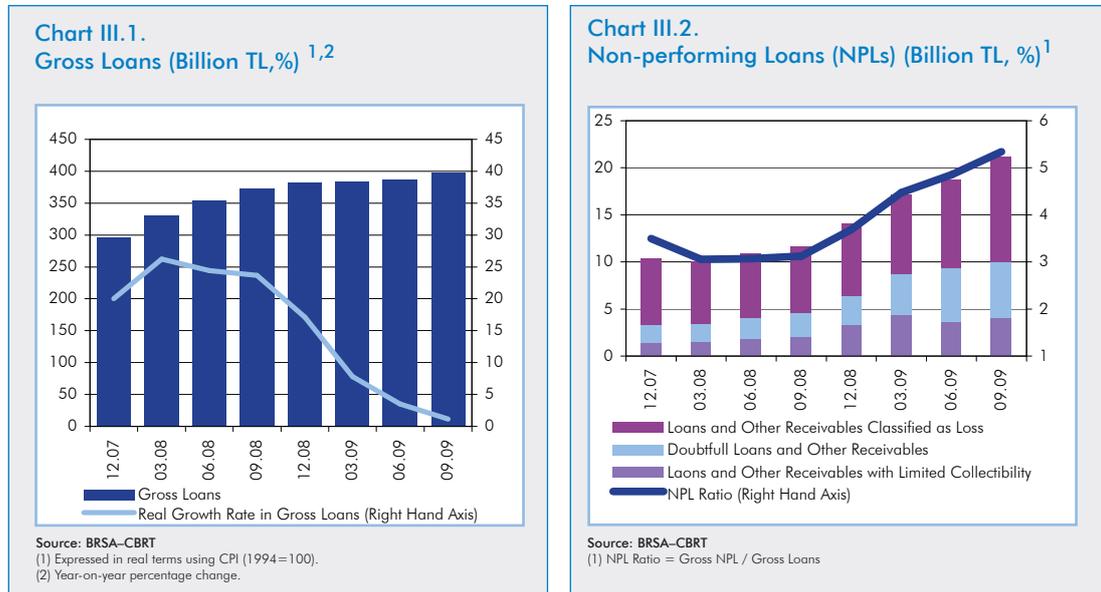# III. BANKING SECTOR RISKS

III.1. Credit Risk and Scenario Analysis

III.1.1. Credit Risk

The growth rate of credits decreased due to tighter credit conditions and a slowdown in economic activity stemming from the global economic crisis.

Nonetheless, a recovery, albeit limited, has recently been observed in loans as a result of the impact of cumulative policy rate cuts since the last quarter of 2008 on market interest rates, liquidity measures and the improvement in risk perceptions.

Chart III.1.
Gross Loans (Billion TL,%) [1,2]

Source: BRSA–CBRT
(1) Expressed in real terms using CPI (1994=100).
(2) Year-on-year percentage change.

Chart III.2.
Non-performing Loans (NPLs) (Billion TL, %) [1]

Source: BRSA–CBRT
(1) NPL Ratio = Gross NPL / Gross Loans

Credit volume reached TL 396.9 billion by September 2009 (Chart III.1). As a result of the decline in purchasing power of the corporate sector and households, the amount of non-performing loans reached TL 21.2 billion in September 2009 and the NPL ratio became 5.3 percent. An analysis of the breakdown of non-performing loans reveals that the "Loans and Other Receivables Classified as Loss" group had the largest share (Chart III.2).

Table III.1. NPL Ratios in Selected Countries

	2006	2007	2008	2009	Latest data
Brazil	3.5	3.0	3.1	4.3	May
Bulgaria	2.2	2.1	2.4	3.2	March
Czech Republic	3.7	2.8	3.3	4.4	June
Croatia	5.2	4.8	4.9	6.0	June
Serbia	4.1	3.8	5.3	9.7	June
Hungary	2.5	2.5	3.0	4.8	June
Latvia	0.4	0.4	3.6	10.7	May
Lithuania	1.0	1.0	4.6	11.3	June
Poland	7.4	5.2	4.4	5.7	April
Romania	8.0	9.7	13.8	-	December
Russia	2.4	2.5	3.8	7.6	June
UK	0.9	0.9	1.6	-	December
USA	0.8	1.4	3.0	3.8	March
Turkey	3.8	3.5	3.6	5.3	August

Source: IMF Global Financial Stability Report, October 2009.

A comparative analysis of NPL ratios in selected countries shows that, with the effect of the crisis, this ratio has significantly increased in most countries, similar to the trend in Turkey (Table III.1).

Table III.2. Selected Credit Ratios[1] (Million TL, %)

|	2007	09.08	2008	09.09
First 5 Banks				
Total Gross Loans	162.452	204.063	211.543	211.313
Share in Total Gross Loans	54,9	54,8	55,5	53,2
NPLs / Total Gross Loans	3,8	3,1	3,7	5,4
Loans / Deposits	88,8	93,6	89,4	83,8
Provision/NPL	89,5	84,3	84,8	88,1
First 10 Banks				
Total Gross Loans	236.833	298.601	309.321	318.576
Share in Total Gross Loans	80,0	80,1	81,1	80,3
NPLs / Total Gross Loans	3,6	3,0	3,5	5,1
Loans / Deposits	77,2	82,6	79,0	75,8
Provision/NPL	89,4	84,2	83,5	84,9
Sector				
Total Gross Loans	295.962	372.717	381.497	396.933
NPLs / Total Gross Loans	3,5	3,1	3,7	5,3
Loans / Deposits	82,9	89,0	83,9	81,2
Provision/NPL	86,8	80,5	79,8	80,0

Source : BRSA-CBRT
(1) The first 5 and 10 banks ranked according to their gross loans.

80.3 percent of total loans as of September 2009 were extended by the first 10 banks. The loans to deposits ratio of the banking sector has been declining since the last quarter of 2008. The loans to deposits ratio, which reached 89 percent in September 2008 as its highest level, came
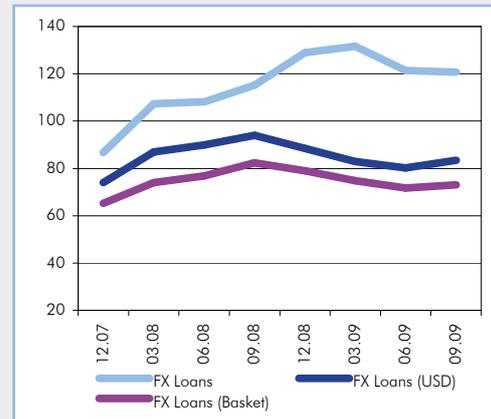
down to 81.2 percent, marking a 7.8 point fall. While the share of the first 5 and 10 banks in terms of total credits has been declining, that of other banks has been increasing (Table III.2).

Chart III.3.
Currency Composition of Loans
(%, Excluding NPLs)
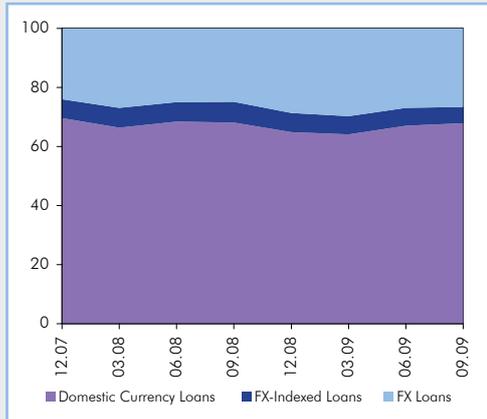
Source: BRSA-CBRT

Chart III.4.
FX Loans
(Billion, Excluding NPLs)[1,2]

Source: BRSA -CBRT
(1) Converted to USD using the CBRT buying exchange rates as of month-end.
(2) FX basket is composed of 70 percent of the USD buying exchange rate and 30 percent of the Euro buying exchange rate.

67.9 percent of total loans extended in September 2009 were Domestic Currency Loans while 26.6 percent were FX loans and 5.5 percent FX-indexed loans. While the rise in the share of FX-loans in the September 2008-March 2009 period was mainly driven by the depreciation of TL, FX-loans in terms of USD and based on the FX-basket reveals that there has been a decline compared to September 2008 (Chart III.3 and Chart III.4).

Chart III.5.
Distribution of Loans by Provinces (%)[1]
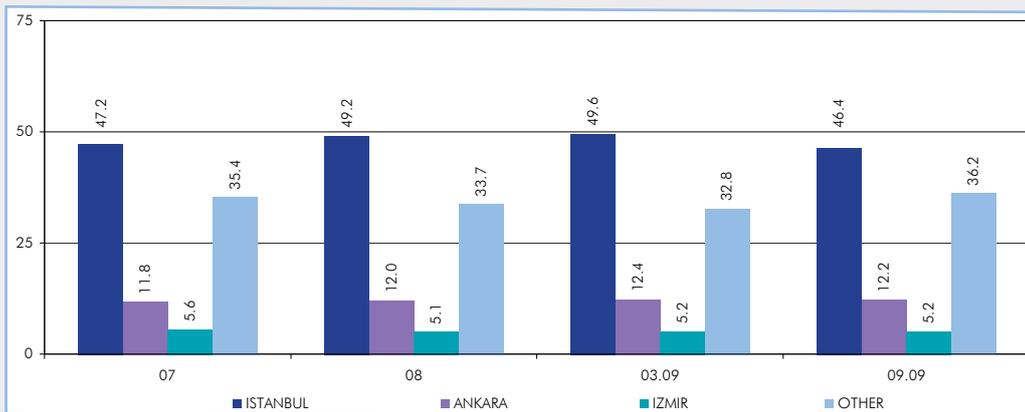
Source: CBRT
(1) Loans are compiled based on bank reporting under the scope of Central Bank Law No:1211, Article:44. They include corporate loans greater than 10 thousand Turkish Liras (inclusive) and retail loans greater than 5 thousand Turkish Liras (inclusive); extended to real and legal bodies by banks (including external loans used by firms with the intermediation of banks). They are inclusive of non-performing loans and accrued interest and exclusive of non-cash loans. Since October 2007, NPL's are being disclosed on the basis of firms without being subject to any limits.

The geographical breakdown of loans shows that the share of Istanbul in total loans decreased while the shares of Ankara, Izmir and other provinces increased in September 2009 compared to end-2008 (Chart III.5).

Chart III.6.
Loan Interest Rates (%)[1,2]

Source: CBRT
(1) Weighted average flow interest rate.
(2) November 2009 data is as of 6 November 2009.

Chart III.7.
Spread between Corporate Loan and Deposit Rates (%)[1,2]
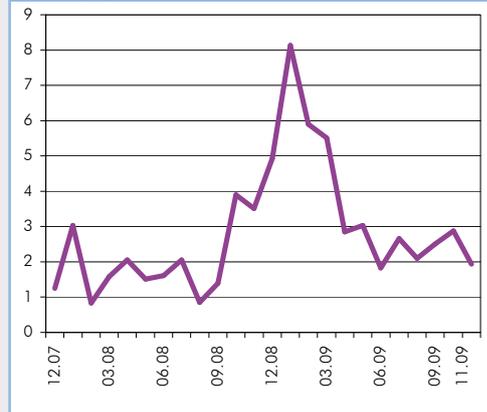
Source: CBRT
(1) Weighted average flow interest rate.
(2) November 2009 data is as of 6 November 2009.

Although the effects of the increased funding costs of the banking sector and adverse expectations about economic activity brought about an increase in loan rates in October 2008, these rates have decreased as an effect of the interest rate cuts of the CBRT and fell even below the September 2008 level (Chart III.6). The spread between corporate loan and deposit rates, an indicator of the tightness in credit conditions, which climbed till February 2009, decreased till June 2009 due to the improvement in risk perceptions and economic recovery, and followed a stable trend afterwards (Chart III.7).
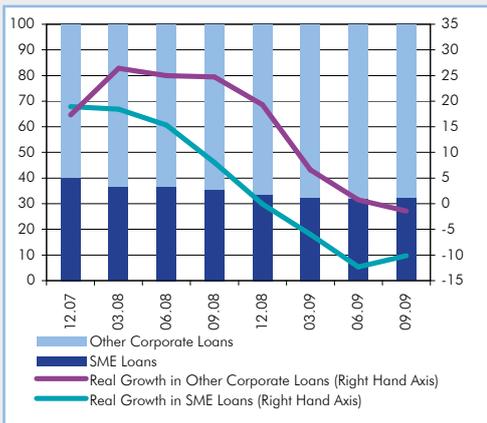
Chart III.8.
Breakdown of Gross Loans and Real Growth Rates (%)[1,2]
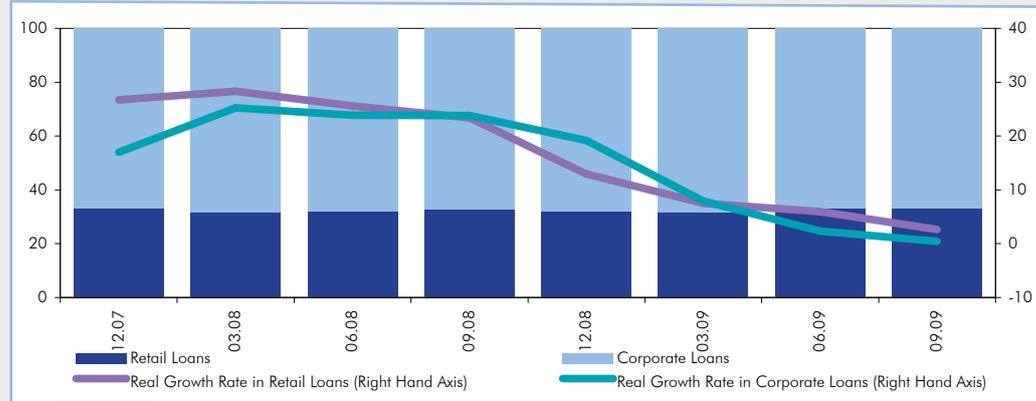
Source: BRSA -CBRT
(1) Expressed in real terms using CPI (1994=100).
(2) Annual percentage change as compared to the same period of last year.

As of September 2009, 33.1 percent and 66.9 percent of total loans were composed of retail loans and corporate loans, respectively. While the slowdown in growth rate of total loans mainly stemmed from corporate loans, the annual real growth rate of retail loans and corporate loans decreased to 2.6 and 0.5 percent, respectively, as of September 2009 (Chart III.8).

Chart III.9.
Corporate Loans by Type (Excl. NPLs, %)[1,2]

Other Corporate Loans
SME Loans
Real Growth in Other Corporate Loans (Right Hand Axis)
Real Growth in SME Loans (Right Hand Axis)

Source: BRSA –CBRT
(1) Growth rates were brought to real terms by using CPI (1994=100).
(2) Annual percentage change as compared to the same period last year.

Chart III.10.
NPL Ratios of Corporate Loans (%)[1,2]

SME Loans
Other Corporate Loans
Total Corporate Loans
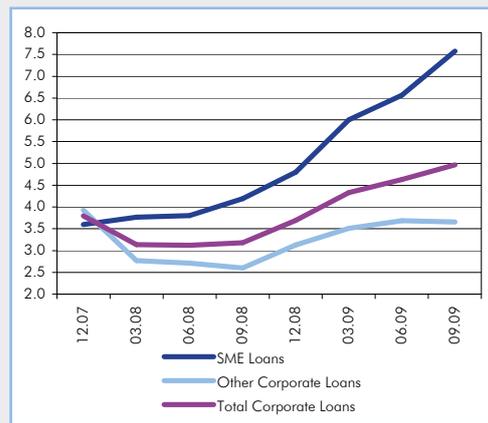
Source: BRSA –CBRT
(1) NPL Ratio = Gross NPL / Gross Loans
(2) Other corporate loans calculated by subtracting SMEs from total corporate loans.

Due to the global liquidity squeeze and tighter credit conditions, the amount of corporate loans decreased to TL 252.4 billion in September 2009. The flat outlook in loans extended to Small and Medium-sized Enterprises (SMEs)[3] that comprise 32.5 percent of corporate loans persists (Chart III.9). While the NPL ratio of corporate loans other than SME loans increased by 1 percentage point and reached 3.7 percent in the September 2008-September 2009 period, the same ratio for SME loans increased by 3.5 percentage point to reach 7.6 percent (Chart III.10). However, in the upcoming period, SME loans are expected to assume an upward trend and the NPL ratio of SME loans is expected to decrease, as the support provided for the Credit Guarantee Fund becomes operational.

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[3]Enterprises that are included in the Regulation on ''Definition, Properties and Classifications of Small and Medium Sized Enterprise'', prepared by the Ministry of Industry and Trade and published in the Official Gazette dated 18.11.2005 and numbered 25997.

Box 10.
The Council of Ministers Decision on the Principles and Procedures of Treasury Support that will be Provided to Credit Guarantee Fund Inc.

SMEs have encountered financial difficulties due to tightening the lending terms that resulted from the reflection of the global crisis on our country. In order to help alleviate these difficulties, a provisional article has been added to the Law on Regulating Public Finance and Debt Management No: 4749 with Law No: 5909 published in the Official Gazette dated June 24, 2009 and the Undersecretariat of Treasury is authorized to transfer cash funds of up to TL 1 billion to credit guarantee institutions that provide guarantees for loans and/or issue private placement domestic government bonds. "The Decision on Principles and Procedures of Treasury Support that will be Provided to Credit Guarantee" was published in the Official Gazette No: 27289 dated July 15, 2009, and in the framework of the mentioned decision, a protocol was signed between Credit Guarantee Fund Inc (CGF) and the Undersecretariat of Treasury on October 13, 2009. After the signing of the protocol between CGF and the banks that provide loans, the mentioned fund will come into effect as a credit guarantee.

In order to take advantage of the stated opportunity, SMEs have to fulfill the requirements in "The Decision on Principles and Procedures of Treasury Support that will be Provided to Credit Guarantee Institutions".

The loans available in these circumstances, will be TL, FX or FX indexed and will have a maturity from a minimum of six months to a maximum of four years. The amount of guarantee that will be provided is limited to TL 1 million per beneficiary and as for beneficiaries of the same risk group, it is limited to TL 1.5 million. With the provision of the mentioned fund, it is aimed to provide a guarantee to loans by the CGF in an amount equivalent to TL 10 billion in the period ahead. We are of the opinion that this amount, which is equal to almost one eighth of cash loans extended to SMEs, will provide significant support to the said firms.

Table III.3. Sectoral Composition of Corporate Loans (Excluding NPLs) [1,2]

		Loans			FX Loans/Total Loans		
		2007	2008	09.09	2007	2008	09.09
1	Wholesale and Ret. Trade, Brokerage, Repair of Mot. Veh.	19.7	18.1	17.1	35.6	42.9	38.1
2	Transport, Storage and Communication	8.5	8.2	8.5	58.3	62.1	59.1
3	Textile and Textile Products Industry	5.9	5.2	4.7	63.9	66.6	63.2
4	Construction	8.5	9.5	10.2	51.0	59.1	55.7
5	Industry of Tobacco, Beverages and Food	5.8	5.3	5.4	43.5	50.7	48.8
6	Manuf. of Basic Metals and Fabr. Metal Prod	5.8	6.1	5.7	70.6	71.7	69.7
7	Sources of Electricity, Gas and Water	4.1	5.0	5.5	90.3	90.9	92.5
8	Agriculture, Hunting and Forestry	5.6	5.1	5.1	24.4	25.6	20.8
9	Manuf. of Mach. and Equipment	3.2	3.0	2.7	41.7	50.6	52.9
10	Hotels and Restaurants (Tourism)	3.1	3.4	3.9	71.2	79.1	78.3
	Total of 10 Sectors	70.2	68.9	68.8	50.3	56.7	54.4

Source: CBRT
(1) Loans are compiled based on bank reporting under the scope of Central Bank Law No: 1211, Article:44. They include corporate loans greater than 10 thousand Turkish Liras (inclusive); extended to real and legal bodies; by banks (including external loans used by firms with the intermediation of banks). They are inclusive of accrued interest and exclusive of non-cash loans.
(2) Excluding Financial Intermediation

According to the Central Bank Risk Center data, the share of ten selected sectors in total corporate loans continued to decline and stood at 68.8 percent in September 2009. The sector

with the largest share in total corporate loans is "Wholesale and Retail Trade, Brokerage and Motor Vehicles Maintenance and Repair Services'' with 17.1 percent. The shares of "Construction", "Electricity, Gas and Water Sources" and "Hotels and Restaurants (Tourism)" sectors in total corporate loans increased, while the share of the "Agriculture, Hunting and Forestry" sector remained unchanged and the shares of other sectors diminished compared to the end of 2008. Again compared to end-2008, the share of FX loans in total loans decreased in September 2009 (Table III.3).

Table III.4. Sectoral Composition of NPL Ratios of Corporate Loans (%)[1]

		2008	09.09
1	Textile and Textile Products Industry	10.1	12.6
2	Agriculture, Hunting and Forestry	4.2	5.9
3	Wholesale and Ret. Trade, Brokerage, Repair of Mot. Veh.	3.9	5.9
4	Industry of Tobacco, Beverages and Food	4.4	5.0
5	Hotels and Restaurants (Tourism)	2.6	3.2
6	Construction	2.6	3.9
7	Manuf. of Mach. and Equipment	2.1	2.9
8	Transport, Storage and Communication	1.7	2.4
9	Manuf. of Basic Metals and Fabr. Metal Prod	1.2	2.3
10	Sources of Electricity, Gas and Water	0.1	0.2
	Total of 10 Sectors	3.4	4.6

Source: CBRT
(1) Loans are compiled based on bank reporting under the scope of Central Bank Law No:1211, Article 44. They include corporate loans that are greater than ten thousand Turkish Liras (inclusive); extended by banks (including external loans used by firms with the intermediation of banks). Firms have been disclosing their NPLs without any limits.

According to the Central Bank Risk Center data, NPL ratios of corporate loans increased compared to the end of 2008 in all sectors analyzed. The highest rise came from the "Textile and Textile Products Industry" with a 2.5 percentage points rise in the NPL ratio (Table III.4).

Chart III.11.
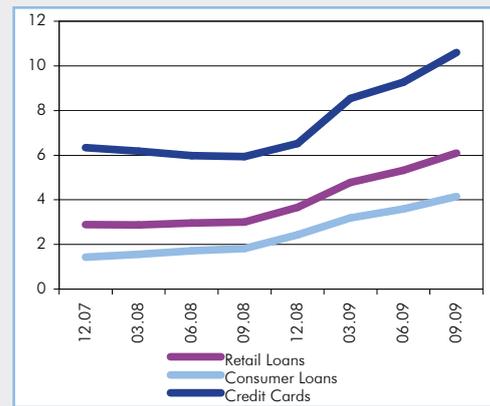Retail Loans[1,2]
(Excluding NPLs, Billion TL, %)
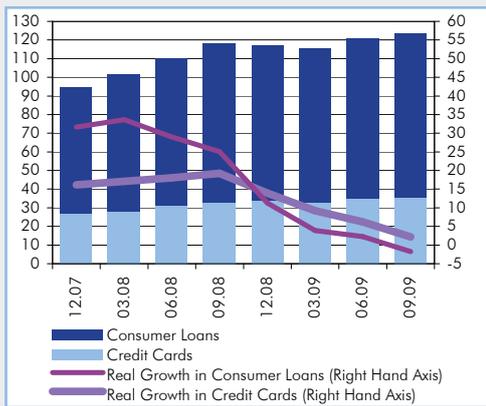
Source: BRSA -CBRT
(1) Expressed in real terms using CPI (1994=100).
(2) Year-on-year percentage change.

Chart III.12.
NPL Ratios for Retail Loans (%)[1]
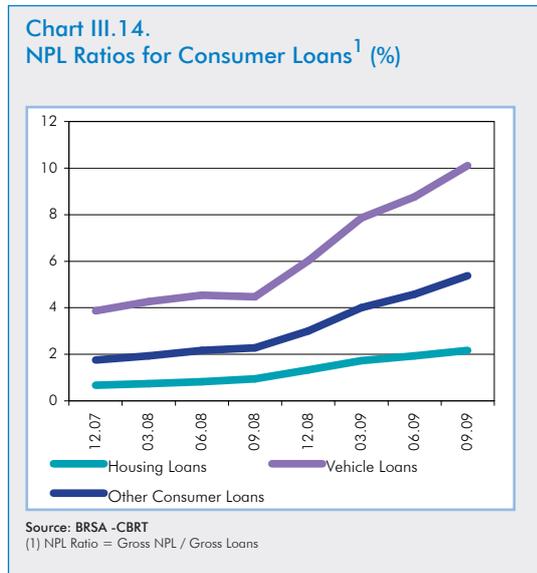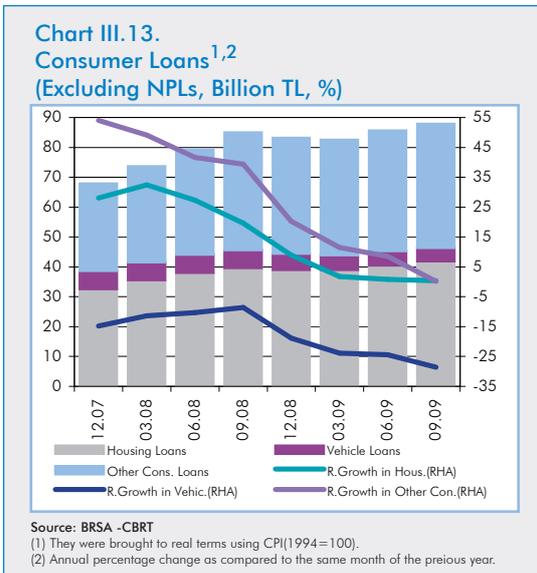

Source: BRSA -CBRT
(1) NPL Ratio = Gross NPL / Gross Loans

As of September 2009, retail loans amounted to TL 123.3 billion. As of the same period, consumer loans contracted by 1.8 percent in real terms year-on-year and credit cards[4]
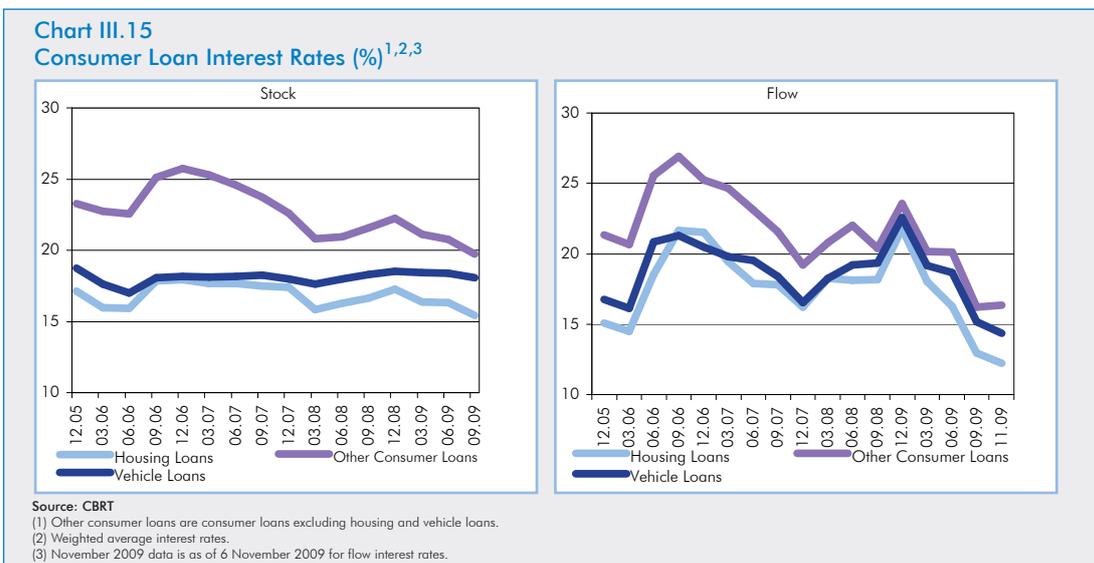
[4] Refers to the balance in the cash loans item, until credit card spending and cash withdrawals are paid back to the bank by the cardholders.

increased by 2.2 percent in real terms year-on-year (Chart III.11). Compared to March 2009, retail loans increased by 5.5 percent in real terms in September 2009 and this rise mainly stemmed from the temporary tax reductions on consumer durables.

The NPL ratio of retail loans, which was 3 percent in September 2008, climbed to 6.1 percent in September 2009 due to the decline in the coverage ratio of household liabilities. In the same period, the NPL ratio of credit cards increased from 5.9 percent to 10.6 percent (Chart III.12). TL 1.2 billion-worth of non-performing credit cards were restructured within the scope of the Law No: 5464 and on a voluntary basis in the subsequent period, and therefore, these rescheduled payments are expected to have a positive effect on the NPL ratios of credit cards (Table I.8).

Chart III.13.
Consumer Loans[1,2]
(Excluding NPLs, Billion TL, %)

Housing Loans
Other Cons. Loans
R.Growth in Vehic.(RHA)
Vehicle Loans
R.Growth in Hous.(RHA)
R.Growth in Other Con.(RHA)

Source: BRSA -CBRT
(1) They were brought to real terms using CPI(1994=100).
(2) Annual percentage change as compared to the same month of the preious year.

Chart III.14.
NPL Ratios for Consumer Loans[1] (%)

Housing Loans
Other Consumer Loans
Vehicle Loans

Source: BRSA -CBRT
(1) NPL Ratio = Gross NPL / Gross Loans

In September 2009, housing loans and consumer loans increased by 0.4 percent and 0.2 percent, respectively, in real terms year-on-year, while vehicle loans decreased by 28.6 percent, thus, total consumer loans became TL 87.9 billion (Chart III.13). As to non-performing consumer loans, the rise in non-performing housing loans remained limited while the rise in vehicle loans became more significant (Chart III.14).

Chart III.15
Consumer Loan Interest Rates (%)[1,2,3]

Stock

Flow

Housing Loans
Vehicle Loans
Other Consumer Loans

Source: CBRT
(1) Other consumer loans are consumer loans excluding housing and vehicle loans.
(2) Weighted average interest rates.
(3) November 2009 data is as of 6 November 2009 for flow interest rates.

It is observed that flow interest rates referring to interest rates on newly extended consumer loans, which increased in the last quarter of 2008 due to the global financial crisis, started to decline in 2009 with the effect of CBRT's cumulative policy rate cuts and other measures pertaining to liquidity (Chart III.15).

III.1.2. Credit Risk Scenario Analysis

With the aim of assessing the credit risk that the banking sector might be exposed to, an analysis was conducted on how CARs and the profitability of banks might be affected from a potential increase in NPL ratios as of September 2009[5].

The scenario analysis was conducted under the following assumptions;

a.   The total credit amount of banks remained unchanged.

b.   NPLs resulting from shocks have the same composition as the existing NPLs of banks. For banks that did not have any NPLs before the shocks, the NPLs that came into existence due to the shock implemented are classified as "loans and other receivables with limited collectibility", setting aside a 20 percent provision.

c.   Post-shock NPLs were categorized as 100 percent risk–weighted loans in the calculation of the pre-shock CAR.

d.   There is no change in the total risk-weighted assets and equity capital of the sector except for the shocks.

Collateral amounts were not taken into account while calculating additional provisions.

Chart III.16.
Effect of Credit Shock on the Profitability of the Sector[1,2]
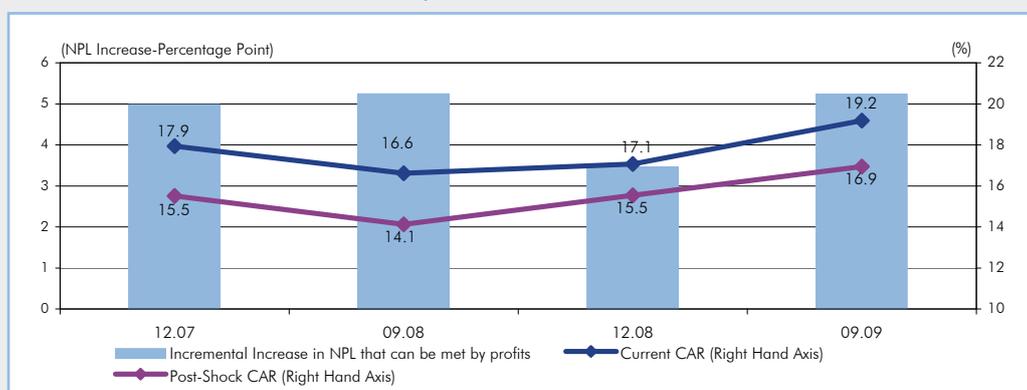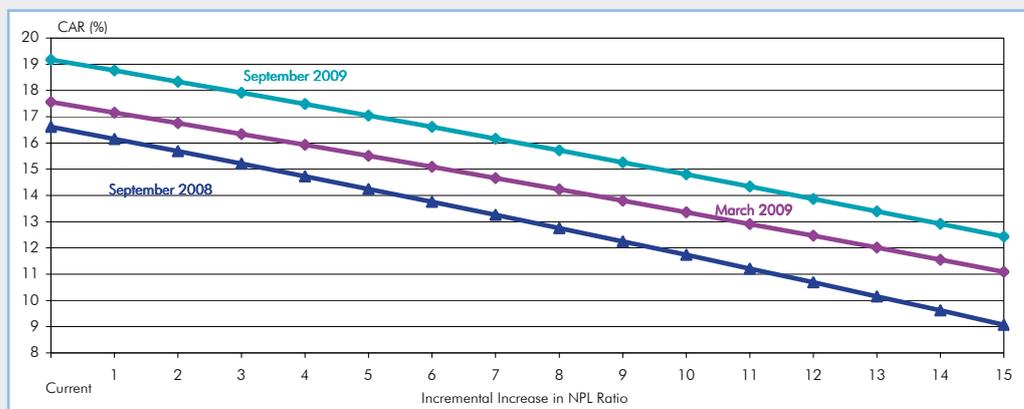

Source: BRSA -CBRT
(1) Excluding the SDIF Bank, Iller Bank and banks that do not have loans in their portfolio.
(2) Post-shock CAR is calculated based on the increase in NPL, which is not covered by the annualized profit.

An analysis of how much additional NPLs can be covered by the net profit of the banking sector reveals that an increase of 5.2 percentage points in NPLs can be covered by that period's net profit in September 2008, whereas at the end of 2008, the figure drops to 3.5 percentage points. However, as a result of the increase in sector profitability in September 2009, the increase in NPLs that can be covered by net profits rebounded to the level of September 2008 (Chart III.16).

Chart III.17.
Effects of Credit Shocks on the CAR of the Sector (%)[1]

Source: BRSA -CBRT
(1) Excluding the SDIF Bank, Iller Bank and banks that do not have loans in their portfolio.

The scenario analysis conducted assesses the effects of a 1-15 point incremental increase in the NPL ratio on the CAR of the banking sector. Accordingly, the shock from a 15-point increase in the NPL ratio of the banking sector reduced the CAR of the sector by 7.6 percentage points in September 2008 when the global crisis started to affect Turkey, an increase-driven shock of the same amount, however, reduced the CAR of the sector by 6.7 percentage points in September 2009 due to the limited rise in risk-weighted assets. As a result of the maximum shock, the CAR of the sector remained above the legal limit of 8 percent, and the target ratio of 12 percent (Chart III.21).

Unlike many countries' banking sectors, which were severely affected by the global crisis, the capital structure of banks in Turkey grew stronger on the back of recent high profits and this increased the banks' lending capacity. Within this framework, it is expected that an acceleration similar to the one in housing loans would be observed in SME loans with the support provided for the Credit Guarantee Fund and a gradual improvement would be observed in credits in general.

III.2. Market Risk and Scenario Analyses

In this section, where the implications of the developments in interest rate and FX risk on bank balance sheets are assessed, the impact of two scenarios based on hypothetical data are also analyzed.

III.2.1. Market Risk

The volatility in the Turkish financial system tapered off compared to the previous periods, on account of measures taken by the Central Bank of Turkey coupled with the improvements in global risk perceptions. As a matter of fact, the Turkish lira appreciated against the US dollar and Euro basket in March 2009 and maintained this level moving within a narrow band in the successive periods. The upward trend in the ISE, which started in March 2009, continued till October and retreated by a small margin recently. The downward trend in interest rates on GDDSs continued, their average level to become 8.7 percent in November 2009 (Chart III.18).

Chart III.18.
Foreign Exchange Rates, Interest Rates and Equity Prices[1]
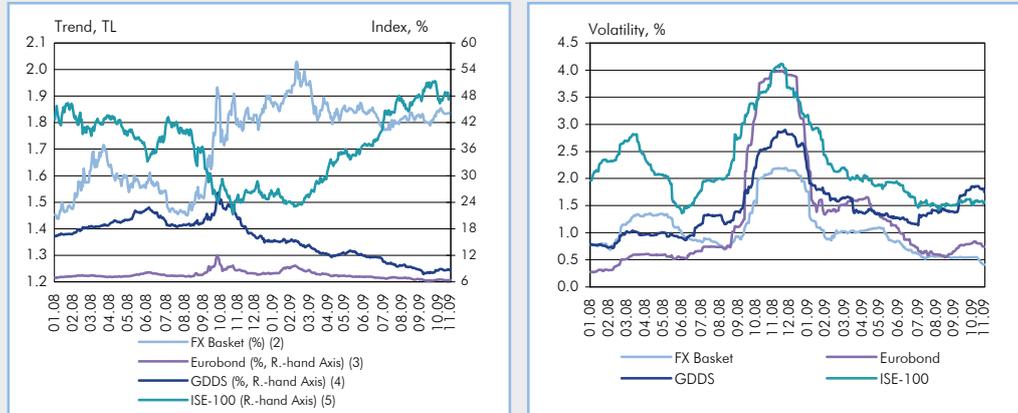
Source: CBRT
(1) For volatility calculations, standard deviation of daily logarithmic yield of the related market instrument (60 business -days moving average) is used.
(2) 50 percent of the Foreign Exchange Basket is in USD and the rest is in Euro.
(3) Based on USD denominated Eurobond interest rate with 2030 maturity.
(4) Based on the interest rate on the benchmark GDDS.
(5) Calculated by dividing ISE-100 by 1,000.

Policy rate-cuts that started in November 2008 continued and the overnight borrowing rate decreased to 6.5 percent by November 2009.

Within this framework, interest rates on deposits and loans continued to decrease as well. However, the fall in interest rates on deposits was sharper than that on loans (Chart III.19).

Chart III.19.
Interest Rates (%)
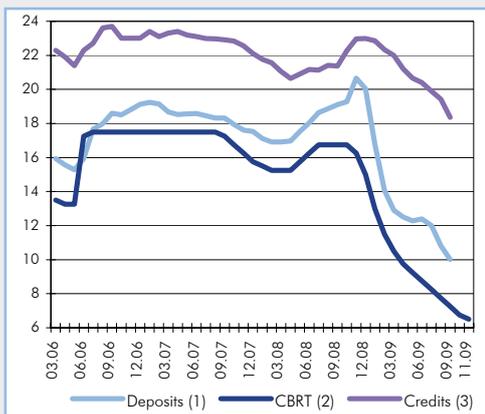
Source: CBRT
(1) Banking sector 3-month weighted "stock TL deposit" interest rate.
(2) CBRT overnight (O/N) borrowing rate.
(3) Banking sector weighted "stock TL credit" interest rate.

Chart III.20.
Ex-ante[1] ve Ex-post[2] Real Interest Rates[3] of GDDS(%)
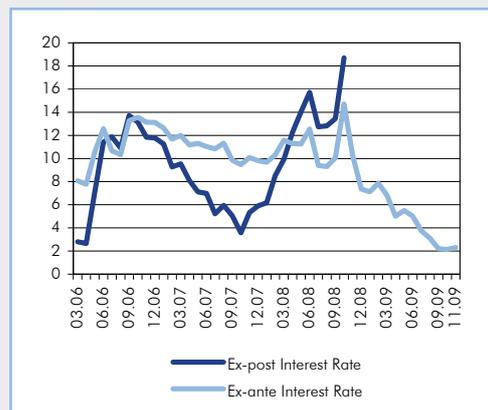
Source: Calculated by using the data of CBRT, ISE and TURKSTAT
(1) Ex-ante interest rate=(((1+ nominal interest rate)/(1+expected inflation rate))-1)*100
(2) Ex-post interest rate=(((1+ last year's nominal interest rate)/(1+realized inflation rate))-1)*100. As expected inflation rate, yearly ex-ante CPI figures in the bi-weekly Survey of Expectations published by the CBRT are used.
(3) GDDS interest rates are the monthly average interest rates on the benchmark GDDS.

Expected real interest rates continued to decline as nominal interest rates decreased faster than the expected inflation, and stood at 2.3 percent by November 2009 (Chart III.20).

Chart III.21. Interest Rate Sensitivity Gap of the Banking Sector(Billion TL)[1,2]

(TL Denominated)

(FX Denominated)

09.08   08   09.09

09.08   08   09.09
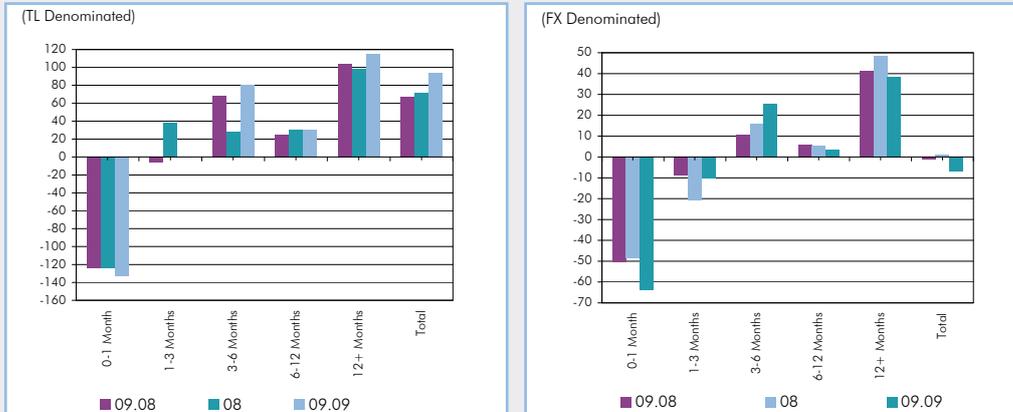
Source: BRSA-CBRT
(1) Time to re-pricing is used.
(2) Excluding SDIF bank

In terms of days to re-pricing, negative interest-rate sensitive TL and FX gaps of the banking sector were mainly observed in the 0-1 month maturity bracket similar to previous periods, and in September 2009, the gap in this maturity bracket widened compared to previous year-end (Chart III.21).

In September 2009, there was a rise in the overall long position of the banking sector due to the upswing in the long position in the 3-6 month maturity bracket for TL. For FX, the banking sector displays a short position in the 0-1month and 1-3 month maturity brackets while holding a long position for longer terms. In terms of overall position, the sector is short as a result of the rise in the open position in the 0-1 month maturity bracket and the decline in the long position in the 12–month and longer maturities (Chart III.21).

Chart III.22.Foreign Exchange Position of the Banking Sector[1] (Billion USD)

On Balance Sheet Position
Off Balance Sheet Position
Net Position
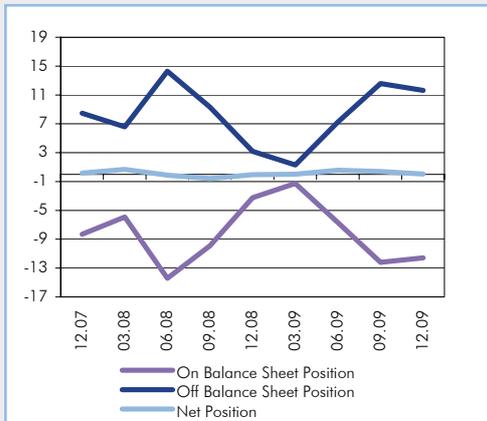
Source: BRSA
(1) Participation Banks are included.

Chart III.23. Swap Transactions in TL/FX[1] (Billion USD)
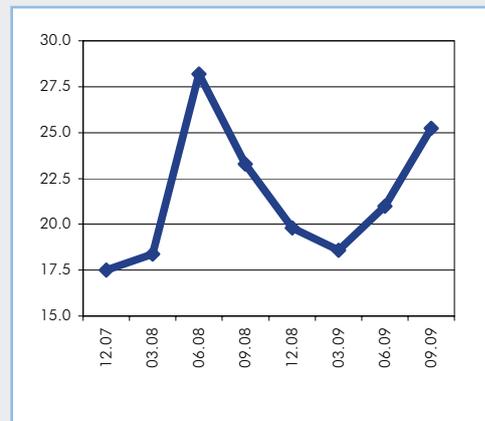
Source: BRSA-CBRT
(1) Participation Banks are included.

The net overall FX position of the banking sector is almost balanced (Chart III.22).

The banking sector's tendency to invest its foreign currency funds in Turkish lira loans through derivatives, especially through swap operations, with an on-balance sheet short position and an off-balance sheet long position, was interrupted during the crisis but later resumed on the back of the positive atmosphere in global financial markets since April 2009. Accordingly, the on-balance sheet short and off-balance sheet long position of the banking sector resumed its upward trend (Chart III.22, Chart III.23).

The banking sector, which balances its on-balance sheet short position with its off-balance sheet long position, held USD 35 billion of selected TL/FX derivative assets by September 2009. For USD 31.3 billion of this amount, the counterparty is a financial institution.

III.2.2.Scenario Analyses

III.2.2.1.Interest Rate and Exchange Rate Increases

In this section, the individual and collective effects of the interest rate and exchange rate increases on the banking sector have been analysed under two scenarios assuming that the two increases occur independently.

Table III.5. Interest and FX Rate Increase Scenarios

	SCENARIO A	SCENARIO B
A. Depreciation of TL	30 percent depreciation of TL against other currencies	40 percent depreciation of TL against other currencies
B. Interest Rate Increase-TL	Re-pricing of TL interest sensitive assets and liabilities falling in 0-1 and 1-3 month maturity brackets at 6 points higher	Re-pricing of TL interest sensitive assets and liabilities falling in 0-1, 1-3, 3-6 month maturity brackets at 12 points higher
C. Interest Rate Increase-FX	Re-pricing of TL interest sensitive assets and liabilities falling in 0-1 and 1-3 month maturity brackets at 5 points higher	Re-pricing of TL interest sensitive assets and liabilities falling in 0-1, 1-3, 3-6 month maturity brackets at 10 points higher
D. Trading Portfolio-TL[1]	6 points increase in market interest rates of YTL denominated fixed income securities in the trading portfolio	12 points increase in market interest rates of TL denominated fixed income securities in the trading portfolio
E. Eurobond Portfolio	Decrease in prices of Eurobonds in the trading portfolio by 15 percent	Decrease in prices of Eurobonds in the trading portfolio by 25 percent

(1) Trading portfolio consists of "financial assets at fair value through profit or loss" and "securities available for sale"

Under Scenario A, it is assumed that the Turkish lira depreciates by 30 percent against other currencies, interest rates for the Turkish currency and foreign currencies increase by 6 and 5 percentage points, respectively, and Eurobond prices decline by 15 percent.

Under Scenario B, it is assumed that the Turkish lira depreciates by 40 percent against other currencies, interest rate increases are twice the increases given in Scenario A and Eurobond prices decrease by 25 percent.

FXNGP data was used to calculate the effects of exchange rate increase on the sector. To calculate the impact of interest rate increases on the sector, the repricing gap method, which complements the standard method and is recommended by the Basel Committee on Banking Supervision, has been applied. In this framework, the difference between interest-rate sensitive assets and liabilities in the days to repricing maturity brackets of 0-1, 1-3, and 3-6 months were used.

In scenario analyses based on repricing, it was assumed that:

- The interest rate sensitivity of banks' assets and liabilities remains unchanged throughout the analysis period,

- Demand deposits are not interest-rate sensitive,

- There are no new fund inflows or outflows,

- Interest rate increases would last for 3 months in Scenario A and for 6 months in Scenario B.

The loss of value in Turkish lira-denominated discount securities within the trading portfolio and the Eurobond portfolio, stemming from the rise in interest rates, has also been calculated.

III.2.2.1.1. Depreciation of TL

Under Scenarios A and B, the banking sector makes profit amounting to TL 159.9 million and TL 213.2 million, respectively, owing to its FX long position as of September 2009. As a result of the shocks, the ratio of losses of banks – arising from their open positions –to their own funds increased by a small margin compared to March 2009 and became 0.6 percent and 0.9 percent, respectively under the two scenarios (Table III.6).

III.2.2.1.2. Interest Rate Increases and Loss in Value

i) Under Scenarios A and B, the TL denominated interest income declines as of September 2009. Under both scenarios, the amount of decline in TL denominated interest income decreased. The decline under Scenario B, which assumes that the shock will last for 6 months, is higher compared to Scenario A, owing to the rise in long position for the 3-6 month maturity bracket.

As for foreign currency, in Scenario A, the decrease in interest income is higher compared to March 2009 owing to the rise in open positions in the 0-1 and 1-3 month maturity brackets. In Scenario B, the amount of decline in interest income is lower compared to March 2009 due to the increase in the long position in the 3-6 month maturity bracket.

While the overall amount of decline in interest income does not indicate a significant change under Scenario A, it is significant under Scenario B. As a matter of fact, under Scenario B, the ratio of loss – due to interest rate increases – to own funds, which was 3.5 percent in March 2009, was down to 1.8 percent in September 2009.

ii) There has been a rise in the banking sector's securities portfolio owing to the increase in the banks' demand for GDDSs as banks deem GDDSs to be risk-free investment instruments.

As they expected the Central Bank to cut policy rates, banks classified the newly acquired securities in their trading portfolios. Therefore, the loss in value due to the shocks in both scenarios increased compared to March 2009 owing to the rise in trading portfolios. As a matter of fact, the ratio of loss of value due to interest rate increases to own funds under Scenario A and Scenario B, which were 2.1 percent and 3.9 percent in March 2009, rose to 2.7 and 5.1 percent in September 2009, respectively.

iii) The loss of value in the Eurobond portfolio increased slightly compared to March 2009 under both scenarios.

Table III.6. Results of Market Risk Scenarios[1] (Billion TL)

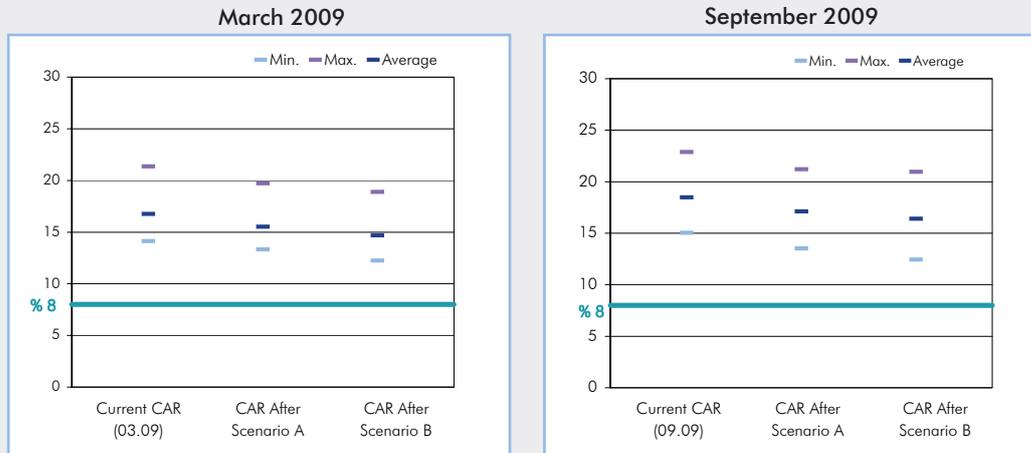|	Scenario A			Scenario B		
	09.08	03.09	09.09	09.08	03.09	09.09
A. TL Depreciation						
a. Total Profit (Loss)	-325.5	147.8	159.9	-434.0	197.0	213.2
Profit (Loss)/Own Funds (%)	-0.4	0.2	0.2	-0.6	0.2	0.2
b. Banks Gaining Profits	155.7	352.5	376.8	207.5	470.0	502.3
c. Banks Suffering Losses	-481.1	-204.8	-216.9	-641.5	-273.0	-289.1
Losses of Banks Suffering Loss/Own Funds (%)	-1.2	-0.5	-0.6	-1.6	-0.7	-0.9
B. Interest Rate Increase						
a. TL	-1,393.6	-1,449.8	-1,332.2	-1,531.3	-1,621.8	-556.5
b. FX	-466.6	-547.0	-594.3	-1,344.1	-1,338.0	-1,125.7
Profit (Loss) due to Interest Rate Increase (a+b)	-1,860.1	-1,996.8	-1,926.5	-2,875.4	-2,959.8	-1,682.3
Profit (Loss) due to Interest Rate Increase/Own Funds (%)	-2.4	-2.4	-2.0	-3.8	-3.5	-1.8
C. TL Trading Portfolio						
Loss in Value due to Interest Rate Increase	-2,089.9	-1,754.0	-2,589.9	-3,914.6	-3,291.9	-4,852.0
Loss in Value due to Interest Rate Increase/ Own Funds (%)	-2.7	-2.1	-2.7	-5.1	-3.9	-5.1
D. Eurobond Portfolio						
Loss in Value	-2,627.6	-2,135.0	-2,297.8	-4,379.3	-3,558.4	-3,829.7
Loss in Value/Own Funds (%)	-3.5	-2.5	-2.4	-6.3	-4.2	-4.0
E. Total Impact						
Profit (Loss)	-6,902.9	-5,738.0	-6,654.3	-11,603.2	-9,613.1	-10,150.9
Profit (Loss)/Own Funds (%)	-9.1	-6.8	-7.0	-15.2	-11.4	-10.7
Current CAR of the Sector (%)	16.0	17.1	18.8	16.0	17.1	18.8
After-Shock CAR of the Sector2 (%)	14.6	16	17.5	13.6	15.2	16.8

Source: CBRT
(1) Excluding SDIF bank. T. Kalkınma Bank. Iller Bank and Eximbank.
(2) After-shock profit/loss amounts under the scenarios are assumed to affect only own funds but not the risk weighted assets.

In conclusion, in September 2009, the losses resulting from both Scenario A and Scenario B increased compared to March 2009 owing to the loss in value shocks in the trading portfolios. Although the CAR of the sector declined by 1.3 percentage points under Scenario A and by 2.0 percentage points under Scenario B, it still stands above the legal ratio of 8 percent and the target ratio of 12 percent.

Chart III.24.
Impacts of the Scenarios on the Largest 10 Banks of the Sector[1]

(1) Largest 10 Banks considering their share in total assets are included in the analysis.

When the impacts of Scenario A and Scenario B on the CARs of the 10 banks with the highest share in assets are analyzed, it is observed that post-shock CARs increased by a small margin compared to March 2009, in paralel to the current increase in CAR. Under both scenarios, the minimum CAR level remained above the target ratio of 12 percent by September 2009 (Chart III.24).

III.3. Liquidity Risk

A relative recovery has recently been observed in liquidity conditions with the support of the measures taken by the CBRT and the improvement in risk perceptions.

Due to its ability to directly control Turkish Lira liquidity, the Central Bank may effectively support the smooth operation of the markets by providing the necessary liquidity. Even if external conditions play a significant role in FX liquidity, the Central Bank of the Republic of Turkey continues to take the necessary measures in order to ensure that the FX market performs well and to bolster FX liquidity management by banks.

With the aim of enhancing sound functioning of the banks' liquidity management and transfer mechanism, in addition to the measures mentioned earlier in this report and to the one-week maturity repo auctions that are the basic funding instruments, the Central Bank started to use repo transactions, when necessary, with maturities up to 3 months actively as of June 19, 2009. Moreover, the Turkish Lira required reserve ratio, which was 6 percent, was reduced by 1 percentage point to 5 percent in October 2009, with the aim of supporting the upward trend in credit growth by reducing intermediation costs and injecting permanent liquidity into the market. With this reduction in the Turkish Lira required reserve ratio, a permanent liquidity that is equivalent to approximately TL 3.3 billion has been provided to the banking system.

Considering that a suitable environment for the CBRT to build up foreign exchange reserves had been achieved based on the relative stability attained in the FX market, it was decided to resume the foreign exchange buying auctions, which were suspended in October 2008, as of 4 August 2009. Approximately USD 3.2 billion worth of foreign exchange was bought and approximately TL 4.7 billion worth of liquidity was injected into the market.

### Box 11.
Market Liquidity Index (MLI)[1]

As it is known, liquidity is the ability of economic agents to exchange their wealth for goods and services or other assets. The three most widely accepted liquidity concepts are central bank liquidity, funding liquidity and market liquidity. Central bank liquidity is the liquidity supplied by the central banks to the economy to the need of the financial system, whereas funding liquidity, which is related to balance sheet composition, is the banks' ability to meet their liabilities on time. In line with this, a bank is said to be liquid as long as its cash inflows meet its cash outflows. Finally, market liquidity is the ability to trade an asset in a short time at minimum cost with little impact on its price. Consequently, a liquid market is the market where bid-ask prices are quoted, the spread between these prices is low and small transactions are executed rapidly without significant effect to prices.

Interactions among these liquidity concepts are of paramount importance, such that during normal periods they are very likely to contribute to the stability of the financial system; however, during periods of stress they may trigger the instability embedded in the system. Especially, sudden declines in market liquidity may place restrictions on monetary policy instruments and subsequent volatility in asset prices may give rise to uncertainties in the fundamental indicators such as the exchange rate and interest rate.

Within this framework, in order to measure market liquidity in Turkey, a MLI is compiled. The markets included in the index are those with high transaction volume and in which banks play an intensive role, as well as where the selection of these markets is justified by the Principal Component Analysis. Eventually, the Bonds and Bills Market-Outright Purchases and Sales Market within the Istanbul Stock Exchange (ISE) and the TL/USD Exchange Rate Market compose the index. The related indicators for these markets are the Relative Spread (RS) and the Illiquidity Ratio (IR) of which formulas are presented below. All in all, an increase in the index implies a decrease in market liquidity.

| Indicator	Markets
Tightness $$RS = \frac{\text{Best Ask-Best Bid}}{(\text{Best Ask}+\text{Best Bid})/2}$$	• Bonds and Bills Market-Outright Purchases and Sales Market • TL/USD Exchange Rate Market
Depth $$IR = \frac{|\text{Daily percentage price change}|}{\text{Transaction Volume to the Outstanding (Turnover Ratio)}}$$	• Bonds and Bills Market-Outright Purchases and Sales Market

Chart 1. Market Liquidity Index
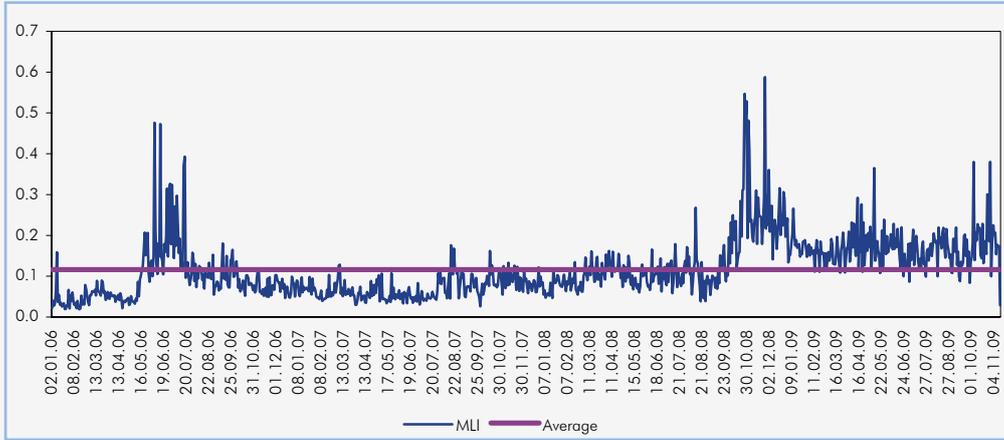
Source: ISE, CBRT

As seen from the course of the MLI, thanks to the robust financial infrastructure and the timely measures taken by the Central Bank, the adverse effects of global turbulence have been limited to a short period of time and the liquidity of Turkish financial markets has faced temporary high volatility. With the decreasing risk appetite, the MLI increased during the last quarter of 2008 and since the beginning of 2009 it has started to decline and has relatively stabilized, however, the vulnerability of financial markets still remains (Chart 1).

(1) The methodology introduced in the BoE's Financial Stability Report (April 2007) has been adapted to Turkey.
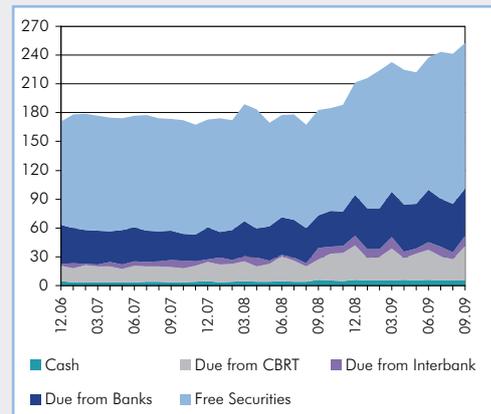
Chart III.25.
Basic Liquidity Indicators (%)[1,2]
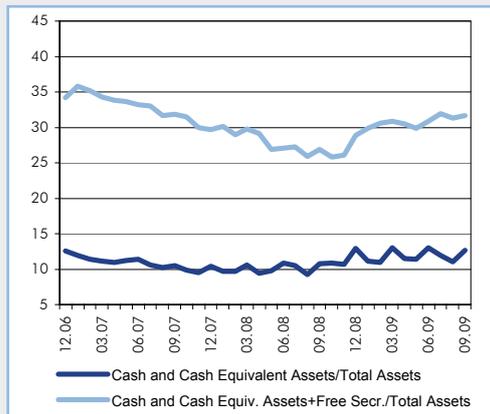
Source: BRSA-CBRT
(1) Cash and Cash Equivalent Assets=Cash + Due from CBRT + Due from Interbank +Due from Banks.
(2) Free Securities= Securities that are not used as collateral or for repo transactions.

Chart III.26.
Liquid Assets (Billion TL)

Source: BRSA-CBRT

When the basic liquidity indicators of the banking sector are analyzed, it is observed that the ratio of cash and cash-equivalent assets to total assets generally maintained a horizontal

course but increased in periods when the "Due from CBT" and "Due from Banks" items were on the rise (Chart III.25).

When the free securities not used as collateral or for repo transactions are taken into account, this ratio displayed a tendency to increase as of end-2008 (Chart III.25).

Being the largest item in liquid assets, the recent increase in free securities is noteworthy. The mentioned development can mainly be attributed to the tendency of private banks to invest in government bonds as a result of their reluctance to extend credits (Chart III.26).
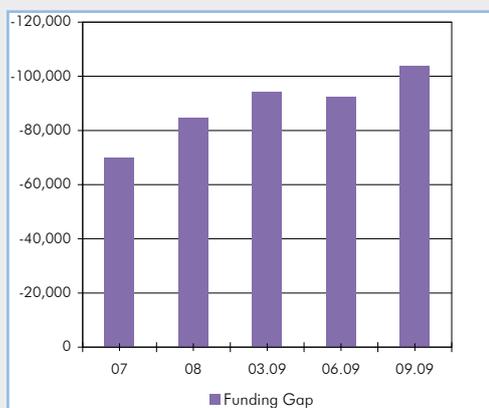
Chart III.27.
Free Securities and Liabilities[1] (Billion TL, %)

Free Securities — Free Securities/Liabilities (Right-hand Axis) — Free Securities/Deposits (Right-hand Axis)
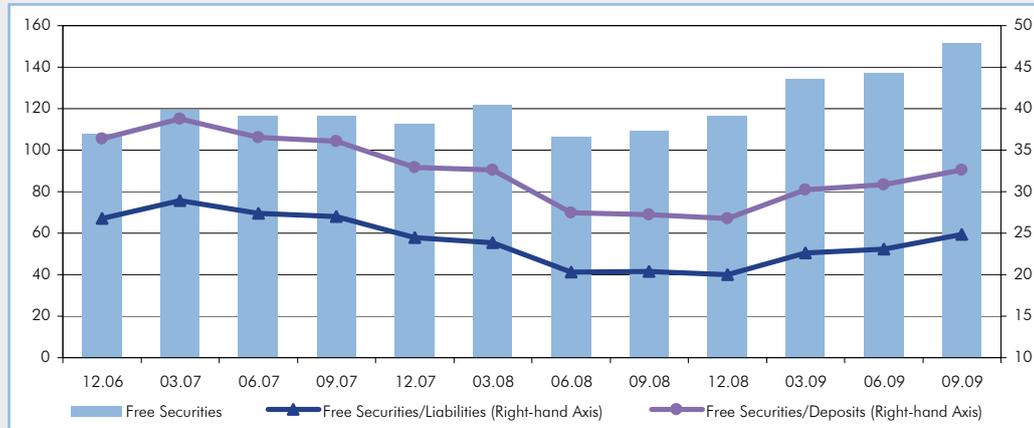
Source: CBRT-BRSA
(1) Participation banks are not included in this calculation

The ratio of free securities, which can be accepted as collateral by the Central Bank in providing liquidity to banks in the event of a temporary liquidity shortage to liabilities and to deposits maintained an accelerating trend as of the end of 2008. In September 2009, the aforementioned ratios reached 25 percent and 33 percent, respectively (Chart III.27).

Chart III.28.
Funding Gap[1] (Billion TL)


Funding Gap

Source: BRSA-CBRT
Funding Gap = Credits - Deposits

Chart III.29.
Funding Gap (September 2009)[1,2] (%)

Weighted Average — Maximum and Minimum

Source: BRSA-CBRT
(1) Funding Gap = (Credits-Deposits) / Credits
(2) Bank under SDIF is excluded.

Deposits, as the most important source of the Turkish banking system, restrain the susceptibility of banks to the volatility of interbank funds. In September 2009, negative funding gap of the sector reached TL 104 billion (Chart III.28). While public banks enjoy a high negative funding gap on average, foreign banks have positive funding gap to a limited extent, as they are funded from abroad (Chart III.29).
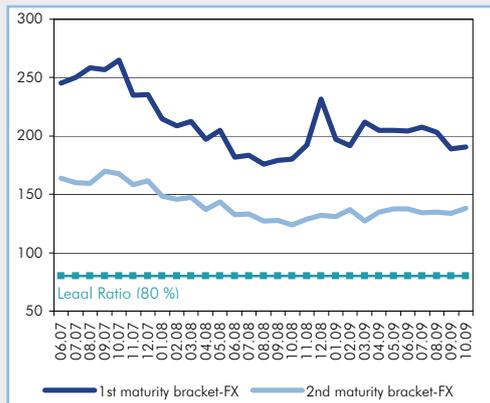

Chart III.30.
FX Interbank Operations (Million USD)
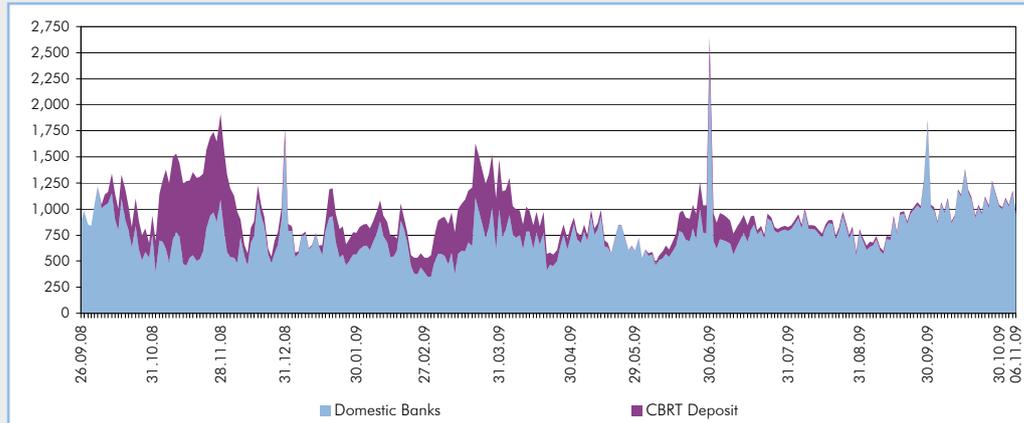
Source: BRSA-CBRT

The Central Bank of Turkey resumed its activities as an intermediary in the foreign exchange deposit market on October 9, 2008 with the aim of enhancing the flow of foreign exchange liquidity. Yet, the transaction volume in this market declined and banks have started to increase interbank transactions again (Chart III.30).

Chart III.31.
FX Liquidity Adequacy Ratio (%)

Source: BRSA-CBRT

Chart III.32.
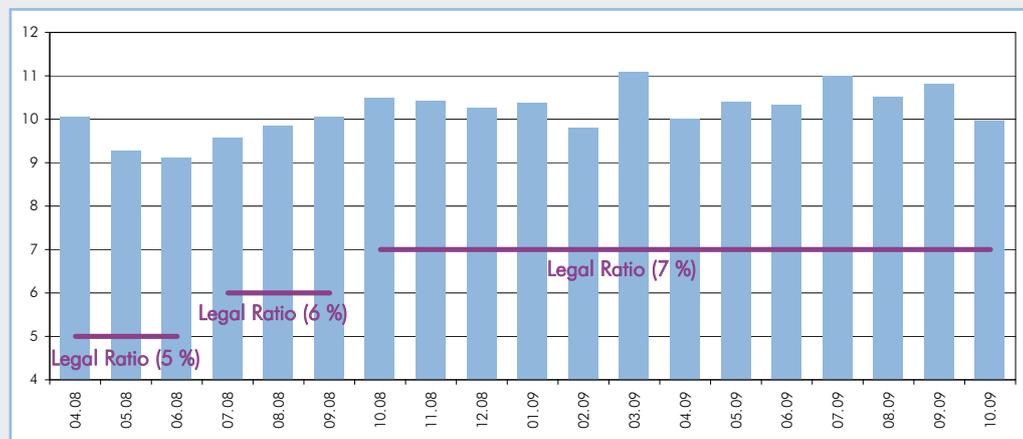Total Liquidity Adequacy Ratio (%)
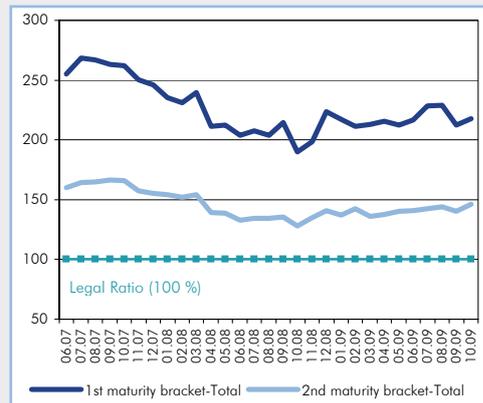
Source: BRSA-CBRT

The liquidity adequacy ratios of the banking sector, calculated pursuant to the "Regulation Relating to the Measurement and Assessment of Liquidity Adequacy of Banks", for both total and foreign currency in 1st and 2nd maturity brackets[6] are well above the legal limit and have been following a stable trend lately (Chart III.31 and Chart III.32).

6 Assets and liabilities with 0 to 7 days to maturity are included in the 1st maturity bracket and those with 0 and 31 days to maturity are included in the 2nd maturity bracket.

Chart III.33.
Liquidity Ratio of the Banking Sector Calculated By Using Stock Values of Selected Assets and Liabilities (%)

Source: BRSA-CBRT

A third liquidity adequacy ratio, which was introduced with an amendment to the "Regulation Relating to the Measurement and Assessment of Liquidity Adequacy of Banks" on April 5, 2008 and calculated by using the full stock values of selected assets and liabilities, also stands above the legal ratio of 7 percent (Chart III.33).

Since the last quarter of 2008, the free securities and basic liquidity indicators of banks have been increasing and banks have maintained their cautious stance.

Box 12.
Liquidity Stress Test[1]

To analyze the robustness of the Turkish banking sector against the funding liquidity risk embedded in the system, a liquidity stress test is carried out on the first 10 banks in terms of their asset size, excluding public banks. With this, the liquidity adequacy ratios of the 1st and 2nd maturity brackets, calculated pursuant to the Regulation Relating to the Measurement and Assessment of the Liquidity Adequacy of Banks issued by the BRSA, are exposed to stochastic analyses based on some probability distributions.

The items liquid assets and unstable liabilities that are considered in the analysis are selected based on the current regulation. For liquid assets, the haircut ratios correspond to the ratios by which the items can lose value and the fractions of items that may not result in cash inflow as opposed to what is expected due to counterparty risk. As for unstable liabilities, the run-off rates represent the ratio of liability items, which may emerge as a non-renewable funding source. These haircut and run-off rates are simulated based on the Monte Carlo Simulation Technique and initial parameters for the simulation are taken to be the official ratios in the regulation.

The simulation results have shown that there was no significant change in the haircut and run-off rates of important balance sheet items, even in the case of the highest decrease in the legal liquidity ratio of the sector. This shows that the ratios of consideration stated in the regulation are prudential enough to reflect the stress cases.

According to the results, as of October 2, 2009, the total liquidity adequacy ratios for the sector, which are calculated for the 1st and 2nd maturity brackets, may at most decline to 197 percent and 132 percent respectively (Chart 1). On the other hand, while conducting the simulation for each bank, the haircuts and the run-off rates which lead to the lowest liquidity ratios for each, are used. In this case, as of the same date, for the maturity brackets stated above, the highest ratios among the 10 banks are 248 percent and 150 percent, respectively, whereas the lowest ones are 128 percent and 102 percent. Consequently, with this analysis, there are no banks which go below the legal ratio of 100 percent amongst the 10 banks.

Chart 1. Total Liquidity Ratio For the 1st and 2nd Maturity Brackets (%)
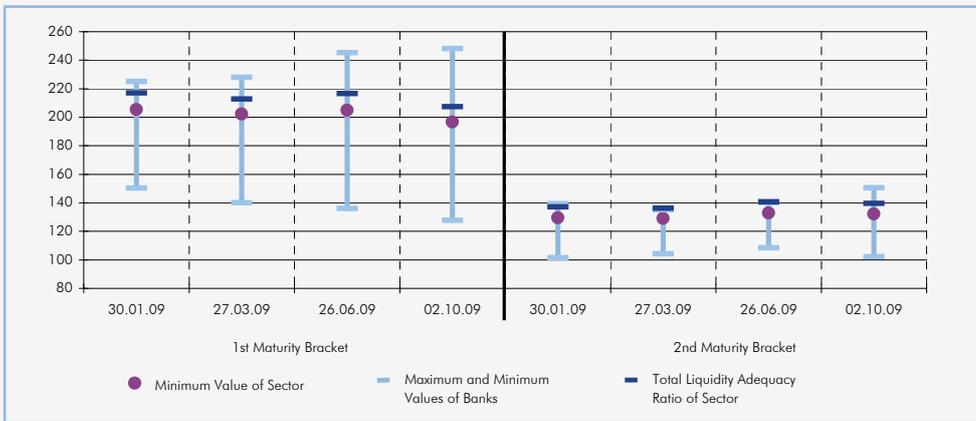
(1) The methodology presented in Van den End, J. W. (2008): Liquidity Stress-Tester: A Macro Model for Stress-Testing Banks' Liquidity Risk, De Nederlandsche Bank (DNB) WP No. 175, has been adapted to Turkey.

III.4. Financial Strenght Index

Table III.7 Financial Strength Index Variables

	Financial Strength Indicators	Direction of the Impact	Weight
Asset Quality	Gross Non-Performing Loans / Gross Loans	negative	0.33
	Net NPL / Shareholders' Equity	negative	0.33
	Fixed Assets / Total Assets [1]	negative	0.33
Liquidity	Liquid Assets / Total Assets [2]	positive	1.00
Exchange Rate Risk	On-Balance Sheet FX Position / Own Funds [3]	negative	0.50
	FX Net General Position / Own Funds [3,4]	negative	0.50
Interest Rate Risk	(Int. Sens. TL Assets with a Mat. Up to 1 Month – Int. Sens. TL Liab. With a Mat. Up to 1 Month) / Own Funds [5]	negative	0.50
	(Int. Sens. FX Assets with a Mat. Up to 1 Month – Int. Sens. FX Liab. With a Mat. Up to 1 Month) / Own Funds [5]	negative	0.50
Profitability	Net Profit / Total Assets	positive	0.50
	Net Profit / Shareholders' Equity	positive	0.50
Capital Adequacy	Free Capital / Total Assets [6]	positive	0.50
		positive	0.50

(1) Fixed Assets consist of subsidiaries, assets to be sold, fixed assets and net non-performing loans.
(2) Liquid Assets consist of cash, due from the CBRT, due from money market, due from banks and receivables from reverse repo transactions.
(3) Own funds is the regulatory capital, and it is different from the equity in the balance sheet. The calculation is in absolute values.
(4) Foreign exchange net open position is the sum of on and off balance sheet foreign currency positions. The calculation is in absolute values.
(5) The calculation is in absolute terms.
(6) Free capital is calculated by deducting fixed assets from equity.

The Financial Strength Index (FSI) is computed with the aim of forming an "aggregate indicator" relating to the direction of the financial strength of the banking sector. Six sub-indices (asset quality, liquidity, exchange rate risk, interest rate risk, profitability, and capital adequacy) were used to form this index. Ratios projecting the risks and fragilities of the banking sector were selected under each sub-index and these ratios, reflected in certain weights, consititute the index (Table III.1.7).

Chart III.34.
Financial Strength Index Variables[1] (1999=100)
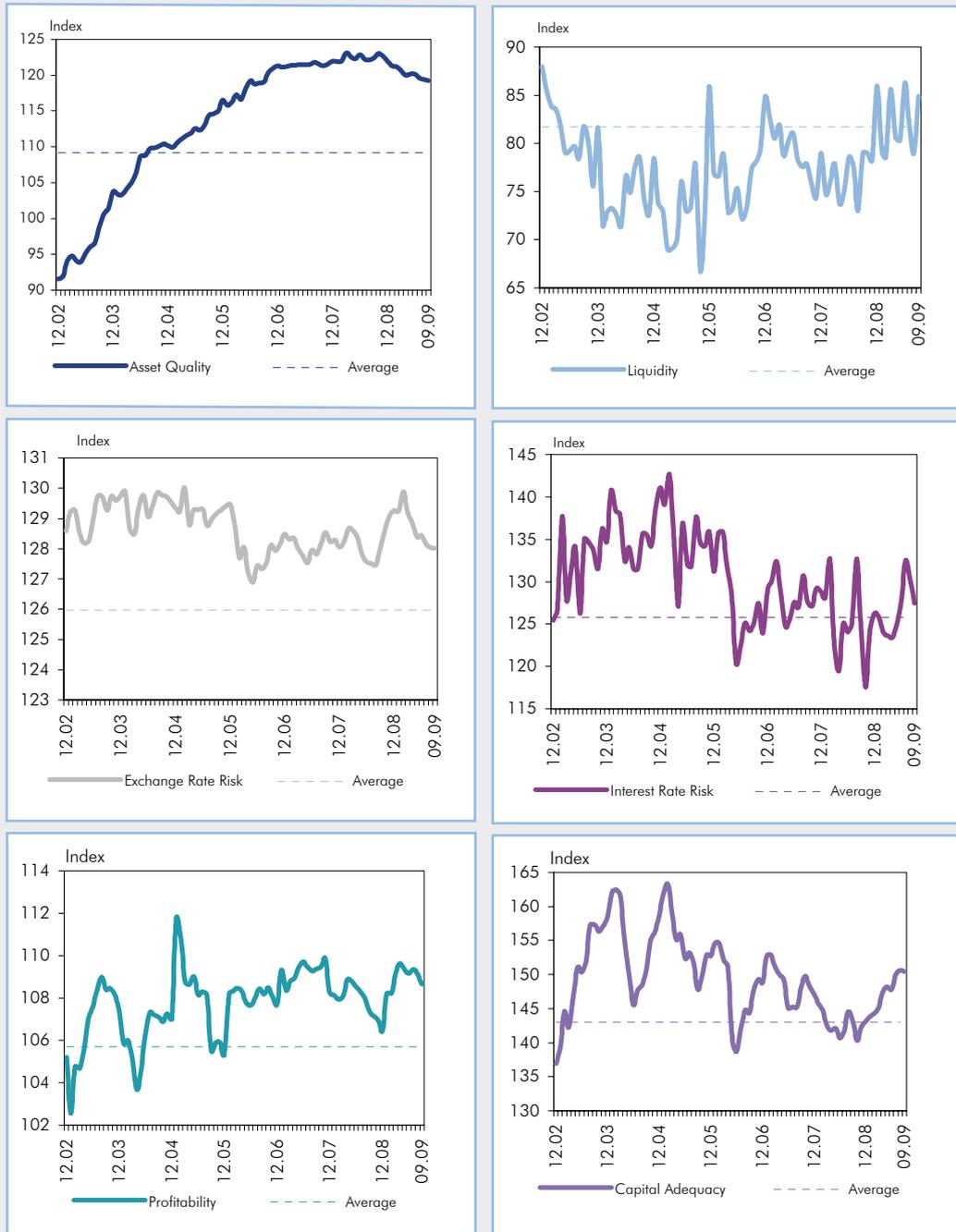
Source: BRSA-CBRT
(1) The averages used are the averages of related sub-indices between December 1999 – September 2009.

The assessment of the sub-indices forming the FSI is as follows (Chart III.34);

i. Asset Quality Index: The Asset Quality Index, which was 122 at the end of 2008, denoted a downward trend in 2009 and became 119.2 in September 2009. This decline was mainly driven by the rise in the NPL ratio.

ii. Liquidity Index: The liquidity index, which was 86 at the end of 2008, was down to 84.9 in September 2009. Despite the fall in the index, the ratio of liquid assets to total assets that makes up the index has been hovering between 10.9 percent and 13.0 percent in the last one-year period.

iii. Exchange Rate Risk Index: The Exchange Rate Risk Index, which was 129.3 at the end of 2008, has declined since March 2009 due to the rise in the on-balance sheet open position and was 128 in September 2009.

iv. Interest Rate Risk Index: Despite the rise in the FX interest-sensitive gap in December 2008, Interest Rate Risk Index showed some improvement and became 126.3 owing to the decline in the TL interest-sensitive gap. The index became 127.5 in September 2009 due to the increase in the ratio of the difference between TL -denominated interest-sensitive assets and liabilities with a maturity of up to 1 month to own funds.

v. Profitability Index: The Profitability Index, which was down to 106.5 in December 2008 – the lowest level of the last three years- exhibited an upward trend in 2009 owing to the rise in the interest margin parallel to easing interest rates and became 108.7 in September 2009. The rise in the profitability performance of the sector in the first nine months of the year was mainly driven by the rise in net interest income. Meanwhile, as profit from securities purchases and sales increased capital market transaction profits, net trading income, which is an important factor of non-interest income, also increased.

vi. Capital Adequacy Index: The index, which had been on an upward trend since October 2008, continued to increase throughout 2009 owing to the rise in the capital adequacy ratio and the ratio of free capital to total assets and became 150.5 in September 2009.

Chart III.35.
Financial Strength Index[1] (1999=100)

Source: BRSA-CBRT
(1) The average used is the average of financial strength index between December 1999 and September 2009.

The Financial Strength Index, monitored as an indicator of the soundness of the banking sector, which was 118.8 at the end of 2008, became 120.3 in July 2009 owing to the rises in the capital adequacy index, profitability index and interest rate risk index. In September 2009, the index fell by a small margin and was down to 119.8 due to the decline in the interest rate risk index (Chart III.35).