

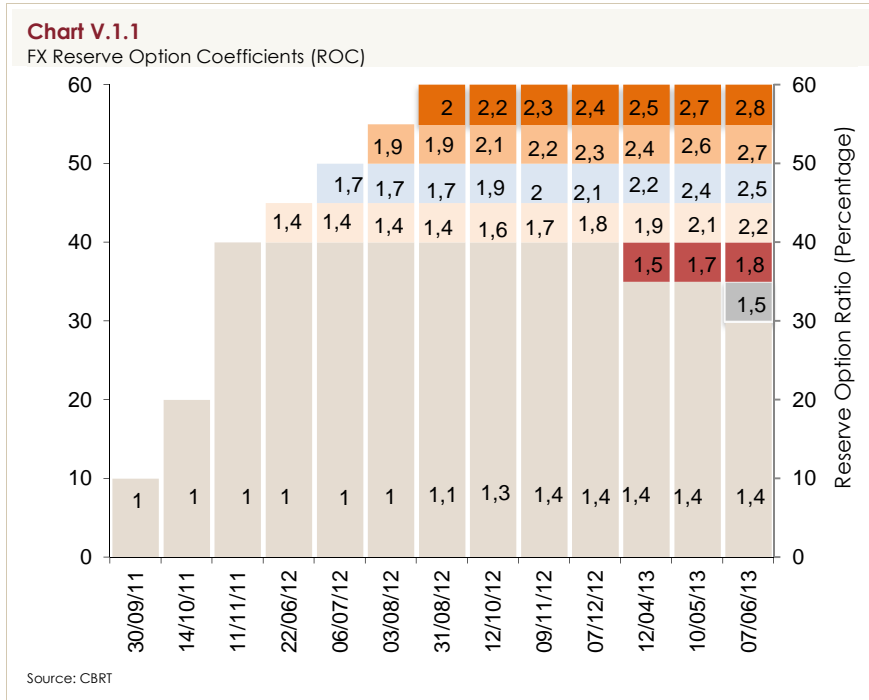
V. Special Topics

V.1. Factors Affecting Banks' Utilization of Reserve Option Mechanism⁷

Introduction

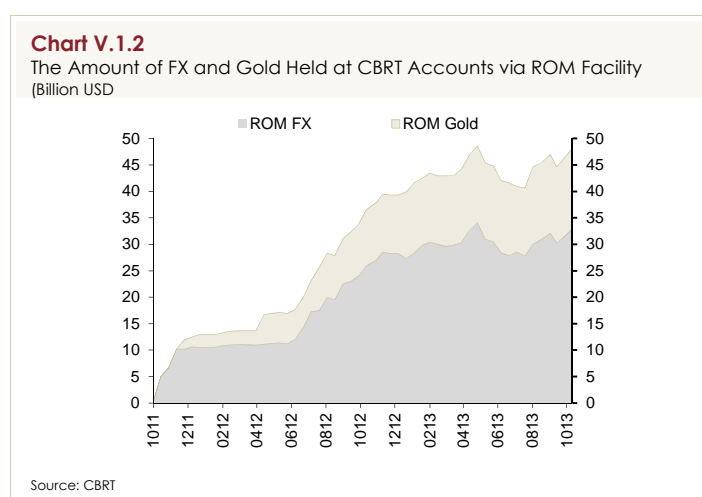
The reserve option mechanism (ROM) is a new monetary policy tool designed by the Central Bank of Turkey to increase the resilience of the economy against external finance shocks. Through the mechanism, banks have the option to hold a fraction (up to the reserve option ratio) of their mandatory required reserves for Turkish lira liabilities in US dollars, euro and gold. The amount of foreign currency/gold towards meeting one unit of TL required reserve is called the reserve options coefficient (ROC)(Alper, Kara and Yörükoğlu 2012; Küçüksaraç and Özel 2012).

In order to observe the ROM's "automatic stabilizer" mechanism, ROCs should be an increasing function of the reserve option ratio and sufficiently large enough. The build-up phase of the ROM is engineered at a gradual pace since the rapid increase in the coefficients might give an additional shock to the banking system. For this reason the CBRT increased the reserve option ratio and reserve option coefficients gradually, also taking into account the course of capital inflows and the pace of credit growth (Chart V.1.1).



⁷ This note summarizes the results of the study conducted by Aslaner, Çıplak, Kara and Küçüksaraç (2013).

Banks accumulated nearly USD 50 billion through the ROM at the CBRT accounts during the last two years (Chart V.1.2). The CBRT's plan was eventually to keep the ROC constant and let the ROM act as an automatic stabilizer against external financing shocks.⁸ In other words, the major aim is to soften the effect of excessive volatility in the capital flows on the domestic economy by allowing banks to decide on their own reserve option utilization, depending on their constraints and objective functions. The main assumption here is that banks will react to the volatility in capital flows by adjusting their ROM utilization. However, this idea is based on theory rather than empirical findings, since the ROM is a new monetary policy tool and thus there is no empirical finding about how the ROM works in case of shifts in capital flows. Our study serves this purpose by investigating the factors affecting the FX ROM utilization rate using panel data.⁹ By doing so, we try to understand how the banks' ROM utilizations respond to changes in financial and economic outlook.

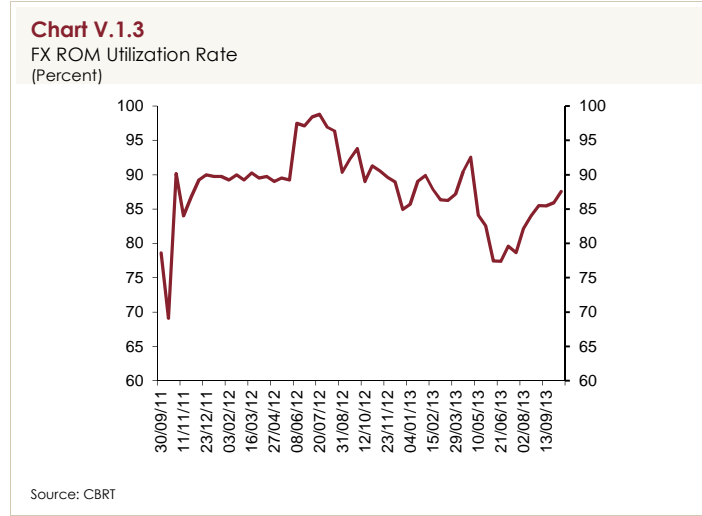


We standardize the ROM utilization rates by dividing the realized utilization rate by the reserve option ratio. Currently, the reserve option ratio is 60 percent (Chart V.1.1). In other words, banks are allowed to hold 60 percent of their mandatory required reserves in Turkish lira in foreign currency. Since the reserve option ratio differs in time, it is more suitable to use the standardized utilization rate, which is over 100 percent. For instance, if a bank keeps 30 percent of its Turkish lira reserve requirements in foreign exchange while the reserve option ratio is 60 percent, the standardized utilization ratio is 50 percent (30/60).

The fact that the ROM utilization rate is mostly below 100 percent indicates some banks do not use the facility fully (Chart V.1.3). Moreover, we observe significant changes in the ROM utilization ratio across time. In order to understand the transmission mechanism of ROM and how it will respond to shocks, it is important to understand why some banks do not fully use the facility or what factors affect the utilization rate.

⁸ See Alper, Kara and Yörükoğlu (2012) for detailed information.

⁹ "ROM" is used for FX ROM in the following parts.



Factors Affecting the ROM Utilization Rate

It is possible to classify the factors which might affect ROM utilization rate as (i) cost related factors and (ii) other factors.

Cost Related Factors

One of the most important factors affecting the banks' ROM utilization rate is the relative cost of FX funding to Turkish lira funding. If the cost of holding Turkish lira required reserves by using the ROM is less than that of holding in Turkish lira, we expect banks to use the ROM provided that other factors such as liquidity constraint or expectations do not change. The CBRT affects the relative cost by changing the reserve option coefficients.

The breakeven ROC, coefficient leaving banks indifferent between using and not using the reserve options facility, is an important parameter in assessing ROM utilization rates. In the calculation of breakeven ROC, we assume that banks use currency forward contracts to compare the cost of Turkish lira and FX funding costs. The approximate breakeven ROC calculated in this context is presented below:¹⁰

$$\text{Breakeven ROC} \sim \frac{(1 - ZK_{FX})r_{TL}}{(1 - ZK_{TL})r_{\$}}$$

The parameters ZK_{FX} and ZK_{TL} in the calculation of breakeven ROC represent foreign currency and Turkish lira reserve requirement ratios and r_{TL} and $r_{\$}$ represents Turkish lira and foreign currency (USD) funding interest rates respectively. Therefore, under the assumption

¹⁰ See Küçüksaraç and Özel (2012) for details.

that reserve requirements are constant in the short run, the main determinant of the breakeven ROC is the relative cost of Turkish lira vs foreign currency funding.

If the breakeven ROC is larger than the ROC level determined by the CBRT, it is expected that banks will prefer using the facility. In other words, the gap between the breakeven ROC and the actual ROC level determined by the CBRT is expected to be the key parameter in determining the ROM utilization rate.

Other Factors Affecting ROM Utilization Rate

There are other factors affecting ROM utilization as well as cost related factors. Since banks need to have foreign currency funds to use the ROM, the foreign currency liquidity condition is expected to affect ROM utilization. In other words, there may be cases where the utilization rate is less than expected because of foreign currency liquidity shortage, although it may otherwise be optimal to utilize the facility. Therefore, the inclusion of a variable representing foreign currency liquidity conditions of banks into the empirical analysis may help to explain the movements in the utilization rate.

In addition to foreign currency liquidity conditions, exchange rate depreciation or appreciation is also expected to affect the utilization rate through a direct but mechanical channel. Since ROM U.S.ge does not necessitate taking a foreign currency position, the exchange rate is not expected to affect breakeven ROC. However, the appreciation or depreciation of the Turkish lira is expected to affect the utilization rate of some banks because of valuation effects. For instance, the Turkish lira depreciation results in an increase in the value of foreign currency funds used for the ROM. Therefore, Turkish lira depreciation would increase the utilization rate of the banks which have foreign currency liquidity constraints.

Furthermore, it would be useful to test the relationship between the volatility in global risk appetite and the ROM utilization rate. At first sight, since global risk appetite is already included into the analysis indirectly through variables such as interest rate, exchange rate and liquidity, it might not be necessary to include this variable separately. However, global risk appetite has become one of the determinants of capital flows after the 2008 financial crises. For that reason, VIX is included in the model directly to test the direct effect of capital flows on the ROM utilization rate.

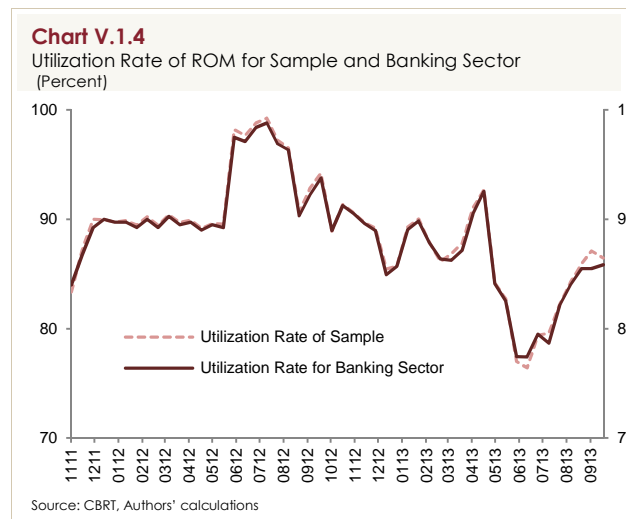
In assessing ROM utilization rates, one should also take into account that banks have the option to use the foreign currency funds in other assets. In the calculation of breakeven ROC, it is assumed that banks do not have any foreign liquidity constraints; therefore, they have sufficient foreign funds to be used for ROM. However, banks could use these foreign

currency funds for extending foreign currency credit or Turkish lira credit using cross currency swaps. For that reason, we include the ratio of credit volume to the balance sheet size as an additional explanatory variable to separate these kinds of effects. We expect this variable to move in the opposite direction from the ROM utilization rate.

Data and Sample

Our sample for empirical analysis starts from 22 June 2012 since reserve option coefficients do not show enough variability before this period. Reflecting the reserve maintenance periods, the data for empirical analysis is at bi-monthly frequency, and covers 37 observations from June 2012 to September 2013.

The panel data analysis covers 18 banks, which constitutes 92 percent of the banking system in terms of reserve requirements. In time series analysis, we calculate the ROM utilization rate for the sample by weighting the utilization rate of each bank by their share in Turkish lira required reserves. Chart V.1.4 shows the utilization rate of 18 banks is a good proxy for the utilization rate of the banking sector.



The Utilization Rate Implied by Breakeven ROC

The fact that breakeven ROC is different for each bank and ROC(s) differ for each reserve option tranche makes it difficult to model the relation between utilization rate and breakeven ROC. Since reserve option coefficients are step functions rather than a continuous function, small movements in breakeven ROCs do not always cause a change in the utilization rate. In order to circumvent this problem, we derive a new index called the "Expected ROM Utilization Rate". This index represents the expected utilization rate implied by the breakeven ROC.

The construction of the Expected ROM Utilization Rate Index rests on the idea that, if the breakeven ROC is higher than the ROC of a tranche determined by the CBRT, we expect that tranche to be utilized. A simple example helps to understand how the expected ROM utilization rate is calculated. Suppose breakeven ROC for a bank is 2.35 and the ROC determined by the CBRT are as in Table V.1.1. In this case, the bank is expected to utilize the tranches whose ROC is below 2.35. In other words, it is not optimal for the bank to utilize tranches between percent 45 and 60. Therefore, the expected ROM utilization rate for the bank would be 45 percent. Through this index, we overcome the difficulty of modeling the breakeven ROC and the utilization rate. The cross sectional variability of the banks helps identify the effects of the variables since the time series dimension of the data is limited.

Table V.1.1

FX Reserve Option Tranches and ROC

FX Reserve Option Tranches	Current ROC
0-30	1,4
30-35	1,5
35-40	1,8
40-45	2,2
45-50	2,5
50-55	2,7
55-60	2,8

The calculation of the expected ROM utilization rate requires knowing which interest rates for foreign currency and Turkish lira funding costs are taken into account by banks in the calculation of breakeven ROCs. There are various financing sources for banks. In this study we try to answer this question through a simple empirical analysis: We first calculate the expected utilization rates implied by the breakeven ROC using alternative funding costs. Next, we try to assess which funding cost better explains the realized ROM utilization rate.

We use the Turkish lira currency swap rate, one-week repo rate, BIST overnight repo rates, overnight lending rate, average funding rate and the deposit rate up to 3 months as alternative Turkish lira funding rates. As for foreign currency funding costs, we use the rate of the foreign currency deposit, which has a high share in the foreign currency funding of the banks. On the other hand, banks have other foreign currency funding sources such as borrowing from abroad in short or long term and security issues. However there is no regular sufficient data for these funding sources. Therefore, we opt to represent the foreign currency funding costs of the banks using the deposit rates. For the foreign currency deposit rate, we use the U.S. dollar and euro deposit rate up to 3 months. The euro based costs are

converted into U.S. dollars and weighted by the ratio of the euro hold for the ROM to the U.S. dollar hold for the ROM.

Empirical Findings

Which Turkish Lira Interest Rate is more important for the ROM Utilization?

In order to find the interest rate that is relevant for banks' ROM utilization, we investigate which interest rate is most successful in forecasting the realized utilization rate of the ROM. For this purpose, using alternative Turkish lira funding sources and foreign currency deposit rates, we calculate the expected ROM utilization rate indexes implied by the breakeven ROC(s). Alternative Turkish lira funding rates are the Turkish lira currency swap rate, one-week repo rate, BIST overnight repo rates¹¹, overnight lending rate, average funding rate and the deposit rate up to 3 months. For each of these alternatives we estimate an expected utilization rate implied by the breakeven ROC and then we calculate the expected utilization rate index for the banking sector by weighting the individual bank's index with their share in the Turkish lira reserve requirement. Then, using an OLS estimation, we ask which index is more successful in explaining the realized utilization rates. The results are presented in Table V.1.2. Each column in the Table represents the expected utilization rate index which is calculated by a different interest rate. Also, we include a constant and a lagged value of the dependent variable.

Table V.1.2

Time Series Results

Explanatory Variables	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7
Lagged Value of Utilization of ROM	0.480*** (0.002)	0.607*** (0.000)	0.845*** (0.000)	0.736*** (0.000)	0.782*** (0.000)	0.600*** (0.000)	0.852*** (0.000)
CBRT Average Funding Rate	0.249*** (0.001)						
BIST Overnight Repo Rates		0.229*** (0.001)					
Currency Swap Rate			0.271*** (0.002)				
TL Deposit Rate				0.464 (0.144)			
Overnight Lending Rate					0.063 (0.359)		
Policy Rate							0.002 (0.925)
Constant	0.266*** (0.003)	0.164*** (0.009)	-0.131 (0.170)	-0.226 (0.376)	0.131* (0.060)	0.202*** (0.007)	0.127 (0.134)
R-Square	0.865	0.860	0.839	0.806	0.797	0.845	0.791

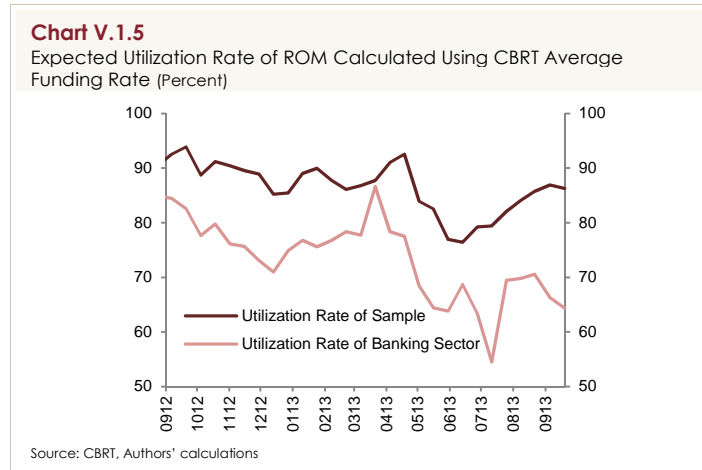
The sample covers the period from 22 June 2012 to 27 September 2013. The first values in the table represent coefficients and the second ones represent p-values.

Results show that the indices calculated with the CBRT average funding rate, BIST overnight repo rates and currency swap rates are statistically significant in explaining the

¹¹ Five day moving averages of overnight repo interest rates in BIST repo and reverse repo have been used.

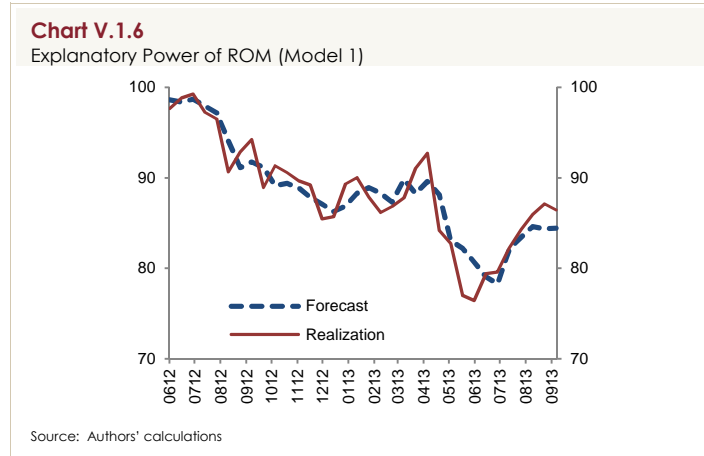
realized utilization rate. The results suggest that banks take into account the CBRT average funding cost and short term money market rates in deciding whether or not use the ROM facility, while the explanatory power of the index calculated by CBRT average funding cost is larger than others. Therefore, in the remainder of the study, we will use the expected ROM utilization rate calculated using the CBRT average funding cost.

The expected ROM utilization rate calculated by the CBRT average funding cost and realized utilization rate is compared in Chart V.1.5. In general, both series move in the same direction. However, the realized utilization rate is consistently higher than the expected one. This situation is because the foreign currency deposit rate used in our calculation of breakeven ROC is higher than the actual cost of short term foreign currency funds in practice.¹²

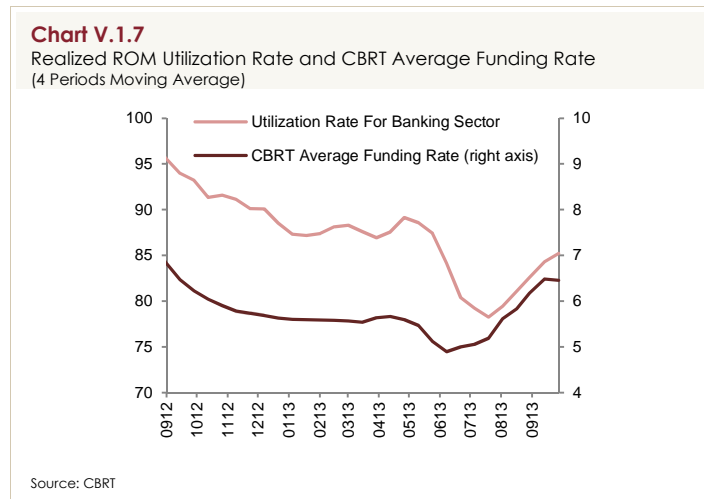


Overall, these results show that the expected ROM utilization rate calculated by using the CBRT average funding cost is an important determinant of ROM utilization. In fact, the explanatory power of a simple OLS model using our expected ROM utilization index as an explanatory variable is quite high (Chart V.1.6).

¹² Since there is no healthy data about the foreign currency borrowing of banks from abroad, foreign currency deposit rate is used in the analysis.



The fact that a relative cost difference between the Turkish lira and foreign currency funds is one of the main determinants of ROM utilization indicates that ROM utilization is sensitive to short term Turkish lira interest rates. Chart V.1.7 shows that the ROM utilization rate and the CBRT average funding rate move together. This observation suggests that a decline in the volatility of short term interest rates will provide more room for the ROM to act as an automatic stabilizer against capital flows. In other words, the wide interest rate corridor causing volatility in short term interest rates might limit the efficiency of the ROM as an automatic stabilizer.



Other Factors Affecting ROM Utilization

Although cost related factors are the main determinants of ROM utilization, there are still significant differences between the expected utilization implied by breakeven ROC and realized utilization in some periods. This observation indicates that other factors are also important for ROM utilization. We conduct a panel data analysis using micro data at the

bank level to evaluate the effect of other variables. To this end, we use the exchange rate, VIX, the share of credit in the banks' balance sheets and foreign currency liquidity ratios. An exchange rate basket is calculated for each bank by using the share of USD and euro which banks hold for the ROM. For instance, if the share of USD in total amount of FX held for the ROM is 60 percent, then the exchange rate basket is calculated by 60 percent USD and 40 percent in euro. Through this calculation the effect of exchange rate on the ROM utilization rate can be conducted more efficiently. Another variable that might affect ROM utilization is global risk appetite, represented by the VIX index, which may also be a direct proxy for capital flows. Moreover, the share of credit in the banks' balance sheets is used as a proxy for the banks' appetite to extend credit. In addition, the foreign currency liquidity ratio of each bank is used as an indicator of the banks' foreign currency liquidity positions.

In terms of timing, we use the most recent data released before the start of each maintenance period. In other words, we use the data set by the time banks claim their ROM utilization. In addition, we used one week lagged data for the foreign currency liquidity position and the share of credits in the balance sheet to reduce the endogeneity problem. For exchange rate basket data, we used the data at the time of obligation date. One day lagged VIX is used for the proxy of global risk appetite.

In this context, we perform a fixed effects panel estimation using the model below with the data from 18 banks between 22 June 2012 and 27 September 2013.

$$ROM_{it} = \alpha_i + \beta_1 ROM_{i,t-1} + \beta_2 EROM_{i,t} + \beta_3 Credit_{i,t-1} + \beta_4 FCLR_{i,t-1} + \beta_5 Basket_{i,t} + \beta_6 VIX_{t-1} + \varepsilon_{it}$$

In the model, "ROM" represents the realized utilization rate, "EROM" represents the expected ROM utilization rate, "Credit" represents the share of credit in the balance sheet of banks, "FCLR" represents the foreign currency liquidity ratio, "Basket" represents the basket exchange rate which is calculated for each bank and "VIX" represents the volatility index.

Panel data results show that in addition to the expected ROM utilization rate calculated by the CBRT average funding rate, the foreign currency liquidity ratio, the share of credits in the balance sheet and the exchange rate basket are statistically significant and the sign of the coefficients are as expected.

Foreign currency liquidity ratio moves in the same direction with the utilization rate. This result is consistent with the view that liquidity constraints regarding foreign currency affect the ROM utilization rate. The volatility index which is an indicator of global risk appetite does not have a statistically significant effect on ROM utilization rate. This result

does not necessarily indicate that VIX is not important, as the impact of the volatility index on ROM utilization may be seen through other variables included in the regression.

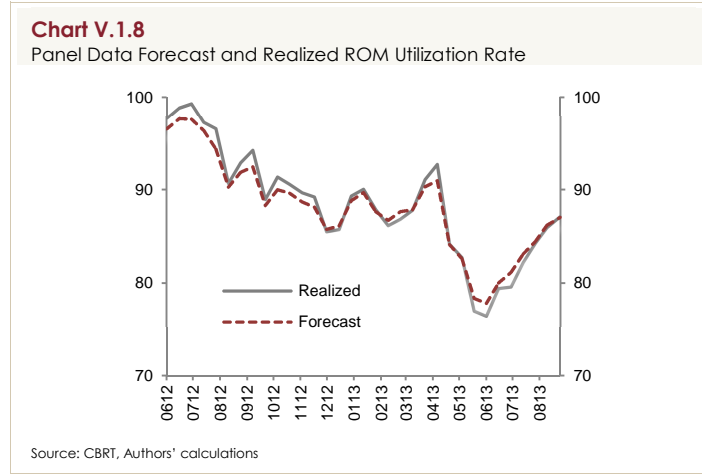
Table V.1.3 also shows that the share of credit in banks' balance sheets moves in the opposite direction from ROM utilization as expected. In other words, banks may tap their resources at the ROM facility when they are more willing to extend new credits. Furthermore, the exchange rate basket is also statistically significant and affects the ROM utilization rate as expected.

Table V.1.3

Panel Data Results About ROM Utilization Rate

Explanatory Variables	Coefficient
Lagged Value of ROM Utilization Rate	0.772*** (0.000)
Expected ROM Utilization Rate Calculated by CBRT Average Funding Rate	0.057*** (0.000)
Share of Credits in the Balance Sheet, Lagged Value	-0.150** (0.012)
Foreign Currency Liquidity Ratio, Lagged Value	0.013 (0.103)
Risk Appetite (VIX)	-0.001 (0.274)
Exchange Rate Basket	0.060** (0.037)
Constant	0.211*** (0.000)
R-Square	0.871

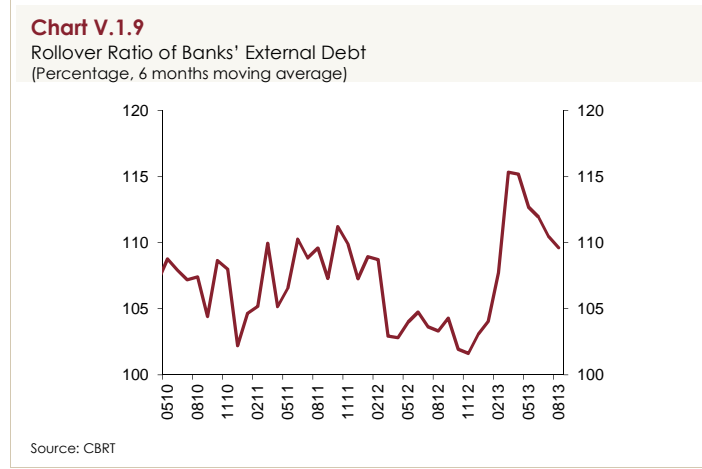
Chart V.1.8 compares the forecast of the model and realizations to evaluate the explanatory power of the model. Using panel estimations, we forecast each bank's ROM utilization and weight them by their share in Turkish lira required reserves to obtain a forecast for the banking sector. This exercise shows that our forecast does a good job in explaining the actual movements in the ROM utilization rate.



Conclusion

Our results show that breakeven ROC is the main determinant of ROM utilization, which depends on the relative cost of foreign currency versus Turkish lira funding as well as reserve option coefficients set by the central bank. Given that during the sample period the most volatile item among these variables was the Turkish lira interest rate, we conclude that the course of the ROM was mainly driven by the Turkish lira interest rate. This may also be explained by the wide interest rate corridor and active liquidity policy adopted by the CBRT during the sample period. In such periods, it will be difficult to observe the automatic stabilizer feature of the ROM. These findings suggest that a decline in the volatility of short term interest rates (for instance an increase in the predictability of CBRT liquidity and interest rate policy) would create a more suitable environment for ROM to act as an automatic stabilizer.

Our findings also provide insights into why banks' ROM utilization increased during the period of capital outflows witnessed in June 2013 following the tapering concerns by the Fed. The results suggest that in this period the increase in the short term interest rate of the CBRT through a tight liquidity policy has made the ROM more profitable for banks, since the cost of Turkish lira funding increased compared to FX borrowing. Moreover, banks did not need to withdraw reserves from their ROM holdings because there was no external borrowing problem for the banks, since the shock in this period was a re-pricing shock rather than a financing shock. Indeed, the rollover ratio for banks' external debt has been at high levels (Chart V.1.9).



Overall, the ROM is designed as a flexible and market friendly mechanism which increases the CBRT reserves with low sterilization cost, and decreases the rollover risks of banks. Our empirical results indicate that these benefits might be observed more significantly if the CBRT implements a less volatile interest rate policy in the following period.

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V.2. The Impact of Monetary Policy Shocks on Firm Credit¹³

After the global financial crisis, the adverse consequences of rapid credit growth for macroeconomics and financial stability have been discussed heavily both in academic studies and among policy makers. In this context, there are many empirical studies about the impact of monetary policy on credit growth dynamics. Although the existing literature mostly focuses on the macroeconomic effects of monetary policy on credit stock, there is still few studies about the microeconomic effects of monetary policy on firm credit growth performance. Using micro-level firm data can be helpful to understand the monetary transmission mechanism and its effects on credit growth. In this special topic, the study about the relation between monetary policy and firm credit growth in Turkey by Altunok, Oduncu and Orman (2013) is summarized.

The monetary policy transmission theory identifies two channels, interest rate and credit channel that influence economic activities as a result of monetary policy shocks. According to the interest rate channel, monetary policy changes directly impact the user cost of capital of firms. Then, firms adjust the level of capital stock till marginal productivity of capital becomes the cost of funding. On the other hand, through the credit channel, monetary policy changes firms' access to credit facilities and credit costs (depending on the information asymmetry problem).¹⁴ Thus, firms with a limited access to financial markets have become more sensitive to the monetary policy shocks as a result of information asymmetries. (Mishkin, 1995; Bernanke and Gertler, 1995). Mojon et al. (2002) investigate the impact of monetary policy on firms' investment by using industry level data from Germany, France, Italy and Spain. They find that the interest rate channel of monetary policy is operative in these countries through the user cost of capital. Nagahata and Sekine (2005) analyze the impact of monetary policy after the collapse of the asset price bubble in Japan by using corporate panel data. They find that monetary policy is effective through the interest rate channel, but its effect through the credit channel is blocked as a result of the deterioration in the balance sheet of Japanese firms. Guariglia and Mateut (2006) investigate transmission of monetary policy by using panel data of UK manufacturing firms. They find that the credit channel is operative since financially constrained firms are affected more from monetary policy shocks.

Altunok, Oduncu and Orman (2013) examine how monetary policy shocks affect the credit growth of the nonfinancial firms listed in Borsa Istanbul. They show that monetary tightening has a significant effect on the decline of the firm credit growth and monetary

¹³ This study has been prepared by Dr. Fatih Altunok and Dr. Arif Oduncu.

¹⁴ In the literature, the credit channel term is used for both the bank lending channel and the balance sheet channel. However, in this study the credit channel only refers the balance sheet channel.

policy shocks have asymmetric effects on firms credit growth. Thus, they conclude that monetary transmission mechanism is operative in Turkey.

The sample consists of panel data for public Turkish nonfinancial firms, about 250 firms, for the period 2003q1–2012q4 and constructed by using consolidated statements obtained from Borsa Istanbul. Moreover, firm loan data including the total real value of credit and credit line as well as firm bank relationship are compiled from the Central Bank of the Republic of Turkey's dataset. This unique and comprehensive dataset enable them to study the effects of monetary policy in micro-firm level. Monetary policy shocks are given from Kılınç and Tunç (2013). The model below is used to investigate the effects of monetary policy shocks on the credit growth of firms.

$$LG_{it} = \beta_0 + \beta_1 MPSt_t + \beta_2 W_{it} + \beta_3 X_{it} + \beta_4 Y_{it} + \beta_5 Z_{it} + \sum_1^3 dquarter + \varepsilon_i,$$

where LG_{it} is the quarterly loan growth of firm i . Our focus variable is $MPSt_t$, which is the quarterly monetary policy shock. The other control variables are represented by the vectors W_{it} , X_{it} , Y_{it} and Z_{it} which are firm characteristics, credit demand, firm financial performance and bank relationship variables. We also include quarter dummies to control seasonal effects. Firm characteristic variables are total assets and age; credit demand variables are sales growth, inventory growth, cash flow, accounts payables and receivables growth. Firm financial performance variables are current assets to total assets, current ratio, liabilities to total assets and tangible assets to total assets; bank relationship variables are bank concentration, credit line and the number of banks from which firm borrows loan. The main variable in the model is the monetary policy shock and it is defined as the unexpected change in the monetary policy. The negative value of monetary policy means a monetary loosening and the positive one is monetary tightening of central bank. The model is estimated by fixed panel data estimation.

The regression results are presented in Table V.2.1. First column presents the effect of monetary policy shocks on firm credit growth without controlling any other variable. The second through fifth columns show the estimation results when control variables are added to model. It can be seen that monetary tightening has a negative effect on firm credit growth at 1% statistically significant level. According to the results, a 25 basis point increase in policy shocks decrease the credit growth of firm by 2.5% points. It is shown that the negative and significant effect of monetary policy shocks on firm credit growth is robust to enclosure of firm-level control variables. According to the standardized beta coefficients, the coefficient of monetary policy shocks is 40% more than the coefficient of cash flow. We re-estimate the effects of monetary policy shocks on firm credit growth by system and difference generalized method of moments (GMM) estimations for robustness check. In

these analyses, the time series effects of monetary policy shocks are examined. The shocks are most effective in the same quarter, the effects of them are declined by 45% in the upcoming quarter and they diminished after the upcoming quarter.

Table V.2.1

Firm Credit Growth and Monetary Policy Shocks

Dependent Variable	Firm Credit Growth				
Independent Variables	(1)	(2)	(3)	(4)	(5)
Monetary Policy Shocks	-0.107*** (0.018)	-0.103*** (0.018)	-0.100*** (0.018)	-0.098*** (0.018)	-0.100*** (0.018)
Firm Specific Variables					
Ln (Total Assets)		0.005 (0.022)	0.000 (0.026)	-0.007 (0.026)	-0.002 (0.028)
Ln (Age)		-0.094 (0.059)	-0.100 (0.095)	-0.096 (0.097)	-0.176* (0.097)
Credit Demand					
Sales Growth			0.039 (0.029)	0.017 (0.028)	0.018 (0.028)
Inventory Growth			0.039 (0.041)	-0.030 (0.042)	-0.026 (0.042)
Cash Flow			-0.261*** (0.073)	-0.304*** (0.068)	-0.292*** (0.068)
Accounts Payables Growth			0.046 (0.040)	0.004 (0.043)	0.003 (0.043)
Accounts Receivables Growth			0.063*** (0.024)	0.048** (0.024)	0.050** (0.024)
Financial Performance					
Current Assets / Total Assets				0.299** (0.128)	0.263** (0.129)
Current Ratio				0.028** (0.012)	0.028** (0.012)
Leverage				0.268*** (0.092)	0.220** (0.093)
Tangible Assets/Total Assets				0.049** (0.021)	0.058*** (0.021)
Bank Relationship Variables					
Bank Concentration					1.481*** (0.318)
Credit Limit					0.070*** (0.025)
Number of Banks Borrowed					-0.002 (0.007)
Quarter Dummies					
1st quarter	0.075*** (0.028)	0.076*** (0.028)	0.078*** (0.029)	0.069** (0.029)	0.068** (0.029)
2nd quarter	0.192*** (0.028)	0.192*** (0.028)	0.186*** (0.027)	0.191*** (0.026)	0.191*** (0.026)
3rd quarter	-0.039* (0.021)	-0.038* (0.021)	-0.029 (0.022)	-0.035* (0.021)	-0.034 (0.021)
Constant	0.037** (0.016)	0.287 (0.327)	0.371 (0.442)	0.096 (0.486)	0.205 (0.524)
Observations	8,237	8,237	7,647	7,647	7,647
R ²	0.019	0.019	0.025	0.031	0.035
Adjusted-R ²	0.02	0.02	0.02	0.03	0.03

The estimated coefficients for control variables are consistent with theoretical predictions. For example, while the increase in the firm's cash flow reduces the credit growth, increase in trade receivables increases the credit growth. Financial performance indicators show that firms with a more robust financial structure have easier access to credit and this situation has the positive effect on the credit growth of firms. Finally, our finding that decreasing competition in the banking sector has a positive impact on credit growth is

consistent with the results found by Mayer (1988), Rajan (1992) and Petersen and Rajan (1994).¹⁵

Table V.2.2

Firm Credit Growth and Asymmetric Monetary Policy Shocks

Dependent Variable	Firm Credit Growth				
Independent Variables	(1)	(2)	(3)	(4)	(5)
Negative Mon. Policy Shocks	-0.062*	-0.077**	-0.070*	-0.073*	-0.063
	(0.037)	(0.038)	(0.040)	(0.040)	(0.041)
Positive Mon. Policy Shocks	-0.133***	-0.110***	-0.109***	-0.103***	-0.118***
	(0.024)	(0.028)	(0.030)	(0.030)	(0.031)
Firm Specific Variables					
Ln (Total Assets)		0.001	-0.005	-0.010	0.001
		(0.016)	(0.019)	(0.021)	(0.020)
Ln (Age)		-0.110**	-0.123*	-0.084	-0.181**
		(0.052)	(0.072)	(0.073)	(0.077)
Credit Demand					
Sales Growth			0.043	0.017	0.016
			(0.026)	(0.025)	(0.025)
Inventory Growth			0.060	-0.005	-0.002
			(0.042)	(0.041)	(0.041)
Cash Flow			-0.176***	-0.200***	-0.199***
			(0.067)	(0.066)	(0.067)
Accounts Payables Growth			0.026	-0.009	-0.008
			(0.035)	(0.035)	(0.035)
Accounts Receivables Growth			0.074***	0.057**	0.058**
			(0.025)	(0.023)	(0.024)
Financial Performance					
Current Assets / Total Assets				0.322***	0.281**
				(0.110)	(0.109)
Current Ratio				0.019	0.020*
				(0.012)	(0.012)
Leverage				0.247***	0.191***
				(0.066)	(0.067)
Tangible Assets/Total Assets				0.053***	0.055***
				(0.019)	(0.019)
Bank Relationship Variables					
Bank Concentration					1.301***
					(0.334)
Credit Limit					0.084***
					(0.027)
Number of Banks Borrowed					0.006
					(0.008)
Quarter Dummies					
1st quarter	0.121***	0.122***	0.123***	0.118***	0.115***
	(0.025)	(0.025)	(0.027)	(0.026)	(0.026)
2nd quarter	0.195***	0.195***	0.183***	0.189***	0.188***
	(0.025)	(0.025)	(0.024)	(0.023)	(0.023)
3rd quarter	0.045*	0.047*	0.053**	0.046*	0.045*
	(0.025)	(0.026)	(0.027)	(0.026)	(0.026)
Constant	0.025	0.375	0.505	0.094	0.171
	(0.018)	(0.253)	(0.324)	(0.348)	(0.343)
Observations	10,048	10,048	9,407	9,407	9,407
R ²	0.011	0.012	0.016	0.021	0.025
Adjusted-R ²	0.01	0.01	0.01	0.02	0.02

Moreover, it is possible that these two different types of shocks have asymmetric effects on firms' loan growth decision. We perform the same regression analysis by using negative and positive monetary policy shocks separately. Obtained results are shown in Table 2. We find that while negative shocks increase the firm credit growth, positive shocks decrease it, as expected. More importantly, positive monetary policy shocks are more

¹⁵In the cited articles, it is argued that increasing competition in financial markets hinder the development of the bank and firm relations and this situation decreases the return benefit of banks by giving to the long-term credit to firms. Therefore, the banks start to give less credit to firms.

effective since the absolute magnitude of the positive coefficient of monetary policy shock and its significance are higher than of the negative monetary policy shock's. Moreover, according to the standardized beta coefficients, the coefficient of positive monetary policy shocks is two times larger than the coefficient of negative one. Therefore, it can be said that there is an asymmetric effect of monetary policy shock on firm credit growth.

Furthermore, the regression analysis is repeated for 3 different samples in order to test the robustness of the results. First, regressions are run separately for manufacturing and non-manufacturing firms and similar results are obtained for these two different data sets. Second, the data is divided into two by less creditworthy and more creditworthy firms and the asymmetric effect of monetary policy is examined. Results suggest that less creditworthy firms are more sensitive to monetary policy shocks. Lastly, the firms are divided into two according to the leverage levels and it is found that the less leveraged firms are more sensitive to monetary policy shocks.

Understanding the transmission mechanism of monetary policy is crucial especially for central banks since they have to know precisely the effects of their policy when they are formulating them. Moreover, the impact of the monetary policy on the credit growth dynamics is an essential topic since rapid credit growth poses risks to macroeconomic and financial stability. We investigate how monetary policy shocks affect the credit growth of firms by using micro firm-level data. We show that firms significantly decrease their credit growth as a response to monetary tightening. Thus, it can be said that monetary policy is operative in Turkey. Furthermore, the evidence shows that the finding of monetary policy shocks have a negative and significant effect on firm credit growth is robust when firm-level control variables are added to model.

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V.3. Net Foreign Exchange Position of Firms and Firm Performance¹⁶

Turkish firms have become more global especially after the 2000s and the volume of exports and imports has increased substantially as a consequence. In addition to this, Turkish firms have been able to borrow easily from international markets due to the implementation of financial and economic stability policies. However, Turkish firms have become more vulnerable to foreign exchange shocks since they cannot balance off foreign liabilities with foreign exchange position. Therefore, foreign exchange shocks might have negative effects on firms. Especially, from an academic and policy-making perspectives, it is important to understand how different types of firms are affected by foreign exchange shocks. In order to find an answer to this question, the effect of foreign exchange shocks on firms should be investigated using micro-level panel data. This section will review the study by Altunok, Aytug and Oduncu (2013), which investigate the effect of foreign exchange position on firm performance.

While theoretical studies argue that foreign exchange shocks can influence firms through various channels including imports and exports, empirical studies find both significant and insignificant results. Horion (1990) argues that foreign exchange shocks have a significant impact on American firms and emphasizes that the main determinant of this effect is exports. On the other hand, Bartov and Bodnar (1994) claim that the impact for the American firms does not occur simultaneously and the effect can be seen after a quarter lag. He and Ng (1998) find that Japanese firms are affected simultaneously however they underlined that there is lagged impact. Pritamani, Shome and Singal (2004) employ American firm level data and find that the effect is insignificant for the exporters but significant for the importers. Doidge, Griffin and Williamson (2006) use panel data of firms from 18 different countries and argue that the effect of foreign exchange shocks on firms is significant. Another finding of this paper is that firms with high level of exports are affected more than firms with low level of exports.

Altunok, Aytug and Oduncu (2013) investigate the effect of foreign exchange position on firm return on assets, particularly using non-financial firm data from Borsa Istanbul. They find that the effect of foreign exchange position on firm performance is negative and the effect increases when there is a foreign exchange shock. In addition to this, the effect gets larger during a financial turmoil.

In this paper, the data of 291 manufacturing firms between 2000-Q1 and 2013-Q2 is used. The data is obtained from the balance sheet and income statements of the firms. However, foreign exchange position data is derived from footnotes of the balance sheet

¹⁶ This study has been prepared by Dr. Fatih Altunok, Dr. Hüseyin Aytuğ and Dr. Arif Oduncu.

statements and this makes the data set to be unique. The model below is used to understand how firm profitability is affected.

$$ROA_{it} = \beta_0 + \beta_1 FXP_{it} + \beta_2 FX_t + \beta_3 (FX_t * FXP_{it}) + \beta_4 EX_{it} + \sum \beta_k X_{it} + \sum_1^3 kq + \varepsilon_i$$

$$ROA_{it} = \beta_0 + \beta_1 FXP_{it} + \beta_2 CR_t + \beta_3 (CR_t * FXP_{it}) + \beta_4 \Delta FX_t + \sum \beta_k X_{it} + \sum_1^3 kq + \varepsilon_i$$

where

ROA_{it} = return on asset of firm i

FXP_{it} = foreign exchange position of firm i

FX_t = change in foreign exchange between Turkish lira and the american dollar¹⁷

EX_{it} = exports of firm i

CR_t = crisis dummy variable

X_{it} = firm specific control variables

kq = dummy variable for 1st, 2nd and 3rd quarters.

The firm specific control variables include firm size, firm age, the leverage as the ratio of liabilities to total assets, investments of the firms, the growth of inventories and the growth of trade credit. Five different specifications of the model are estimated. In all models, the dependent variable is defined as the return on asset (ROA) and the Fixed-Effect model is used in the estimations.

The estimation results are presented in Table 1. There is a negative and significant relationship between foreign exchange position and ROA for all specifications of the model. The first column shows that foreign exchange position has a negative impact on ROA when it is the only independent variable. In this case, a 10 percent increase in foreign exchange position of an average firm causes ROA to fall by 5.2 percent. Starting from the second column to the fifth, some control variables are added to the regressions that may affect ROA. In the second column, the effect of a foreign exchange shock is analyzed and it is found that the depreciation of Turkish lira has a negative impact on ROA. Moreover, the negative effect of foreign exchange position increases when there is a foreign exchange shock. In the third and fourth columns, the effect of exports is analyzed. Although the effect of exports on ROA is positive, the firms are not able to balance off the negative impact of foreign exchange position in the case of a foreign exchange shock. In the last column, the firm specific control variables are included in the model, however the estimated coefficients of the focus variables are not affected and the coefficients of the control variables are in line with current literature.

¹⁷ Foreign exchange is defined as euro and euro-usd basket and similar results have been reached.

Table V.3.1

Return on Asset and Foreign Exchange Position

	ROA				
	(1)	(2)	(3)	(4)	(5)
FXP	-0.110*** (0.011)	-0.085*** (0.011)	-0.083*** (0.011)	-0.062*** (0.013)	-0.026** (0.012)
FXP x FX		-0.354*** (0.040)	-0.354*** (0.040)	-0.355*** (0.040)	-0.378*** (0.038)
FX		0.031*** (0.008)	0.029*** (0.009)	0.027*** (0.009)	0.024*** (0.009)
Exports/Total Assets			0.031*** (0.010)	0.040*** (0.011)	0.043*** (0.010)
Exports/ (Total Assets)x FX			0.017 (0.040)	0.026 (0.040)	0.054 (0.040)
Exports/ (Total Assets) x FXP				-0.127*** (0.042)	-0.144*** (0.039)
LN(Total Assets)					0.020*** (0.004)
LN(Firm Age)					-0.000 (0.017)
Leverage					-0.086*** (0.010)
Investments					0.012*** (0.003)
Inventory Growth					0.159*** (0.025)
Trade Debt/Total Assets					0.050** (0.020)
1st quarter	-0.026*** (0.003)	-0.025*** (0.003)	-0.020*** (0.004)	-0.020*** (0.004)	-0.018*** (0.004)
2nd quarter	-0.015*** (0.002)	-0.015*** (0.002)	-0.012*** (0.002)	-0.012*** (0.002)	-0.007*** (0.002)
3rd quarter	-0.000 (0.001)	-0.000 (0.001)	0.001 (0.001)	0.001 (0.001)	0.004*** (0.001)
Constant	0.039*** (0.003)	0.036*** (0.003)	0.030*** (0.003)	0.029*** (0.003)	-0.226*** (0.083)
Observations	9,590	9,590	9,590	9,590	9,559
R ²	0.136	0.156	0.160	0.164	0.210
Adjusted-R ²	0.13	0.15	0.16	0.16	0.21

In order to understand how the crisis played a role, the model is re-estimated using the crisis dummy variable. The dummy variable takes 1 for the quarters of 2008, 2009 and 2011, while it takes 0 otherwise. The new estimation results are presented in Table 2. The effect of foreign exchange position is still negative and significant in all columns except the last column. If an average firm experiences a financial crisis with a 9 percent of foreign exchange position (the average foreign exchange position), ROA falls by 57 percent. Another worthwhile result is that when the crisis dummy variable is included in the model, the coefficient of exchange rate growth becomes insignificant. Moreover, a foreign exchange shock only influences firms through foreign exchange position.

Table V.3.2

Return on Asset and the Crisis

	(1)	(2)	ROA (3)	(4)	(5)
FXP	-0.069*** (0.011)	-0.060*** (0.011)	-0.058*** (0.011)	-0.038*** (0.013)	-0.005 (0.012)
Crisis Dummy	-0.010*** (0.003)	-0.011*** (0.002)	-0.011*** (0.002)	-0.012*** (0.003)	-0.009*** (0.003)
FXP x Crisis Dummy	-0.125*** (0.015)	-0.095*** (0.015)	-0.096*** (0.015)	-0.096*** (0.019)	-0.095*** (0.018)
FXP x FX		-0.230*** (0.039)	-0.230*** (0.039)	-0.233*** (0.039)	-0.248*** (0.037)
FX		0.006 (0.008)	0.000 (0.010)	0.000 (0.010)	0.006 (0.008)
Exports/Total Assets			0.036*** (0.010)	0.043*** (0.011)	0.049*** (0.011)
Exports/ (Total Assets) x FX			0.030 (0.040)	0.029 (0.036)	0.052 (0.034)
Exports/ (Total Assets) x FXP				-0.125*** (0.040)	-0.144*** (0.038)
Exports/ (Total Assets) x FXP X Crisis				0.010 (0.070)	0.017 (0.067)
Exports/(Total Assets) X Crisis				0.005 (0.010)	0.006 (0.010)
LN(Total Assets)					0.015*** (0.004)
LN(Firm age)					-0.026** (0.011)
Leverage					-0.073*** (0.010)
Investment					0.015*** (0.003)
Inventory Growth					0.150*** (0.025)
Trade Debt/Total Assets					0.052** (0.021)
1st quarter	-0.027*** (0.003)	-0.026*** (0.003)	-0.020*** (0.004)	-0.020*** (0.004)	-0.017*** (0.004)
2nd quarter	-0.016*** (0.002)	-0.015*** (0.002)	-0.011*** (0.002)	-0.012*** (0.002)	-0.008*** (0.002)
3rd quarter	-0.000 (0.001)	-0.000 (0.001)	0.002 (0.001)	0.001 (0.001)	0.004*** (0.002)
Constant	0.043*** (0.002)	0.042*** (0.002)	0.034*** (0.003)	0.033*** (0.003)	-0.071 (0.054)
Observations	9,590	9,590	9,590	9,590	9,582
R ²	0.146	0.154	0.159	0.163	0.202
Adjusted-R ²	0.15	0.15	0.16	0.16	0.20

As a robustness check, firms with high and low leverage, firms with high and low fixed assets to total assets ratio and firms in the services and manufacturing industries are investigated separately. Our results indicate that the effect of foreign exchange position is smaller on firms with low leverage compared to firms with high leverage. On the other hand, the effect of foreign exchange position is smaller on firms with high fixed assets to total assets ratio compared to firms with low fixed assets to total assets ratio. However, the effect of foreign exchange position does not vary for firms in different industries.

In conclusion, the question of which firms are influenced the most due to a foreign exchange shock is very crucial for financial stability. In this study, we find that a foreign exchange shock affects the firms, which have the higher level of a foreign exchange position. We also demonstrate that exports have a positive effect on ROA. However, the negative effect of a foreign exchange position with a foreign exchange shock is not balanced off by exports. Based on these results, it is shown that foreign exchange position

matters for financial stability. It is suggested that policy makers pay close attention to this case in order to mitigate the risks that can affect financial stability.

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V.4. Firm Leverage and the Financial Crisis¹⁸

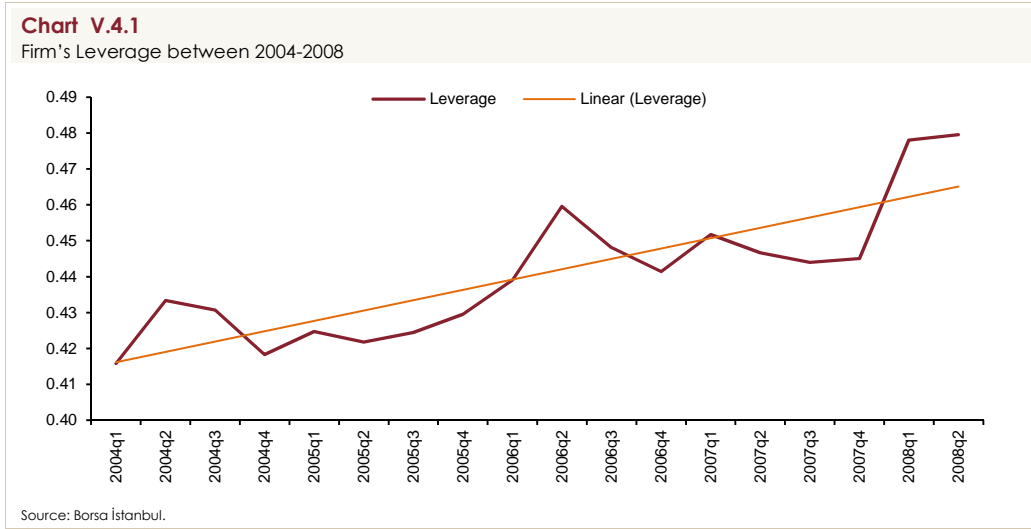
The growth performance of firms is one of the main determinants of the macroeconomic growth. Thus, the firm growth dynamics is an important issue of economics. Financial structure of firms, especially the level of leverage and change in its level may play a crucial role on the growth of the firms. In other words, a sharp increase in the leverage may dampen their performance in terms of accessing new finance especially during a Financial crisis.

There is a growing literature, especially after the global financial crisis of 2007-2008, on the relation between economic crisis and high growth of leverage. Leamer (2007) argues that most of the U.S recessions after World War II have been related with the increase in leverage. Mendoza and Terrones (2008) claim that excessive leverage growth has increased the fragility of banking sector especially in emerging markets and this situation has been associated with economic and financial crisis. Glick and Lansing (2010) find evidence that the countries with lower leverage ratios had better economic performance after the global financial crisis of 2008. Mian and Sufi (2010) examine the relation between household leverage and economic downturn across the U.S counties and they show that a sharp increase in household leverage before the global financial crisis is closely linked to the economic recession of 2007 in U.S.

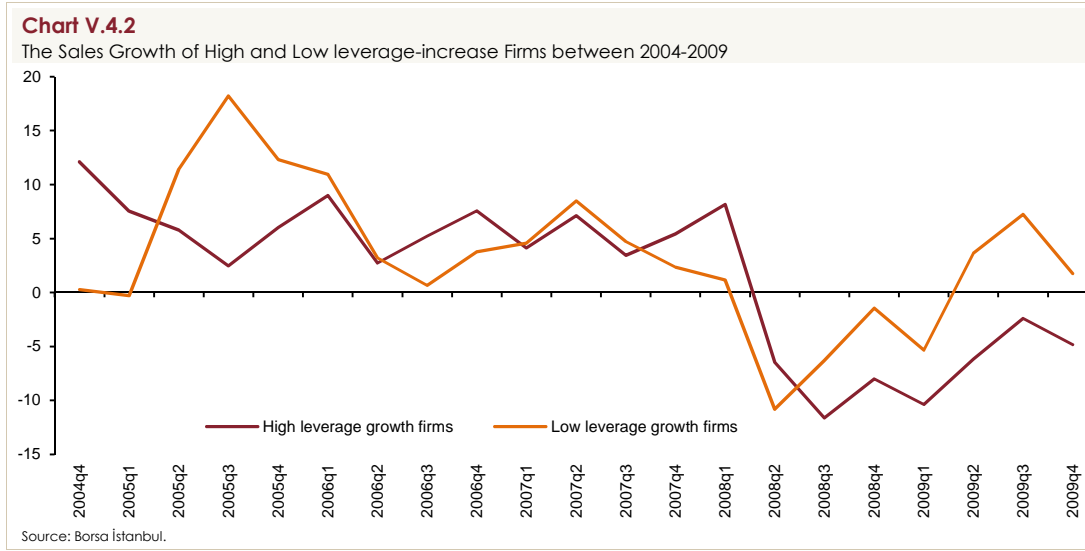
Most of the studies (except Mian ve Sufi, 2010) focus on the aggregate debt of the counties using aggregate data and majority of the studies are cross-country analysis. There is no study exploring the impact of fast growing leverage on the growth of firm during the recent crisis. The study by Altunok and Oduncu (2013) aims to void this gap. In this study, it is investigated how the fast growth of leverage before the crisis affects the growth of firms during the crisis by using Turkish firms listed at Borsa İstanbul. The summary of this study is presented here.

This study's sample consists of panel data for 200 hundred public Turkish nonfinancial firms for the period 2003q4–2009q4 and is constructed by using consolidated statements obtained from Borsa İstanbul. The panel dataset is converted to a cross-section dataset to overcome the very possible endogeneity problem due to the huge correlation and reverse causality problem between sales growth and leverage of the firms.

¹⁸ This study has been prepared by Dr. Fatih Altunok and Dr. Arif Oduncu.



There is a drastic increase in the leverage of the firms between the period of 2004 and 2007 as seen in Chart V.4.1. Thus, we select this period to determine the high and low-leverage growth firms in order to examine their growth performance during the period 2007-2009. The distinct patterns for sales growth performance of low and high-leverage-increase firms are displayed in Chart V.4.2. The firms that experienced a large increase in their debt-to-asset ratio from 2004 to 2007 have inferior sales growth performance in the period 2007-2009. By the last quarter of 2009, sales declined for firms experiencing a sharp increase in leverage by 13% compared to 2007 q4. Quite the opposite, there is an increase in sales growth by 12% compared to 2007 q4 for low-leverage-increase firms at the last quarter of 2009. Moreover, in the third quarter of 2008, although sales growth declines for both low and high-leverage-increase firms, the decline is less severe for low-leverage-increase firms. In this case, it can be said that the firms with low leverage growth rate eliminated the risks arising from the crisis better. The rapid leverage growth before the crisis affected adversely the growth of the firms through increasing the fragility of firms' financial structure.



The model below is used to examine how the high growth of leverage before the crisis affects the growth of firms during the crisis.

$$\Delta SG_i = \beta_0 + \beta_1 \Delta Leverage_i + \sum_k \beta_k X_i + \varepsilon_i;$$

where ΔSG_i is the change in sales growth of firm i from 2007q4 to 2009q4. Our focus variable is $\Delta Leverage_i$ which represents the change in leverage from 2004q4 to 2007q4 of firm i . The other control variables are represented by the vector X_i which includes log of assets, log of age, fixed assets to assets ratio, inventories to assets ratio, liquid assets to assets ratio, return on assets, gross margin, total sales to assets and exports share in total sales.

The regression analysis is done for 4 different base models. In all models, the dependent variable is the sales growth from 2007q4-2009q4. In the first model, only the change in leverage is used as an independent variable and then the other variables are added to regression analysis in model 3 and 4. Industry dummies are used in model 2 and 4 in order to control the different growth performances of the industries. The regression results are presented in Table 1.

According to the results obtained from 4 models, there is a negative and statistically significant relation between leverage growth and sales growth. First column presents that the change of debt-to-asset ratio from 2004 to 2007 is significantly negatively correlated with the sales growth performance of 2007 to 2009. The second through fourth columns show that the coefficient of leverage increases with the addition of control variables. According to the results in the fourth column, a 20 percent increase in the leverage of an average firm between 2004 and 2007 will result in 12.4 percent points decline in the change of sales

growth between the period of 2007 and 2009. The explanatory power of the change in the leverage ratio is increased when firm-specific variables and industry dummies are added to the model. These results show that we successfully control the effects that may result from the difference between sectors and firm-specific factors.

Table V.4.1
Leverage Increase and Sales Growth Performance

Dependent Variable: Independent Variables	Change in sales growth, 2007q4-2009q4			
	(1)	(2)	(3)	(4)
Change in leverage , 2004q4-2007q4	-0.340* (0.187)	-0.433** (0.204)	-0.543*** (0.197)	-0.621*** (0.200)
Leverage, 2003q4			-0.178* (0.096)	-0.198** (0.088)
Ln(Assets)			0.007 (0.019)	-0.016 (0.021)
Ln(Age)			-0.012 (0.076)	0.015 (0.072)
Fixed assets/ Assets, 2007q4			-0.341 (0.302)	-0.269 (0.282)
Fixed assets/ Assets, 2004q4			-0.028 (0.240)	-0.088 (0.234)
Inventories/ Assets, 2007q4			0.078 (0.428)	0.175 (0.394)
Inventories/ Assets, 2004q4			-0.361 (0.424)	-0.392 (0.386)
Liquid assets/ Assets, 2007q4			-0.743* (0.377)	-0.787** (0.365)
Liquid assets/ Assets, 2004q4			0.228 (0.435)	0.181 (0.418)
Return on assets, 2007q4			0.005 (0.433)	0.173 (0.429)
Return on assets, 2004q4			-0.696 (0.482)	-0.779* (0.444)
Gross margin, 2007q4			-0.229 (0.388)	-0.345 (0.390)
Gross margin, 2004q4			-0.038 (0.370)	0.140 (0.432)
Sales/ Assets, 2007q4			-0.133*** (0.044)	-0.135*** (0.045)
Sales/ Assets, 2004q4			0.042 (0.062)	0.060 (0.071)
Changes in sales growth, 2004q			0.043 (0.062)	0.129* (0.076)
Exports/ Sales, 2007q4			-0.022 (0.184)	0.147 (0.157)
Exports/ Sales, 2004q4			-0.011 (0.179)	-0.113 (0.166)
Industry dummies	no	yes	no	yes
Constant	-0.127*** (0.025)	0.138** (0.058)	0.304 (0.448)	0.698* (0.371)
Observations	202	202	183	183
R-squared	0.025	0.082	0.188	0.274
Adj. R-squared	0.02	0.03	0.09	0.14

The regression analysis is repeated for two different samples in order to test the robustness of the results. First, we perform the same analysis excluding the distressed firms which have negative profit and sales growth in 2007. We investigate this scenario since the distressed firms may drive our results due to their poor performance during the financial crisis. By doing so, we overcome some structural problems and the problems related with the poor management of those firms.

Second, we also exclude the most leveraged firms right before the crisis since their high level of leverage might cause their poor performance during the crisis. For this analysis, we exclude the most leveraged quintile of the firms, thus we perform the analysis for remaining 155 firms. We still obtain consistent robust results. This results show that there is a very strong negative correlation between leverage increase and change in sales growth. These results are provided in Table V.4.2.

Table V.4.2

Leverage Increase and Sales Growth Performance (Non-distressed and Less Leveraged Firms)

Variables	Change in sales growth, 2007q4-2009q4			
	(1)	Non-distressed (2)	(3)	Less Leveraged Firms (4)
Change in leverage , (2004q4-2007q4)	-0.409** (0.190)	-0.488*** (0.189)	-0.581** (0.270)	-0.699** (0.294)
Industry dummies	no	yes	no	yes
Constant	-0.226*** (0.253)	0.751 (0.729)	-0.138*** (0.029)	0.098 (0.079)
Observations	96	96	155	155
R-squared	0.048	0.279	0.047	0.153
Adj. R-squared	0.040	0.190	0.04	0.09

In conclusion, understanding the firm growth dynamics is crucial in order to commentate the economic fluctuations. This paper focuses on the role of firm leverage on the growth performance of the firm during the global financial crisis. It is shown that the firms that experienced a large increase in leverage before the global financial crisis has a worse growth performance during 2007-2009 crisis than firms that didn't experience the increase in leverage. Fast growth of the firm leverage might deepen the crisis and increase the severity of the crisis. Moreover, fast growth of the firm leverage might give some clues about an upcoming crisis. Therefore, it is worthwhile to understand the reasons and results of rapid leverage growth for financial stability. It can be said that macro-prudential policies can be implemented to avoid rapid leverage growth and these policies can contribute positively to financial stability.

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V.5. Some Findings and An Assessment of Capital Adequacy and Profitability¹⁹

The claim that financial markets can reach a harmonious balance compatible with economical base without intervention has weakened significantly after the global crisis. If a financial system, on which dynamics disconnected with economical base are dominant, is not regulated and inspected as it should be, it can be a significant source of instability not only for the soundness of financial sector but also for the overall economy. Today, it is understood that it is necessary for central banks and other institutions to help the markets be ready for large negative shocks with policies they apply in normal times. Extraordinarily strong credit growth, high asset prices, low risk premium and low volatilities can indicate that risk taking has reached to a dangerous extend. (Borio and Drehmann, 2009). At such times, it is more difficult as well as extremely necessary to intervene in the vulnerabilities in the financial system in a balancing way. The fact that financial institutions intervene in the financial markets only at the time of the crisis, enlarges the extent of the crisis.

Macroprudential precautions designed to enforce the soundness of financial system take place on the top of both academic and financial sector's agenda. Central banks and other regulatory institutions have given priority to macroprudential precautions with the aim of decreasing the fluctuation seen in the business cycles. For example, global financial crisis has increased the importance of capital adequacy in the banking sector. Both macroprudential precautions and other reforms about the regulations targeting financial institutions aim a higher quality and stronger capital form. Thus, it is of crucial importance to better analyse the several indicators such as capital adequacy and banking profitability for the precautions in question to take effect. Capital is of high importance for banks and financial systems due to its functioning as a financial buffer in compensating losses. For this reason, capital adequacy and additional capital buffers have contributed much to the sound functioning of the economy in terms of reflecting the risk outlook of financial institutions and resistance of the sector at the times of financial stress.

According to the widely accepted traditional approach in the banking sector literature, it is supposed that there is a negative correlation between capital adequacy ratio and return on equity. As a consequence of high capital adequacy ratio, riskiness decreases and thus, return on equity demanded by investors decreases. According to the hierarchy theory in finance literature²⁰, a company's capital adequacy is determined by available domestic funding and investment opportunities. If a company with a high profitability aims at spending a great deal of its gain for the financing of its investments, it can prefer relatively low capital adequacy in the long term. But, data indicates that there is not always

¹⁹ This chapter has been prepared by Mahir Binici, Yasin Mimir, Canan Özkan and Pinar Özlü.

²⁰ See Myers and Majluf (1984)

a negative correlation between capital adequacy ratio and return on equity . On the contrary there is a positive correlation between those at times. For example, in their study covering 1970-2010 term, Osborne and others (2012) have found out that there is a negative correlation on average between capital and profitability for the U.S. banks. But, it has been found out that the correlation in question was positive at such times when financial stress was high such as savings and credit crisis in the 1980s and recent global financial crisis. The correlation between capital adequacy and profitability can be positive or negative under certain situations and assumptions as explained above.²¹

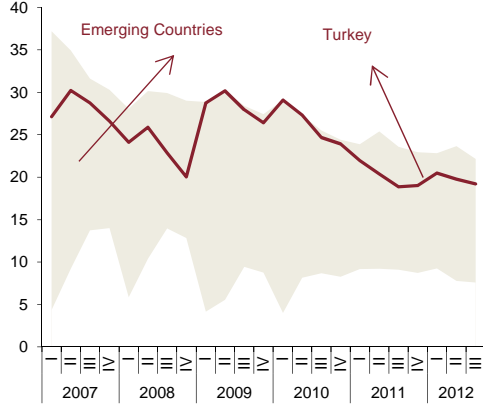
The correlation between return on equity, return on asset and capital adequacy ratio has been analysed on this special topic for several developed and developing countries and a comparative assessment has been made with Turkey. According to the findings, capital adequacy ratio and return on asset and return on equity in our country compared to other sample countries have been materialized at higher levels recently. There is a positive correlation between profitability indicators and capital adequacy ratio and it is expected that precautionary regulations put into effect recently might be effective in determining the way of this correlation.

Comparison of Other Countries with Turkey

The gap between the lowest and the highest levels of return on equity and return on asset decreases in time in developing countries, and return on equity and return on assets get closer among the related country groups. Based on the comparison made after 2009 period, it was observed that return on equity and return on asset have relatively wide range and sometimes lower values in the developed countries affected by global financial crisis and Europe debt crisis. In Turkish banking sector, both return on equity and return on assets are over the average of the country sample used for the observation period and decrease with the overall trend recently. (Chart V.5.1-Chart V.5.4).

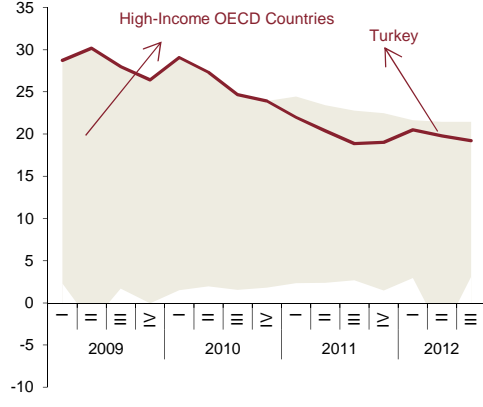
²¹ For a detailed analysis of capital adequacy and profitability, see Berger (1995).

Chart V.5.1
Emerging Countries and Turkey ROE Comparison



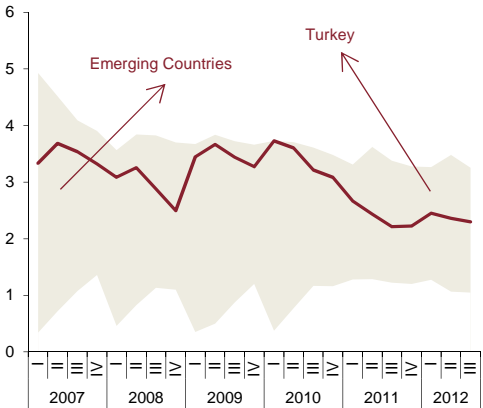
(1) Brazil, Chili, Colombia, Croatia, Czech Rep., Malaysia, Mexico data have been used.
Source: CBRT, IMF, Financial Soundness Indicators

Chart V.5.2
High-Income OECD Countries¹ and Turkey ROE Comparison



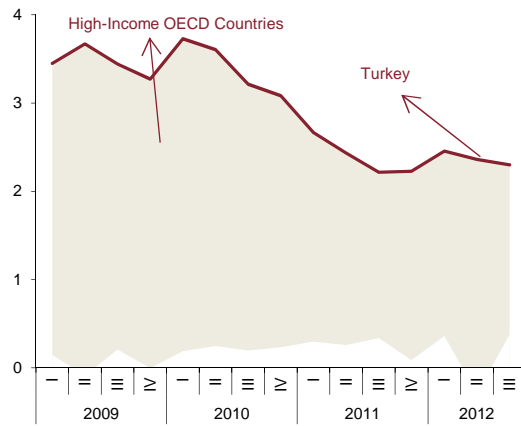
(1) Australia, Canada, Finland, Israel, Korea, Spain, UK, U.S. data have been used.

Chart V.5.3
Emerging Countries and Turkey ROA Comparison



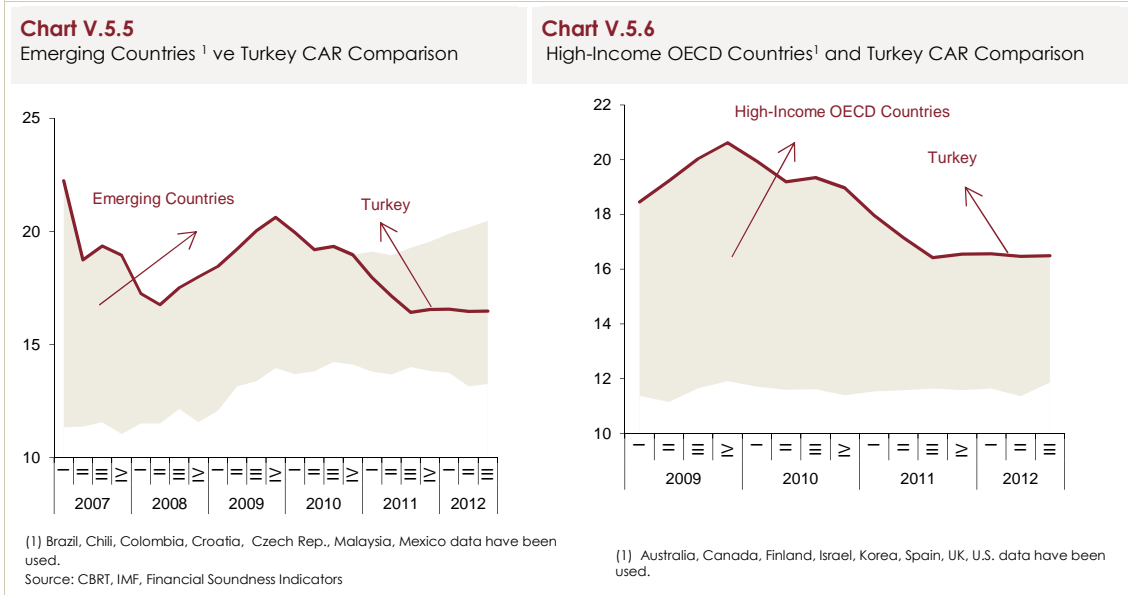
(1) Brazil, Chili, Colombia, Croatia, Czech Rep., Malaysia, Mexico data have been used.
Source: CBRT, IMF, Financial Soundness Indicators

Chart V.5.4
High-Income OECD Countries¹ and Turkey ROA Comparison



(1) Australia, Canada, Finland, Israel, Korea, Spain, UK, U.S. data have been used.

Capital adequacy ratio keeps its usual trend for the sample countries because of the regulatory framework and legal restrictions. While Turkish banking sector has the highest capital adequacy ratio during a considerable part of the observation period, recently it has converged to the middle of the range among the developing countries (Chart V.5.5). Compared to developed countries, Turkish banking sector capital adequacy ratio has kept its place on the top during the observation period (Chart V.5.6). It is believed that regulations applied for the capital ratio increase for the enhancement of financial soundness in Turkish banking sector are effective in this situation.



Country-specific summary statistics of indicators displayed between the Chart V.5.1 and V.5.6 are shown in Table V.5.1. Developed and developing countries are similar in capital adequacy with the effect of international regulations but, indicators of profitability can vary significantly among countries and country groups. When correlations between indicators of profitability and capital adequacy are studied, the result is incompatible with the theory for the sample period and sample countries but compatible with earlier empirical studies. For example, while some countries have statistically significant, high and positive profitability and equity correlation as expected in theory, it is observed that some countries have negative equity and profitability correlation. This situation requires a more comprehensive study investigating the causation side between equity and profitability and the relation between these two variables could be led by other variables as discussed in Berger (1995).

The findings in question are compatible with earlier studies that find a positive relation (Demirguc-Kunt and Huizinga, 1999; Vennet, 2002; Nier and Baumann, 2006; Flannery and Rangan, 2008). The relation between capital and profitability might also be associated with hierarchy theory. Because prior period profits enforce the current capital as mentioned above, if capital buffer approach is considered, firms wishing a high profitability in the long-term might prefer low capital adequacy relatively (Osborne and others, 2012). On the other hand, the negative relation between capital and profitability is coherent with the results of the studies conducted by Berger (1995) and Gropp and Heider (2010), that examine US and EU banks. Meanwhile, Gropp and Heider (2010) came to the conclusion that there is no significant relationship between profitability and capital at the point that the capital adequacy ratio reached to minimum legal levels.

Table V.5.1

Summary Statistics

	Capital Adequacy Ratio				Return on Assets				Return on Equity			
	NO ¹	Mean	Min	Max	NO	Mean	Min	Max	NO	Mean	Min	Max
High-Income Countries												
U.S.	17	14.41	13.14	15.01	17	0.29	0.18	0.45	17	2.40	1.46	4.39
UK	8	15.05	12.92	16.42	8	0.18	-0.09	0.48	8	3.72	-2.45	10.57
Spain	15	11.74	11.27	12.22	15	0.57	-1.45	1.15	15	9.88	-22.17	20.90
Canada	34	14.88	12.22	16.33	34	1.00	0.27	1.53	34	22.93	7.16	37.06
Australia	31	11.13	10.11	11.92	30	1.30	0.84	1.78	30	22.77	16.35	31.17
Finland	23	14.58	13.26	16.98	30	0.85	0.45	1.82	30	12.50	8.97	21.04
Israel	27	12.97	10.66	14.93	34	0.84	-0.61	1.40	34	13.70	-9.94	22.76
Korea	17	14.12	12.94	14.70	17	0.82	0.15	1.51	17	10.79	2.31	18.97
Emerging Countries												
Turkey	31	18.75	16.34	23.73	31	3.00	2.21	3.73	31	24.38	18.88	30.22
Ukraine	31	16.57	13.29	20.83	31	-0.08	-4.38	1.34	31	-0.19	-32.25	11.38
Mexico	31	15.79	13.89	17.44	32	1.99	1.32	2.77	32	20.95	13.96	31.30
Czech Republic	26	13.85	11.05	16.55	26	1.34	1.10	1.55	26	22.76	17.95	27.80
Colombia	31	17.30	15.49	19.59	32	3.81	3.08	4.93	32	27.98	21.44	37.19
Chili	31	13.38	12.10	14.66	31	1.57	1.13	1.91	31	21.00	14.99	25.24
Brazil	34	17.14	15.53	18.65	34	2.03	1.33	2.74	34	19.04	13.02	25.55
Malaysia	31	16.13	14.30	18.21	31	1.12	0.32	1.79	31	12.88	3.99	19.68

Source: CBRT, IMF

(1) NO, denotes number of observations. The period of observations differs between countries and the longest period extends from first quarter of 2005 to second quarter of 2013.

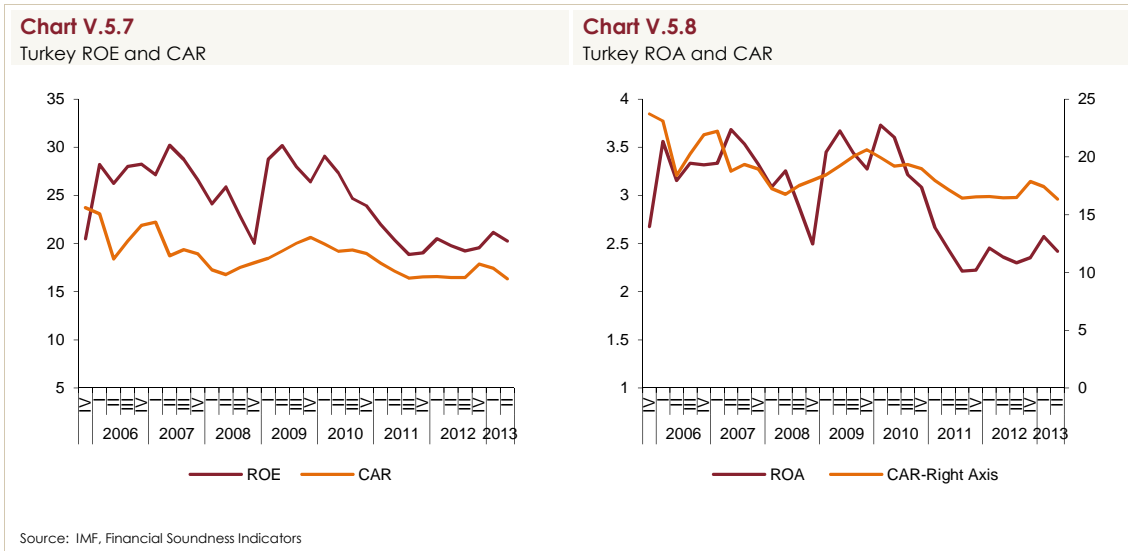
Table V.5.2Correlations Between Capital Adequacy and Profitability¹

	Return on Equity		Return on Assets	
	Correlation	p-value	Correlation	p-value
High-Income Countries				
U.S.	-0.113	0.67	0.063	0.81
UK	0.762	0.03	0.766	0.03
Spain	0.222	0.43	0.226	0.42
Canada	0.7222*	0.00	0.8568*	0.00
Australia	-0.8640*	0.00	-0.8240*	0.00
Finland	-0.104	0.64	-0.307	0.15
Israel	0.191	0.34	0.255	0.20
Korea	0.568	0.02	0.509	0.04
Emerging Countries				
Turkey	0.5530*	0.00	0.5839*	0.00
Ukraine	-0.4803*	0.01	-0.4661*	0.01
Mexico	-0.4575*	0.01	-0.242	0.19
Czech Republic	-0.7576*	0.00	0.130	0.53
Colombia	-0.336	0.06	-0.132	0.48
Chili	0.273	0.14	0.5970*	0.00
Brazil	-0.046	0.80	-0.011	0.95
Malaysia	0.156	0.40	0.266	0.15

Source: CBRT, IMF

(1) Left panel of the table denotes the correlation between ROE and CAR, whereas right panel denotes the correlation between ROA and CAR, and (*) shows the significance of correlation under 10 percent.

In a detailed look to Turkish banking sector, there is a positive correlation between capital adequacy ratio and return on equity as well as return on assets (Chart V.5.7, Chart V.5.8). Due to the regulations that bring a cap to distribution of dividends, current period net income is added to equity at the end of balance sheet calendar year and this causes a higher capital adequacy ratio. Despite the opportunity cost of this situation in which capital cannot be directed to investments that could potentially bring positive cash flows and profitability, in the long term a strong capital structure helps return on equity of banks to increase. At the second quarter of 2013, the capital adequacy ratio was 16,3 percent in Turkey and made up the upper bound of high-income OECD country banks' capital adequacy ratio levels.



Conclusion and Policy Implications

Within the framework of different regulations aiming to strengthen the banking sector and enhance financial stability, additional capital requirements are put into effect. For example, the analysis of the effect of leverage, being systemically important, countercyclicality, and similar regulations are of crucial importance to improve macroprudential policies. At the time of financial expansion, the cost of extending new credits is expected to increase, on the other hand, extension of credits would be incentivized at the time of financial contraction. How the reflection of the relationship of this policy tool with banking profitability will be on financial cycles will also be important in developing macroprudential policies.

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V.6. "Too-Big-To-Fail" Financial Institutions²²

Too-Big-To-Fail Problem

Considering their size, complexity and inter-linkages with the rest of the financial system, the failure of a too-big-to-fail financial institution often creates huge costs for the economy. Therefore, authorities approach the failure of such institutions unlike other financial institutions and provide capital support for them by using taxpayers' money. Thanks to the measures against these institutions, it is possible to avoid the costs due to the failures of large and systemically important banks. However, such measures result in considerable cost to taxpayers by using public resources.

The too-big-to fail problem also causes a moral hazard issue. Investors often have an expectation that public authorities will rescue distressed large banks. This encourages big banks to behave differently from other banks to some extent. In general, big banks tend to undertake more risks, borrow more and reach financial funds at lower costs (Box V.6.1 summarizes the behaviors of big banks in Turkey). Hence, such institutions may hamper the efficient and effective functioning of financial markets through creating negative externalities. As a result, the tendency toward excessive risk taking increases, market discipline diminishes and competition conditions deteriorate²³.

²² This special topic is prepared by Nihal Değirmenci and Bahadır Çakmak.

²³ Negative externalities in a financial system may stem from the failure of a large and complex financial institution as well as excessive risk taking and the inter-linkages with the rest of the financial system. For detailed information on negative externalities and related policy measures see De Nicolò, G. Giovanni Favara and Lev Ratnovski (2012): Externalities and Macroprudential Policy, IMF, SDN/12/05 and Flannery, M.J. (2010) What to Do about TBTF?, presented at the Federal Reserve Bank of Atlanta 2010 Financial Markets Conference.

Box
V.6.1

The Behavioral Pattern of Big Banks in the Turkish Banking System

Banks in Turkey differentiate in their conduct of businesses. This box compares the banks with shares of more than 5 percent in the totals assets of the sector (big banks) with other banks in terms of the structure of the balance sheets and profitability.

Accordingly,

- For big banks, the share of the securities portfolio in the balance sheet is larger.
- The deposit base of big banks is wider due to their widespread branch networks.
- Big banks operate with less shareholders' equity and more debt.
- With the high share of deposits in total liabilities, big banks mainly finance the loans they grant by deposits. However, other banks often rely on funding sources other than deposits in financing the loans.

Chart V.6.1.1 Asset Structure of the Banks
(As of September 2013, % of assets)

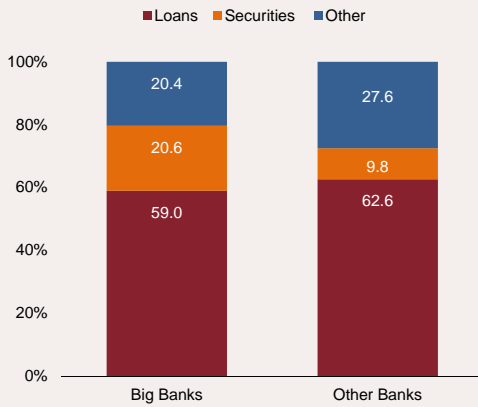
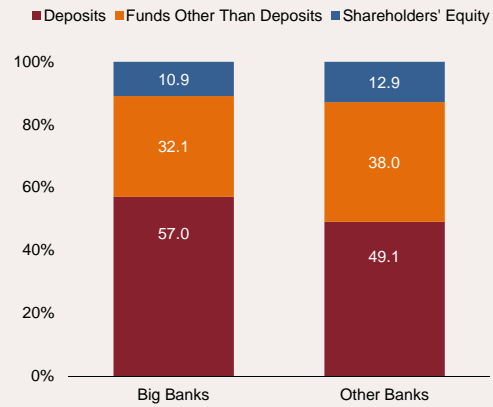


Chart V.6.1.2 Liability Structure of the Banks
(As of September 2013, % of liabilities)



Source: BRSA-CBRT

- Big banks operate with higher profit margins. The low operational cost due to economies of scale is the main factor for high profitability rates.

Chart V.6.1.3 Return on Equity(ROE)
(As of September 2013, annualized,%)

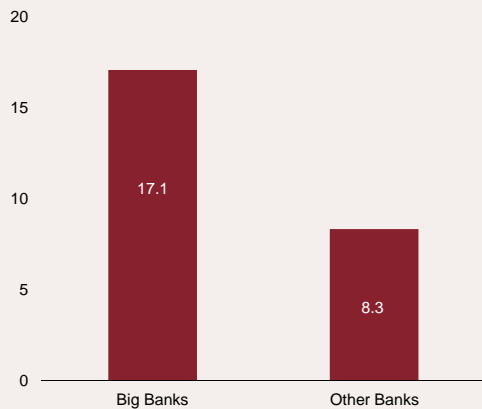
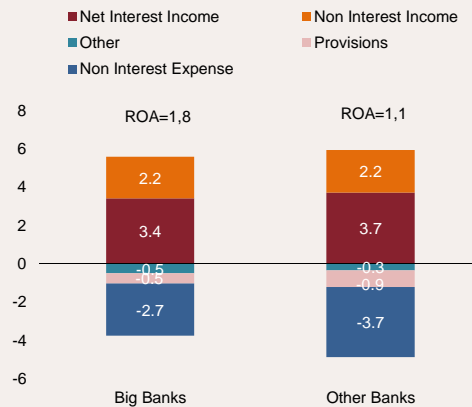


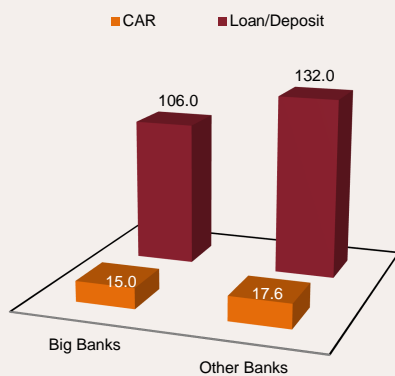
Chart V.6.1.4 Return on Assets (ROA)
(As of September 2013, annualized,% of assets)



Source: BRSA-CBRT

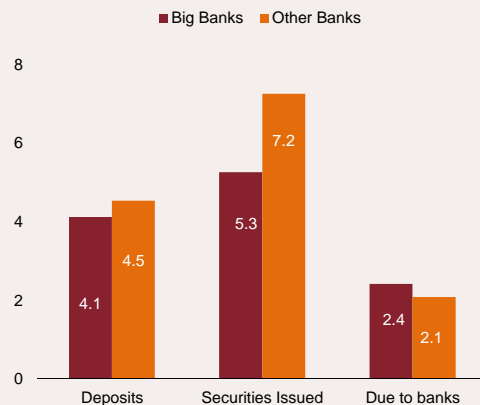
- Loan to deposit ratio is smaller for big banks.
- Capital adequacy ratios of big banks are lower.
- Big banks can have lower cost of funds.

Chart V.6.1.5 Capital Adequacy and Loan-to-Deposit Ratios (As of September 2013, %)



Source: BRSA-CBRT

Chart V.6.1.6 Borrowing Costs (As of September 2013, %)



Several policy measures have been designed on a global scale under the leadership of the Financial Stability Board (FSB) and the Basel Committee on Banking Supervision (BCBS) to end the too-big-to-fail problem. Within this framework, too-big-to-fail financial institutions are expected to have a higher loss absorbency capacity and be subject to recovery/resolution planning to reduce the probability and impact of such institutions failing.

Systemically Important Financial Institutions (SIFI)

The global crisis has revealed that large and complex systemically important financial institutions lie behind the too-big-to fail problem. At the Pittsburgh Summit in 2009, G-20 leaders called on the FSB to propose possible measures to address the too-big-to-fail problem associated with SIFIs. At the Seoul Summit in 2010 the G-20 leaders endorsed the FSB framework for SIFIs. FSB and BCBS developed a methodology for determining SIFIs and proposed three main policy measures. The SIFI methodology is based on an indicator-based measurement approach. This approach focuses on a global loss-given-default concept rather than a probability of default concept. For each bank, a score is calculated using the indicators that measure systemic risk. Depending on this score that reflects systemic importance, a financial institution is designated as a SIFI or not.

The main policy measures on global and national scale for SIFIs are as follows

- (i) Higher loss absorbency capacity (additional capital requirement)
- (ii) Enhanced supervision
- (iii) Effective resolution without resorting to public resources.

Following the efforts of the FSB to address SIFIs, the details of the policy measures towards SIFIs were unveiled at the Cannes Summit in 2011 and the initial group of global systemically important financial institutions was publicly announced. At the Los Cabos Summit in 2012, the G-20 countries rehearsed their commitment to implement the policy measures and called on the FSB to prepare a progress report to be presented at the St. Petersburg Summit in 2013. In September 2013 FSB made the report publicly available.

G-SIFI Assessment Methodology

Global Systemically Important Banks (G-SIBs)

The banks in the category of G-SIFIs are called G-SIBs. In November 2011 the Basel Committee published the G-SIB assessment methodology and the additional loss absorbency requirement. In July 2013 the Basel Committee updated the methodology and published the latest version. Accordingly, the banks are assessed based on the twelve indicators that are classified under the main categories of size, cross-jurisdictional activity, interconnectedness, substitutability and complexity. Equal weights are given to both the categories and the indicators (Table V.6.1). One significant issue is that a cap is placed on the substitutability category in line with the quantitative impact study of the BCBS avoid a bias in total scores. Hence, the BCBS curbs the increase in the systemic importance of the banks due to a hike in one specific score.

For each subsequent financial year-end, all banks with a leverage ratio exposure measure exceeding 200 billion euro should be required to present the twelve indicators used in the assessment methodology to national authorities. The FSB expects national authorities to work on the disclosure requirements. Banks below this threshold that have been added to the sample by supervisory judgment or as a result of being classified as a G-SIB in the previous year will also be required to comply with the disclosure requirements. Publication of the twelve indicators is the minimum requirement. National authorities may also wish to require that banks disclose the full breakdown of the indicators.

Table V.6.1
G-SIB indicators

Category	Individual indicator	Indicator weighting
Cross-jurisdictional activity (% 20)	Cross-jurisdictional claims	%10
	Cross-jurisdictional liabilities	%10
Size (% 20)	Total exposures as defined for use in the Basel III leverage ratio	%20
Interconnectedness (% 20)	Intra-financial system assets	%6.67
	Intra-financial system liabilities	%6.67
	Securities outstanding	%6.67
Substitutability (%20)	Assets under custody	%6.67
	Payments activity	%6.67
	Underwritten transactions in debt and equity markets	%6.67
Complexity (% 20)	Notional amount of over-the-counter (OTC) derivatives	%6.67
	Level 3 assets	%6.67
	Trading and available-for-sale securities	%6.67

Source: BIS

Based on this methodology, in November 2011, for the first time, 29 banks were designated as G-SIB and the list was made publicly available. Each year in November the G-SIB list is updated²⁴.

Domestic Systemically Important Banks (D-SIBs)

Considering the fact that a bank that is not global systemically important may cause systemic risk domestically. In October 2012, the BCBS published a document to assess domestic systemically important banks. The document draws a principle-based framework. The framework is composed of 12 principles. The first seven principles focus mainly on the assessment methodology for D-SIBs while the other five principles are related to high loss absorbency capacity.

²⁴ The G-SIB lists dated November 4, 2011, November 1, 2012 and November 11, 2013 can be reached at: http://www.financialstabilityboard.org/publications/r_111104bb.pdf http://www.financialstabilityboard.org/publications/r_121031ac.pdf http://www.financialstabilityboard.org/publications/r_131111.htm respectively.

The methodology is consistent with the assessment methodology for G-SIBs, but the main categories do not include cross-jurisdictional activity since the main reference point is domestic economic activity. Hence, any assessment by national authorities should mainly be dependent on the categories of size, interconnectedness, substitutability and complexity. On the other hand, national authorities are encouraged to choose additional indicators. For instance, they may employ additional indicators such as the size of a bank relative to domestic GDP. National authorities also have national discretion as to the appropriate relative weights they place on these indicators.

Australia, Austria, Canada, China, Denmark, the Netherlands, Singapore, Sweden, Switzerland, the United Kingdom and the U.S. have already designated their D-SIBs. In 2015 the BCBS will implement an international peer review program on the adoption D-SIB principles by member countries.

Global Systemically Important Insurers (G-SIIs)

Financial institutions other than banks can also create systemic risk, which is why studies to determine non-bank SIFIs are being conducted. Insurers are one group of these financial institutions. The source of systemic risk of insurers is mainly their non-traditional insurance activities. Studies on this issue are being conducted by the International Association of Insurance Supervisors (IAIS). The assessment methodology of and policy measures for G-SIIs were published in July 2013. The methodology used to determine G-SIIs is parallel to the one for G-SIBs. Categories of the methodology are size, global activities, interconnectedness, substitutability and non-traditional and non-insurance activities. The weights for non-traditional and non-insurance activities and interconnectedness are higher than other categories (Table V.6.2).

Table V.6.2
G-SII indicators

Category	Individual indicator	Indicator weighting
Size (% 5)	Total assets	%2.5
	Total revenues	%2.5
Global Activity (% 5)	Revenues derived outside of home country	%2.5
	Number of countries	%2.5
Interconnectedness (% 40)	Intra-financial assets	%5.7
	Intra-financial liabilities	%5.7
	Reinsurance	%5.7
	Derivatives	%5.7
	Large exposures	%5.7
	Turnover	%5.7
	Level 3 assets	%5.7
Non-traditional insurance and non-insurance activities (% 45)	Non-policy holder liabilities and non-insurance revenues	%6.4
	Derivatives trading	%6.4
	Short term funding	%6.4
	Financial guarantees	%6.4
	Minimum guarantee on variable insurance products	%6.4
	Intra-group commitments	%6.4
	Liability liquidity	%6.4
Substitutability (% 5)	Premiums for specific business lines	%5

Source: IAIS

As of July 2013, FSB, in coordination with IAIS, determined nine G-SIIs by using this methodology²⁵. Starting from 2014, the list of G-SIIs will be updated every November.

Other SIFIs

The International Organization of Securities Commissions (IOSCO) will finalize methodologies for identifying systemically important non-bank non-insurance financial institutions (NBNI G-SIFI) by the end of 2013. In this framework, the financial institutions listed below are considered as NBNI G-SIFI.

- (i) Finance companies,
- (ii) Securities broker-dealers,
- (iii) Investment funds (including hedge funds).

The other systemically important financial institutions are financial market infrastructures (FIMs). FSB studies propose that all standardized over-the-counter derivatives to be subject to central clearance will reinforce the importance of these institutions. The Committee on Payment and Settlement Systems (CPSS) and the IOSCO published a

²⁵ For the list of G-SII published at 18 Temmuz 2013: http://www.financialstabilityboard.org/publications/r_130718.pdf

document in April 2012 on the principles for FMIs. In this document, as a rule, all FMIs are accepted as systemically important. Countries that do not share this approach and think that their FMIs are not systemically important should provide justification for this view.

Policy Measures for SIFIs

At the Seoul Summit in 2010, G20 leaders endorsed the policy measures for SIFIs prepared by the FSB. These policy measures involve creating a higher loss absorbency capacity (additional capital requirements) for SIFIs, more intensive supervisory oversight of SIFIs and resolution of SIFIs without exposing public resources.

Higher Loss Absorbency Capacity (Additional Capital Requirements)

The score for each bank is calculated by using an indicator-based measurement approach of BCBS for G-SIBs. Banks are ranged on their scores from the highest to the lowest. Banks that have scores over the minimum score level (threshold) are designated as G-SIB. BCBS further classified the G-SIBs as five buckets. The systemic importance of banks increases from the first bucket to the fifth one. The fifth bucket is empty as a disincentive precaution for limiting the systemic risk of banks. The buckets are constructed above the threshold and equal in size.

As one of the policy measures, the BCBS proposed imposing higher capital adequacy requirements to G-SIBs compared to other banks. Accordingly, banks will be subject to additional capital requirements depending on their buckets. The level of these additional requirements imposed on G-SIBs are 1 percent, 1.5 percent, 2 percent and 2.5 percent according to their systemic importance degree (Table V.6.3). The additional capital requirement that G-SIBs are subject to is to be met with common equity Tier 1 capital which has high loss absorbency capacity.

Table V.6.3
Higher loss absorbency requirements for G-SIBs

Bucket	Score range	Higher loss absorbency requirements (common equity as a percentage of risk-weighted assets)
5	D-E	% 3.5
4	C-D	% 2.5
3	B-C	% 2.0
2	A-B	% 1.5
1	Cutoff point -A	% 1.0

Source: BIS

When one of the banks' scores increases and this bank moves to the fifth (empty) bucket, a new empty bucket will be created to protect the disincentive precaution and 1 percent more of previous bucket's additional capital requirement will be applied to this new bucket. This procedure continues to make certain that there is always an empty bucket.

The BCBS, proposed an implementation period for additional capital requirements for G-SIBs parallel to capital buffers. Accordingly, starting from 2016, additional capital ratios will increase gradually, becoming fully effective by 2019.

The FSB-BCBS Macroeconomic Assessment Group (MAG), predicts that a 1 percentage addition to capital requirements of G-SIBs will cause a 5 to 6 basis points increase in the interest rate spread. Moreover, the annual GDP will decrease 0.06 percent. It is proposed that in the long run, the benefit provided by the SIFI framework by limiting systemic risk will be greater than the cost it brings.

The insurance sector does not have a capital adequacy regulation like the Basel capital adequacy framework. For this reason, the capital adequacy framework should be designed for G-SIIs before defining a high loss absorbency capacity. The IAIS has been working on the development of the Common Framework for the Supervision of Internationally Active Insurance Groups (ComFrame) since 2010. The risk based capital adequacy ratio will also be completed by the end of 2016. The implementation of this ratio will be effective by 2019 after a 2 year testing period.

During this transition period, the IAIS will conduct studies on the development of "Basic Capital Requirements" for G-SIIs. These studies will be finalized at the end of 2014. Accordingly, additional capital requirements that applied to G-SIIs will be calculated by adding simple capital requirements until the risk based capital requirements are determined. The implementation date for additional capital requirements is 2019.

Strengthening SIFI Supervision

After the financial crisis, the determination of a more effective and more intensive supervisory framework for financial institutions, especially for SIFI, was defined as a primary topic by FSB and leaders of G-20. The FSB published recommendations on this subject in November 2010. The FSB expects international standard setters (BCBS, IAIS and IOSCO) to update their core principles to align with these recommendations. These institutions should focus on covering SIFI supervision while updating their principles.

The FSB's recommendations cover the aspects outlined below:

- Mandate, independence and resources of supervisory authorities and also the techniques that authorities use
- Group-wide and consolidated supervision, continuousness and comprehensiveness of supervision, supervisory colleges, home/host information sharing
- Macro-prudential surveillance and use of third parties

Recommendations for updating core principles aim to strengthen the scope and efficiency of the approaches of, the techniques used by and the solutions produced by supervisory authorities. In this framework, the FSB expects its members to review their current supervisory systems in light of the recommendations and prepare a plan to overcome the deficiencies.

International institutions like the BCBS, IAIS and IOSCO reconfigured their core principles in light of the recommendations. In October 2012, the BCBS updated core principles which were published in 2006 and comprised of eighteen principles. New core principles for effective banking supervision comprised of twenty nine core principles. The first thirteen principles define the aim, mandate and responsibilities of supervisory authorities while the rest determine the aspects of prudential regulations.

Besides the development of the supervisory framework for SIFIs, the adequacy of supervisors' qualifications to analyze the risk culture of financial institutions that are under their responsibilities is important. Accordingly, the FSB determined core principles for risk appetite and compensation. On the other hand, the thematic peer review of the FSB on risk management provides a framework to increase efficiency in this area.

Resolution Regimes

The financial crisis revealed that there are no effective resolution regimes for large systemically important financial institutions, related authorities do not have necessary power and tools for resolution of financial institutions and there are inconsistencies in resolution

regimes among jurisdictions. To resolve a financial institution in an orderly manner without exposing public resources, the FSB published “Key Attributes of Effective Resolution Regimes for Financial Institutions” The principles of this document were endorsed at the 2011 G20 Cannes Summit.

The main aim of an effective resolution regime is to resolve any financial institution without creating systemic disruption and without exposing taxpayers to the loss. The most important aspects of this process are to protect critical functions of financial institutions and to impose losses to shareholders and unsecured (bail-in) creditors.

Four of the FSB (8, 9, 10 and 11) principles are directly related to G-SIFIs. These are:

- (i) Establishing crisis management groups
- (ii) Signing of institutions-specific cross border cooperation agreements
- (iii) Assessing resolvability
- (iv) Preparing recovery and resolution plans.

Crisis management groups are established for each G-SIFI and consist of representatives of home and key host authorities. Institutions-specific cross border cooperation agreements are binary cooperation and information sharing agreements signed among home and host authorities for each G-SIFI. Recovery plans are plans of G-SIFIs that answer the question of how will the G-SIFI continue their operations under the financial crisis? On the other hand, resolution plans are plans of authorities that answer the question of how will insolvent G-SIFIs be resolved? Resolvability Assessments are studies of international institutions like the FSB and World Bank/IMF that aimed to test the soundness of the resolution plans of G-SIFIs.

The actions displayed in Table V.6.4 should be taken in the recommended time intervals after a financial institution is designated as a G-SIFI.

Table V.6.4
Timetable for implementation of resolution planning

	Deadline for completion following date of G-SIFI designation
Establishment of crisis management group (CMG)	6 months
Development of recovery plan	12 months
Development of a resolution strategy and review within CMG	12 months
Agreement of institution specific cross-border cooperation plan	18 months
Development of operational resolution plan	18 months
Conduct of resolvability assessment by CMG and resolvability assessment process	24 months
Source: FSB	

The FSB published the report on the results of thematic peer review on the adherence of jurisdictions to Key Attributes in April 2013. According to the report, although the U.S. and some European countries completed their reforms on resolution regimes, the level of implementation of Key Attributes on many jurisdictions is still inadequate and there are differences among the implementation of jurisdictions.

The FSB expects its members to constitute their resolution regimes to align with Key Attributes by the end of 2015. There are some areas of resolution that are determined as primarily important for 2014 by FSB. The first is to develop a proposal for loss absorbency during resolution. The second is to prepare a framework for the international validity of the decision of resolution. In this framework, specifically two topics are presented. The first is the imposing of losses occurred during resolution to the shareholders and unsecured (bail-in) creditors of financial institutions and the second is early termination of contracts. The last important area is the starting of the resolvability assessment process.

An annex about the resolution of non-bank financial institutions will be added to Key Attributes by the end of 2013. On the other hand, members of the FSB should prepare their resolution regimes including the one for financial market infrastructures by the end of 2015.

Turkey

International regulations for SIFIs may affect Turkey from two perspectives. Firstly, some of the banks operated in Turkey are on the FSB's list of G-SIFIs. Secondly, authorities in Turkey should develop methodologies for determination of domestic systemically important banks and the policy measures in align with the FSB framework.

The eleven banks from the G-SIB list determined by the FSB in November 2013 operate in Turkey in a form of bank, branch or partnership. The share of these banks' assets to total assets is 12.6 percent. According to their systemic importance, these banks are HSBC, JP

Morgan Chase, BNP Paribas, Citigroup, Deutsche Bank, Royal Bank of Scotland, BBVA, ING Bank, Société Générale, Standard Chartered and Unicredit Group respectively. The four insurers that are designated as G-SII by FSB operate in Turkey. These are Allianz, AIG, Aviva and Axa. National authorities will start to apply additional capital requirements gradually to D-SIB at the beginning of 2016. Full implementation will take place in 2019. In Turkey, studies on D-SIB determination methodology parallel to the FSB methodology is still going on by using Turkish banking sector dynamics.

Another policy measure proposed by FSB is the development of resolution regimes for SIFIs. Turkey participated in the thematic peer review of the FSB on the adherence of jurisdictions to Key Attributes in 2012. Additional measures are needed for the full adherence to Key Attributes.

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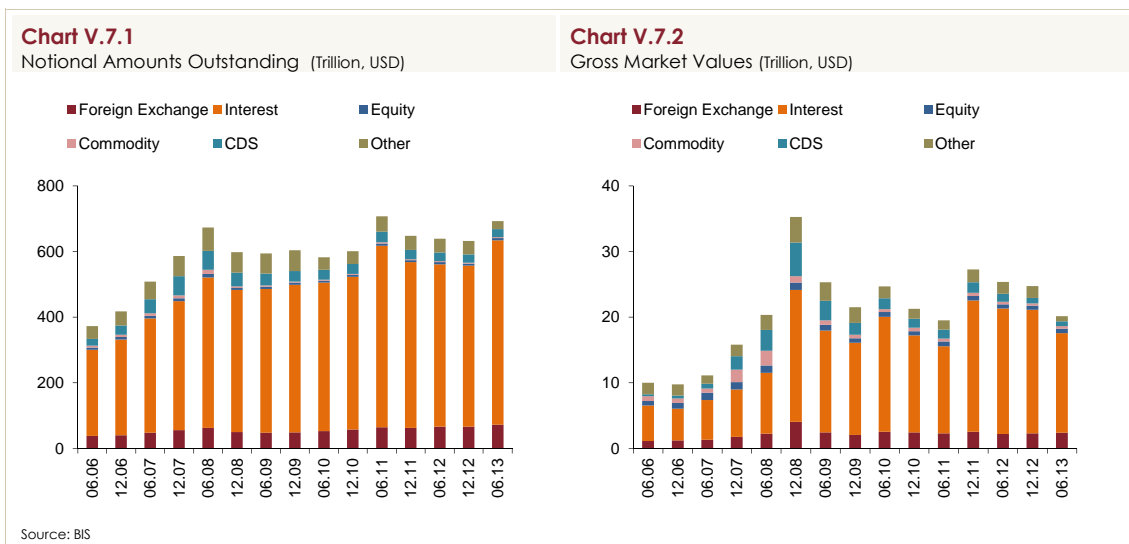
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V.7. Over the Counter Derivatives Markets Reforms²⁶

The variety of tools used in today's financial markets is increasing rapidly. Derivative instruments which take their value from underlying assets also occupy an important place in financial markets. While derivatives can be traded on organized markets which have pre-determined contract conditions, they can also be traded in over the counter (OTC) markets that enable parties to define contract terms flexibly. As of June 2013, the total notional amount of OTC derivatives transactions was 693 trillion USD, while the market value was 20 trillion USD. Derivative transactions consist mainly of interest rate derivatives (Chart V.7.1, Chart V.7.2). The notional value of transactions executed on OTC derivatives markets constitutes 91% of the total notional amount of derivatives²⁷. OTC derivatives markets are used extensively since they allow parties to enjoy high leverage and define contract terms flexibly.



In case one party is unable to fulfill its contractual obligations arising from OTC derivatives, the risks may spread to the entire financial system and create negative consequences. In addition, since the transactions are not executed on an organized trading platform and most parts of the trades are not reported to competent authorities, it is difficult to determine the exact risks that may arise from OTC derivatives transactions. In fact, OTC derivatives markets, which had no efficient supervision mechanism before the global financial crisis, are considered as one of the reasons for the deepening and spreading of the crisis. Lack of awareness of the risks arising from OTC derivatives markets had a great impact on the Lehman Brothers bankruptcy which was regarded as the beginning of the crisis and the financial stress that AIG experienced. Therefore, the necessity to regulate OTC

²⁶ This special topic is prepared by Ayşe Aydoğan ve Ahmet Deryol.

²⁷ BIS, organized and OTC derivatives markets statistics.

derivatives markets and minimize risks has emerged. In the 2009 Pittsburgh Summit, G20 Leaders agreed to regulate the OTC derivatives markets to increase transparency, minimize systemic risk and protect market participants from market abuse. As a result, derivatives markets transactions are to be:

- Reported to trade repositories,
- Subject to central counterparty (CCP) clearing if possible
- Subject to higher capital requirements if CCP clearing not possible,
- Standardized and exchanged on electronic platforms

Later, at the G20 Cannes Summit in 2011, the leaders decided that

- If contracts are not centrally cleared, they should be subject to margin requirements.

At the G20 Summit in 2009, the leaders had expressed that reforms should be finalized by the end of 2012. Despite significant progress, the reforms have not yet been completed. Studies are being carried out by the Financial Stability Board (FSB), the Basel Committee on Banking Supervision (BCBS), the International Organization of Securities Commissions (IOSCO) and the Committee on Payment and Settlement Systems (CPSS). These studies fall under five headings.

Reporting to Trade Repositories

It has become necessary to aggregate the transaction records in a center in order to reveal the risks arising from OTC derivatives markets. Therefore, it is recommended that trade repositories should be established to record trade data and share the data between jurisdictions when needed. Trade repositories will provide a better measurement of risks and help regulate and supervise OTC derivatives markets.

The most progress has been achieved in trade reporting reform. Currently, 18 trade repositories have been authorized to operate in 10 different countries. However, market participants are also required to make their infrastructure suitable to report trade repositories for the reform to be fully implemented. According to the study conducted by FSB, 56%²⁸ of market participants will make their infrastructure suitable for trade reporting by the end of 2013. According to BIS data, most progress has been achieved in reporting interest rate and credit derivatives among other asset classes. Currently, almost all the interest rate and credit transactions of 15 dealers that have the highest share in OTC trading are reported to trade repositories.

²⁸ FSB, Sixth Progress Report on OTC derivatives reform implementation

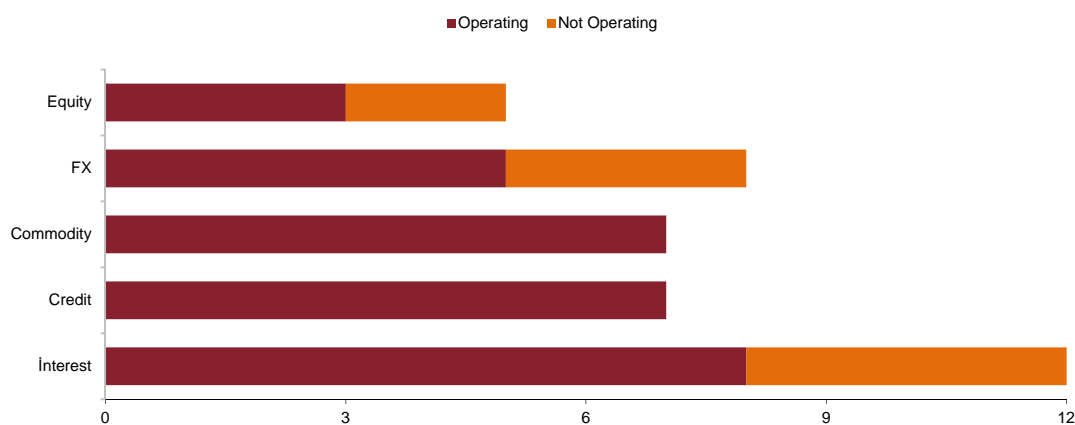
On the other hand, there are legal and technical problems in the information sharing collected by trade repositories between jurisdictions. It is emphasized that authorities should elaborate on data confidentiality to solve legal problems.

Central Clearing

The aim of the reform is to clear transactions in OTC derivatives markets via central counterparties. Central counterparties are the clearing institutions that act as buyers to the sellers and sellers to the buyers. With this method, in case one of the parties fails to fulfill its obligation arising from contracts, the central counterparties undertake the obligation. Thus, transactions will be carried out in a safer manner and risks will be minimized. By the end of 2012, the total OTC derivatives notional value was 633 trillion USD, 173 trillion USD of which was centrally cleared²⁹. The majority of central clearing transactions consists of credit and interest rate derivatives. According to the FSB's sixth progress report on OTC derivatives reform implementation, as of June 2013, 42% of the interest rate transactions of 15 dealers who have highest share on OTC derivatives were centrally cleared. Globally, 14% of credit derivatives transactions were centrally cleared. As of April 2013, in 12 countries, 19 institutions were authorized as central counterparties (Chart V.7.3). Efforts to increase the amount of transactions centrally cleared and increase the number of central counterparties continue.

Chart V.7.3

Number of Central Counterparties by Underlying Assets, April 2013



Source: FSB, OTC Derivatives Market Reforms, 5th progress Report

Even though central clearing is a limiting mechanism for risks arising from counterparties, it brings additional burdens to the system. Since a large portion of OTC derivatives transactions will be carried out by central counterparties, risks will concentrate on those institutions. From this perspective, the risk management process of financial market

²⁹ <http://www.iosco.org/library/pubdocs/pdf/IOSCOPD426.pdf>

infrastructures³⁰ needs additional attention. Also, the costs might increase since central counterparties require commissions and default fund contributions.

Margin Requirements

OTC derivatives contracts cannot be centrally cleared under the lack of standard contracts and unfavorable liquidity conditions. In addition, contracts may exist that central counterparties refrain from clearing. In 2011, G20 commitments were extended by introducing margin requirements for non-centrally cleared contracts. Margin requirements contribute to mitigate systemic risk and promote central clearing. In case one of the parties fails to fulfill its obligations, collaterals are converted to cash, claims of the counterparty are paid and spillover effects will decline. At the same time, since margin requirements for non-centrally cleared contracts lead to additional costs for counterparties, central clearing is indirectly encouraged.

The BCBS and IOSCO published the final rules regarding margin requirements for non-centrally cleared contracts in September 2013³¹. In the final framework, two types of margins, namely, the initial margin and the variation margin³² were defined. Moreover, liquid instruments³³ that can be used as collateral and minimum haircuts were identified. The rules also enabled national authorities to determine the assets that will be accepted as collateral. Even though margin requirements will be mandatory for non-centrally cleared contracts, there are some exceptions. The framework exempts physically settled foreign exchange forwards and swaps from initial margin requirements. Some measures were also taken to protect the deposited collateral. While re-hypothecation of variation margin collateral is permitted, re-hypothecation of initial margin is subject to a number of restrictions.

Discussions of the benefits of margin requirements cannot ignore the effects on liquidity. This implies that parties are expected to turn to liquid and high-quality assets to meet their requirements. This increase in the demand for collateral might alter the functioning of the market. In addition, financial institutions might need additional liquidity sources. Ways to implement margin requirements in cross-border transactions is also an issue that should be considered. Compatibility of regulations in jurisdictions is important in the sense of which country's regulations will be applied to subsidiaries and branches in a country. At this point, the authorities in jurisdictions need to collaborate in determining incompatible and repetitive regulations to avoid regulatory arbitrage.

³⁰ Central Counterparties, Trade Repositories, Securities and Settlement Systems, Payment Systems

³¹ <http://www.bis.org/publ/bcbst261.pdf>

³² Initial margin is requested to protect transacting parties from potential future exposure that could arise from future changes in the mark to market value of the contract during the time it takes to close out in the event that one or more counterparties default. Variation margin is needed to protect the transacting parties from the current exposure of changes in mark to market value of the contract after the transaction has been executed.

³³ Cash, government and central bank securities, corporate bonds, covered bonds, equities included in major stock indices and gold.

Capital Requirements

During the global financial crisis, the capital that a bank needed to keep for counterparty credit risk was insufficient to cover losses. Thus, a reform in this area is necessary to make the capital structure more risk sensitive. The main aim of the reform is the requirement to hold more capital for non-centrally cleared contracts compared to centrally cleared contracts. Thus, market participants involved in transactions that might cause systemic risk have to bear additional costs, while standardized and centrally cleared contracts are promoted.

Capital requirements for centrally cleared contracts are based on two types of exposures. Banks acting as clearing members keep capital for trade exposures and default fund exposures separately. While trade exposure reflects the risk of default of a central counterparty, default fund exposure involves risks associated with any clearing member defaults. Capital requirements for these exposures are differentiated for qualifying and non-qualifying central counterparties (Table V.7.1). Banks' capital requirements for exposures to qualifying central counterparties are kept lower. Compatibility with the CPSS-IOSCO principles will be determined to identify the qualifying central counterparties³⁴.

Table V.7.1

Risk Weights for Centrally Cleared Transactions

	Trade Exposures	Default Fund Exposures
Qualifying Central Counterparty*	2%	1250%**
Non-Qualifying Central Counterparty	20% or 100%***	1250%

* Subject to an overall cap on the risk weighted assets of all exposures to the CCP (including trade exposures) equal to 20% times the trade exposures to the CCP.

** Risk weights for standardized approach. Banks may use internal ratings based approach.

***Risk weight is 20% if NQCCP is a bank, 100% if NQCCP is a corporate financial institution.

Interim rules were published in July 2012 by BCBS³⁵. The BCBS, CPSS and IOSCO have been working on new methods to calculate the capital requirements for banks' exposures to qualifying central counterparties to improve the current framework.

Trading on exchanges or electronic platforms

Standardization is a prerequisite for OTC derivatives to be traded on exchanges or electronic trading platforms. There are also a number of other benefits of standardization in the OTC derivatives market beyond increasing suitability for organized trading platforms. The following benefits can be achieved in the market with standardized OTC derivative instruments:

³⁴ <http://www.bis.org/publ/cpss101a.pdf>

³⁵ <http://www.bis.org/publ/bcbs227.pdf>

- Central clearing
- Automated processing of transactions
- Greater market liquidity
- Improvement in risk management
- Increase in transparency and reliability of information
- Effective reporting to trade repositories

The objective of the reform that all standardized contracts should be traded on exchanges or electronic trading platforms is to promote central clearing and effective oversight. Limited progress has been achieved in this area since steps related to this reform have not been presented clearly. However, it is hard to achieve trading of all contracts in organized platforms as it is not possible to satisfy sufficient standardization of all contracts. According to a survey that the FSB conducted with market participants, trading volume will not change significantly by moving transactions to organized trading platforms. At present, electronic platforms are used more widely for FX and credit derivatives compared to commodity, interest rate and equity derivatives. Efforts related to this area are underway at the international and national levels.

Conclusion

To summarize, the G20's underlying objectives to implement the reforms is to make the derivatives markets safer and more resilient. Even though significant progress has been made in regulatory reforms, there are some challenges that slow down the implementation. Jurisdictions apply regulations according to their understanding and thus there are certain differences in regulations of jurisdictions in the current framework. In this regard, with a collaboration of jurisdictions in implementing the rules, the aim is to prevent conflicts of laws, inconsistencies and legal uncertainty and increase compliance with international rules. While central clearing of transaction reduces counterparty credit risk, it may also result in a concentration of risk in central counterparties. Therefore, recovery and resolution plans for financial market infrastructures will be established to decrease the default risk during a crisis. The CPSS and IOSCO continue to work on this issue.

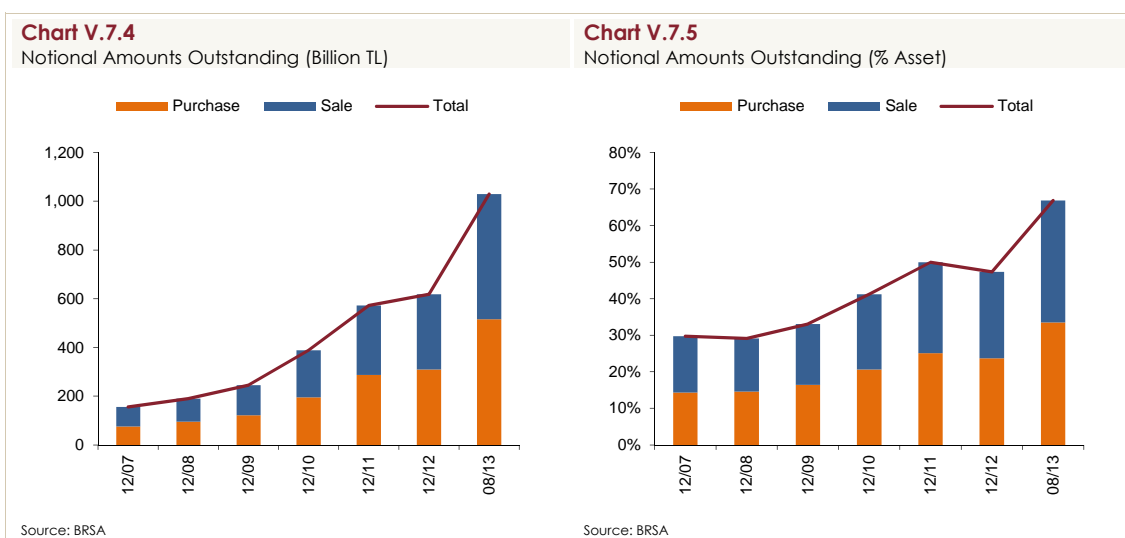
There is no doubt that these reforms will bring additional costs to economies of jurisdictions and the financial sector. However, it is expected that the benefits of reforms are likely to outweigh the costs in the long run. The Macroeconomic Assessment Group on Derivatives conducted a macroeconomic impact assessment of OTC derivatives regulatory reforms to see the effects on global GDP³⁶. The study indicates that reforms lower the probability of a financial crisis. With the decrease in the probability of a financial crisis, the benefit from reforms is equal to 0.16 percent of global GDP. The costs related to holding

³⁶ <https://www.bis.org/publ/othp20.pdf>

more capital and collateral is estimated to be 0.04 percent of global GDP. As a result, the net benefit of the reforms is expected to be 0.12 percent of global GDP per year.

Overview of Derivative Transactions in the Turkish Banking Sector

In Turkey, 99.45 percent of the derivative transactions of the banking sector is traded on the OTC derivatives market³⁷. As of August 2013, while notional amounts outstanding of banks' derivative transactions was 1.1 trillion Turkish lira, the ratio of this amount to total assets was 66.8 percent³⁸. Derivative transactions have shown a rapid growth with an average annual growth rate of 35 percent since 2007 (Chart V.7.4, Chart V.7.5).



A closer look at the distribution of derivative contracts shows that the largest segment belongs to the FX contracts with 71 percent, followed by interest rate contracts with 20 percent (Chart V.7.6). Although interest rate derivatives have the largest share in the global derivatives markets, FX derivatives have a higher proportion in the Turkish banking sector. An assessment of the distribution of types of derivative transactions shows that the banking sector heavily trades swaps contracts (Chart V.7.7). Moreover, a significant portion of transactions are short term. Almost 76 percent of derivative transactions have a maturity of less than 1 year (Table V.7.2). The short term structure of derivative transaction exposes banks to liquidity and re-pricing risks.

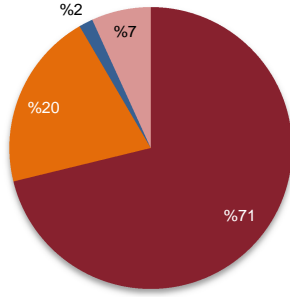
³⁷ Financial Markets Report, December 2012, BRSA

³⁸ The majority of derivative transactions are double recorded in terms of accounting techniques in accordance with the legislation in force. All data in this section are double recorded and the data are as of August 2013.

Chart V.7.6

Distribution of Derivative Transaction by Underlying Assets

■ FX ■ Interest ■ Commodity ■ Other

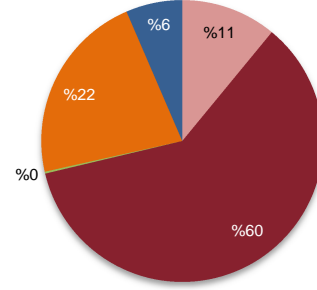


Source: BRSA

Chart V.7.7

Distribution of Derivative Contract Types

■ Forward ■ Swap ■ Future ■ Option ■ Other

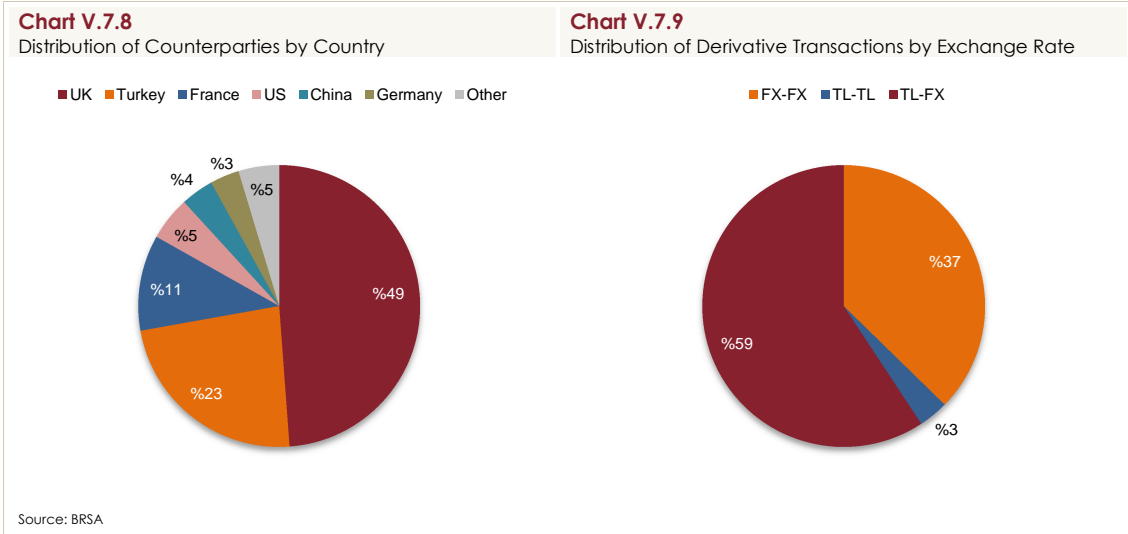
**Table V.7.2**

Distribution of Derivative Transactions by Maturity

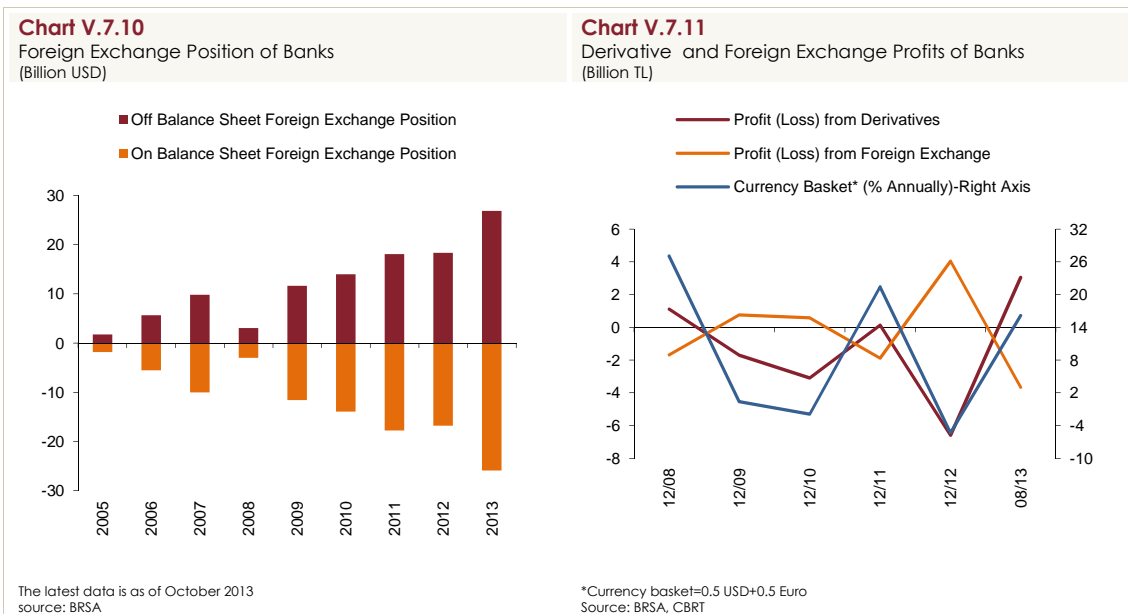
Less than 1 Month	1-3 Month	3-6 Month	6-12 Month	1-5 Years	5-10 Years	More than 10 Years
39.61%	12.81%	11.32%	12.38%	16.47%	7.17%	0.23%

Source BRSA

When derivative transactions are classified according to counterparties, 77 percent of transactions are traded with foreign counterparties (Chart V.7.8). Of these transactions, 49 percent are made with foreign counterparties in the UK. Differentiating according to exchange rate reveals that 59 percent of transactions are based on TL-FX, while 37 percent are based on FX-FX contracts (Chart V.7.9). Five banks with the highest share in derivative markets have approximately 58 percent of total transactions whereas the share of the top ten banks reaches almost 84 percent. In this respect, operations are concentrated on certain banks.



Given the distribution of transactions in the banking sector, derivatives are traded to manage the exchange rate and interest rate risk. Banks convert the foreign exchange source with low rates, which they find especially to benefit from the difference between domestic and foreign interest rates, to Turkish lira and then provide higher rates in Turkey. Risks in the banking sector resulting from FX open positions on balance sheets are compensated with off balance sheet derivative trades (Chart V.7.10). Even though 93 percent of transactions are recorded for trading purposes due to the accounting standards, it can be concluded that trades are carried out with the aim of hedging. Indeed, while foreign exchange loss occurs due to the on balance sheet FX open position during the periods of Turkish lira depreciation, the loss is compensated by gains in derivative trades (Chart V.7.11).



In summary, in the banking sector of Turkey, derivatives are traded mainly to manage the exchange rate and interest rate risk instead of speculation. Nearly all of the transactions are carried out on OTC markets. The fact that derivatives are traded with counterparties in developed economies is a factor reducing counterparty credit risk. On the other hand, the short term structure of trades makes the banking sector exposed to liquidity and re-pricing risks. Although mandatory central clearing of OTC derivatives reduces counterparty risk, it is expected that transaction cost will rise by a certain amount.

As a member of the G20 countries, Turkey is committed to implement the derivative market reforms, and effort in this area has recently accelerated. The Central Clearing and Settlement Regulation and the Central Counterparty Regulation were published in the Official Gazette in 18 July 2013 and 14 August 2013, respectively. The Istanbul Settlement and Custody Bank Incorporation (Takasbank) will undertake the clearing and settlement service with regulations. In the first stage, Takasbank has started to act as a central counterparty in the Stock Lending and Borrowing Market. Endeavors also continue for Takasbank to be the central counterparty in the Futures and Options Market and the Stock Market. Thus, the implementation of a central counterparty is firstly planned to be experienced in organized markets, then in OTC markets, making progress in other reform areas as well. Considering the fact that a significant portion of transactions are made with foreign counterparties, it is important that Takasbank is compatible with the CPSS-IOSCO principles. In addition, consistency of capital and collateral requirements in trades with international regulations has become an important issue for Takasbank to act as a central counterparty in transactions with foreign counterparties. Reporting to trade repositories and standardizing contracts are other areas that will gain momentum.

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V.8. A Closer Look at “Shadow Banking” Concept³⁹

Shadow banking includes non-bank credit intermediation activities. Shadow banks create leverage as they borrow as in a regular banking sector, and are exposed to maturity mismatch by transforming their raised funds to long-terms investments. Securitization and securities financing transactions including securities lending and repurchase (repo) agreements are important activities for shadow banking as well. However, these activities are not subject to capital and liquidity requirements like in the banking sector. Thus, shadow banking might create certain risks to financial stability while contributing to financial deepening. On the other hand, in times of regulatory tightening in the regular banking sector, regulatory arbitrage arises and shadow banking grows at a rapid pace. Therefore, monitoring and developing policy measures for shadow banking activities have been among the FSB's important duties.

According to the FSB's calculation, the total size of the shadow banking sector in 2012 reached 71 trillion USD, representing 117% of total global GDP. This magnitude constitutes half of the global banking assets. Shadow banking grew at a rapid pace especially prior to the global financial crisis. The ratio of the shadow banking sector to the global GDP increased by 30 percentage point in the last decade, exceeding the banking sector assets in developed economies. Among the FSB member countries, the U.S. had the largest shadow banking system followed by the Euro area, England and Japan. The vigorous growth trend in the shadow banking system has continued in developing economies while losing momentum in developed countries after the financial crisis. The growth rates of the system in China, Argentina, India and South Africa are above 20%.

The work done by the FSB are two-fold. The first is to monitor shadow banking developments. The magnitude of shadow banking intermediaries, their risks and relevance with the regular banking sector are detected via monitoring reports published yearly. The second part of the work comprises regulatory initiatives associated with shadow banking activities. Five different working groups were formed to develop policy measures. The reform areas assigned to the working groups are outlined below:

1. Mitigating the spill-over effect between the regular banking system and the shadow banking system and contagion risk;
2. Reducing risks that stem from money market funds (MMFs) to “runs”;
3. Having transparent and standardized securitization activities;
4. Mitigating risks associated with repo and securities lending transactions;

³⁹ This special topic is prepared by Sinem Uçarkaya and Erhan Akkaya.

5. Assessing and mitigating risks posed by other shadow banking entities and activities.

The aim of the reform agenda implemented by the FSB is to monitor risks posed by the shadow banking system continuously, to make these risks manageable and to avoid regulatory arbitrages which might arise from regulatory tightening.

Mitigating the Contagion Effect

Shadow banking intermediaries are largely funded by the banking sector. Banks place their resources in mutual funds and grant direct credit limits to special purpose vehicles by intermediating as a sponsorship in issuances of asset backed securities. On the other hand, banks particularly provide funds to shadow banking activities by means of reverse repo transactions and are exposed to counterparty risk.

To avoid risks in the banking sector exposed by shadow banking activities, policy recommendations have been developing regarding capital requirements which take the scope of consolidation, large exposures of banks to shadow banking activities and banks' investments in equity of funds into consideration.

Preventing Money Market Funds (MMFs) to "runs"

The MMFs' vulnerability to run-like behavior is an important risk factor on financial stability. MMFs invest in short-term borrowing instruments. These funds are similar to bank deposits in terms of being short-term and having a stable net asset value; however, they are not covered by deposit-insurance systems. Therefore, MMFs' investors have an incentive to run in case of experiencing turmoil in the markets. In response to runs on MMFs that occurred in the U.S. in 2008, the FED, for a one year period, expanded emergency lending to finance purchases of asset-backed paper from money market funds to curb risks on financial stability. Nonetheless, as of 2012, the bank and non-bank sector in developed countries have obtained a considerable amount of funds through MMFs. In the U.S. alone, repo and MMFs related borrowings from banks and broker-dealers have reached nearly 2 trillion U.S. dollars.

Work on a set of regulatory reforms to reduce MMFs to runs in stressed market conditions and avoid disturbing effects of these funds on financial stability has been ongoing. For example, the IOSCO issued 15 policy recommendations in October 2012 in response to a request from the FSB⁴⁰. The reform recommendations on switching from a stable net asset value to a floating net asset value and MMFs' retention requirements, among other things, particularly stand out. It is expected that measures such as a floating

⁴⁰ <http://www.iosco.org/library/pubdocs/pdf/IOSCOPD392.pdf>

net asset value and liquidity retention requirement will reduce the susceptibility of MMFs to runs.

Securitization

Securitization transactions are among the shadow banking activities. Long-term and risky credits could be transformed to short-term and liquid securities and later could be used as collateral in repo markets.

The problems arising from sub-prime mortgages in the U.S. in 2008 spread to the asset backed commercial paper markets and caused difficulty in accessing liquidity in the repo markets where these commercial papers were traded as collateral. The financial institutions which carried such securities in their balance sheets incurred losses and suffered losses in accessing liquidity by using their collateral. At the same time, a fire sale in asset backed securities was used as collateral and increased value losses.

The prospect that the risks borne by securitization disrupt financial markets during the global financial crisis has necessitated making regulations. In response to a request from the FSB, the IOSCO issued principles in November 2012 that aimed to mitigate the securitization related risks and to enable a more transparent and standardized securitization process⁴¹. The report includes recommendations to enhance transparency and standardization in the securitization process, to inform investors in a more detailed manner, and to avoid conflict of interest by selling credits and wiping it away from balance sheets.

Repo and Securities Lending Transactions

The non-bank financial institutions that rely on collateralized short-term funding might encounter significant difficulty in liquidity and interest rate risk. On the other hand, the borrowing facility might change depending on the value of the collateral, intensifying pro-cyclicality and bringing about instability.

In this context, the FSB has developed policy recommendations to ensure efficient management of the risks arising from securities lending and repo transactions, and to limit their disrupting effects on financial stability⁴². The recommendations include, among other things, cash collateral reinvestment by securities lenders and re-hypothecation of client assets, collateral valuation and management, and haircut floors to be implemented for securities. In addition, work has been on-going to introduce minimum haircut rates to the repo and reverse repo transactions except those that are sovereign and are not subject to clearing in central counterparties (CCPs).

⁴¹ <http://www.iosco.org/library/pubdocs/pdf/IOSCOPD382.pdf>

⁴² http://www.financialstabilityboard.org/publications/r_130829b.pdf

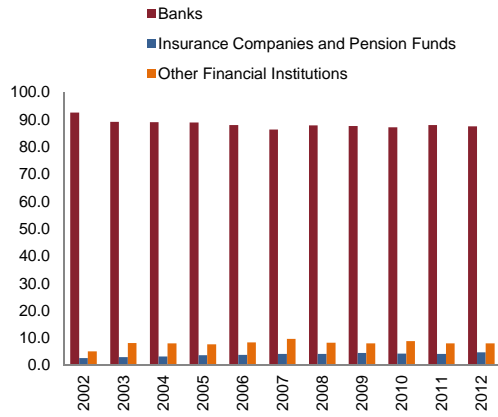
Regulation of Other Shadow Banking Activities

The financial institutions which deal with activities accepted as shadow banking might differ among countries. Since the global financial crisis, it has become necessary to monitor those risks that these entities carry and include them in the regulatory scope and prevent capital and liquidity arrangements introduced for banks in the post crisis period that cause regulatory arbitrage.

Within the scope of regulation of shadow banking activities, because shadow banking entities and activities might appear under different legal entities among different countries, categorization based on economic functions of shadow banks, rather than their legal identity or form, is preferred. According to this option, collective investment vehicles, intermediation activities, credit insurance, credit facilitation and securitization based credit intermediation were determined as the five different economic activities and policy measures were developed for each one.

The Outlook for Non-bank and Non-insurance Financial Institutions in Turkey

The size of the financial sector as of end-2012 was 1.568 billion TL in Turkey. Of this amount, 87.4 percent of the financial sector was composed of bank assets, 4.7 percent of insurance companies and pension funds' assets and 8 percent was composed of other financial institutions' (OFI) assets (Chart V.8.1). OFI stands for non-bank, non-insurance financial institutions that are engaged in credit intermediation activities and is used as proxy for determining the size of the shadow banking system in a country. According to this definition, the total assets of the shadow banking system is 125 billion TL in Turkey and makes up 8 percent of the financial sector. The ratio of OFI assets to bank assets is 9.1 percent. The ratio of OFI assets to GDP which was 3.3 percent in 2002 increased to 8.8 percent in 2012 (Chart V.8.2). Shadow banking activities are rather limited in Turkey when compared to global figures.

Chart V.8.1Balance Sheet Size of the Financial Sector
(Percent)^{1,2}

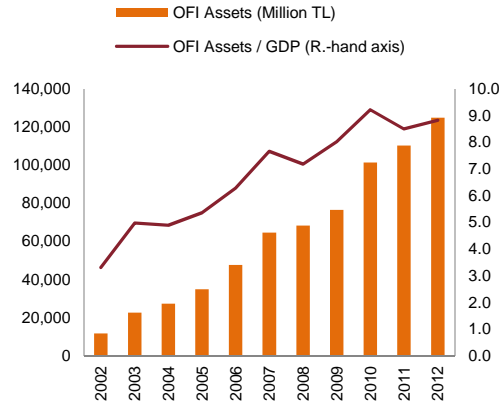
(1) The figures for consumer finance companies, factoring and leasing companies were included starting from 2006 and the figures for asset management companies, portfolio management companies and financial holding companies were included starting from 2007.

(2) For real estate investment trusts portfolio value was used before 2011 and total assets were used for 2011 and 2012.

Source: BRSA – CBRT, ACMIIT, CMB, AIRCT, CGAT

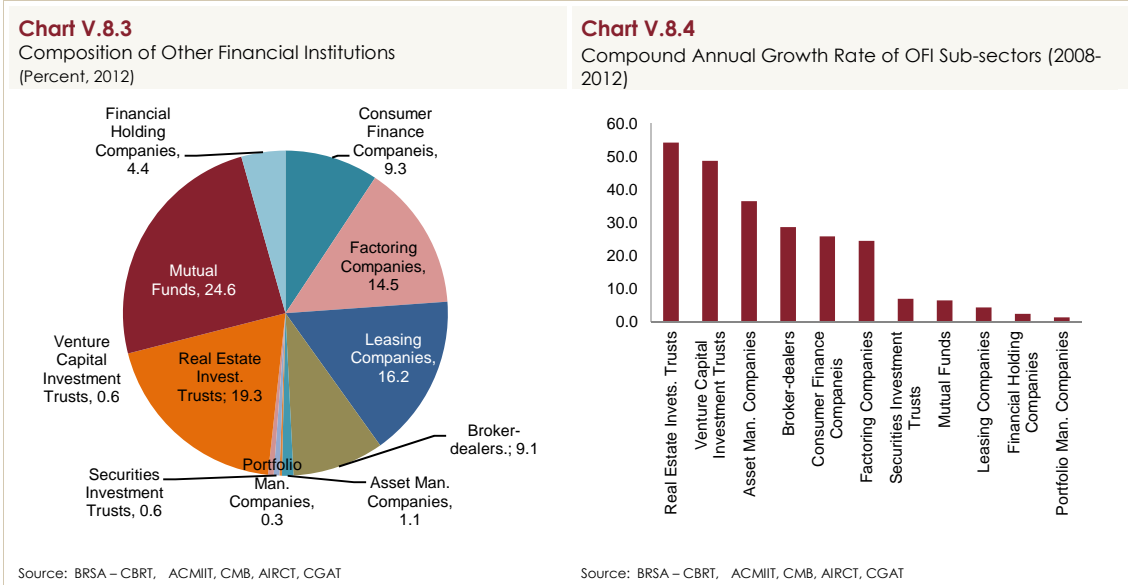
Chart V.8.2

Assets of Other Financial Institutions

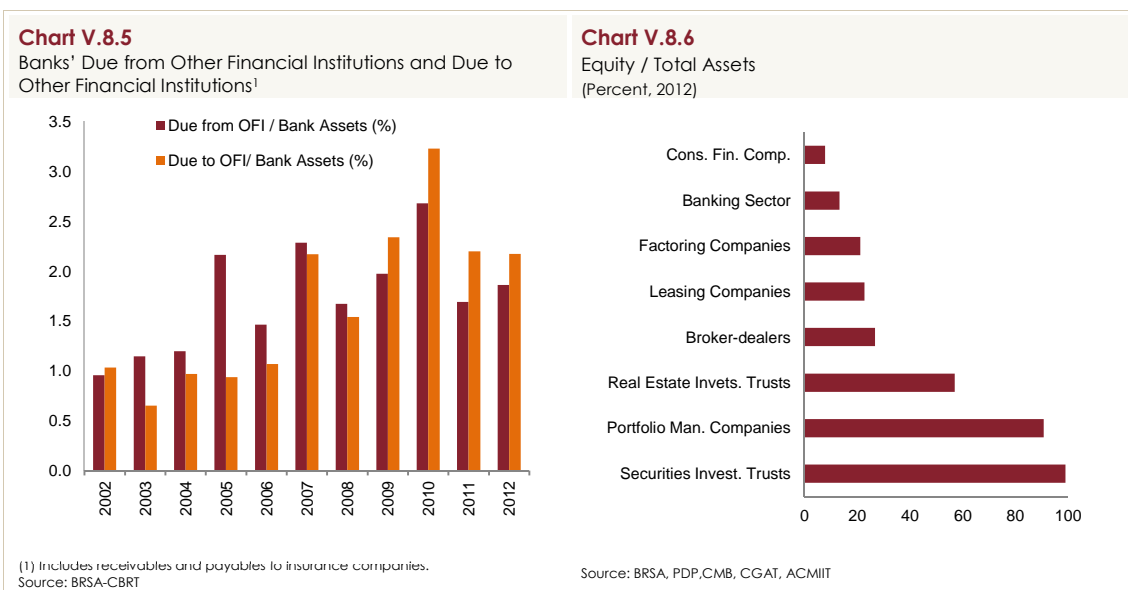


Source: BRSA – CBRT, ACMIIT, CMB, AIRCT, CGAT, TÜRKSTAT

As of 2012, 24.6 percent of OFI assets belongs to mutual funds having the largest share, 19.3 percent to real estate investment trusts, 16.2 percent to leasing companies, 14.5 percent to factoring companies and 9.3 percent to consumer finance companies. The share of securities investment trusts, asset management companies and portfolio management companies on the other hand is rather limited (Chart V.8.3). In the 2008-2012 period, the compound annual growth rate of OFI assets was 16.3 percent. The compound annual growth rate of bank assets in the same period was 17 percent. With the contribution of the low base, real estate investment trusts grew fastest by 54.1 percent, followed by venture capital investment trusts, asset management companies, broker-dealers, consumer finance companies and factoring companies. The growth of portfolio management companies, financial holding companies, leasing companies, securities investment trusts and mutual funds was rather slow (Chart V.8.4).



The interconnectedness between the banking sector and OFI can lead to systemic risks and take several forms. Banks can directly own OFI, they can fund OFI or be funded by OFI or the two sectors may invest in similar assets or be exposed to the same counterparty risks. Interconnectedness might lead to contagion effects from one sector to the other during stress periods. Therefore, it is important to monitor the interconnectedness between banks and OFI. In Turkey as of end-2012, the banks' due from OFI and due to OFI as a percentage of banks' assets was 1.9 and 2.2 respectively. These figures reveal that the interconnectedness between banks and OFI is low (Chart V.8.5). Moreover, the ratio of equity to total assets shows that, except for consumer finance companies, OFI operate with less leverage compared to the banking sector (Chart V.8.6).

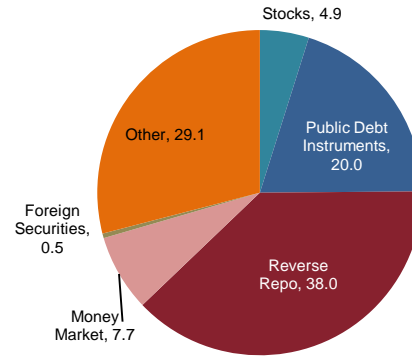


As of end-2012, the current ratio of broker-dealers, portfolio management companies, real estate investment trusts and securities investment trusts was above 100 percent (Table V.8.1).

As of end-2012, 65.7 percent of mutual funds' portfolio consisted of public debt instruments, reverse repo and money market investments. This indicates that the assets of these funds were mainly composed of short-term, low credit risk assets (Chart V.8.7).

Table V.8.1Current Assets to Short-term Liabilities^{1,2}
(2012)

	Current Assets / Short-term Liabilities (%)	Current Assets (Million TL)	Short-term Liab. (Million TL)
Broker-dealers	126	10,335	8,215
Portfolio Man. Comp.	1,087	290	27
Real Estate Invest. Trusts	147	4,419	3,007
Securities Investment Trusts	10,547	667	6
Banks	128	966,773	753,793

Chart V.8.7Portfolio Composition of Mutual Funds
(Percent, 2012)

(1) Except for banks, on-balance sheet figures are used.

(2) Bank figures were weighted in accordance with Regulation on Measurement and Evaluation of Liquidity Adequacy of Banks provisions, figures were allocated depending on whether their maturity is taken into account or not and off-balance sheet data was included as well.

Source: BRSA, ACMIIT, PDP, CGAT

Source: CMB

Leasing, factoring and consumer finance companies established in Turkey are subject to the "Financial Leasing, Factoring and Financing Companies Law" and are regulated by the BRSA. According to the "Regulation on the Establishment and Operation Principles of Financial Leasing, Factoring and Financing Companies" the ratio of these companies' equity to total assets must be 3 percent, minimum. Any company failing to meet this requirement may not engage in a new leasing, factoring or financing contract. The "Communique On Procedures And Principles For The Provisions To Be Set Aside By Financial Leasing, Factoring and Financing Companies For Their Receivables" regulates provisions to be set aside by these companies for their receivables.

Broker-dealers, portfolio management companies and other financial institutions categorised under OFI are regulated and monitored by the CMB. These institutions are subject to the "Capital Markets Law No: 6362" and the operations of these institutions are regulated by separate communiques. There are provisions in these communiques which limit these institutions' risks and in accordance with the communiques regarding broker-dealers

and portfolio management companies, the minimum equity, capital adequacy base and liquidity requirements of these institutions are regulated.

In Turkey, the shadow banking sector comprises a limited share of the total financial sector. The interconnectedness between banks and OFI is low and the leverage of OFI is not high. However, the on and off-balance sheet exposures of OFI should be closely monitored and data deficiencies should be overcome considering the fact that the share of OFI in the financial sector has been rising. Necessary regulations should be enacted for risky areas taking into account international developments on this issue. The effects of the banking sector regulations on the shadow banking sector development should be monitored as well.

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V.9. New Period in Risk Culture⁴³

Many articles emphasize that risk management, firms and individuals have become increasingly important for the finance sector after the declaration of Lehman Brother's bankruptcy on the 15th of September, 2008 in the U.S.. Especially beginning from 2005, the period of increase of lower quality subprime loans in the U.S. housing market, which led to the housing bubble, followed by the mortgage subprime crisis and the period of "liquidity excess", "default credits", "uncontrolled of mortgage-backed securities" and "inadequacy of banking audit" combined with the ongoing macroeconomic problems in Europe has led to the global crisis.

Because collecting diversified and detailed information about a loan applicant's profile has gained more importance for lenders to examine an applicant's ability to pay, the traditional loan process begins with a "status inquiry" and the "loan assesment" process, then continues with the loan monitoring stage.

Turkey adapted the rules from Basel II's consensus on international standards for financial system soundness into the finance system and all components of loan risk have been taken into account for the real risk level of borrowers. Hence, many criteria which display the repayment capacity of borrowers like loan type, maturity, collateral, borrower's (individual or firm) credit scores are taken into the loan price assesment.

Although an individual's or firm's historical "ability to pay" is the most significant criteria to approve a loan for many lenders, other criteria like the number of payment delayed days, positive and negative events in the current income level, performance of historical ability to pay bills are also important supporting decisions to determine a loan applicant's custom of repayment. In this respect, financial institutions have to take into consideration all expressive information which shows a client's historical habits of repayment to determine the real risk level.

Because credit institutions are mostly limited to collecting information about a borrower's financial history by themselves, specialized institutions on datawarehouse and datamining have emerged and produced informative products about borrowers' (individuals or firms) profiles for credit institutions' use. Credit institutions are members of these specialized institutions, which is why contributing to a database by sending their clients' credit information through these institutions allows them the right to access these joint databases whenever needed. In this way, the excessive cost of forming a complicated database is shared by credit institutions and the need for information technology investment and specialized human resources are fulfilled by these specialized institutions. These

⁴³ This section is prepared by Dr. Derya Sürmen.

institutions work on producing new products and tools to ensure supportive information determining the real riskness of individuals, firms and financial institutions. Controlling the riskness of economic agents will help to sustain economic activities properly and contribute to economic progress as well.

Two institutions in Turkey serve as credit registries to banks and other financial institutions to determine a customer's credit worthiness. The first one is the "Risk Center-RM" division in the Central Bank of Turkey which performed from 1952 to June 2013. Its activities are transferred according to Banking Law, No.6111 to The Banks Association Of Turkey (TBB). The other is the Credit Bureau (KKB) which was established by a partnership of 11 major banks in 1995. KKB operates their own activities and undertook the duties on behalf of the TBB-Risk Center after June, 2013.

The Banks Association of Turkey- Risk Center System and Vision

TBB-RM offers new scores, models and products for the growing needs of the finance sector to manage risks effectively. The TBB-RM database will collect over-drawn cheque information, past cheque payment information, protested bills and bills paid on time information, credit accounts of public service companies and private retail chain companies' term receivables. This comprehensive database will allow economic agents to make the right assessment about third parties' risk levels and have a chance to assess their own risk level from the point of real and financial perspectives.

Followings are the reports and tools needed by the financial sector and real sector offered by KKB on behalf of TBB-RM.

- **Loan Limit, Risk and Non-Performing Loan Report:** This report provides information about Risk Center members which are banks, leasing companies, factoring companies, finance institutions and asset management companies, clients' loan limit, risk and non-performing loan information.

- **Protested Bills Report:** This report provides information about protested bills in the last five years. It includes the drawing bank and branch code, notification record (protested or withdrawn protested bill), the amount of the bill, period of protested bill and withdrawal of a bill and reason for withdrawal of protest.

- **Cheque Report:** This report provides information about over-drawn cheques since 2007, paid information on a later date related with over-drawn cheques and cheques paid at sight information. the report also includes the number and amount of cheques, banks holding the client's cheque accounts and information about the last fifty endorsed cheques.

• **Non-Performing Consumer Credits Report:** This report provides information on identification of individuals who defaulted on their consumer loans/credit cards but paid back at a later stage. This report also covers loan type, bank and branch code, credit card number, term of follow-up (month/year), term of later payment (month/year) information.

Credit Bureau of Turkey (KKB) and Services

KKB admits organizations as members which get permission from BRSA (Banking Regulation and Supervision Agency) and produce the following reports which contain collected detailed information of members' clients accounts:

• **Credit Reference System (CRS):** The members can access this database online to get information about all a loan applicants' open account details where the applicant is a debtor or guarantor, closed account details during the last five years, application details during the last six months and credit repayment performance for the last thirty-six months.

• **Credit Bureau Score:** This product is defined as a decision supporting product calculated by using a statistical model. This model is a numerical indicator calculated for foreseeing the repayment performance of customer compared to another for the credit received or will be received from a KKB member institution. It is also defined as the summary of information obtained related to the customer through the CRS.

• **Risk Report:** This report provides information of historical repayment performance of individuals' and firms' loans used from the banks. KKB was previously sharing the report only with banks as of September, 2012. The report is now shared with individuals and organizations as well as third parties approved by these individuals and organizations through bank branches. It is now possible for individuals and firms (legal entities) to access all financial information related to their outstanding and closed debts by applying through bank branches or alternative distribution channels. This report contains not only credit accounts in default and non-performing credit information but also positive payment performance information (on time paid credit information). This report is available on mobile devices and the internet by using an e-report infrastructure.

• **Consumer Indebtness Index:** This is a score based risk index that identifies individuals who have a tendency toward overindebtedness. The focal point is the individual who has an inability to repay a recent loan or in the past but has a tendency of getting credit exceeding his/her ability to pay. This index is developed for determining the individuals who are approved for new credit by closing existing debts and not defaulting but getting into more debt in time.

This index provides a new risk perception to the banking and finance sector. Beneath the Credit Bureau Score and other prediction models which try to anticipate the "non-performing loans" definition, the index adds an "overindebtedness" definition (used for individuals who didn't make three consecutive payments, are subject to legal proceedings

and moved into loss accounts). This index takes into consideration individuals with an unsecured debt balance of more than 250 Turkish Lira and for estimating overindebtedness.

- **Limit Control System:** This system is an information exchange for credit card accounts according to the Bank Card and Credit Cards Law. According to the law, the total credit limit of all credit cards from all bank limits to a customer who starts using credit cards for the first time cannot exceed two times the monthly average net income level for the first year, and cannot exceed four times the monthly average net income level for the second and subsequent (latter) years. This system ensures that credit card limits collected from all institutions granting credit card in the sector are combined on a customer basis and managed by the institutions offering a single limit practice.

- **Commercial Bureau System:** This system was launched in 2005 and offers a rich information set that might be needed to evaluate the risk of a legal entity customer. This system shares company and real entity identity information, capital based relationship information, credit accounts and repayment information, collateral, import and export information as well as bad cheque information.

- **Cheque Report:** This service provides past cheque payment information of the cheque drawers to enable the cheque holders to make sound decisions on whether to accept the cheque.

- **Fraudulent Information/Document/Declaration/Application Detection System (SABAS):** SABAS was developed by KKB as an information sharing platform to protect consumer information, documentation and estates against fraud. With this system, KKB members are able to seamlessly exchange facts, findings and evidence related to crimes such as counterfeiting, fraud, personal information theft and money laundering.

- **Internet Fraud Alarm System:** This system establishes communication between the member institutions related to fraudulent acts performed on the internet. The requests for blocking accounts in fraudulent money transfer are submitted through this system. This system enables more effective communication between institutions and keeps any kind of information related to transactions in the IT environment. Another substantial feature of this system is that it works in harmony with SABAS. Fraudsters usually open saving accounts with fake information to draw money transferred from customer accounts. Such account information is shared within SABAS and, in case of internet fraud, all relevant units of member institutions can access this platform.

Conclusion

The TBB-RM system was established to effectively use financial resources in the economy and to meet the needs of the finance sector more dynamically. The system is growing under the supervision of CBRT and BRSA. TBB-RM facilities will cover new products

and tools served by KKB for the real sector and individuals under finance sector products and will serve new products and tools in the new period by detailing the database.

In the new system financial institutions, real sector institutions and individuals will have a chance to monitor their own risk levels more closely and this new constitution will make a contribution to the finance sector by producing new products and tools.

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V.10. The Payment Systems Law and Financial Stability

The use of non-traditional channels for funds transfer and goods and services purchases has been proliferating parallel to technological developments. Likewise, the importance of payments and securities settlement systems and electronic payment methods have been increasing in financial markets and commerce.

Safe and efficient-functioning payment and securities settlement systems are among the most important factors needed for the successful implementation of monetary policy and for a sound financial system. A problem arising from payment and securities settlement systems might spread to other areas of the financial system, thereby threatening financial stability. Because of the contribution of efficient payment systems to financial stability, Central Banks act as operator, regulator and overseer in this area. Article 4, 1/f of the Law on the Central Bank of the Republic of Turkey (CBRT) (Law no.1211) states the following among the fundamental duties of the Bank: to regulate the volume and circulation of the Turkish Lira, to establish payment, securities transfer and settlement systems, to ensure the uninterrupted operation and oversight of the systems established and to be established and to make the necessary regulations, to determine the methods and instruments, including electronic environment that shall be used for payments. On the other hand, CBRT had a leading role in preparing a new Law on the payments area considering the necessity of strengthening the legal infrastructure in this area.

Law Nr. 6493

The draft proposal of "The Law on Payments and Securities Settlement Systems, Payment Services and Electronic Money Institutions" was prepared in accordance with the EU Acquis and international standards and by taking into account the opinions of relevant stakeholders. The Law entered into force on the 27th of June, 2013 by being published in the Official Gazette No. 28690.

The aim of this Law is to regulate the procedures and principles regarding the payment and securities settlement systems, payment services, payment institutions and electronic money institutions. Thanks to this law, the regulations in this area which were dispersed previously, are gathered under a single framework.

The Law regulates the establishment, licensing, operating conditions, oversight, measures regarding payment and securities settlement systems and settlement finality of payments in these systems.

The Law draws the general framework of payment services and empowers the Banking Regulation and Supervision Agency (BRSA) to prepare secondary legislation that

specifies the rules to be obeyed by payment service providers. Based on this power, the BRSA will regulate relations between service providers and beneficiaries, specify rights and obligations of both parties and take appropriate measures against possible problems in the payment services area.

The law gives the responsibility and power of licensing and oversight of payment and securities settlement systems to the CBRT while other authorities' powers granted by other regulations continue. In this framework, CBRT takes responsibility for:

1. Preparing secondary legislation regarding establishment, operations, acquisition and transfers of share and oversight of payment and securities settlement systems within a year,
2. Designating and publishing in the Official Gazette payment and securities settlement systems that are subject to the protection provisions of the Law regarding settlement finality of the transactions realized through these systems,
3. Carrying out operations regarding licensing of payment and securities settlement systems,
4. Monitoring of licenses of payment and securities settlement systems and revocation of licenses in certain situations established by the Law,
5. Overseeing all the payment and securities settlement systems that operate in Turkey,
6. Imposing administrative fines to be applied to system operators that do not obey the regulations of the Law and secondary regulations.

According to the Law, the entities that have been authorized to provide services in the payments area are classified as banks, payment institutions and electronic money institutions. Banks are given the right to provide payment services and to issue electronic money within the scope of this law without further approval.

With this Law, "payment institutions" and "electronic money institutions" are legally defined for the first time. These institutions are required to be established as joint stock companies and forced to hold a certain amount of assets. The Law gives responsibility and power to the BRSA in issues such as licensing, operating areas and supervision of these institutions.

As well as licensing and supervising payment institutions and electronic money institutions, provisions regarding consumer protection like safeguarding collected funds are also described in the Law.

Consequently, the "Law on Payments and Securities Settlement Systems, Payment Services and Electronic Money Institutions" provides legal support to developments in the payments area and also strengthens financial stability by supporting the efficient and

uninterrupted operation of these systems. With the framework of the financial architecture set up by this Law, the CBRT, the BRSA and the Capital Markets Board, all of which have the responsibility in the area of financial infrastructure, are expected to increase their support to financial stability by improving their existing cooperation.