

### III. Financial Sector

The loan growth, which had been pulled down to reasonable levels, recently lost some pace further due to the elevated uncertainties in external and domestic markets. The downward movement in credit growth was mainly driven by the TL corporate loan growth. Credit demand may revive once the domestic uncertainties taper off.

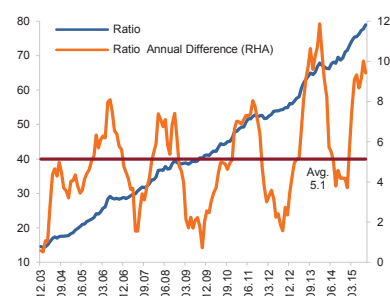
The interest rate risk that the banking sector might be exposed to is still low. The decreasing weight of securities in the balance sheet as well as the level of variable rate TL and FX assets broadly offset the risks that might stem from maturity mismatch. The current equity capital of the sector is sufficient to cover likely losses.

Banks access to FX liquidity via the CBRT to fully cover their external debt payments for the coming year was ensured with the arrangements made in the framework of the FX liquidity measures cited in the policy document titled "Road Map during the Normalization of Global Monetary Policies". Moreover, the CBRT has made some changes in the reserve requirement ratios to extend the maturities of banks' non-core FX liabilities. These regulations, which make core funding more favorable and encourage extending the maturities of external liabilities, are contributing to the improvement in the loan to deposit ratio together with moderate loan growth.

#### III.1. Credit Risk

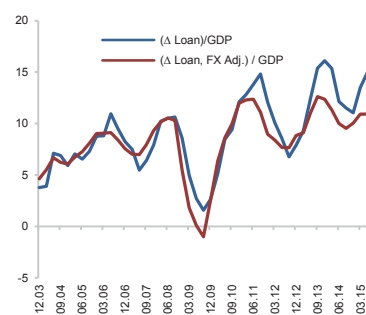
**While the annual growth of loans is at reasonable level, the ratio of loans to GDP recently increased due to the exchange rate developments.** Credit demand, which decreased on the back of the macroprudential measures introduced in early 2014 and the weak economic activity, lowered the loan/GDP ratio spread; nevertheless, the ratio picked up again recently due to the valuation effect of the rise in exchange rates on FX credit stock (Chart III.1.1). Meanwhile, the flow loans adjusted for exchange rate effects remain moderate. Actually, the flat trend in the ratio of the annual change in exchange rate-adjusted loan stock to GDP suggests that the recently accelerated loan growth is consistent with the economic growth (Chart III.1.2).

**Chart III.1.1**  
Loan/GDP Ratio<sup>1</sup>  
(Percent)



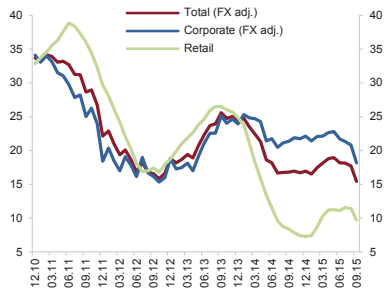
[1] GDP projections were used for July-September 2015 period.  
Source: CBRT, BRSA, TURKSTAT (Latest Data: 09.15)

**Chart III.1.2**  
Change in Loans / GDP<sup>1</sup>  
(Nominal, FX Adjusted, Percent)



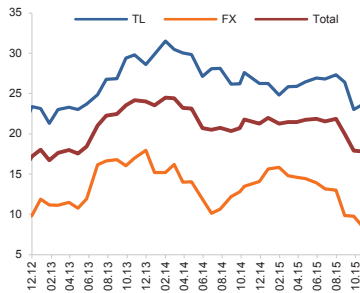
[1] GDP projections were used for July-September 2015 period. Quarterly FX flow loan data is derived from quarterly outstanding FX loan data differences in original Euro, USD and other foreign currency terms. These flow FX loan data in original term are exchange rate adjusted by using quarterly average USD and Euro CBRT buying rate and converted to TL terms. Annual exchange rate adjusted total flow loan data includes 4 quarter cumulative TL loan and exchange rate adjusted FX loan amounts. FX-indexed loans are included in FX loans.  
Source: CBRT, BRSA, TURKSTAT (Latest Data: 09.15)

**Chart III.1.3**  
Annual Loan Growth<sup>1</sup>  
(Percent, Excluding NPL)



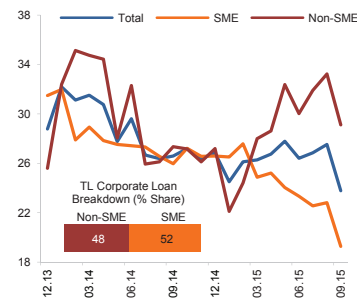
(1) The basket value used to adjust for the exchange rate effect is composed of 70 percent USD and 30 percent euro. FX-indexed loans have been included in FX loans.  
Source: CBRT, BRSA

**Chart III.1.4**  
Domestic Corporate Loans  
(FX-adjusted, Annual Percentage Change)



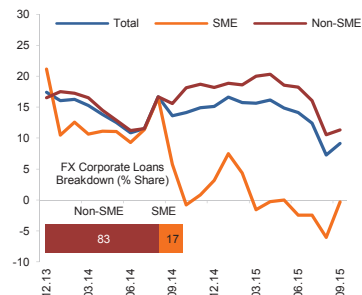
Source: CBRT, BRSA

**Chart III.1.5**  
TL Corporate Loan Annual Change by Size  
(Percent)



Source: CBRT, BRSA (Latest data: 09.15)

**Chart III.1.6**  
FX Corporate Loan Annual Change by Size  
(Percent, FX-adjusted)



Source: CBRT, BRSA (Latest data: 09.15)

**The exchange rate-adjusted loan growth has been displaying signs of deceleration as of the second half of 2015.**

The exchange rate-adjusted loan growth slightly decreased in the second half of the year due to heightened uncertainties stemming from expectations about monetary policies of advanced economies and domestic developments. Retail loan growth, which started to decrease as of the second half of 2013 on the back of the macroprudential measures taken, has been flat since the second half of 2015 with the contribution of the base effect. The decline in corporate loan growth has been more significant since mid-2015 owing to the decline in banks' risk appetite and the drop in credit demand. As of September 2015, the exchange rate-adjusted annual corporate loan growth was 18.2 percent, while the retail loan growth remained at 9.7 percent (Chart III.1.3).

**The TL corporate loan growth has moved on a downtrend.**

Despite the slowdown in the FX corporate loan growth since end-2014, the overall corporate loan growth has remained stable owing to the strong TL corporate loan growth. However, in the third quarter of 2015, TL corporate loan growth started to decline while the downtrend in FX loan growth continued (Chart III.1.4).

**Growth in small and medium scale enterprise (SME) loans is more subdued compared to the growth in corporate loans extended to large companies.** SMEs generally use TL loans from domestic banks and that TL loan growth significantly decreased in the second half of the year mainly due to the decline in loans extended to micro and small-scale enterprises. The decline in the exchange rate adjusted FX SME loan growth started well before the decline in the TL SME loan growth. The FX corporate loans are mostly used by large companies. Growth in FX corporate loans extended to large companies has been decreasing since the second quarter of 2015. Meanwhile, growth in TL corporate loans extended to large companies has been strong, albeit a recent limited drop (Charts III.1.5 and III.1.6).

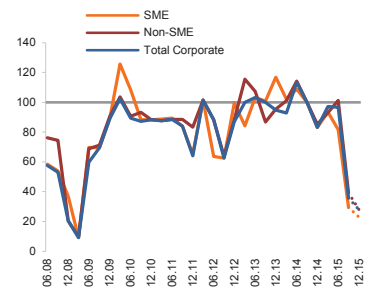
**Results of the Bank Loans Tendency Survey for the third quarter of 2015 suggest that the decline in corporate loan growth is driven by both demand and supply conditions.** The Survey results reveal that loan standards were significantly tightened for both SMEs and large companies in the June-September 2015 period (Chart III.1.7). On the demand side, demand for corporate loans decreased generally; the decline was more significant in SME loans (Chart III.1.8). The survey results suggest that loan standards are expected to be tightened further and demand is expected to increase in the last quarter of the year.

The Survey results point that the domestic and external funding facilities have been tightened, banks remain cautious about extending FX corporate loans and the tightening in FX loan standards is stronger than TL loan standards. The tightening is mainly driven by expectations about overall economic activities and the sector's/firms' outlook. Meanwhile, the decline in the demand for corporate loans can mostly be attributed to the decrease in funding needs stemming from fixed investments and merger/acquisitions (Chart III.1.9). The decline in the fixed investment demand, which has been accelerating for the last three quarters, is quite remarkable. The Survey results also suggest that credit conditions like the interest margin on loans, charges and commissions collected on loans other than interest and collateral conditions have been tightening.

**The increment in banks' funding costs coupled with the tightened loan standards have led to a rise in interest rates on corporate loans.** The rise in TL corporate loans rates outpaced that on deposit costs, as interest rates and loan-deposit loan spreads across all corporate loan types moved upwards in the second half of the year (Chart III.1.10). The rise in rate spreads suggests that banks have reflected the cautious stance that they assumed in supplying credits on pricing as well. In the second half of 2015, corporate loan rates displayed a rapid rise and this rise was more manifest in corporate loans extended to large companies and the uptrend in interest rates accelerated in the third quarter (Chart III.1.11). FX corporate loan rates, which remained flat in the third quarter of 2015, have started to move up recently.

**Chart III.1.7**

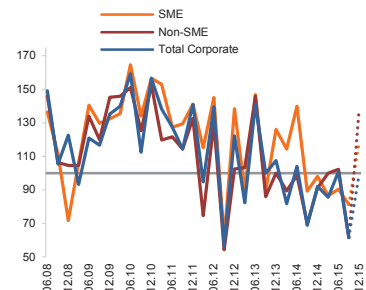
Corporate Loan Supply<sup>1</sup>  
(Percent)



(1) Derived from the Bank Loans Tendency Survey. December 2015 data show expectations. Values below 100 imply a tightening, above 100 imply an easing. Source: CBRT

**Chart III.1.8**

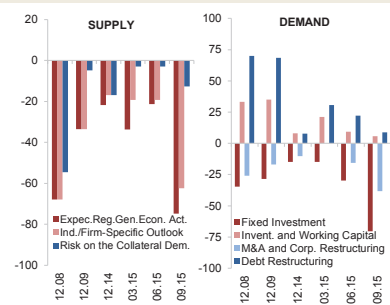
Corporate Loan Demand<sup>1</sup>  
(Percent)



(1) Derived from the Bank Loans Tendency Survey. December 2015 data show expectations. Values below 100 imply a deceleration in demand, above 100 imply increase. Source: CBRT

**Chart III.1.9**

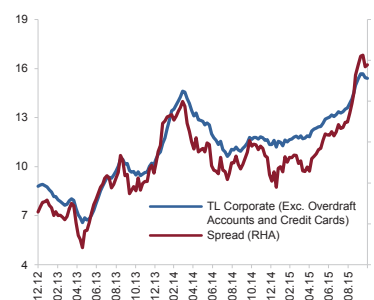
Contributions to Corporate Loan Supply and Demand<sup>1</sup>



(1) Derived from the Bank Loans Tendency Survey. Positive values imply easing in supply / increase in demand and negative values imply tightening in supply / decrease in demand. Source: CBRT

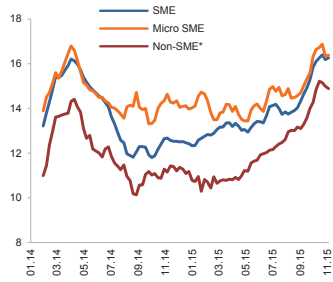
**Chart III.1.10**

TL Corporate Loans Rate<sup>1</sup> and Loan-Deposit Spread  
(Flow Data, 4 Weeks MA, Percent)



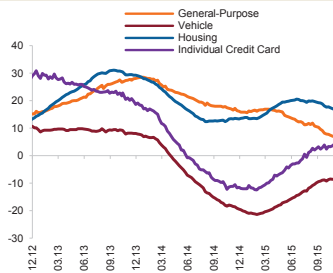
(1) Excluding specialty loans, fund-sourced loans, securities purchases loans, overdraft accounts, credit cards and the zero-rate loans. Source: CBRT (Latest data: 30.10.15)

**Chart III.1.11**  
TL Corporate Loan Interest Rates by Size Breakdown<sup>1</sup>  
(Excluding Corporate Credit Cards and Overdraft Accounts, %)



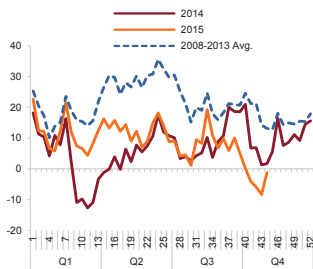
(1) Zero-rate loans extended that week for big firms are excluded. Source: CBRT (Latest Data: 30.10.15)

**Chart III.1.12**  
Retail Loan Growth by Type of Loan<sup>1</sup>  
(Outstanding Data, Annual Percentage Change)



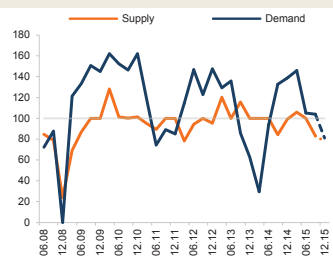
(1) Financing companies excluded. Source: CBRT, BRSA (Latest Data: 30.10.15)

**Chart III.1.13**  
Retail Loan Growth<sup>1</sup>  
(Outstanding Data, 4-Week MA, Annualized, Percent)



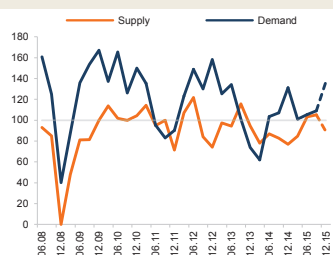
(1) Financing companies excluded. Source: CBRT, BRSA (Latest Data: 30.10.15)

**Chart III.1.14**  
Housing Loans Supply and Demand<sup>1</sup>



(1) Derived from the Bank Loans Tendency Survey. December 2015 data show expectations. Values below 100 imply a tightening, above 100 imply an easing. Source: CBRT

**Chart III.1.15**  
General-Purpose Loans Supply and Demand<sup>1</sup>



(1) Derived from the Bank Loans Tendency Survey. December 2015 data show expectations. Values below 100 imply a tightening, above 100 imply an easing. Source: CBRT

A breakdown of retail loans by type reveals that the decline in general purpose loan growth has accelerated as of the second half of the year. Housing loan growth, which increased slightly in the first quarter of 2015, remained flat for a while and assumed a downtrend in September. The uptrend observed in growth in vehicle loans and personal credit card balances until recently is mainly attributed to the base effect of the previous year (Chart III.1.12).

Currently, retail loan growth is below both the previous year's level and the average of the past few years. The growth trend decreased significantly below the averages of the previous years as of the third quarter (Chart III.1.13). The weak growth can be mainly attributed to the increased retail loan rates and decreased consumer confidence due to domestic and international uncertainties.

Results of the Bank Loans Tendency Survey for the third quarter of 2015 indicate that the tightening in credit conditions have been influential in the slight decline in the housing loan growth. According to the Survey, demand for housing loans was weaker compared to previous quarters and banks tightened credit standards due to increasing funding costs and balance sheet constraints. The Survey results about expectations for the last quarter suggest that the tightness in credit standards are expected to continue. In the near future, demand for housing loans may assume a more favorable trend than implied by the expectations in the Survey if domestic uncertainties wane (Chart III.1.14).

The Survey results reveal that there has been a limited easing in general-purpose loan standards in the third quarter. The respondents of the Survey stated that increased competition among banks induced an easing in credit standards. The rise in the demand for general purpose loans in the third quarter was mainly driven by spending on durable goods. The banks expect that there will be a slight tightening in general purpose loan standards and demand for these loans will inch up in the final quarter of the year (Chart III.1.15).

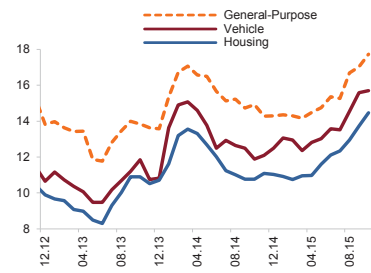
**Consumer loan rates have increased significantly.** Loan rates have climbed across all consumer loan types (Chart III.1.16). Deposit rates increased too, but the increase in retail loan rates exceeded the rise in deposit rates. The rise in rate spreads suggests that banks are cautious about extending loans. Banks' cautiousness stem from elevated retail loan riskiness and domestic and foreign uncertainties. The widening gap between rate spreads might be temporary provided that the uncertainties abate.

**While loan growth is weak, the uptrend in the amount of non-performing loans (NPL) continues and the NPL ratios are increasing.** As of third quarter of 2015, the annualized in-quarter collection trends slightly increased, the written-off non-performing loans decreased and the add-ons to the non-performing loans in the quarter increased. While the ratio of written-off non-performing loans to total NPL was 9.6 percent in the first three quarters of 2014, the ratio decreased to 4.4 percent in the first three quarters of 2015. While loan growth was weak in the first three quarters of the year, there has been no significant change in the quarterly developments compared to the first two quarters. The rise persists in the loans that are closely monitored due their potential to become non-performing loans (Chart III.1.17).

There has been no significant change in the share of standard loans (Class 1) with revised conditions. Meanwhile, the share of monitored loans (Class 2), the loan agreements of which have been changed due to restructuring or re-scheduling of the debt, increased in 2015 (Chart III.1.18).

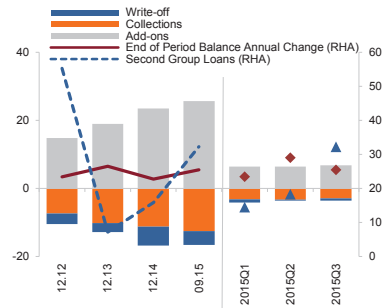
**In the second half of 2015, not only did the NPL ratios of retail loans increase but also the NPL ratios of corporate loans.** NPL ratios of retail loans have been on an uptrend since 2013 while NPL ratios of corporate loans, the downtrend of which terminated in the second half of 2015, have been moving upwards since then. The SME loan riskiness has been influential in this development. The ratio of bad cheques has moved slightly upwards as well. The NPL ratio in corporate loans extended to large companies and FX corporate loans remain weak (Chart III.1.19 and Chart III.1.20).

**Chart III.1.16**  
Consumer Loan Interest Rates  
(Percent)



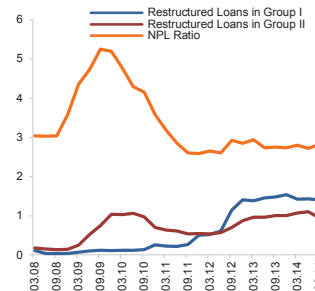
Source: CBRT (Latest Data: 30.10.15)

**Chart III.1.17**  
NPL Amount Developments and Loans under Close Monitoring<sup>1</sup>  
(Flow, Billion TL, Percent)



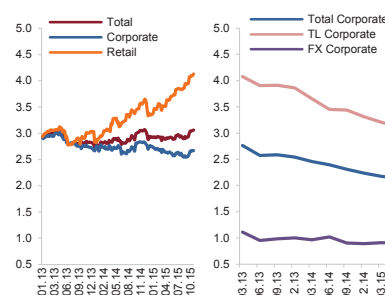
[1] 12 months cumulative intra-period write-off, add-on (including movements across groups) and collection amounts are used. Bars on the right part of the line shows quarterly amounts.  
Source: CBRT, BRSA

**Chart III.1.18**  
NPL Ratios and Restructured Loans/Other Receivables Classified in Groups I and II<sup>1</sup> (Percent)



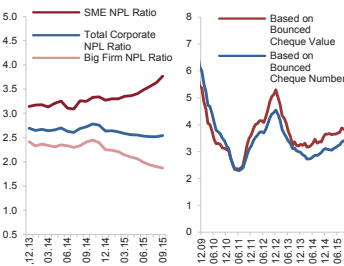
[1] Ratio of restructured loans and other receivables classified in groups I and II is calculated by dividing restructured loans over total loans excluding NPLs and covers data of 15 banks which forms 89% of total banking sector loans  
Source: CBRT, BRSA, Independent Audit Reports (Latest Data: 09.15)

**Chart III.1.19**  
NPL Ratios<sup>1</sup>  
(Percent)



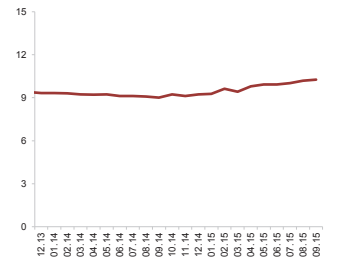
[1] NPL ratios for TL and FX corporate loans consist of 6 banks. Data derived from those banks' quarterly independent audit reports.  
Source: CBRT, BRSA, Independent Audit Reports

**Chart III.1.20**  
NPL Ratios and Bounced Cheque Ratios<sup>1</sup>  
(Percent)



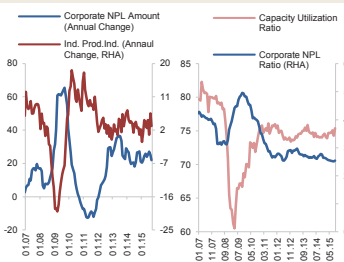
(1) 3 months moving averages of bounced cheque data from Interbank Clearing Houses are used. Source: CBRT, BRSA (Latest Data: 09.15)

**Chart III.1.21**  
Share of Default Corporates<sup>1</sup>  
(Number, Percent)



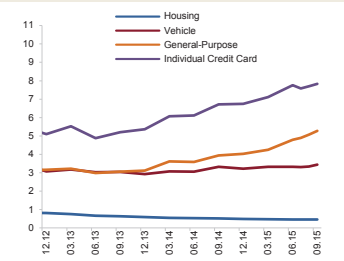
(1) Share of default corporates is the ratio of number of firms with non-performing loans to total number of firms using loans. Source: BAT Risk Center

**Chart III.1.22**  
Corporate NPL, Industrial Production Index and Capacity Utilization Developments<sup>1</sup> (Percent)



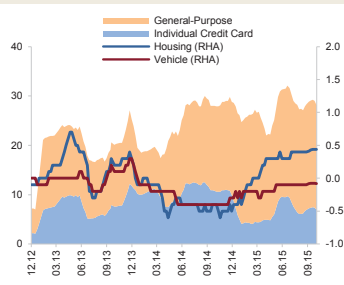
(1) Seasonal and calendar adjusted industrial production index and seasonal adjusted capacity utilization are used. Source: CBRT, BRSA, TURSTAT

**Chart III.1.23**  
Retail Loan NPL Ratios  
(Percent)



Source: CBRT, BRSA

**Chart III.1.24**  
Retail Loan NPL Growth Contribution by Type  
(4 Weeks MA, Percent)



Source: CBRT, BRSA

The rise in the delinquency ratios for firms started in the final quarter of 2014, in advance of the rise in the ratio of non-performing loans calculated based on credit volume (Chart III.1.21). The rise in the number of firms having difficulty in repaying their debts on time started before the NPL ratios based on loan amounts and this supports the assumption that the deterioration in the financial indicators of SMEs started before the deterioration in those of the large companies.

The annual change in the industrial production index moves in the opposite direction of the annual change in the corporate loan NPL amount, suggesting that the NPL ratios and industrial production index are correlated. Therefore, the recent uptrend in industrial production is likely to have a favorable impact on the corporate loan NPLs. Meanwhile, there is a moderate pick-up in the rate of capacity utilization that has an inverse relationship with corporate loan NPLs (Chart III.1.22).

**The upward trend in NPL ratios in unsecured retail loans continues.** The persisting rise in the NPL ratio in individual credit cards is attributed to the increase in NPLs while the rise in the NPL ratio in general purpose loans is attributed to both the increasing NPLs and the recent downtrend in the growth of performing loans. Meanwhile, the positive outlook in secured consumer loans continues. The NPL ratios in vehicle loans and housing loans have been flat for a while (Chart III.1.23).

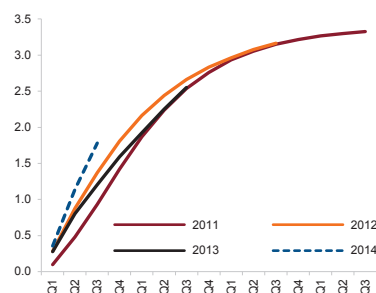
**The rise in the NPL balance in retail loans was driven by unsecured loans.** The contribution from general purpose loans and personal credit cards to the NPL was much higher than those from housing and vehicle loans. In the period analyzed, the contribution of credits cards to the growth in the NPL amount was flat while the contribution of general-purpose loans was on an uptrend (Chart III.1.24).

**The rise in the NPL ratios of general-purpose loans mainly stemmed from the general-purpose loans that were extended in 2014.** The aging analysis based on the loan start period shows that the NPL performance of general purpose loans in 2013 was better than the performance in 2012. The NPL performance started worsening in the last quarter of 2013, and NPL ratios in 2014 were significantly above the levels of the preceding years (Chart III.1.25).

The number of retail loan defaulters to banks showed a significant rise after the release of the last Financial Stability Report and the number of real persons with debts to asset management companies also increased due to NPL purchases from banks (Table III.1.1). Particularly in 2015, the number of defaulters moved upward in tandem with the rise in NPL ratios.

**NPL ratios of unsecured retail loans usually rise following a rise in unemployment rates.** There is a correlation between the NPL ratios of individual credit cards and general-purpose loans, and unemployment rates with a lag of 6 months (Chart III.1.26). The outlook for retail loan riskiness might become positive provided that the flat/downward trend in unemployment rates is sustained in the upcoming period.

**Chart III.1.25**  
Vintage Curves for General-Purpose Loans  
(Percent)



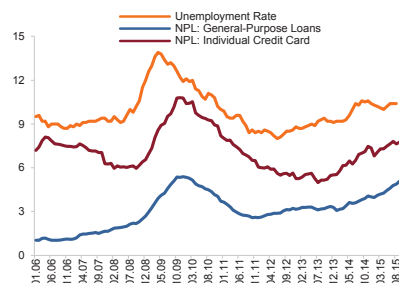
Source: CBRT

**Table III.1.1**  
Number of Credit Card and Consumer Loan Defaulters<sup>1,2</sup>  
(Thousand)

	12.12	12.13 <sup>3</sup>	12.14	09.15
Banking	1,487	1,339	1,380	1,575
Asset Management Companies	782	898	1,045	1,282
Financing Companies	8	10	10	12
<b>Total<sup>B</sup></b>	<b>1,949</b>	<b>2,001</b>	<b>2,149</b>	<b>2,492</b>

(1) Customers with more than one registry in a particular financial institution group are counted as a single customer.  
(2) The minimum amount of non-performing loans to be disclosed by each bank has been set as 20 TL as of September 2013. Amounts less than 20 TL have not been included in the calculation.  
(3) As customers may be registered in more than one financial institution group, the sum of the three rows in the table and grand total are not equal.  
Source: CBRT and BAT Risk Center

**Chart III.1.26**  
NPL Ratios in Retail Loans vs. Unemployment Ratios<sup>1</sup>  
(Percent)



(1) Unemployment ratios are seasonally adjusted. NPL ratios are the arithmetic mean of the respective month.  
Source: CBRT, BRSA, TURKSTAT (Latest Data: Unemployment Rate 08.15; NPL Ratio 10.15)

Box  
III.1.1

## Changes in Lending Standards for Households

Banks can update their lending standards for new loan applicants and revise the distribution of loans among low-risk and high-risk customers according to developments in the macroeconomic outlook and financial market conditions. A change in credit standards translates into a change in the riskiness of the bank's largest asset item; its credit portfolio. This Box presents the change in the distribution of the newly-issued general purpose loans among customers with different credit scores over time by using the retail loan data compiled by the Credit Bureau of Turkey (KKB).

The KKB classifies retail loan customers into 11 main groups with respect to their Retail Loan Scores (RLS). The RLS ranges between 1 and 1900 points and lower points correspond to higher risk levels.<sup>6</sup> Data are compiled by groups on a monthly basis since June 2013, and contain information on the number of customers and the average loan amount per customer. In the framework of the analysis, two indices have been produced displaying the change in the riskiness of banks' general purpose loan portfolios over time.

While producing the first index, the RLS groups were numbered from 1 to 11, starting with the least risky group. Each group's share of the total amount of general purpose loans was then weighted by their corresponding number. This "Interval Weighted" index shows which group among the 11 is the average recipient of new loans for each period. High values indicate that banks change the composition of their loan recipients (concentrating on low RLS groups) and extend new general purpose loans to higher-risk groups, while low values denote a change in bank's credit composition in the reverse direction (this time concentrating on high RLS groups) as banks issue new loans more cautiously. Chart III.1.1.1 shows that the series was on a downtrend since the beginning of the observation period as banks followed a more prudent policy opting for high-score groups. This trend reversed back towards the period average when the policy was eased in the third quarter of 2015.

The first index shows the distribution of newly-extended loans among RLS groups over time using a representative risk group and calculates the riskiness in the general purpose loans market qualitatively. In order to evaluate the riskiness of general purpose loans quantitatively, the loan performance of each RLS group should be taken into account. Accordingly, the ratio of good loans to bad loans that the KKB calculated at the group level by using a large sample from the database for 2012 has been converted to the share of bad loans in total loans for each group.<sup>7</sup> Similar to the first index, this group-based weight has been multiplied by the share of RLS groups in total general purpose loans. The sum over groups for each period gives the index showing "Default Likelihood".<sup>8</sup> The series shows the change in the total likely default ratio over time stemming from compositional changes among groups. Therefore, the second index, which is weighted by this coefficient, can better represent the change in loan riskiness quantitatively. However, it should be borne in mind that the KKB sample only calculates a ratio showing whether new loans are overdue or not; and this ratio does not take into account the collections for overdue general purpose loans.

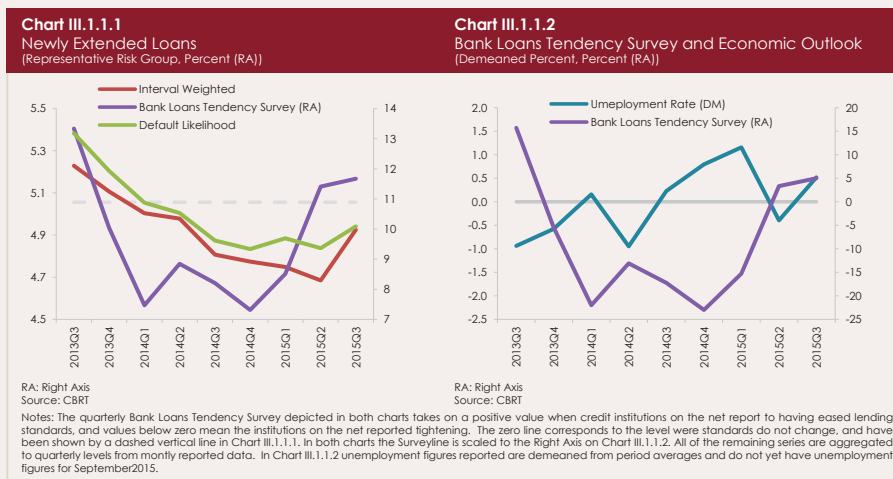
<sup>6</sup> The lowest credit score interval 1-740 is followed by 9 more score intervals of 120 points each up until the lowest risk group for the RLS range of 1821-1900. The boundaries of these groups have been adjusted in a way to maximize the risk estimation prowess of the current and latest version of RLS in use since 2012. Applicants with insufficient credit history who are assigned a RLS value of 0 points have not been included in the study.

<sup>7</sup> The bad loans cover either loans that are under administrative or legal prosecution due to three consecutive overdue status or loans that are written off. The good/bad loan ratio for each risk group provided by the KKB has been converted to bad/ (bad + good) ratio. The loans that don't fall in either the good or the bad group that are labeled as unclear by the KKB have not been included in the conversion.

<sup>8</sup> The converted KKB ratio corresponds to a default rate between 7.7 and 11 percent of loans on a monthly basis without group share weights; lending support to the credibility of KKB's sample-dependent RLS group risk ratios.



As it would be expected, the two indices move in tandem. The general downward trend in the first index until the second quarter of 2015 is also observed in the potential defaults series. When the average debtor group represented by the interval weighted index moved from high-risk debtors to lower-risk debtors, the expected default ratios decreased as well. In the last quarter of the data, both values started to increase, in other words, as loans on average are issued to a higher representative risk group, the expected default ratio increased as well.



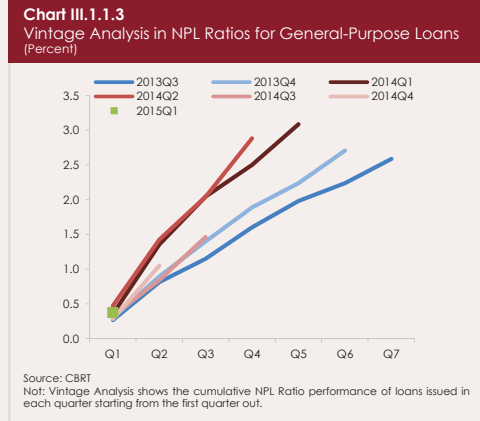
The developments pointed out by both the risk-weighted total and the likely default amount are consistent with the CBRT'S Bank Loans Tendency Survey for the developments in general purpose loan standards.<sup>9</sup> The Survey shows the share of banks that state a net easing (positive values) or net tightening (negative values) in the new general purpose loan standards for each calendar quarter in percentages. The loan standards, which had been tight between the final quarter of 2013 and early 2015, were eased in the last two quarters.

The Bank Loans Tendency Survey is broadly consistent with the implications of general macroeconomic indicators. Chart III.1.1.2 displays the Survey results along with demeaned unemployment rates, adjusted for quarterly averages, which are taken to represent the general macroeconomic outlook. Accordingly, during periods of increasing unemployment when payment conditions deteriorate and/or are expected to deteriorate, such as the one-year period following the second quarter of 2014, the credit conditions were tightened; while in periods when unemployment rates decreased below the averages, as in the second quarter of 2015, credit conditions were eased.

The representative power of the indices established in gauging credit portfolio riskiness can be put to a test by examining loan performances. For this purpose, the most convenient instrument is a vintage curve analysis for loans issued in each quarter. Deterioration in the macroeconomic outlook can have opposing effects on credit standards and the general credit performance, and therefore can result in different outcomes for active and newly issued loans. Amid a deteriorating outlook and tightening credit standards, new loans will be extended to a more cautious risk distribution (opting for high RLS) and as a result are expected to result in lower NPL ratios. On the contrary, any negative developments in real economic activity will worsen the performances of all active loans issued in earlier periods and push the NPL ratios up. Moreover, banks who are

<sup>9</sup> In the Bank Loans Tendency Survey, data on the developments and banks' expectations in each loan item are compiled in the second week of the last month of each quarter, and then they are weighted with the market share of each bank for related loan type; and the results are issued by the CBRT in 4 weeks.

expected to tighten their credit standards in worsening conditions may lead to an additional increase in NPL ratios for existing loans by being less flexible about the conditions for the credits that they had extended before. Therefore, in evaluating the NPL performance of loans originating in a given period, it would be wise to consider the credit standards of the origination period as well as the macroeconomic developments in quarters that followed.



Correspondingly, in the last two quarters of 2013, as the macroeconomic outlook was better than the period average, and even though banks had begun to assign new loans more cautiously as indicated by the declining "Interval Weighted" index, the loans issued in this period were extended on average to groups bearing the highest risk throughout the observation period. Nevertheless, according to the vintage analysis in Chart III.1.1.3, loans issued in 2013 performed better than those issued in 2014 since the macroeconomic outlook in the first half of 2014 hovered around the averages.

The loans issued in the first half of 2014 were given to an average representative risk level with the effect of the macroeconomic developments of the period. However, the severe macroeconomic deterioration in the following quarters adversely affected the performances of these loans. The second quarter of 2014 was an exception to the standard tightening observed in the Survey series and the new loans extended in this quarter displayed the highest NPL ratios in the period analyzed due to the macroeconomic developments in following quarters.

As the loans extended in the last two quarters of 2014 were exposed to the tightest loan standards of the observation period, the quality of the new loans issued in this period was higher. Although the macroeconomic outlook in the period in which the loans were issued was adverse, the loans' performance improved in the following quarters as the outlook converged to average. As illustrated in Chart III.1.1.3, the NPL ratios of the loans extended in the third and fourth quarters of 2014 were lower compared to those extended in the first half of the year.

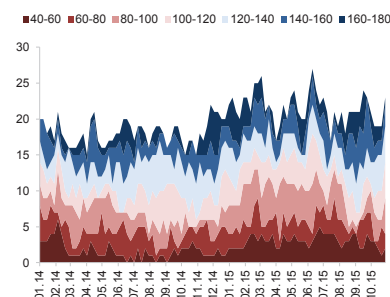
### III.2. Liquidity Risk

**The TL assets of the banking sector are mostly composed of core liabilities, while the liquidity risk of the sector is concentrated in non-deposit FX funding.** In this respect, the future timing and speed of the Fed's lift-off is closely monitored by the banking sector. Currently, the banks are successful in managing their FX liquidity risk. The cost of external funding borne by the banks remains low.

**Banks continue to meet the legal limits for FX and total liquidity coverage ratios.** The liquidity coverage ratios (LCR), which show the capability of banks to cover net cash outflows for a duration of 30 calendar days from the high-quality asset stocks in their balance sheets, was set at 40 percent and 60 percent for FX and total assets, respectively, for all banks (except development and investment banks) as of January 2015. The liquidity risk in the sector is contained by the FX and gold reserves that banks hold in the scope of the ROM and the reserves requirements. The liquidity risk is also contained by the securities portfolio that continues to occupy a significant space in banks' balance sheets despite a weakening in recent years. There are no banks that are unable to meet the legal liquidity coverage ratio (Chart III.2.1). An analysis of banks with respect to the ability to meet the total liquidity coverage ratio reveals that the number and distribution of banks that fall between the legal limit and the sector average display a more fluctuating trend while the number of banks close to the limit has been increasing since June (Chart III.2.2).

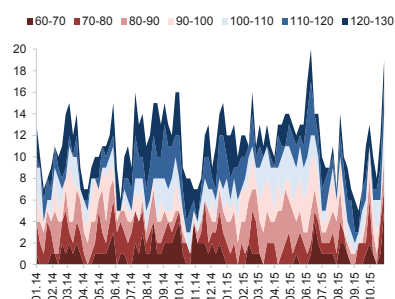
**The share of non-deposit funding in funding sources has displayed a fluctuating but flat trend since end-2014.** The TL equivalent of funding obtained from abroad that constitutes an important part of non-deposit funding may show increments depending on exchange rate developments. Nevertheless, the uptrend in the share of external funding in total funding sources terminated due to the decline in external repo funding. In the same period, even if there has been a rise in the domestic non-deposit funding with the effect of the rise in debts to banks and repo funding, there has been no significant change in the share of domestic funding in total funding sources (Chart III.2.3).

**Chart III.2.1**  
Number of Banks by FX Liquidity Coverage Ratio Brackets<sup>1,2</sup>



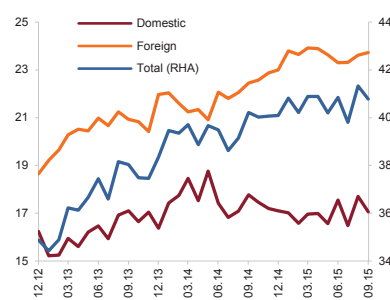
(1) Excluding development and investment banks.  
(2) Based on non-consolidated reportings.  
Source: BRSA (Latest Data: 31.10.15)

**Chart III.2.2**  
Number of Banks by Total Liquidity Coverage Ratio Brackets<sup>1,2</sup>



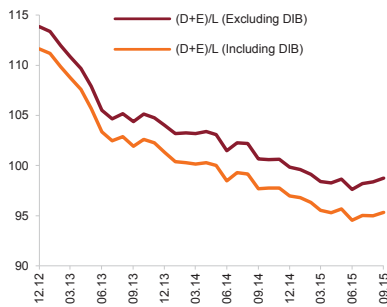
(1) Excluding development and investment banks.  
(2) Based on non-consolidated reportings.  
Source: BRSA (Latest Data: 31.10.15)

**Chart III.2.3**  
Ratio of Non-Deposit Funding to Funding Sources (Percent)



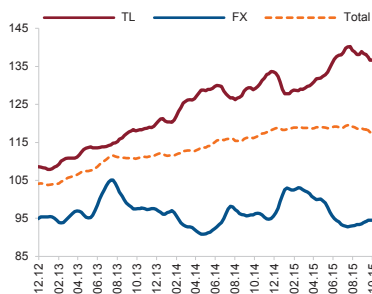
Source: CBRT

**Chart III.2.4**  
(Deposits+Equity)/Loans Ratio<sup>1</sup>  
(Percent)



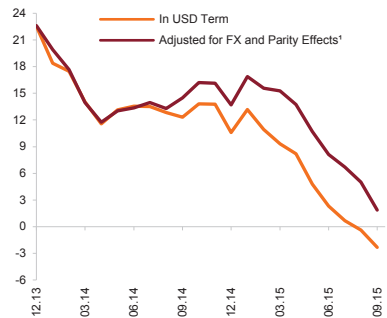
(1) Official deposits excluded.  
Source: CBRT

**Chart III.2.5**  
Loan/Deposit Ratio  
(4 Week Moving Average, Percent)



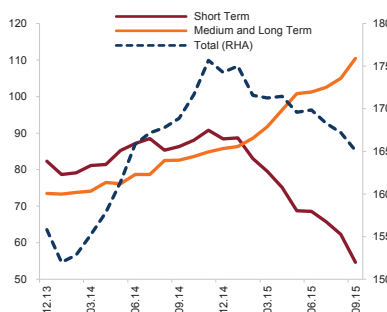
Source: BRSA (Latest Data: 30.10.15)

**Chart III.2.6**  
Growth in Banks' External Liabilities  
(Annual Percentage Change)



(1) Calculated based on the USD/TRY and EUR/USD parity at end-2013.  
Source: CBRT, MKK

**Chart III.2.7**  
Development of Banks' Short Term and Medium-Long Term External Liabilities  
(Billion USD)



Source: CBRT, MKK

**The downtrend in the share of core liabilities has started to improve in response to the measures taken.** In October 2014, the CBRT announced that it would start remunerating TL required reserves to encourage core liabilities, and the remuneration of TL required reserves continues with decisions on gradual increment of remuneration rates. Moreover, the CBRT has announced several decisions on the reserve requirement ratios to extend the maturities of banks' non-core FX liabilities and has made some adjustments in the reserve option coefficients (ROC) parallel to these decisions. These arrangements, which decrease TL costs and make deposit funding more favorable, help increase banks' tendencies towards deposits and this development together with moderate loan growth contribute to improvement in loan/deposit ratio in favor of deposits (Chart III.2.4). The rise in the share of stable funding sources in banks' balance sheets is a favorable development with respect to financial stability.

The TL and FX loan/deposit ratio discrepancy is expected to be gradually eliminated on the back of the moderate trend in TL loans and depositors' return to TL deposits (Chart III.2.5).

**Banks' external financing demand and the conditions on accessibility to external financing are still important with respect to liquidity risk management.** The USD equivalent of the banking sector's external debt to banks and such institutions decreased in the first nine months of 2015 for the first time since 2009. The annual growth of these liabilities started to decline as of January 2015 due to escalating domestic and foreign uncertainties and became negative in August. The foreign debt growth is positive when adjusted for the exchange rate and the parity effect but a significant slowdown is observed (Chart III.2.6). With the contribution of the arrangements that the CBRT introduced to encourage long-term maturities in non-core liabilities, banks' borrowing from abroad with maturities due within one year significantly decreased in the first nine months of the year while medium and long-term liabilities increased (Chart III.2.7).

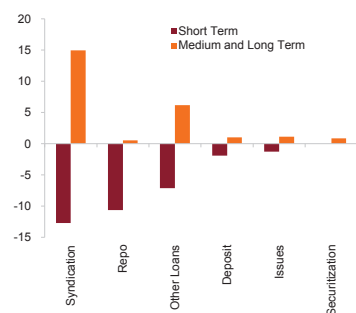
An analysis of external borrowing by types reveals that banks have shifted from short-term to long-term in syndicated loans and other loans and have decreased repo funding by not renewing the short-term ones. Borrowing through securitization

loans with longer maturities continues while there have been signs of decline in security issues over the last few months (Chart III.2.8). In syndicated loans, maturities shifted from short-term maturities to medium and long-term maturities as banks renewed their matured loans with a maturity of one year with tranches mostly with 367 day-maturity. Besides, it is noteworthy that recently, some banks have borrowed via syndicated loans with a maturity of three years. Banks' syndicated loan costs declined in 2015, compared to the previous year (Chart III.2.9). In addition, there has been no significant rise in the costs of other loans in the first nine months of the year. In this framework, the drop in banks' external borrowing in 2015 can mainly be attributed to the domestic banks' preferences rather than to the decline in foreign financial institutions' risk appetite.

**Amid lingering uncertainties pertaining to the Fed's potential lift-off, in 2015, the CBRT introduced several gradual changes in reserve requirement ratios for banks' non-deposit FX liabilities to encourage long-term borrowing.** With the last announcement dated 29 August 2015, the reserve requirement ratios for new FX liabilities other than deposits/participation funds were raised significantly for tranches shorter than 3 years (Table III.2.1). The arrangement is expected to incentivize an increase in the banks' non-core FX liabilities with maturities longer than three years. Since the Financial Stability Report of November 2014, when the first signals of a regulation amendment were given, the share of non-core liabilities with maturities up to one year dropped gradually and came down to 30 percent by September 2015. The fall was mainly substituted by liabilities with maturities of 1-3 years; the share of liabilities with maturities longer than 3 years increased by 5 points to 43 percent (Chart III.2.10). With a press release announced in May 2015, the coverage of liabilities subject to reserve requirements of foreign branches of banks incorporated in Turkey has been broadened. The objective of the regulation was also to encourage the banks' foreign branches to borrow with longer maturities.

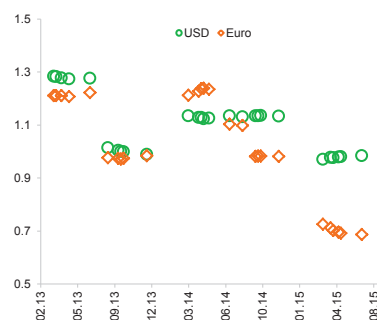
The weighted average maturity of the banking sector's external liabilities started to be extended in February 2015 and reached 51 months by September while the share of short-term liabilities in total decreased to 33 percent. The decline in the share of short-term external liabilities was mainly driven by the

**Chart III.2.8**  
Change in External Borrowing Instruments between 2014Q4 and 2015Q3 (Billion USD)



Source: CBRT, MKK

**Chart III.2.9**  
Cost of Short Term Syndicated Loans<sup>1</sup> (Transaction Based, Percent)



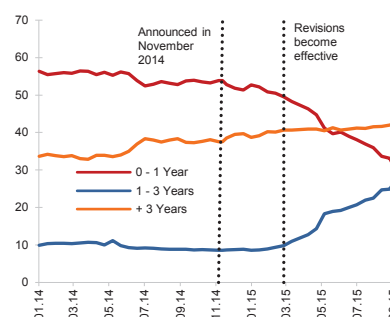
(1) Includes only large scale banks  
Source: PDP

**Table III.2.1**  
Reserve Requirement Ratios for Non-Core FX Liabilities (Percent)

	24.05.13	13.02.15	13.03.15	09.10.15 <sup>1</sup>
<b>0-1 Year</b>	13	18	20	25
<b>1-2 Year</b>	11	13	14	20
<b>2-3 Year</b>	11	8	8	15
<b>3-5 Year</b>	6	7	7	7
<b>5 Year +</b>	6	6	6	5

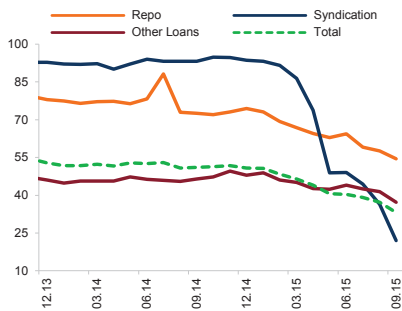
(1) Reserve requirement ratios will be applied as of the liability period dated 09 October 2015, to the new liabilities obtained after 29 August 2015.  
Source: CBRT

**Chart III.2.10**  
Maturity Breakdown of Non-Core FX Liabilities Subject to Reserve Requirements (Percentage Share)



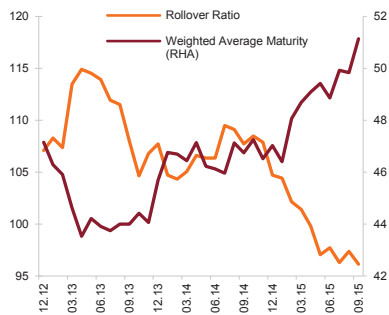
Source: CBRT (Latest Data: 23.09.15)

**Chart III.2.11**  
Share of Short Term in Total External Liabilities by Borrowing Instruments (Percent)



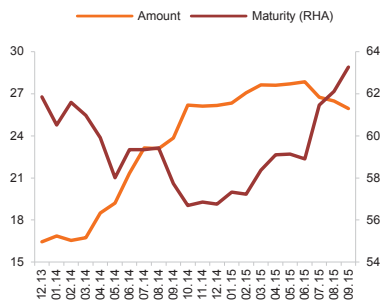
Source: CBRT, MKK

**Chart III.2.12**  
External Debt Roll-over Ratio<sup>1</sup> and its Average Maturity (Percent, Month)



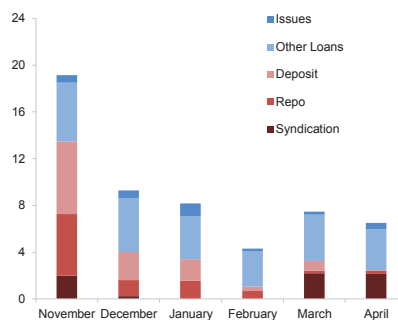
(1) Calculated based on 6-month moving totals of banks' borrowings and repayments of total external liabilities of including securities issued abroad.  
Source: CBRT, MKK

**Chart III.2.13**  
Foreign FX Issues (Stock, Billion USD, Month)



Source: MKK

**Chart III.2.14**  
Payment Plan of Banks' External Liabilities in the Near Future (Billion USD)



Source: CBRT, MKK (Latest Data: 10.15)

decrease in other loans, repos and syndicated loans in which the share of short term liabilities decreased by 11, 20 and 72 percent, respectively, compared to end-2014 (Charts III.2.11 and III.2.12). The average maturity of other loans was extended from 52 months to 54 months while that of syndicated loans was extended from 13 months to 15 months. The average maturity of repo funding was extended significantly from 17 months to 26 months.

The stock average maturity of FX-denominated securities issued by the banking sector abroad was extended after November 2014 on the back of the decline in short-term security issues. By September 2015, the average maturity of the FX-denominated securities issued abroad was 63 months. The share of short-term ones in these securities was 9.1 percent with respect to original maturity and 20.7 percent with respect to remaining maturity. Although the average maturity of banks' FX securities issued abroad was extended, the stock amount recently decreased (Chart III.2.13).

**Over the next one year, the banking sector has a total of USD 86 billion of external debt repayment, USD 82 billion of which is in foreign currency (Chart III.2.14).** The developments in global markets may induce banks to roll over their external debts with longer maturities. While the share of banks' core liabilities are increasing, the banks have been rolling over their external liabilities by declining ratios since July 2014. The roll-over ratio fell below 100 percent in April 2015 after a long time (Chart III.2.12).

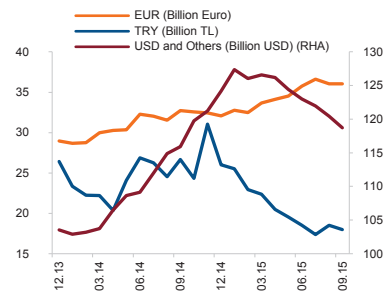
**An analysis of banks' external borrowing with respect to currency units reveals that the share of external borrowing in euros has been relatively increasing since February 2015.** External borrowing in euros increased in the first nine months of 2015 owing to the increments in syndicated loans, deposits and other loans. In this period, the sector's short-term borrowing in euros decreased while long-term borrowing in euros increased. Moreover, the sector has a small amount of debts to financial institutions abroad in terms of TL mostly composed of loans that are not syndicated or securitization and deposits. The TL-denominated external liabilities decreased remarkably in 2015 due to the decline in the mentioned borrowing types (Chart

III.2.15). If the Fed does not postpone the lift-off anymore, banks' preferences for borrowing in euros from abroad may continue depending also on the speed and scale of interest rate hikes. The course of borrowing in euros against borrowing in US dollars will be continue to be monitored in the framework of the expansionary monetary policy implemented by the ECB.

**Banks have adequate liquidity buffers.** The banks' selected FX liquid assets were at USD 58 billion level in October 2015 with no noteworthy change compared to end-2014. While there has been no remarkable change in the sector's cash reserves, foreign exchange and gold reserves held at the CBRT in the scope of the ROM decreased with the impact of the rise in the exchange rate, whereas unencumbered assets in the banks abroad increased. The mentioned assets are at a level to cover approximately 70 percent of the FX liabilities due within one year (Chart III.2.16). This suggests that even if the external debt roll-over ratio drops as low as 30 percent, the banks would still have adequate short-term liquidity buffers (Chart III.2.17). Moreover, in case FX external liabilities of banks decline, the banks can obtain additional FX cash reserves from their FX required reserves. Meanwhile, banks have a portfolio of TL-denominated and FX-denominated unencumbered government debt securities at the amount of TL 69 billion and USD 9 billion, respectively, that are not included in the calculation of their selected liquid assets. Any decline in domestic - foreign repo transactions and secured loans may evoke an increase in the sector's unencumbered securities portfolio.

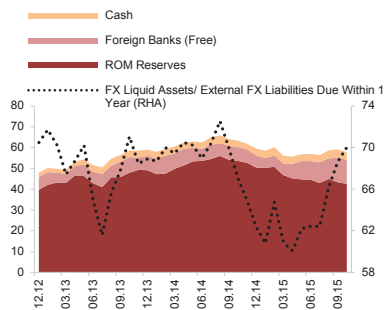
The CBRT's press release on 18 August 2015 on the road map related to the amendments to be made before and during the normalization of global monetary policies, included disclosures about the framework of Turkish lira liquidity management and simplification steps, FX liquidity measures and measures to support financial stability. In the scope of foreign exchange liquidity measures, the press release issued on 29 August 2015 stated that banks' transaction limits in the CBRT Foreign Exchange and Banknotes Markets were increased approximately by 130 percent to USD 50 billion (Chart III.2.18). Thus, the sum of the Foreign Exchange Deposit limits allocated to the banks and the foreign exchange and gold assets held at the CBRT through the ROM facility reached a level adequate

**Chart III.2.15**  
Development of Banks' External Liabilities by Currency Units



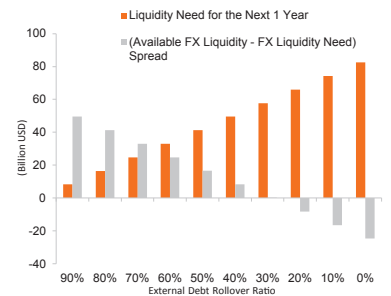
Source: CBRT, MKK

**Chart III.2.16**  
FX Liquid Assets<sup>1</sup> and FX External Liabilities Due Within 1 Year (Percent)



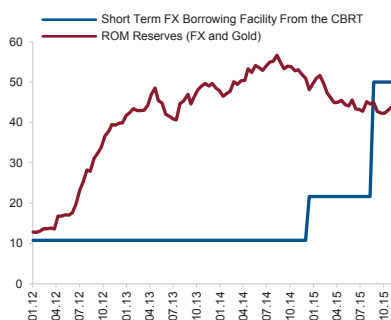
(1) Selected FX Liquid Assets: Cash+Foreign Banks (free) + Required Reserves held within the ROM facility.  
Source: CBRT, MKK (Latest Data: 10.15)

**Chart III.2.17**  
External Debt Roll-over Ratios and FX Liquidity Need<sup>1</sup>



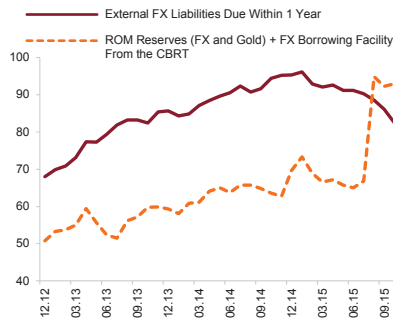
(1) Selected FX Liquid Assets: Cash+Foreign Banks (free)+Required Reserves held within the ROM facility.  
Liquidity Need: FX external debt due within 1 year x (1 - external debt roll-over ratio).  
Liquidity Surplus/Deficit: FX Liquid Asset - FX Liquidity Need.  
Source: CBRT, MKK

**Chart III.2.18**  
ROM Reserves and FX Borrowing Facility from the CBRT (Billion USD)



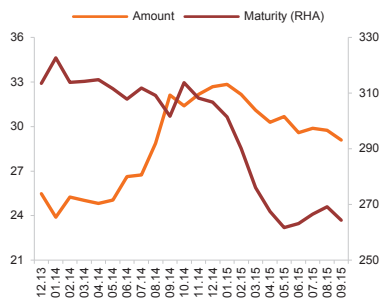
Source: CBRT (Latest Data: 06.11.15)

**Chart III.2.19**  
ROM Reserves + FX Borrowing Facility and External FX Liabilities Due Within 1 Year (Billion USD)



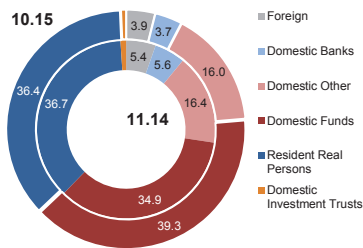
Source: CBRT, MKK

**Chart III.2.20**  
Domestic TL Security Issues (Stock, Billion USD, Month)



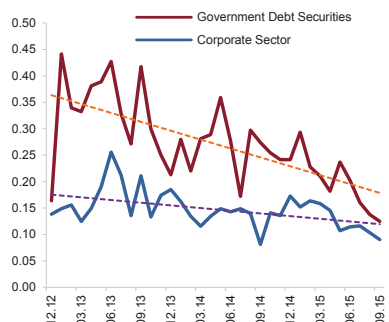
Source: MKK (Latest Data: 30.09.15)

**Chart III.2.21**  
Breakdown of Holdings of the Banking Sector's TL Security Issues (Percentage Share)



Source: MKK

**Chart III.2.22**  
Ratio of the Average Daily Volumes of Secondary Market Security Issues<sup>1</sup> to Stock Security Issues (Percent)



(1) BIST Outright Purchases and Sales Market Private Sector Security Issues. Dashed lines show linear trend of the series. Source: CBRT, BIST, MKK (Latest Data: 30.09.15)

to meet the banks' external FX debt payments due within one year (Chart III.2.19).

**An analysis of the development of the stock amount and the average maturity of securities issued by the banking sector in Turkey reveals that securities issued in the domestic market have been decreasing since November 2014.** In this period, the securities issued by banks had shorter maturities than securities that matured in the same period, thus the average maturity of domestic securities were shortened. Since May 2015, the decline in the stock amount of securities slowed and maturities were slightly extended (Chart III.2.20).

The domestic securities issued by the banking sector are mostly demanded by domestic funds and resident real persons. A comparison between October 2015 and November 2014 that was marked by a contraction in the domestic bond market with respect to type of investors reveals that the shares of real persons were almost the same while there was a shift from the share of foreign investors and domestic banks to the share of domestic finance institutions. It is remarkable that the share of foreign investors in securities issued by the banking sector in Turkey is quite limited (Chart III.2.21).

Accordingly, the depth of the secondary market of GDDS and private sector securities has been decreasing since end-2012 (Chart III.2.22).



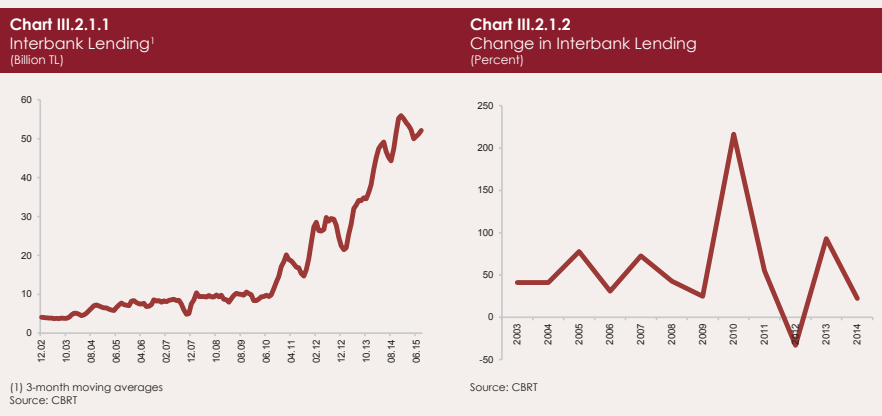
Box  
III.2.1

## Systemic Risk in the Banking Sector with Respect to Interconnectedness

The global financial crises that loomed in 2008 forced central banks to attach greater importance to financial stability. As a component of financial stability, a network analysis has been conducted to determine the contagion effect of a shock on financial markets. The recent academic studies that use network analysis to evaluate the interconnectedness between banks and the systemic risk. Moreover, both advanced and emerging economies like Poland, India, Brazil, Tanzania, Portugal, UK and USA present studies based on network analysis in their financial stability reports. The Global Financial Stability Report prepared by the International Monetary Fund (IMF) also presents a global banking network analysis composed of the leading countries in the global banking system. In this Box, the interconnectedness of the Turkish banking system was analyzed by using network analysis and some complementary statistics and some evaluations have been made pertaining to the systemic risk.

A dataset of the debtor-creditor relationship between banks in a banking system is required to assess the degree of influence of one bank or more than one bank's failure in paying its/their liabilities on other banks that are in direct or indirect relation with the defaulter bank/banks. This Box presents an analysis of the development of bilateral liability relations between banks in Turkey by using the interbank lending data provided by the CBRT. The lending relations stemming from credit, deposit, repo and reverse repo operations of 61 banks that have been operating in Turkey between 2002-2015 have been analyzed via networks established for each month. The criteria derived from the network analysis have been determined as monthly time series.

The total interbank lending, which was TL 4.1 billion in 2002, became TL 52 billion in 2015 (Chart III.2.1.1). The annual percentage changes suggest that interbank lending decreased during the 2007-2008 crises (Chart III.2.1.2).



In network analysis, each point is called a node and the paths connecting those nodes are called the links. The set composed of these links is called a network. In this Box, each of the 61 banks analyzed in this study are nodes and the lending-borrowing relations between those banks are the links. Allen and Gale (2000) have used the terms completeness and connectivity to show the contagion effect of a shock in the market. A complete market is a market in which each bank has a lending-borrowing relation with all other banks. The more completeness a market has, the stronger the contagion effect of a likely shock becomes while the influence of the contagion effect becomes less severe.

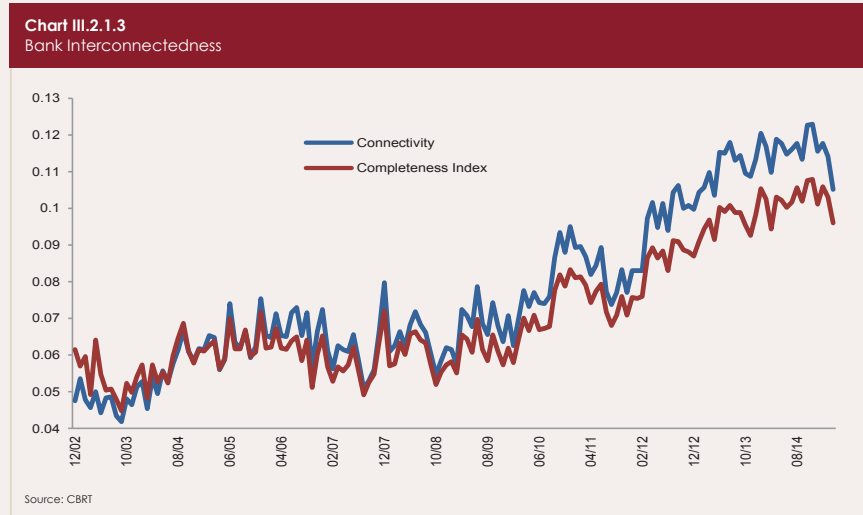
In mathematical terms, if the number of nodes in a network is  $n$ , and the number of links is  $l$ , the ratio of the links in the network to the maximum number of possible links in the network that can be defined is interconnectedness- $C$ .

$$C = \frac{l}{n * (n - 1)}$$

$C=1$  denotes a complete and fully interconnected network. When the borrowing-lending relations of the 61 banks are represented in a matrix, the  $a_{ij}$  element is 1 if there is a connection from bank  $i$  to bank  $j$ ; and 0 if there is no relation between these banks and the completeness index is calculated by the formula below:

$$C(G) = \frac{\sum_i \sum_j a_{ij}}{2n * (n - 1)}$$

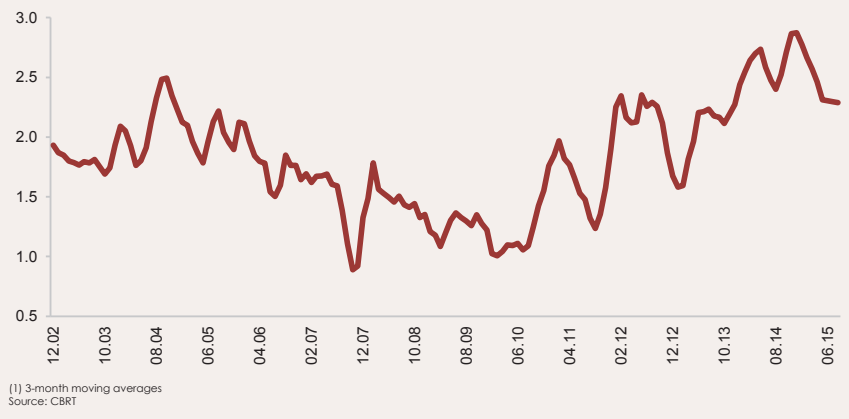
Chart III.2.1.3, which shows the change in interconnectedness and integration index values over time, indicates that these values decreased in the 2007-2008 crisis but increased again in time. This change suggests that international market became more interconnected.



The centrality measures are used to show the priority of participants in network analysis. For the purposes of this Box, the degree, power, betweenness and eigenvector centrality measures for the Turkish banking system have been calculated and it was observed that similar banks came to the fore for these measures.

Upper (2010) points out that in literature, the contagion effect of a shock in the interbank market becomes more severe if the share of the market in the banking system is large and there is no collateral for the liabilities. Accordingly, the change in the share of interbank lending-borrowing relations in total banking assets over time assumed relatively small values between 0.9 and 2.9 (Chart III.2.1.4).

**Chart III.2.1.4**  
Share of Interbank Lending in Total Banking Assets<sup>1</sup>  
(Percent)



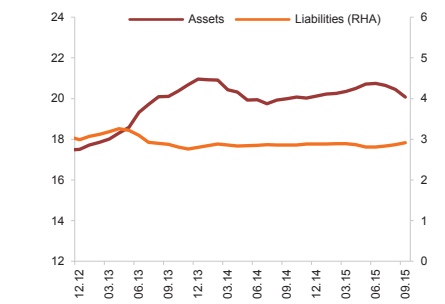
To conclude, despite the moderate rise in the amount of bilateral indebtedness relations among banks, the ratio is below 3 percent and it can be asserted that the risk from the "contagion channel" is quite limited for the banking system. Meanwhile, the findings of the network analysis reveals that the interconnectedness among banks increase in tandem with the growth in the banking sector; nevertheless, it is still low compared to similar network analyses carried out for financial markets.

### III.3. Interest Rate and Exchange Rate Risk

The likely adverse impacts of the normalization process in advanced economies on capital flows shall be closely monitored with respect to the interest rate risk that the banking sector might be exposed to in the upcoming period. The interest rate risk has been analyzed in the framework of the impacts of the re-pricing resulting from the maturity mismatch between the banking sector's assets and liabilities and the re-valuation in the securities portfolio.<sup>10</sup>

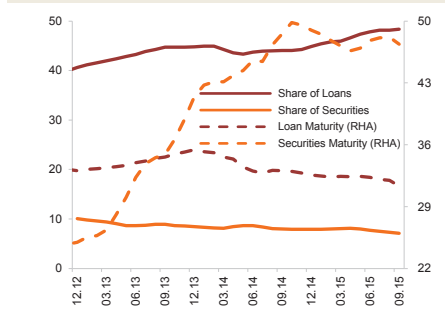
**The maturity mismatch between banks' TL assets and liabilities has slightly improved compared to the last report period.** This improvement can be mainly attributed to the contraction in the maturities of assets (Chart III.3.1). The maturity of assets has been fluctuating within a narrow band since 2013. In this period, the downtrend in the maturities of loans making up approximately half of the interest rate-sensitive assets and the decline in the share of securities portfolio have been important

**Chart III.3.1**  
Maturities of TL Assets-Liabilities of Banks  
(Interest rate-sensitive assets and liabilities, 3-Month MA, Month)



Source: CBRT

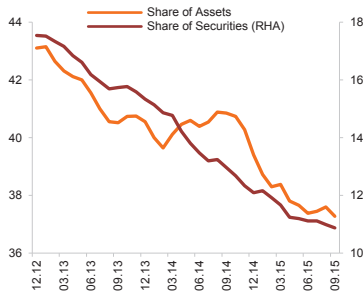
**Chart III.3.2**  
Fixed-Rate TL Loan and Securities' Share<sup>1</sup> and Maturity  
(3-Month MA, Percent, Month)



[1] Share in total interest rate sensitive assets.  
Source: CBRT

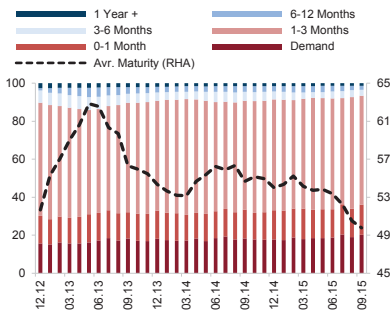
<sup>10</sup> In this section, participation banks have been excluded from the study. As for maturities, days to repricing have been used. The interest rate-sensitive on-balance asset and liability items and derivatives have been used in the analysis.

**Chart III.3.3**  
Share<sup>1</sup> of Floating-Rate TL Assets and Securities  
(3-Month MA, Percent)



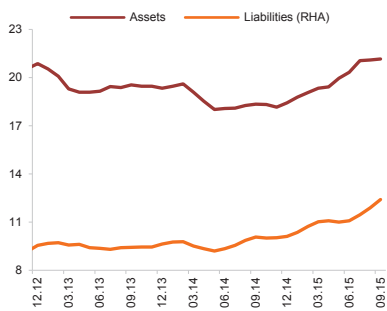
(1) Share in total interest rate sensitive assets.  
Source: CBRT

**Chart III.3.4**  
Breakdown of Maturity of TL Deposits<sup>1</sup> and the Average Maturity<sup>2</sup> (Percent, Day)



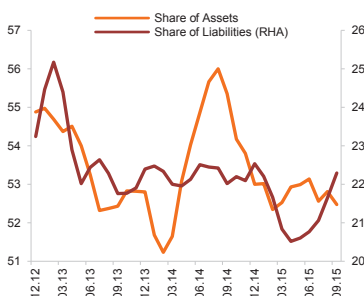
(1) Banking sector deposits and precious metal deposit accounts excluded.  
(2) Participation banks excluded.  
Source: BRSA

**Chart III.3.5**  
Maturities of Banks' FX Assets-Liabilities  
(3-Month MA, Month)



Source: CBRT

**Chart III.3.6**  
Share of Variable Rate FX Assets and Liabilities in Interest Sensitive FX Assets and Liabilities (3-Month MA, Percent)



Source: CBRT

developments with respect to asset maturities. The downtrend in the maturities of fixed-rate TL loans was mostly influenced by the macroprudential measures introduced towards the maturities of retail loans. Meanwhile, the decline in the share of the securities portfolio in total assets had a two-way impact. While the decline in the share of the fixed-rate securities portfolio has made a positive impact on the average maturity, the decline in the short-term variable-rate securities portfolio has made a negative impact on the average maturity. In the third quarter, the average maturity of fixed-rate loans continued to contract while the share of the fixed-rate securities portfolio having longer average maturities than loans continued to decline, which in turn contained a rise in the interest rate risk stemming from the fall in the share of TL variable-rate assets (Charts III.3.2 and III.3.3).

Meanwhile, the marginal contraction in the maturity of deposits, which is a fixed-rate liability, has made a negative effect on the maturity of liabilities. Most of the TL deposits continue to have maturities of 1-3 months and the shares of long-term deposits are declining (Chart III.3.4).

**Maturities of banks' FX assets and FX liabilities have been extended.** Over the last six months, on the FX side, the maturity of assets was extended more rapidly than the average maturity of liabilities (Chart III.3.5). While the extension of the maturity of FX assets was driven by the extension of maturities of both fixed and variable rate assets, on the liabilities side, the extension in the maturity of fixed-rate liabilities was limited by the contraction of the maturity of variable-rate liabilities. On the liabilities side, even if the share of variable-rate FX liabilities is low, the recent rise in this item limited the extension in the maturity of liabilities (Chart III.3.6).

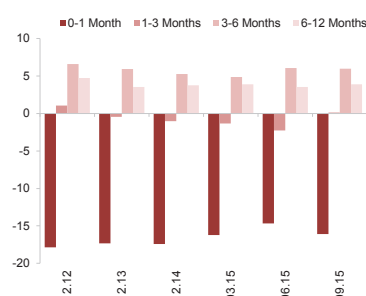
**There has been a modest improvement in the interest rate-sensitive TL position subject to repricing while there has been no significant change in the FX position.** The decline in the TL short position was mainly driven by the improvement in maturities up to 1 month and 1-to-3 months on the TL side (Chart III.3.7). On the FX side, the improvement in the maturity of 1-to-3 months was offset by the deterioration in the maturity of 6-to-12 months (Chart III.3.8).

In the quantitative analysis made towards measuring interest rate exposure, based on banks' balance sheets at the beginning of the specified period, their interest rate-sensitive assets and liabilities with maturities of 0-to-1, 1-to-3, 3-to-6 and 6-to-12 months have been repriced according to assumed interest rate hikes of 500 basis points on TL side and 250 basis points on FX side. Under the assumption that the interest rate shocks would last for 1 year, the losses emerging from repricing interest rate-sensitive assets and liabilities was divided by the regulatory capital amount. The ratio calculated shows the probable losses that might emerge in regulatory capital after shocks.

**Accordingly, under a scenario assuming an interest rate shock that would last for 1 year, the banking system's sensitivity to the interest rate risk is estimated to be limited for maturities up to 1 year and the regulatory capital levels are strong enough against losses that might emerge as a result of interest rate shocks.** For the period analyzed, it is estimated that a TL interest rate shock would lead to greater losses than an FX interest rate shock and the losses due to the TL and FX interest rate shocks would be 1.9 percent and 0.7 percent of regulatory capitals, respectively. Almost half of this difference in the size of the impact stems from the difference in the severities of the interest rate shocks that interest rate-sensitive TL and FX assets and liabilities are exposed to, while the remaining half stems from the difference between the absolute magnitudes of interest rate-sensitive short positions. Compared to end-2014, the ratio of losses stemming from TL interest rate shocks to regulatory capital decreased by 0.1 percent, while the ratio of losses stemming from FX interest rate shocks increased by 0.1 percent. Therefore, the overall impact of the shocks on the regulatory capital has been limited and there has been no significant change compared to end-2014 (Chart III.3.9).

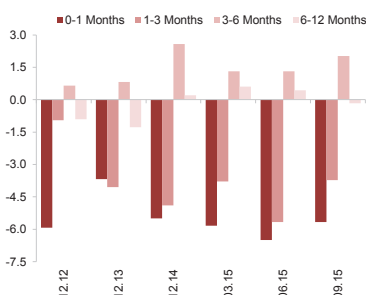
The decline in the share of securities in total assets of the banking sector continues. The share of FX assets, which constitute almost one third of the securities portfolio, in total securities has grown markedly since 2013 (Chart III.3.10). The securities portfolio has a significant weight in banks' balance sheets and more than half of the securities portfolio is composed of fixed-rate securities. Thus, in the case of negative shocks to

**Chart III.3.7**  
TL Assets-Liabilities Position / Total Liabilities<sup>1</sup>  
(Interest-Rate Sensitive Asset - Liability Difference, Percent)



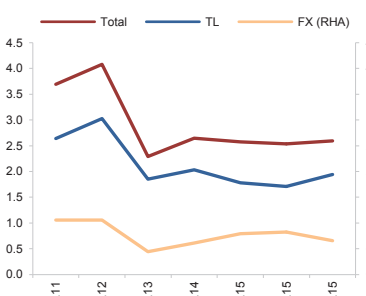
(1) Interest rate sensitive on-balance sheet assets and liabilities, and derivatives are used. Source: CBRT

**Chart III.3.8**  
FX Asset-Liability Position / Total Liabilities<sup>1</sup>  
(Interest-Rate Sensitive FX Asset - Liability Difference, Percent)



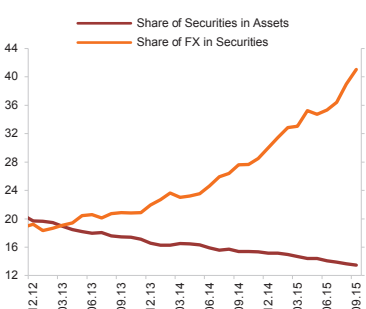
(1) Interest rate sensitive on-balance sheet assets and liabilities, and derivatives are used. Source: CBRT

**Chart III.3.9**  
Lost/Capital after TL and FX Interest Rate Shocks<sup>1</sup>  
(Percent)



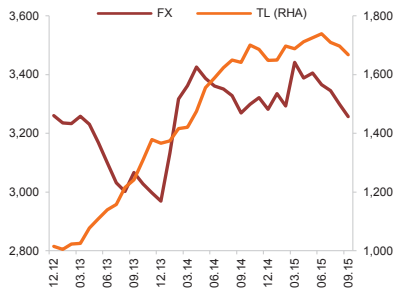
(1) Calculations are based on the data of banks with an asset size of TL 6 billion and more (excluding Eximbank and Provincial Bank- İller Bankası). Source: CBRT, BRSA

**Chart III.3.10**  
Securities Portfolio  
(Percent)



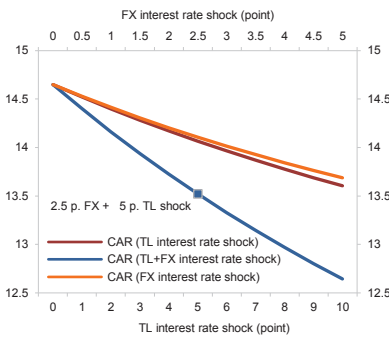
Source: BRSA

**Chart III.3.11**  
Weighted Average Maturity of Securities  
(Day, Based on remaining maturity)



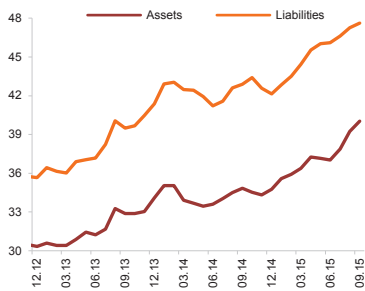
Source: CBRT

**Chart III.3.12**  
Impact of TL and FX Interest Rate Shocks on the CAR  
(Percent)



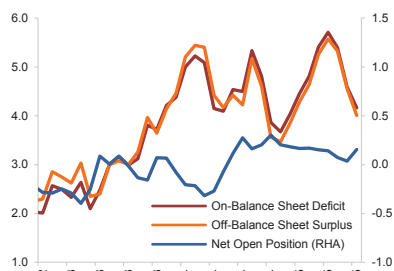
(1) For interest rate shocks calculations include 99% of TL securities, 90% of FX securities. Source: CBRT, BRSA, Bloomberg (Latest data: 09.2015)

**Chart III.3.13**  
Share of FX in Banking Sector Assets and Liabilities  
(Percent)



Source: CBRT

**Chart III.3.14**  
Ratio of FX Positions to Total Assets  
(Percent)



Source: BRSA

both TL and FX interest rates, the balance sheets of banks may be affected via profit/loss accounts. Meanwhile, maturities of both TL and FX securities contracted in the third quarter of 2015; this is deemed to be a factor mitigating the repricing risk (Chart III.3.11).

The interest rate analysis has been applied to banks' fixed-rate TL and FX securities, like Treasury bills and bonds, foreign government bonds and corporate sector bonds, for which the market interest rates and current value data are accessible. In terms of amount, this sub-group of securities constitutes 99 percent of banks' fixed-rate TL and FX securities.

**The banking sectors sensitivity to interest rate shocks through the securities portfolio is believed to be limited and the sector's current capital level is strong enough to meet the losses in case of an interest rate shock.** TL interest rate shock of up to 1000 basis points will have up to 105 basis points of a negative effect on the sector's CAR, whereas FX interest rate shock of up to 500 basis points will have up to 96 basis points of a negative effect. When 500 basis points of TL and 250 basis points of FX interest rate shocks mentioned in the repricing section are imposed simultaneously, the CAR of the sector falls by 113 basis points (Chart III.3.12).

**Banks are not directly exposed to exchange rate risk due to exchange rate movements.** In the banking sector, the share of on-balance-sheet FX assets and liabilities has been significantly increasing since 2012 while the share of FX in liabilities is higher than the share of FX in assets (Chart III.3.13). The on-balance-sheet FX position has been more volatile compared to the movements in assets and liabilities. Banks' on-balance sheet short positions and off-balance sheet long positions increase at the same time, thus the net open position displays a balanced trend (Chart III.3.14). The impact of a rise in exchange rates on the CAR has been analyzed assuming that the open position losses are directly deducted from regulatory capital and the fixed risk weighted assets. The results of the analysis suggest that a rise in exchange rates as high as 100 percent would lead to a limited gradual decline of 19 basis points on the CAR through the net open position channel.

### III.4. Capital Adequacy and Profitability

The 12-month cumulative net profit amount of the banking sector slightly increased year-on-year and stood at TL 24.7 billion as of September 2015 (Chart III.4.1). The rise in the net profits can be mainly attributed to the increased net interest income stemming from loans. Despite the rise in the net interest income, the increase in the net profits was contained by the rise in the specific provision expenses and the deterioration in the non-interest income-expense position (Chart III.4.2). The rise in general provisions and the adjustment account pertaining to the prior periods' income in which reimbursements of the fees and commissions are recognized, had an influence on the non-interest income-expense imbalance.

The sum of the profits/losses of the capital market and foreign exchange transactions, which was positive in 2013, has been on the negative side since 2014. This development is mainly attributed to the rise in the capital market transaction losses that moved upwards since 2014. As from May 2015, unlike previously, banks could not make profits from currency swap transactions due to the increase in the interest rates on these transactions and thus capital market and foreign exchange transaction losses increased (Chart III.4.3).

The recent rise in NPL ratios is adversely affecting the profitability of banks. Nevertheless, the ratio of specific provision expenses recorded on the income statement to average loans is approximately flat and has decreased recently. This mainly stemmed from the rise in average loans with the impact of the exchange rate effect and the moderate decline in bank's coverage ratios. The banking sector keeps provision for 74 percent of non-performing loans. However, when the collaterals against loans extended are evaluated along with the consideration ratios, it is observed that banks are on average keeping provisions of more than 100 percent. The impact of the rise in NPL on banks' profitability are less influential owing to the recent decline in banks' adjusted coverage ratios (Chart III.4.4).

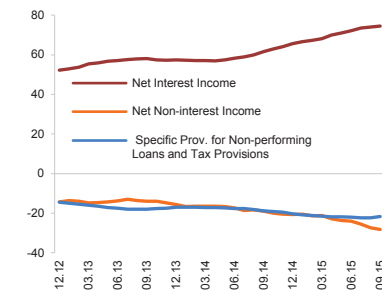
While the banking sector's 12-month cumulative net profits displayed an uptrend for the one-year period starting from the second half of 2014, return on assets remained flat because of

**Chart III.4.1**  
Net Profits Developments  
(12-Month Cumulative, Billion TL)



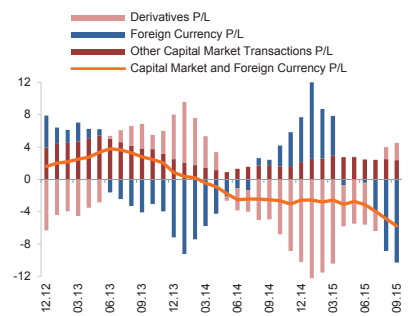
Source: CBRT

**Chart III.4.2**  
Components of Net Profits  
(12-Month Cumulative, Billion TL)



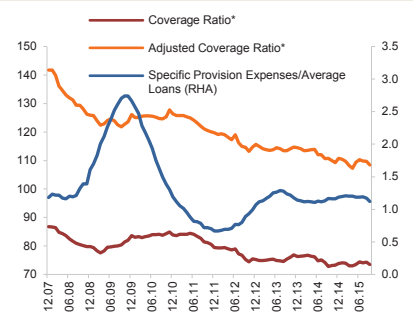
Source: CBRT

**Chart III.4.3**  
Capital Market and Foreign Currency Transactions Profits/Losses<sup>1</sup>  
(12-Month Cumulative, Billion TL)



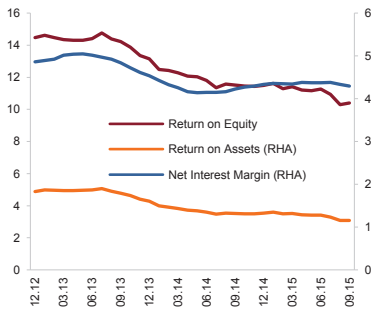
(1) Consists of capital market transactions P/L, derivatives P/L and other capital market transactions P/L.  
Source: CBRT

**Chart III.4.4**  
Credit Quality and Cost of Credit Risk  
(Percent)



(\*) Coverage Ratio=Provision for Non-performing Loans/Non-performing Loans  
(\*\*) Adjusted Coverage Ratio=Provision for Non-performing Loans/(Non-performing Loans-Collaterals Adjusted by Consideration Ratios)  
Source: CBRT, BRSR (Latest Data: 09.15)

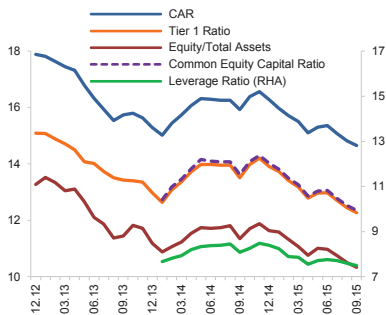
**Chart III.4.5**  
Profitability Indicators  
(Percent)



Source: CBRT

exchange rate effect and return on equity remained flat due to revaluation increments. Nevertheless the recent decrease in profitability and ongoing asset growth stemming from exchange rate effect pushed profitability indicators to move downwards again (Chart III.4.5). As the rise in the loan-deposit rate spreads is reflected on net interest margin with a lag due to the asset-liability duration difference and one-off impacts unbalancing non-interest income-expense balance fade, the profitability ratios are expected to assume an uptrend in the upcoming period.

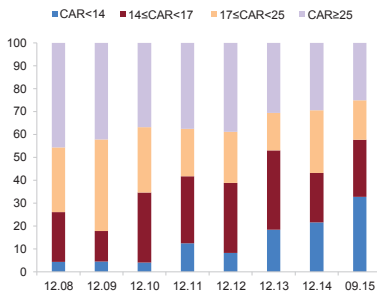
**Chart III.4.6**  
Capital Indicators  
(Percent)



Source: CBRT, BRSA

In September 2015, the CAR of the banking sector declined to 14.7 percent and the tier 1 capital ratio to 12.3 percent. In the same period, the regulatory capital and risk-weighted assets increased by 7.9 percent and 20 percent, respectively (Chart III.4.6). The value at credit risk, which makes up 90 percent of total risk-weighted assets, increased by 19.7 percent compared to end-2014 due to exchange rate developments, while the value at market risk climbed by 43.4 percent due to increased exchange rate and interest rate volatility. While the number of banks with CARs below 14 percent has been gradually increasing since 2013, this increase became more evident in September 2015 (Chart III.4.7). On the other hand, the core CAR ratio of the banking sector, which has been calculated since early 2014, was 12.3 percent in September 2015 marking a quite higher level than the minimum legal limit (Chart III.4.6).

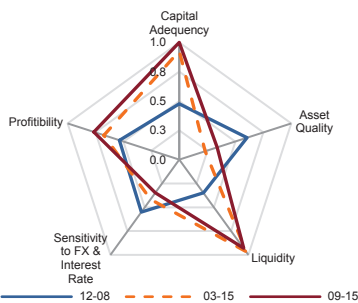
**Chart III.4.7**  
Number of Banks by CAR Brackets  
(Percentage Share)



Source: BRSA

The banking sector leverage ratio, which was introduced to ensure that the banks maintain adequate capital against any potential risks due to the leverage impact, was 7.5 percent in September 2015. This ratio is well above the minimum legal limit of 3 percent and following a stable path. In addition, there are no banks with a leverage ratio below 3 percent (Chart III.4.6).

**Chart III.4.8**  
Banking Sector Stability Map<sup>1</sup>



[1] A sub-field of the "Financial Stability Map".  
Source: CBRT, BRSA

An analysis of the development of risk indicators in the banking sector compared to the last Report period shows that the asset quality, profitability and capital adequacy indicators have slightly deteriorated while exchange rate and interest rate sensitivity indicators have improved; there has been no significant change in liquidity (Chart III.4.8)



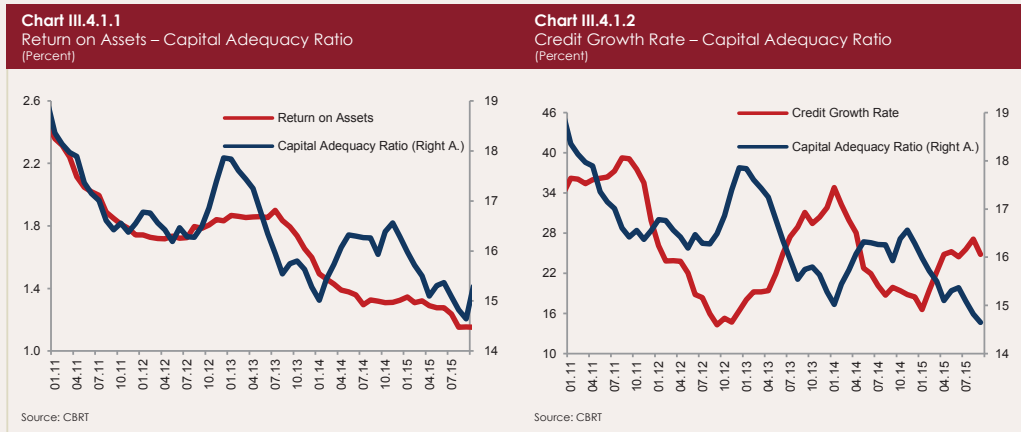
Box  
III.4.1

Capital Adequacy Ratio - Loan Growth - Return on Assets

Regulations on capital adequacy increase the importance of the capital level on banks' decisions about loan supply. For instance, banks with capital adequacy ratios close to the (regulatory specified) minimum limit have to restrict loan growth and/or increase their equity capital. In order for the banks to keep their equity capital at a level that they desire they need to have a reasonable profit level. Therefore, capital adequacy and profitability of banks play crucial roles in the banks' capacity to fund the economy.

The degree of the constraints on loan growth that recent movements in level of capital adequacy and profitability impose on Turkish banking system is analyzed in this box. For the purpose of this analysis, the capital adequacy ratio (CAR), return on assets and loan growth variables have been expressed as mathematical relationships under several assumptions.

Over the last few years, the CAR of the Turkish banking system displayed a downtrend on the back of the rapid growth in loans. The return on assets (ROA), which had been quite high until recently, also declined in the last few years (Chart III.4.1.1 and III.4.1.2). Meanwhile, capital adequacy ratios as well as profitability averages in Turkey are at reasonable levels compared to their levels in peer countries.



**Relationship between Capital Adequacy, Profitability and Loan Growth**

The CAR is defined as the ratio of regulatory capital (RC) to risk-weighted assets (RWA):

$$(1) CAR_t = RC_t / RWA_t$$

RWA is mostly composed of loans. Therefore, as confirmed by historical data, assuming RWA growth be equal to loan growth (LG) would not be misleading:

$$(2) RWA_{t+1} = (1 + LG_t) * RWA_t$$

Under the assumption that the RC is only supported with retained earnings in each period and the ratio of return on assets (ROA) is positive ( i.e., banks are making profits), the regulatory capital dynamic can be expressed with the equation below:

$$(3) RC_{t+1} = RC_t + ROA_t * TOA_t * RER_t$$

Retained earnings is derived by multiplying total profit -which is the sum of ROA multiplied by total assets (TOA)-, with the parameter (RER), representing the ratio of retained earnings over net income.

If the definition of the CAR (1) and the dynamic equation of RWA (2) are used, and the ratio of TOA to RWA is assumed to be stable in time, equation no (3) expressing the regulatory capital dynamics ( $TOA_t/RWA_t = \rho > 1$ ) can be modified to show the CAR dynamic as follows:

$$(4) \text{CAR}_{t+1} = \frac{\rho \text{ROA}_t * \text{RER}_t}{(1 + \text{LG}_t)} + \frac{1}{(1 + \text{LG}_t)} \text{CAR}_t$$

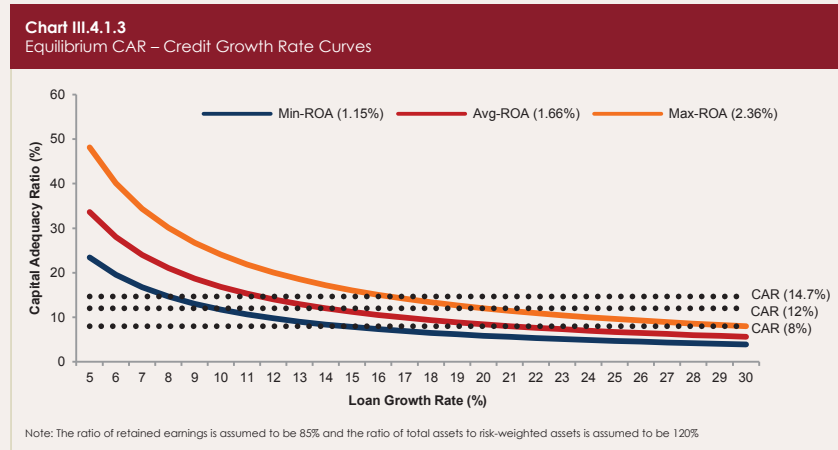
The equation implies that CAR would follow a stable trajectory provided that the return on assets, profit distribution ratio and loan growth have a stable path. By removing the time dimension, the long-term relation between variables can be shown as follows:

$$(5) \text{CAR} = \rho * \text{RER} * \text{ROA} * \frac{1}{\text{LG}}$$

By using the equation, for a specified CAR value, CAR-consistent ROA and LG values can be calculated.

#### Graphic Illustration of the Relations between Variables

Chart III.4.1.3 presents curves connecting CAR and loan growth values that are consistent with each other for different return on assets ratios. The return on assets ratios used are the minimum – and at the same time current (1.15 percent), average (1.66 percent) and maximum (2.36 percent) values that have been observed in the banking sector since January 2011. The horizontal lines denote the current CAR level (14.7 percent) and the regulatory ratios (12 percent and 8 percent).



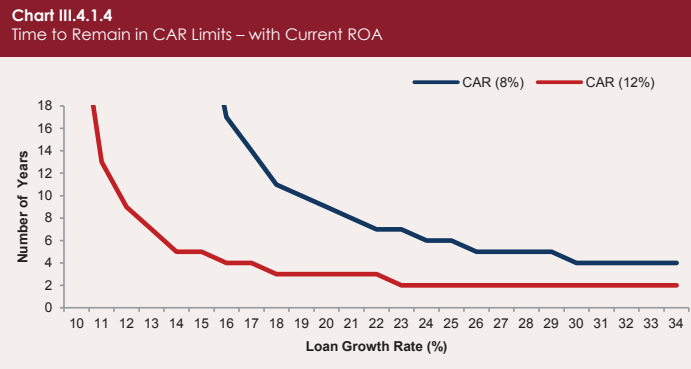
As demonstrated in Chart III.4.1.3, to retain the current value of the CAR under the historical minimum value of 1.15 percent, the loan growth ratio shall be approximately 8 percent. Loan growth rates above 8 percent would pull down the CAR under the current return on assets conditions. Actually, at a loan growth rate of 10 percent, the equilibrium value of the CAR would decrease to 12 percent and at a loan growth rate of 15 percent, the equilibrium CAR would come down to 8 percent, the regulatory minimum level.

If the return on assets of the banking sector takes greater values, higher loan growth ratios can be supported by keeping the CAR values unchanged. If the sector's return on assets hover around the values observed after 2011, to keep the CAR values of 14.7, 12 and 8 percent, the loan growth shall be 10 percent, 14 percent and 21 percent, respectively. Meanwhile, if the sector profitability reaches 2.36 percent which is the highest value observed in the analysis period, the maximum loan growth rates to support the equilibrium CARs would be 16 percent, 20 percent and 30 percent.

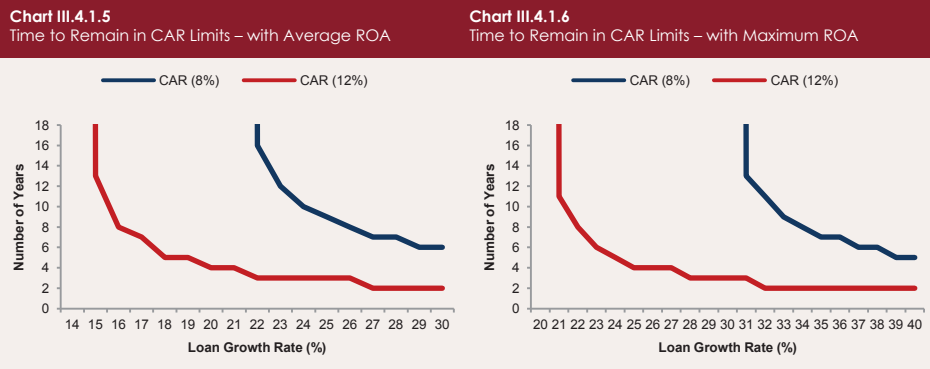
Meanwhile the ratios of retained earnings that are kept constant in the analysis have a direct influence on the equilibrium CAR-loan growth rate values. Lowering the amount of profit distributed can lead to a faster loan growth rate for a specific CAR.

In addition to the equilibrium analysis, starting from the banks' current capital adequacy ratios, banks were exposed to different growth rates to see when they would fall below the regulatory CARs. For return on assets, 3 different values were taken into account similar to the analysis above.

The results of the analysis suggest that if the banking sector maintains its current return on assets level and continues its operations with a loan growth rate over 20 percent, the sector's CAR will decrease to 12 percent at the end of 2 years. If the loan growth rate is kept at 15 percent, the sector's CAR will decrease to 12 percent at the end of 4 years. As indicated in previous section at the current return on assets ratio, a 10 percent loan growth rate will keep the CAR at 12 percent and loan growth rates below 10 percent should push the CAR above the current values (Chart III.4.1.4).



Meanwhile, if the return on assets level of the banking sector increases alongside the same loan growth rates, either it will take longer for the CAR to decrease to the regulatory limits or the CAR will be balanced at a higher level than the starting point at the related loan growth rates (Chart III.4.1.5 and III.4.1.6).



To sum up, the relationships between profit level, capital level and loan growth rate have been expressed in mathematical equations under several assumptions. The analyses made on the equations suggest that if the long-term value of the Turkish banking system's return on assets is kept close to the average values calculated after 2011, the system will not have any difficulty in supporting a moderate loan growth. Although it is not possible to make an exact estimation on how long it will take for the return on assets to converge to the historical averages, the analyses suggest that the current CAR level is high enough for the banks not to have to change their loan growth rates in the short term.