necessity to monitor international financial activities in particular, introduce stricter regulations for countries' banking systems, and reduce the divergence in global regulations. In this framework, founded in 1974, the Basel Committee on Banking Supervision (the Basel Committee) issued the "Capital Adequacy Accord" called "Basel I" in 1988. Basel I sets out a capital adequacy ratio which stipulates that the ratio of a bank's capital to risk weighted assets (RWAs), calculated by multiplying asset and off-balance sheet items by certain risk weights, should be no less than 8 percent. In 2004, Basel I was revised in line with new developments and replaced by Basel II, standards of which released in 2006 aimed to achieve an effective risk management, supervision and market discipline as well as contribution to financial stability.

In the aftermath of the global financial crisis, financial regulatory reforms were initiated under the lead of the G20 to eliminate the fragilities in the banking and financial sectors, and increase the bank's resilience to financial shocks.

In this context, the Basel Committee revised the Basel II framework in light of the lessons derived from the crisis, leading to the inception of Basel III along with a calendar for transition period in 2010 (Table V.2.1).

Table V.2.1: Basel III Phase-in Arrangements (%)

		2013	2014	2015	2016	2017	2018	2019
CAPITAL	Minimum Common Equity Capital Ratio	3.5	4.0	4.5				4.5
	Capital Conservation Buffer				0.625	1.25	1.875	2.5
	Minimum Common Equity + Capital Conservation Buffer	3.5	4.0	4.5	5.125	5.75	6.375	7
	Phase-in of Deductions from CET1*		20	40	60	80	100	100
	Minimum Tier 1 Capital	4.5	5.5	6.0				6.0
	Minimum Total Capital			8.0				
	Minimum Total Capital + Conservation Buffer		8.0	8.625	9.25	9.875	10.5	8.0
	Leverage Ratio			Parallel run: 1/1 /2013 -1/1/ 2017; Disclosure starts: 1 January 2015				
Liquidity	Liquidity Coverage Ratio			60	70	80	90	100
	Net Stable Funding Ratio						Introduce Minimum Standard	

Source: Basel Committee on Banking Supervision

*Including amounts exceeding the limit for deferred tax assets, mortgage servicing rights and financials (Deferred tax assets: assets that may be used to reduce any subsequent period's income tax expense)

V.2.2 Finalization of the Basel III Framework

The Basel III framework consists of three structural pillars of minimum capital requirements, effective supervision and market discipline based on the principle of simplicity, comparability and risk-sensitivity.

While this framework constitutes the key component of the Basel Committee's works in the aftermath of the global financial crisis, the first phase of the Basel III reforms focuses on strengthening the following components of the regulatory framework:

- Improving the quality of the regulatory capital by increasing the weight of common equity Tier 1 capital,
- Enhancing banks' resilience during periods of stress by raising regulatory capital ratios,
- Expanding the risk-based capital adequacy scope by including insufficiently-covered areas such as market risk, counterparty credit risk and securitization,
- Adding macroprudential elements such as capital buffers, additional requirements for systemically important banks and large exposures to the regulatory framework,
- Defining the leverage ratio, and
- Defining global liquidity ratios

Following the consensus reached on the remaining regulations mainly on the output floor¹, the Basel III framework was finalized with the revisions published in December 2017². The revisions made for finalization of the Basel III regulations mainly aim to increase the risk-sensitivity of banks' capital adequacy ratios and to ensure comparability of these ratios. In this scope, specific reviews were conducted to reduce differences between the RWA amounts of banks. The following components of Basel III framework were revised:

a. Revised Standardized Approach for Credit Risk

Credit risk matters a lot in banks' risk-based transactions. The standardized approach is used widely by many banks, whether members of the Basel Committee or not, in calculating RWA based capital ratios. The following revisions were made in the current standardized approach for credit risk:

- Introducing a gradual approach for unrated exposures instead of a flat risk weight,
- Applying a more gradual approach for exposures to corporates and SMEs,
- For residential real estate exposures, shifting to a more gradual system whereby risk weights vary based on the loan-to-value ratio,
- Reducing mechanistic reliance on credit ratings and ensuring that banks can conduct reviews and ratings with due diligence,
- Providing a foundation to internally modelled capital requirements and related disclosure requirements to enhance comparability across banks and restore a level playing field,
- Adopting a more gradual treatment for retail exposures by differentiating risk weights for different retail exposures,
- Developing a more risk-sensitive approach for commercial real estate exposures,
- Applying a more gradual risk weight treatment for subordinated debt and equity exposures, instead of current flat risk weight, and

¹ Output floor can be defined as a measure serving to prevent a marked divergence between capital requirements due to alternative approaches employed by banks in their capital adequacy calculations.

² <https://www.bis.org/bcbs/publ/d424.pdf>

- Allowing a more risk-sensitive calculation for credit conversion factors for off-balance sheet items.

b. Revised Internal Ratings-Based (IRB) Approaches for Credit Risk

The global financial crisis underlined a number of shortcomings related to the use of IRB approaches for assessing capital requirements. These shortcomings include the excessive complexity of the IRB approaches used in calculation of credit risk, the lack of comparability among banks using IRB models and the lack of robustness in modelling certain asset classes.

To address these shortcomings, the following revisions were made to the IRB approaches:

- In the revised IRB approach, the option to use the advanced IRB approach for asset classes that cannot be modelled in a robust and prudent manner is not allowed. In this sense, the advanced IRB approach will not be used for exposures to banks and other financial institutions, and exposures to large and mid-sized corporates. Use of the foundation and advanced IRB approach in calculating the credit risk for shares on the asset side is disallowed.
- In the revised IRB approach, floors are defined for the inputs used. In this scope, input floors are adopted for probabilities of default (PD), loss-given-default (LGD) and exposure at default (EAD).
- In the foundation IRB approach, for exposures secured by non-financial collateral, while haircuts that apply to the collateral were increased, the LGD parameters were reduced. For unsecured exposures, the LGD parameter was reduced from 45 percent to 40 percent for exposures to non-financial corporates.

c. Credit Valuation Adjustment

Credit Valuation Adjustment (CVA) is defined as potential marked-to-market losses of derivative instruments as a result of the deterioration in the creditworthiness of the counterparty. The CVA framework was also revised as follows:

- Instead of the current CVA framework, which was not sensitive to the price of the transactions that are within the scope of application of the CVA risk capital charge, a framework taking into account the related risks was introduced.
- The internally modelled approach for the CVA risk was removed given the Basel Committee's view that it cannot be modelled by banks in a robust and prudent manner due to its complexity and thus a revised framework was introduced consisting of standardized approach and basic approach.
- Within the new framework, the CVA capital charge can be calculated as a simple multiplier of the counterparty credit risk charge for banks with an aggregate notional amount of non-centrally cleared derivatives less than or equal to 100 billion euro.
- As CVA risk is a form of market risk, the standardized and basic approaches of the revised CVA framework have been designed to be consistent with approaches used in the revised market risk framework.

d. Output Floor

Within the scope of Basel III reforms, with the completion of revision in relation to output floors, the capital requirement calculated by using the IRB approach by banks is targeted to not fall below a certain percentage of the capital requirement to be calculated by using the standardized approach.

According to the revised output floor, banks' RWAs should be calculated as the higher of:

- Total RWAs calculated using the standardized or the IRB approach that the bank has the supervisory approval to use,
- 72.5 percent of the total RWAs calculated using only the standardized approach.

Banks will also be required to disclose their RWAs based on the revised standardized approaches. Meanwhile, a transition period from 2022 to 2027 is envisaged for implementation of the output floor, as given in Table 3.

e. Operational Risk Framework

The financial crisis highlighted that capital requirements for operational risk proved insufficient to cover operational risk losses incurred by some banks and that operational risks were mainly driven by misconduct risk and inadequate systems. Therefore, the operational risk framework was revised.

Above all, the existing approach, based on three different methods and also internal models, was replaced with a single risk-sensitive standardized approach. According to the standardized approach, a bank's capital requirement for operational risk is calculated by using two indicators related to the bank's income and its historical losses. The standardized approach assumes that operational risk increases with an increase in bank's income, and banks which have experienced greater operational risk losses historically are assumed to be more likely to experience operational risk losses in the future.

According to the standardized approach, while calculating the income of a bank, a business indicator is used, composed of the interest, leases and dividends components, the services component and the financial component. Whereas, in calculation of historical losses, the loss component is taken into account, calculated as equal to 15 times a bank's average historical losses over the preceding ten years. However, the Basel Committee member countries can use national discretion and elect to set the internal loss multiplier equal to one for all banks in their jurisdiction and thus, banks' historical losses will not be taken into account in calculation of the operational risk. Nevertheless, to ensure comparability, all banks, including those operating in countries that use the above-mentioned national discretion, will be required to disclose their historical operational risk losses.

f. Leverage Ratio Framework

The leverage ratio is designed to complement the risk-weighted capital requirements. The leverage ratio defined within the framework of Basel III is calculated by dividing the Tier 1 capital by the sum of off-balance sheet items and assets considered with specific conversion coefficients. While the minimum leverage ratio was 3 percent until early 2017, the Basel III reforms introduced higher leverage ratios for global systemically important banks (G-SIBs). The final leverage ratio framework has been included in Pillar 1 since 1 January 2018.

Table V.2.2 shows the leverage ratios for G-SIBs set at five levels. If the leverage ratio of a G-SIB with a common equity Tier 1 (CET1) capital ratio between 4.5 percent and 5.375 percent is within a range from 3 percent to 3.125 percent, this bank should maintain a minimum capital conservation buffer at 100 percent (Table V.2.2). On the other hand, if the CET1 is at or above 8 percent, the minimum capital conservation buffer of the respective G-SIB is set to zero on condition that its leverage ratio is above 3.5 percent.

Table V.2.2: Leverage Ratio for G-SIBs (%)

CET1 Risk-Weighted Ratio	Tier 1 Leverage Ratio	Minimum Capital Conservation Ratios (expressed as a percentage of earnings)
4.5 – 5.375	3 – 3.125	100
> 5.375 – 6.25	>3.125 - 3.25	80
> 6.25 – 7.125	>3.25 – 3.375	60
>7.125 – 8	>3.375 – 3.5	40
>8	>3.5	0

Source: Basel Committee on Banking Supervision

The Basel Committee has also devised a transition period for the final Basel III framework that revises the regulations published in June 2011 (Table V.2.3).

Table V.2.3: Implementation Dates of Basel III Revisions

Revision	Implementation Date
Revised Standardised Approach for Credit Risk	1 January 2022
IRB Framework	1 January 2022
CVA Framework	1 January 2022
Operational Risk Framework	1 January 2022
Leverage Ratio	Existing Exposure Definition: 1 January 2018 Revised Exposure Definition: 1 January 2022 G-SIB Buffer: 1 January 2022
Output Floor	1 January 2022: 50% 1 January 2023: 55% 1 January 2024: 60% 1 January 2025: 65% 1 January 2026: 70% 1 January 2027: 72.5%

Source: Basel Committee on Banking Supervision

V.2.3 Adoption of Basel III by Member Countries

The Basel Committee has been publishing semiannual progress reports evaluating the adoption status of Basel III standards for each Basel Committee member jurisdiction since October 2011. The fourteenth progress report published on 23 April 2018³ indicates that all 27 member jurisdictions have risk-based capital rules, liquidity coverage ratio (LCR) regulations and capital conservation buffers in force as of end-March 2018. Twenty-six member jurisdictions have also final rules in force for countercyclical capital buffers and domestic systemically important bank (D-SIB) requirements and all members that are home jurisdictions to G-SIBs have final rules in force. Twenty-four member jurisdictions have issued draft or final rules for the Net Stable Funding Ratio (NSFR) and 19 member jurisdictions have issued drafts of final rules for the revised securitization framework. While Basel II regulations are implemented by the majority of the non-member countries, there is a differentiation among countries with regard to the implementation of Basel III⁴.

The implications of the Basel III regulations are monitored at regular intervals through the monitoring reports. The Basel III Monitoring report⁵ published in March 2018 reveals that all banks included in the sample meet the minimum CET1 capital requirement of 4.5 and target CET1 capital requirement of 7 percent (plus capital buffer ratios related to global systemically important banks).

V.2.4 Turkish Banking Sector in the Context of Basel Banking Regulations

a. Capital Regulations

The Basel III capital regulation is intended for a higher-quality capital structure. Accordingly, capital is classified based on the capacity to absorb losses. Moreover, banks have to meet the minimum capital requirement in relation to RWAs. The regulatory framework also introduces additional capital buffers. These buffers are set to be built up of common equity capital including high-quality capital. It is planned that the

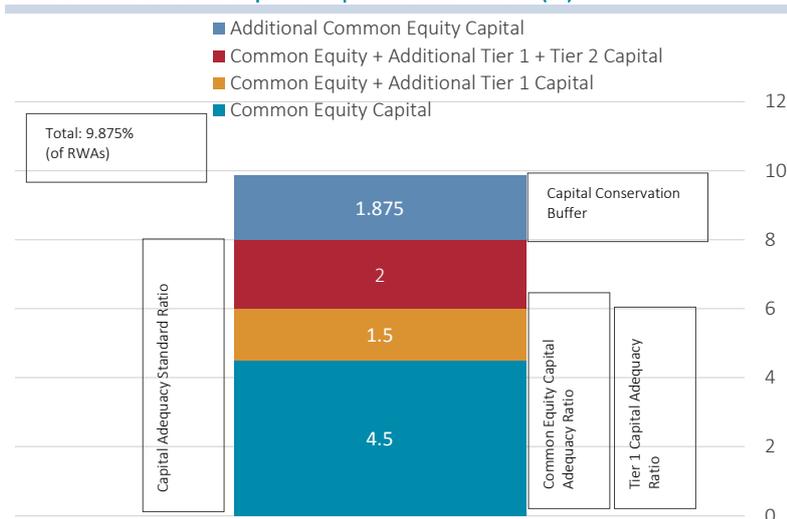
³ <https://www.bis.org/bcbs/publ/d440.htm>

⁴ <http://www.bis.org/fsi/fsiop2015.pdf>

⁵ <https://www.bis.org/bcbs/publ/d433.htm>

capital conservation buffer⁶ ratio is gradually raised from 2016 through 2019 so that it will ultimately be 2.5% of RWAs. If the capital conservation buffer requirement is not met, banks will still be able to conduct business as usual but dividend distribution constraints will be imposed on banks at different rates. To factor in procyclicality, Basel standards have also introduced a countercyclical capital buffer requirement that will vary between 0 percent and 2.5 percent depending on the conditions and preferences of member countries. This countercyclical capital buffer, which will be increased or reduced according to an economy's growth rate, is anticipated to avert rapid credit growth. Basel III capital requirements for 2018 are shown in Chart V.2.1.

Chart V.2.1: Basel III Capital Requirements – 2018 (%)



Source: Basel III: A global regulatory framework for more resilient banks and banking systems

Currently, the Banking Regulation and Supervision Agency of Turkey (BRSA) stipulates a minimum capital adequacy ratio (CAR) of 8 percent that is consistent with Basel III. In addition to this minimum ratio, Turkey has also a target CAR ratio of 12 percent. In Turkey, the capital conservation buffer ratio is 1.875 percent and the countercyclical capital buffer ratio is 0 percent.

b. Liquidity Regulations:

The Basel III Liquidity Coverage Ratio (LCR) regulation is intended to ensure that banks have unencumbered, high-quality liquid assets to offset the net cash outflows over a 30-day-horizon. The LCR should be minimum 100 percent by 2019. On the other hand, the net stable funding ratio (NSFR) was devised against the long-term liquidity risk. Banks are obliged to meet the minimum NSFR requirement of 100 percent by 2018.

In Turkey, the minimum total and foreign-currency LCRs will be applied as 100 percent and 80 percent, respectively, by 2019.

c. Leverage Ratio:

The BRSA stipulates in its "Regulation on Measurement and Evaluation of Leverage Level of Banks" effective as of 1 January 2015 that banks should achieve and maintain a minimum quarterly (March, June, September, December) simple arithmetic mean of 3 percent for the monthly consolidated leverage ratio⁷.

⁶ The capital conservation buffer refers to additional amount of Common Equity Tier 1 expected to be held by banks to avoid a situation where equities prove insufficient according to capital adequacy regulations due to losses that may be incurred when economic and financial indicators deteriorate.

⁷ The "Draft Regulation on Measurement of Leverage Ratio of Banks" was published for public consultation on the BRSA web site on 4 April 2018. The new regulation is expected to take effect on 1 July 2018.

d. Systemically Important Banks:

The Basel Committee has introduced a more prudential regulatory framework for systemically important banks that present a large and complicated structure. Thus, it is intended to ensure that banks have higher loss absorbing capacities (additional capital requirement), are subjected to stricter supervision, and can be resolved without resorting to public funds.

The BRSA published the “Regulation on Systemically Important Banks” on 23 February 2016. The Regulation adopts an indicator-based measurement approach for the specification of a bank’s systemic importance. This approach takes into account the following categories: size, interconnectedness, complexity and substitutability, as well as the indicators and sub-indicators related to these categories. Also, an additional common equity capital requirement is calculated for D-SIBs⁸. The transitional process for the D-SIBs regulation in Turkey is shown in Table V.2.4.

Table V.2.4 Transitional Process for the D-SIB Regulation in Turkey

Groups	Systemically Important Bank Buffer Ratios (%)			
	2016	2017	2018	2019
Group 4 (Empty)	0.75	1.5	2.25	3
Group 3	0.5	1	1.5	2
Group 2	0.375	0.75	1.125	1.5
Group 1	0.25	0.5	0.75	0.75

Source: BRSA

⁸ Additional common equity Tier 1 requirement is calculated by multiplying the systemically important bank buffer ratio corresponding to the bank’s group by the consolidated RWA amount.

V.3 Externality Arising from FX Loans and Its Real Effects

Exchange rate depreciation causes firms with FX debt that are not hedged against FX movements to have difficulty in their repayments. Therefore, although banks hedge themselves against exchange rate fluctuations with off-balance sheet instruments, they may indirectly have FX risk on the asset side of their balance sheets. This risk may negatively affect the fresh lending capacity of banks in periods of exchange rate depreciation. Consequently, even those firms that are fully hedged against the FX risk or that do not have any FX debt may be indirectly affected by exchange rate movements unfavorably, depending on whether they are working with banks with risky FX loan portfolios or not. This special topic focuses on the externality that may be caused by FX loans.

V.3.1 Data Set and Methodology

This study employs three different data sets: one that includes information on corporate loans and bank loans gathered by the BRSA, data on banks' balance sheets and income statements, and the CBRT's Sectoral Balance Sheet data on firms' balance sheets and income statements. The first two data sets are available in monthly frequency while the sectoral balance sheet data set is available in annual frequency. Corporate and bank loans data have been matched with sectoral balance sheets and bank data.

The study addresses the sudden stop period in capital flows between 2008 and 2009. First, identifying the portion of total bank loans that was extended to risky firms in October 2008 ("pre-crisis"), the FX risk on bank assets has been calculated via the following formula:

$$FX Risk_b = \frac{\sum FX Loans_b}{\sum Total Loans_b} \sum_b w_{bf} Risk_f \quad (1)$$

Accordingly, the FX risk of bank b varies depending on

- (i) the share of FX loans in its total loans ($\frac{\sum FX Loans_b}{\sum Total Loans_b}$), and
- (ii) the weighted riskiness of firms to which it has lent ($\sum_b w_{bf} Risk_f$).

Here, w_{bf} refers to the share of firm f in total FX loans extended by bank b , and $Risk_f$ refers to the sensitivity of firm f to exchange rate movements.

Two alternative indicators have been used for the $Risk_f$ variable:

- (i) **FX Open Position_{October 08}** : This is a dummy variable that takes the value of 1 if the total FX loans of firm f are greater than its export revenue in October 2008, and the value of 0 in other cases.
- (ii) $\frac{\sum FX Loans_{October 08}}{\sum Total Loans_{October 08}}$: This ratio shows the share of FX loan balance of firm f in total bank loan balance as of October 2008.

High levels of these ratios indicate that the firm is more sensitive to sudden exchange rate movements in its FX loan repayment.

To wrap up, formulation (1) implies that banks may be exposed to FX risk on the asset side if they extend high amounts of FX loans to firms that are more sensitive to exchange rate movements in particular.

After the calculation of banks' FX risk on the asset side ($FX Risk_b$), firms' indirect FX risk ($Indirect FX Risk_f$) has been calculated based on their relations with the banking sector. This variable has been created using the formula $Indirect FX Risk_f = \sum_f w_{fb} FX Risk_b$. Here, w_{fb} shows the share of loans that firm f has obtained from bank b in the total loans of firm f and provides information about the firm-bank relationship. In this framework, it has been taken into account that a firm may indirectly

become sensitive to exchange rate movements if it is working with risky banks extending FX loans, even though it does not have any FX loans.

Firms' exposure to exchange rate movements through the credit channel and the real effects of this exposure have been analyzed for the sudden stop period in capital flows between 2008 and 2009. The following model has been estimated for this analysis:

$$\begin{aligned} \Delta Y_{f,2008-2009} = & \gamma_1 \text{Indirect FX Risk}_{f, \text{October } 08} \\ & + \gamma_2 \text{Bank Loan Borrowing}_f * \text{Indirect FX Risk}_{f, \text{October } 08} \\ & + \text{Firm Control Variables}_{f,2008} + \eta_s + \varepsilon_f \end{aligned}$$

$\Delta Y_{f,2008-2009}$ refers to the change in tracked variables of firm f during the 2008-2009 period. It shows (i) the probability of debt restructuring by the firm in the next 12 months calculated by using a data set on corporate and bank loans, (ii) the percentage change in the amount of *trade loans* that the firms has obtained from other firms, (iii) the percentage change in the firm's total *bank loans*, (iv) the percentage change in the amount of the firm's total *financial debt*, and (v) the percentage change in fixed capital *investments*, respectively.

Bank Loan Borrowing_f is a dummy variable showing the bank loan borrowing preference of the firm. It takes the value of 1 if the difference between the firm's total bank loans and trade loans is greater than the difference in the medians of firms in the sector under which the firm operates, and it takes the value of 0 in other cases.

Indirect FX Risk_f shows the indirect sensitivity of firm f to exchange rate movements via the banks that it was working with in October 2008. *Firm Control Variables* refers to the ratio of the firm's total assets and net debt (net debt= short-term foreign sources + long-term foreign sources-liquid assets) to total assets. 2008 values of firm control variables have been added to the model. To control for unobservable sectoral peculiarities of firms, sector fixed effects (η_s), where sectors are identified by two-digit numerical codes under NACE Rev.2, have been included in the model. Table V.3.1 demonstrates the explanatory statistics of variables used in the analyses.

Table V.3.1: Explanatory Statistics on a Firm Basis

	Unit	Average	Median	St.Deviation	25th Percentile	75th Percentile	Number of Observations
Dependent Variables							
Probability of Debt Restructuring by the Firm in the Next 12 Months	0 or 1	0.045	0	0.208	0	0	8,859
Δ Trade Loans/Receivables	Δ Log	-0.115	-0.068	0.863	-0.445	0.266	7,507
Δ Bank Loans	Δ Log	-0.03	-0.041	1.123	-0.36	0.275	6,810
Δ Total Financial Debt	Δ Log	-0.064	-0.056	1.079	-0.36	0.236	6,998
Δ Investment	Δ Log	0.144	0.029	0.541	-0.055	0.24	7,665
Independent Variables							
Firm's Indirect FX Risk (1)	-	12.314	12.591	4.882	10.001	14.846	8,859
Firm's Indirect FX Risk (2)	-	23.554	24.376	8.518	18.874	29.134	8,859
Bank Loan Borrowing	0 or 1	0.511	1	0.5	0	1	8,859
Firm Control Variables							
Total Assets	Log	16.657	16.567	1.442	15.71	17.489	8,859
Net Debt Ratio	-	0.496	0.535	0.275	0.325	0.709	8,859

Note: Firm's Indirect FX Risk (1) has been obtained using the banks' FX risk calculated via the FX Open Position_{October 08} indicator of firm's riskiness. Firm's Indirect FX Risk (2) has been obtained using the banks' FX risk where the firm's riskiness is measured based on the $\frac{\sum \text{FX Loans}_{\text{October } 08}}{\sum \text{Total Loans}_{\text{October } 08}}$ ratio.

V.3.2 Results

Results are presented in Table V.3.2 and Table V.3.3.

Results in Table V.3.2 demonstrate that firms with a higher degree of sensitivity to exchange rate fluctuations through the credit channel, i.e. firms that work with banks carrying FX risk on the asset side, are 1.5 percent more likely to restructure (or be forced to restructure) their loans. Such firms cannot readily change the banks they are working with, and they register a 6.3-percent decline in their total bank loans. Moreover, these firms increase their trade loans (5.3 percent) to compensate for the difficulty they face in accessing bank loans. However, this increase in trade loans falls short of covering the decrease in bank loans and consequently, total financial debts of these firms diminish (4.4 percent). As a result of these elevated financial constraints, firms are eventually forced to reduce their investments (1.9 percent).

In sum, results suggest that even if they do not have any FX risk, firms may still be negatively affected by exchange rate depreciation through the banking system channel, have difficulty in accessing loans, and have to cut down on their investments. We also observe a similar result for an alternative definition of FX risk (Table V.3.3).

Table V.3.2: Estimation Results

	Dependent Variables									
	Probability of Debt Restructuring by the Firm in the Next 12 Months		Δ Trade Loans		Δ Bank Loans		Δ Total Financial Debt		Δ Investment	
Firm's Indirect FX Risk (1)	0.003*** (0.000)	0.002*** (0.001)	0.001 (0.002)	-0.009*** (0.002)	-0.003 (0.003)	0.010*** (0.003)	-0.002 (0.003)	0.007** (0.003)	-0.003** (0.001)	-0.001 (0.001)
Firm's Indirect FX Risk (1)* Bank Loan Borrowing		0.001** (0.000)		0.019*** (0.002)		-0.022*** (0.002)		-0.016*** (0.002)		-0.003*** (0.001)
Total Assets	0.023*** (0.002)	0.023*** (0.002)	0.005 (0.008)	-0.003 (0.008)	-0.027*** (0.010)	-0.020* (0.010)	-0.029*** (0.010)	-0.023** (0.010)	-0.016*** (0.004)	-0.015*** (0.004)
Net Debt Ratio	0.012 (0.008)	0.010 (0.008)	-0.098** (0.043)	-0.158*** (0.043)	-0.087 (0.066)	-0.044 (0.066)	0.005 (0.064)	0.040 (0.063)	-0.042* (0.026)	-0.033 (0.026)
Sector Fixed Effect	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Number of Observations	8,859	8,859	7,507	7,507	6,810	6,810	6,998	6,998	7,665	7,665
R ²	0.042	0.043	0.012	0.033	0.017	0.033	0.015	0.025	0.022	0.023
Relative Difference in the Dependent Variable ($\psi_1 + \psi_2$) (Firms having bank loans and carrying higher indirect FX risk relative to firms with lower indirect FX risk (p75-p25))		1.5%		5.3%		-6.3%		-4.4%		-1.9%
Relative Effect of Bank Loan Borrowing (ψ_2) (Firms with higher indirect FX risk relative to firms with lower indirect FX risk (p75-p25))		0.5%		9.2%		-10.7%		-7.8%		-1.5%

Note: Results in this table have been obtained via the least squares method. Firm's Indirect FX Risk (1) has been obtained using the banks' FX risk calculated via the $FX\ Open\ Position_{October\ 08}$ indicator of firm's riskiness. Standard errors have been clustered on the firm level. ***, **, * refer to a significance level of 1%, 5%, and 10%, respectively.

Table V.3.3: Estimation Results

	Dependent Variables									
	Probability of Debt Restructuring by the Firm in the Next 12 Months		Δ Trade Loans		Δ Bank Loans		Δ Total Financial Debt		Δ Investment	
Firm's Indirect FX Risk (2)	0.001*** (0.000)	0.001*** (0.000)	0.000 (0.001)	-0.005*** (0.001)	-0.001 (0.002)	0.005** (0.002)	-0.002 (0.002)	0.003 (0.002)	-0.002** (0.001)	-0.001 (0.001)
Firm's Indirect FX Risk (2)* Bank Loan Borrowing		0.000*** (0.000)		0.010*** (0.001)		-0.012*** (0.001)		-0.009*** (0.001)		-0.002*** (0.000)
Total Assets	0.023*** (0.002)	0.023*** (0.002)	0.005 (0.008)	-0.003 (0.008)	-0.027*** (0.010)	-0.019* (0.010)	-0.029*** (0.010)	-0.023** (0.010)	-0.017*** (0.004)	-0.015*** (0.004)
Net Debt Ratio	0.012 (0.008)	0.009 (0.008)	-0.099** (0.043)	-0.160*** (0.043)	-0.087 (0.067)	-0.043 (0.066)	0.001 (0.064)	0.037 (0.063)	-0.043* (0.026)	-0.034 (0.026)
Sector Fixed Effect	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Number of Observations	8,859	8,859	7,507	7,507	6,810	6,810	6,998	6,998	7,665	7,665
R ²	0.041	0.041	0.012	0.033	0.017	0.034	0.015	0.025	0.022	0.023
Relative Difference in the Dependent Variable (y₁ + y₂) (Firms having bank loans and carrying higher indirect FX risk relative to firms with lower indirect FX risk (p75-p25))		1.0%		6.2%		-7.2%		-6.2%		-2.1%
Relative Effect of Bank Loan Borrowing (y₂) (Firms with higher indirect FX risk relative to firms with lower indirect FX risk (p75-p25))		0.0%		10.3%		-12.3%		-9.2%		-2.1%

Note: Results in this table have been obtained via the least squares method. Firm's Indirect FX Risk (2) has been obtained using the banks' FX risk where the firm's riskiness is measured based on the $\frac{\sum FX\ Loans_{October\ 08}}{\sum Total\ Loans_{October\ 08}}$ ratio. Standard errors have been clustered on the firm level. ***, **, * refer to a significance level of 1%, 5%, and 10%, respectively.

V.3.3 Conclusion

FX loans may create an externality through the credit channel and the banking system. Even those firms that have full hedging against exchange rate movements or that do not have any FX loans may be negatively affected by exchange rate movements depending on whether they are working with banks holding a risky FX loan portfolio or not. Following an exchange rate depreciation, these firms face increased financial constraints and are forced to curb their investments.