TÜRKİYE CUMHURİYET MERKEZ BANKASI

CBT RESEARCH NOTES IN ECONOMICS

Interest Rate Corridor: A New Macroprudential Tool? *

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Abstract: The procyclical behavior of credit supply amplifies the business cycles. One of the aims of the traditional macro-prudential policies is to smooth the business cycle fluctuations by mitigating the excessive volatility in the risk appetite of financial intermediaries. This study shows that asymmetric interest rate corridor, a new policy instrument designed by CBRT, can be used for such a purpose. In this respect, this study focuses on the interaction of the interest rate corridor with the credit-deposit spread which is an important indicator of banks' appetite for lending and hence credit supply. Our findings suggest that through the use of an asymmetric corridor policy together with an active liquidity management strategy, monetary policy is able to affect credit and deposit rates via different channels. Therefore, the interest rate corridor can be used to adjust the credit spread, and hence has the potential to be used as a macro-prudential policy tool.

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I. Introduction and Motivation

Capital flows to emerging market economies have been quite volatile in recent years due to monetary easing in advanced economies, excess liquidity, and uncertain environment in the global economy. These conditions have caused excessive volatility in credit growth and exchange rates of emerging markets including Turkey. As a response to these developments, in order to mitigate macro-financial risks stemming from global imbalances, the Central Bank of the Republic of Turkey (CBRT) designed a new monetary policy framework by incorporating financial stability as a supplementary objective. To this end, liquidity management tools, reserve requirement ratios, and short-term interest rates have been jointly used to achieve credit growth consistent with economic fundamentals.

One of the new instruments developed under the new policy framework to support financial stability is interest rate corridor. Interest rate corridor refers to the distance between the overnight borrowing and lending rates of the central bank. The use of interest rate corridor in the new set-up differs from the other central banks adopting traditional inflation targeting regime. Under the traditional inflation targeting regime the interest rate corridor is defined as a symmetric and narrow band around the policy rate and used to ensure that the short term market rates are reasonably close to the policy rate. In other words, the corridor has a passive role in the standard inflation targeting regime. On the other hand, in the current policy framework of the CBRT, both the width and the asymmetry of the corridor may be used as an active policy instrument to promptly react to the volatility in cross border capital flows.[1]

This study provides some empirical evidence with respect to the use of interest rate corridor as a macro-prudential tool affecting the loan-deposit spread, and hence credit supply. In this context using both time series and cross section data, we analyze the effect of interest rate corridor on loan and deposit rates as well as their spread. The empirical results indicate that, the use of interest rate corridor jointly with active liquidity policy enables the CBRT to affect the loan-deposit spread. In other words, asymmetric interest rate corridor has the potential to be used as a macro-prudential policy instrument.

This study contributes to the literature in two dimensions. First, since the active use of interest rate corridor as a policy instrument is a new approach in practice and theory of monetary policy, the question asked in this study has not been discussed explicitly in the literature. Second, our work also contributes to the literature on the behavior of loan-deposit spreads. Unlike previous studies, our analysis of spread addresses the maturity mismatch problem by using loan and deposits with similar (and short-term) maturities. By doing so, we are able to circumvent issues related to term spread

[1] On the other hand, the active use of reserve option mechanism has mitigated the need for interest rate corridor to be used against the volatility in capital flows and exchange rates. See Alper, Kara and Yörükoğlu (2013) for details.

behavior, focusing mainly on bank supply behavior. This approach also allows us to better identify the interaction between credit spread and the new monetary policy tools.

II. Loan-Deposit Spread, Business Cycles and Monetary Policy

Loan-deposit spread is an important indicator for lending conditions. During expansion phase of the business cycles credit conditions are loosened, competition among banks intensifies, and the spread narrows. On the other hand, the cycle is reversed during slowdown periods, where a higher level of spread is typically associated with tighter credit conditions (Bernanke et al., 1996; Gilchrist and Zakrajsek, 2011). The pro-cyclical behavior of credit supply amplifies the business cycles and increases the volatility in economic activity.[2] Gertler and Karadi (2011) provide evidence that the fluctuations in loan-deposit spread may cause inefficient cycles in the economy. Gertler et al. (2012) and Ünsal (2013), on the other hand, theoretically show that, during good times banks take more risk and the spread narrows; during periods of economic contraction just the opposite happens; and this problem can be mitigated through macroprudential policies. This study argues that the interest rate corridor has the potential to be used for such macroprudential purposes.

There is another line of research related to this study, which argues that monetary policy should take credit spreads into account when setting the policy rate. For example, Curdia and Woodford (2009) conclude that smoothing the fluctuations of the spread by using some form of spread-augmented Taylor rule improves the total welfare. In parallel to this evidence, Fendoğlu (2011) shows that when there is a negative shock to the economy during periods of high volatility, mitigating the fluctuations in credit spread contributes to economic welfare. Gilchrist and Zakrajsek (2011) also discuss the potential benefits of monetary policy reacting to fluctuations in credit spread. However, unlike our study, these papers do not provide any discussion or analytical work regarding the use of multiple instruments by the central bank.

Turkey has used macroprudential tools actively in recent years to smooth credit cycles. For example, the current macro-prudential framework has taken several steps to dampen the rapid credit growth during 2011-2012 period. In this context, the risk weights and loan-to-value ratio used by the Banking, Regulation and Supervision Agency (BRSA) as well as the measures taken by the Central Bank through reserve requirements are examples of macro-prudential policies for smoothing credit cycles. These policies work basically through containing excessive credit cycles by affecting banks' lending appetite and hence loan-deposit spread.

Various forms of macroprudential instruments have been used in practice to smooth the financial cycles and there has been extensive research on the effectiveness of these instruments. On the other

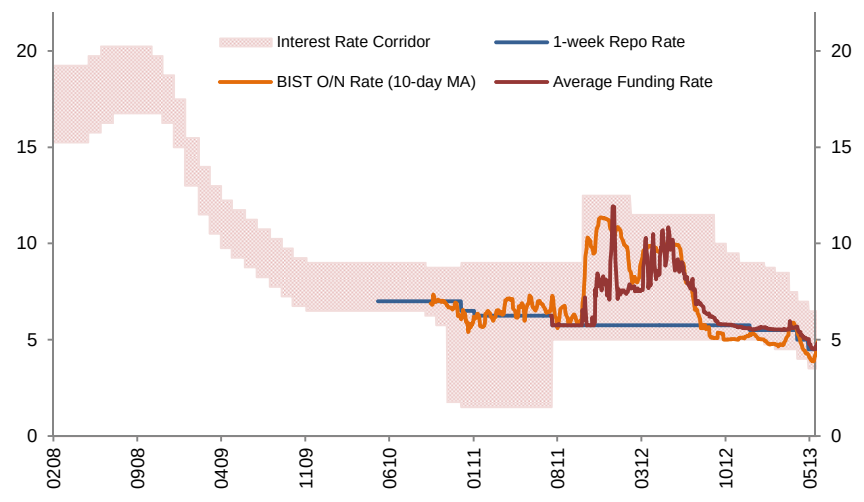
[2] See IMF (2012).

hand, the question regarding whether asymmetric interest rate corridor could be used as a macro-prudential tool has not been addressed in the academic literature. This study is motivated by the observation from the Turkish experience that interest rate corridor coupled with an active liquidity strategy can affect loan and deposit rates via distinct channels, suggesting that the interest rate corridor may have the potential to be used as a macro prudential policy tool. Moreover, being completely under the disposal of monetary policy and a highly flexible tool, the use of the interest rate corridor will enable the central bank to respond to the short-term fluctuations in loans. In addition, the analysis of interaction between the interest rate corridor and the market interest rates is important for understanding the channels of monetary transmission mechanism. To shed light on all these issues, this study investigates how asymmetric interest rate corridor and liquidity policies implemented by the CBRT affect the commercial loan rates, deposit rates, and their spread.[3]

III.The Use of New Policy Instruments

Before presenting the empirical analysis, a brief discussion regarding the practical use of the interest rate corridor in recent years would be useful to motivate the main question. The CBRT have used interest rate corridor actively since the end of 2010. At the first stage, the corridor was used to realign the exchange rate with economic fundamentals. In this respect, the CBRT widened the interest rate corridor downwards to mitigate short-term capital flows (Figure 1). At the same time, required reserve ratios were increased in order to slow down the surge in credit volume.

Figure 1. Interest Rate Corridor and Average Funding Cost



[3] It could be argued that reserve requirement can be used by the central bank to achieve the same purpose. But the cost effect of reserve requirement may be limited (Kara, 2012). To achieve a certain level of increase in interest rates through cost channel, sizeable hike in reserve requirement ratio may be needed. This requires a large withdrawal of liquidity and difficult to implement in practice.

The upper bound of the corridor, which is more relevant for the purpose of this study, has been actively used since the end of 2011. The CBRT raised the upper bound of the corridor in October 2011 and occasionally tightened the liquidity provided to the markets. The active use of interest rate corridor together with liquidity management played a significant role in the slowdown of credit growth to more reasonable levels consistent with financial stability. This experience, which suggests that, the interest rate corridor can be used as a macro-prudential policy tool to control loan supply, has been the main inspiration for this study.

IV. Term Structure of Loans and Deposits

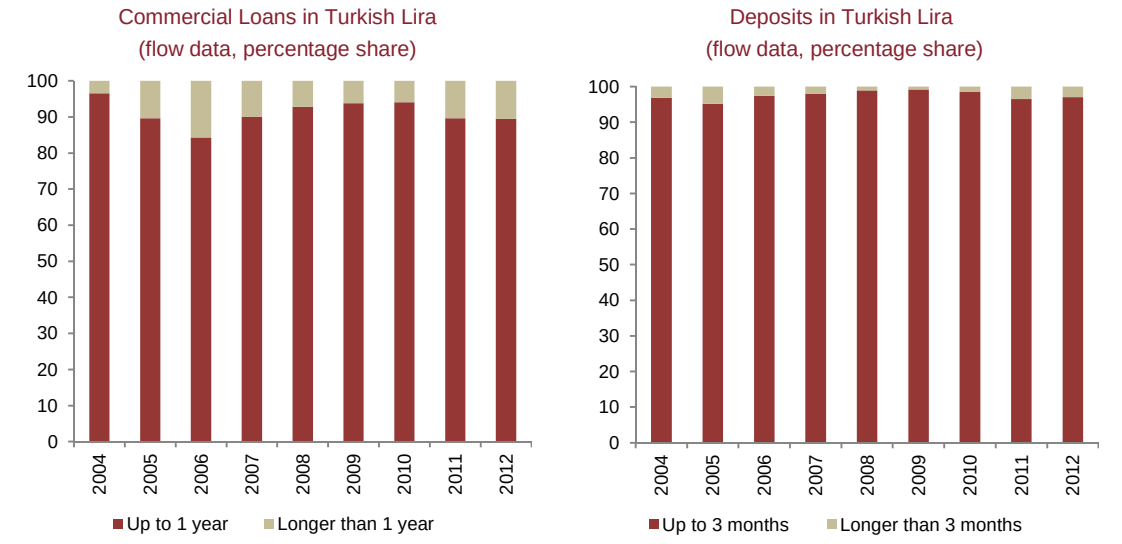
Most studies on loan-deposit spread use aggregate loan series.[4] However, the maturity of loans are typically much longer than deposits, and thus the spread between the two rates are affected by not only credit supply behavior, but also by the term spread variations which may be driven by medium term macroeconomic expectations or other factors affecting term structure of market interest rates. Therefore, the use of the interest rates on aggregate credit series may complicate the whole analysis, often making it difficult to distinguish the movements in the spread related to the bank lending behavior from the cyclical variations in the term spread. Moreover, since the interest rate corridor and liquidity policy are instruments that usually work through short-term channels, the maturity mismatch problem makes it more difficult to assess the effect of these tools on the credit spread. Therefore, in order to better identify the fluctuations in the credit spread that is driven by the corridor policy, it is crucial to use both loan and deposit rates with similar term structures.

In order to address the problems mentioned above, we use interest rate on commercial loans rather than aggregate loans throughout the study. Commercial loans in Turkey have short-term maturity similar to the maturity of deposit rates. Figure 2 shows that newly granted commercial loans are mostly concentrated on less than one year maturity.[5] Moreover, the anecdotal evidence indicates that very short-term and frequently renewed commercial loans constitute a large fraction of the total commercial loans. Thus, commercial loan rates are expected to be sensitive to short-term interest rates and liquidity policy of the central bank. Similarly, most of the deposits are concentrated in less than three months maturity. In other words, both the commercial and deposit loans have short term maturities. Accordingly, in terms of bank lending rates, our focus will be on commercial loan rates throughout the study, which eases the empirical identification strategy by circumventing the maturity mismatch problem between lending and deposits. The analysis of consumer loan rates, which are largely affected by the term structure of market interest rates, is left for future research.

[4] Saunders and Schumacher (2000), Maudos and Fernández de Guevara (2004), Özdinçer and Özyıldırım (2010).

[5] Interest rates on commercial loans reported by the Turkish banking sector are classified as “less than and more than one year” maturity buckets. Further details on the term structure of loans is not available.

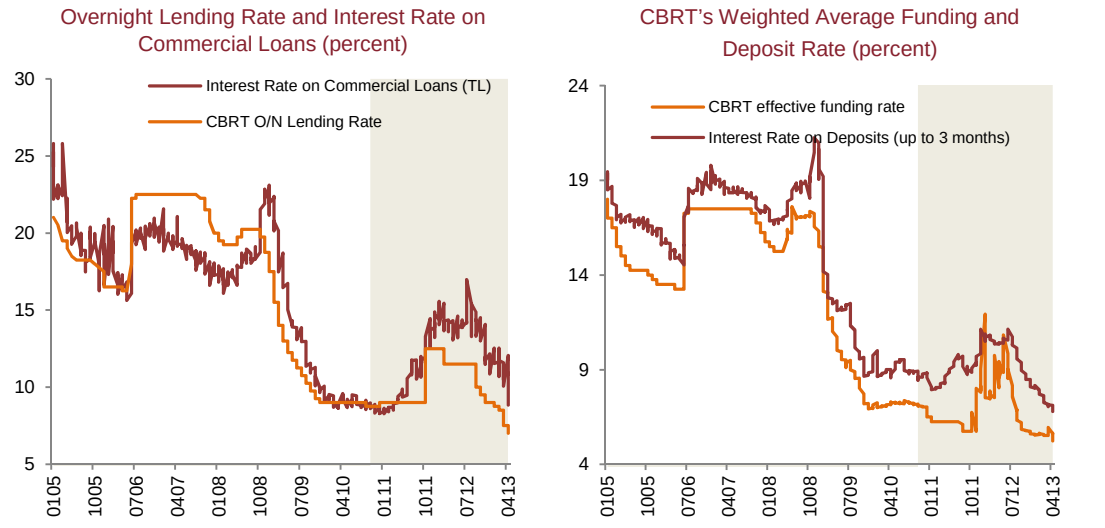
Figure 2. Maturity Structure of Commercial Loans and Deposits



Source: CBRT.

Figure 3 displays various indicators regarding corridor and liquidity policy of the CBRT together with bank loan and deposit rates. The figure on the left displays the upper bound of the corridor and the interest rate on commercial loans. It is striking to observe the strong co-movement of the two series during the recent period. The figure on the right panel displays the deposit rate together with the CBRT average funding rate. Similarly these two series also move very closely. These observations imply that CBRT may affect the loan-deposit spread through the use of different parameters of the corridor and liquidity policy. Motivated by this simple observation, in the rest of the study, we will assess the impact of several policy variables on lending rates, deposit rates, and the credit spread; showing that, by using the parameters of the corridor, the central bank can have significant impact on the credit spread and thus on bank lending behavior.

Figure 3. CBRT Policy Rates and Interest Rates on Commercial Loans and Deposits*



*The shaded area in the figures corresponds to the period for the new policy framework adopted in November 2010 and afterwards.

Source: CBRT.

V. Empirical Evidence

V.1.Time Series Analysis

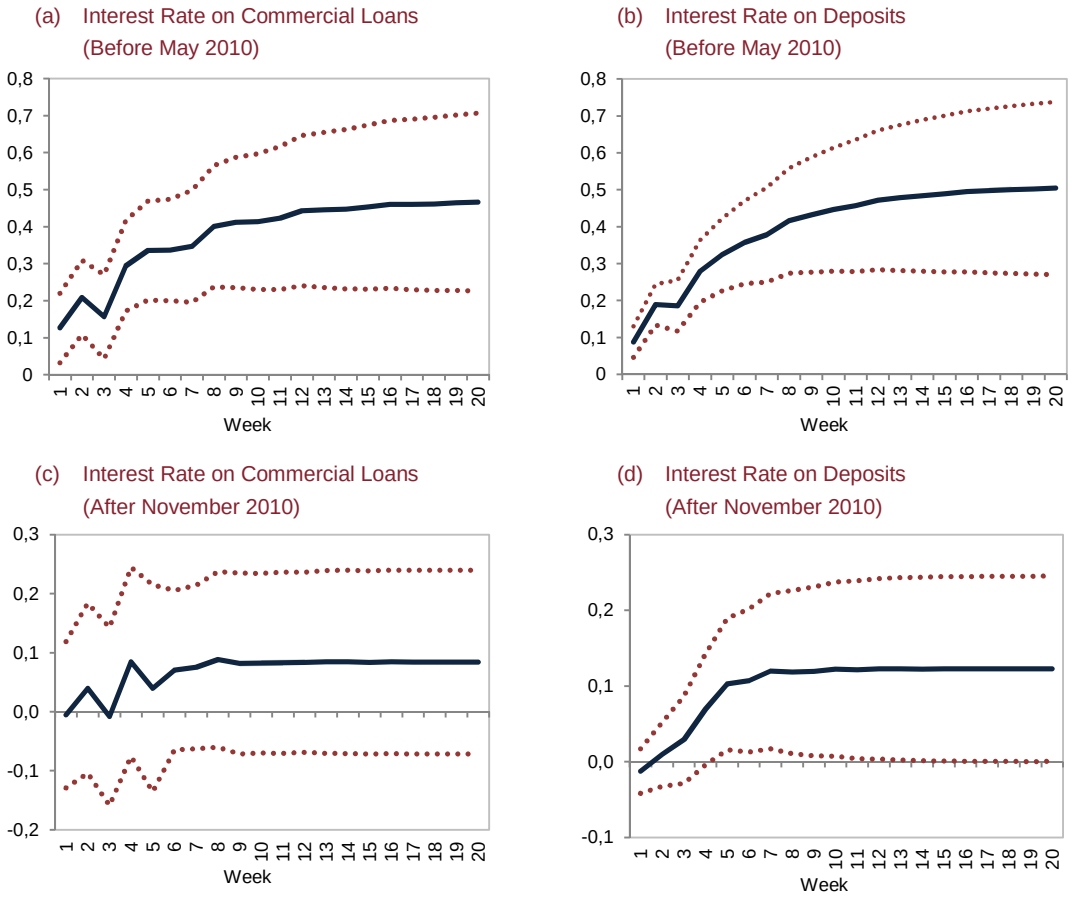
The CBRT introduced a number of new policy tools in recent years, including asymmetric interest rate corridor and reserve requirements. One important issue is the transmission mechanisms of these new instruments. For example, the question of whether pass through from monetary policy to loan and deposit interest rates has changed becomes important. A quick way to assess the changing transmission mechanism is to compute impulse responses from a simple VAR analysis for two sub-periods. To this end, we employ a bivariate VAR model to compare January 2005-May 2010 and November 2010-December 2012 periods (Figure 4).

According to the results of the VAR estimation[6], in the first period covering the period before May 2010, we observe that both rates on commercial loans and deposits react significantly and in a similar way to the overnight borrowing interest rate (Figure 4, panel (a) and panel(b)). This is not surprising given the short term nature of both deposits and commercial loan rates. Consequently, it could be argued that it is not possible to have an effect on the loan-deposit interest rate spread through the change in policy rate during this period. On the other hand, impulse-response functions for November

[6] In the VAR estimation, weekly series of policy rate, flow deposit interest rates up to 3 months and flow commercial loan rate with 4 lags are taken. Choleski decomposition is used in the VAR impulse-response functions. The order of policy rate, deposit rate and commercial rate is preferred. In this ordering it is assumed that policy rate affects other interest rates and deposit rate affects commercial rate simultaneously; other effects are assumed to be observed with one lag. When the effect of upper bound of corridor and BIST overnight is investigated, these variables are used instead of policy rate.

2010 and afterwards presented in Figure 4 panel(c) and panel (d) suggest that there is a change in the transmission mechanism in recent years.[7] During this period reaction of commercial loan rates to one-week repo rate has become statistically insignificant while the response of deposit rates has been weakly significant. This simple observation suggests that the monetary transmission channels have changed after the implementation of the new policy framework by the CBRT.

Figure 4. Cumulative Responses to a Policy Rate Shock*



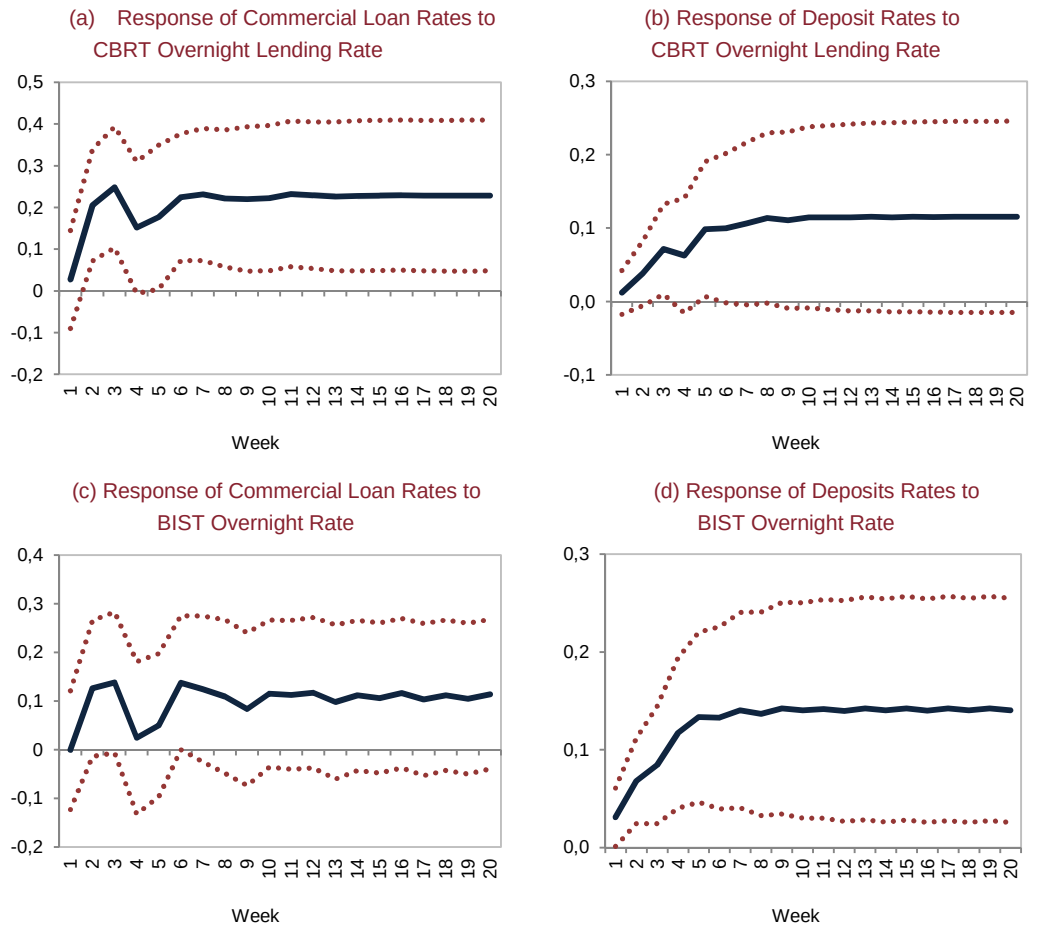
Source: CBRT.
* In the graphs, straight line depicts the cumulative response of financial market variable to one standard deviation shock of monetary policy whereas dashed line shows +/- two standard error band.

Insignificant reaction of commercial loan rates and weak reaction of deposit interest rates to policy rate can be explained by the increasing variety of policy tools in this period. In fact, Figure 5 shows that loan and deposit rates have become responsive to other short term interest rates. For example,

[7] During the period between May–November 2010 CBRT has increased the variety of policy instruments. Since it is explicitly announced in the monetary policy committee meetings that new monetary policy framework is adopted as of November 2010 ,impulse-response functions for November 2010 and afterwards are presented in Figure 4 panel (c) and (d).

interest rates on commercial loans react to CBRT overnight lending rate more strongly and significantly in this period, possibly because of the active use of the upper bound of the interest rate corridor along with the liquidity policy (Figure 5, panel (a)). Similarly, deposit interest rates react significantly to overnight market interest rate in Istanbul Stock Exchange (BIST) in recent years (Figure 5, panel (d)). These results suggest that there is now a variety of short term interest rates that is important for bank behavior. In other words, one week repo rate, which is also called the policy rate, have been less relevant for the monetary policy transmission mechanism in recent years. This is mostly a result of the adoption of asymmetric interest rate corridor by CBRT and the deliberate rise in the volatility of short-term interest rates within the corridor. These developments may have increased the importance of short-term market rates for funding costs of banks, making them more responsive to the upper bound of the interest rate corridor as well as money market interest rates.

Figure 5. Cumulative Responses to CBRT Overnight Lending and BIST Overnight Rates (After November 2010)*



Source: CBRT.
* In the graphs, solid line depicts the cumulative response of financial market variable to one standard deviation shock of monetary policy whereas dashed line shows +/- two standard error band.

In sum, the time series findings imply that the pass-through from new policy instruments to market rates and consequently to loan-deposit spreads may have changed in recent years; and monetary policy may have a significant impact on loan-deposit spread in the new setting.

V.2.Panel Data Analysis

In this section, we will complement the previous section's time series results with panel data analysis by investigating the response of interest rates on commercial loans, deposits, and the spread. Our panel covers bank level data for 13 major deposit banks with the largest share in the industry covering the period between November 2010 and December 2012.[8] We use flow data on deposit and loan rates. Since flow data indicate the rates applied to the newly issued deposit and loan accounts in a given week, they are expected to reflect a more timely response of the monetary policy decisions on the pricing behavior. The use of flow data becomes particularly more important, given our short sample period.

The frequency of the data for loan and deposit rates is weekly but in order to filter the noise in the erratic behavior of commercial loan rates, we use monthly frequency by averaging weekly data for a given month for both loan and deposit interest rates. The interest rate spread is also constructed at a monthly frequency. Regarding monetary policy variables, we use average of daily data for a given month. Finally, non-performing loans are computed using monthly balance sheet data.

Using the variables described above, we estimate the following dynamic panel model:

$$\Delta Y_{it} = \beta_0 + \beta_1 \Delta Y_{i,t-1} + \beta_2 \Delta RR_{it} + \beta_n (\Delta X_t) + \varepsilon_{it} \qquad (1)$$

In this model, $\mathrm{Y_{it}}$ denotes interest rates on commercial loans and deposits, $\mathrm{RR_{it}}$ is required reserve ratio, and $\mathrm{X_t}$ represents a vector of other monetary policy variables such as policy rate, upper bound, and lower bound of the interest rate corridor. During the period of analysis, the required reserve ratios vary based on maturity, thus it differs across banks. To capture the dynamic adjustment and to account for the persistency in interest rates on commercial loans and deposits, the lagged value of dependent variable is included as the right hand side variable. To remove the inconsistency in parameter estimates, generalized method of moments (GMM) of Arellano and Bond (1991) is used as the estimation method. Given the endogeneity problem introduced by the lagged dependent variable, further lags of dependent variable are used as instruments.

Dynamic panel model estimation results are presented in Table 1. Interest rate corridor and required reserves have positive and statistically significant effect on commercial loan rates. Especially, it is interesting to observe that upper bound of the interest rate corridor is the most significant driver of commercial loan rates. This is possibly because of the fact that, during the period of analysis, CBRT

[8] The share of those banks in total banking sector is above 90 percent.

has let the overnight rate to fluctuate within the corridor, increasing the interest rate risk for commercial banks. Accordingly, upper bound of the interest rate corridor may have become an important parameter for the perceived interest rate risk by banks, increasing the sensitivity of the upper bound of the corridor to the commercial loan rates. In addition, we find that the required reserve ratios also have a significant effect on loan and deposit rates.

Table 1. Estimation Results for Commercial Loan and Deposit Rates* (November 2010-December 2012)

	Commercial Loan Rates	Deposit Rates
	(1)	(2)
Commercial Loan Rate $_{(t-1)}$	-0.013	
	(0.068)	
Deposit Rate $_{(t-1)}$		0.384***
		(0.037)
Policy Rate	0.673	0.915***
	(0.455)	(0.113)
Lower Bound	0.128**	-0.003
	(0.050)	(0.011)
Upper Bound	0.768***	0.267***
	(0.182)	(0.022)
Reserve Requirement Ratio	0.090**	0.042***
	(0.045)	(0.011)
Constant	0.136***	0.027***
	(0.045)	(0.008)
Number of Observations	338	338

*Dynamic panel (Arellano and Bond, 1991; GMM) estimation results are presented. All variables are in first difference form (basis point). Standard errors are given in parenthesis and adjusted for heteroskedasticity.
*** p<0.01, ** p<0.05, * p<0.1

An important result revealed by the estimations in Table 1 is that the main driver of the deposit rate is the policy rate, while commercial loan rate is more sensitive to the upper bound of the interest rate corridor. These evidences suggest that, the CBRT can have an influence over the credit spread by adjusting the parameters of the interest rate corridor. In order to test this hypothesis, we next estimate a dynamic panel model for credit spread. The same methodology adopted for the analysis of loan-deposit interest rates is also used for the spread analysis (Table 2). However, since spread is a stationary series by definition, the model is specified in levels rather than first differences.

Dependent variables are constructed by using the set of variables in Table 1. Since both the deposits and loans used in our analysis have short term maturities, and our aim is to explore the impact of short term interest rates on the spread, we do not need to use medium and long-term factors commonly used in the literature on the determinants of credit spread. We use the margin between the upper bond of the corridor and the policy rate as well as the width of corridor to proxy the intermediation cost and funding uncertainty. The required reserve rates are also used as an

intermediation cost indicator. Finally, as an important performance and risk indicator, the non-performing loan (NPL) rates are also used as explanatory variable for the spread model. [9]

Empirical findings summarized in Table 2 indicate that both interest rate corridor and required reserves have significant effect on the spread between loan and deposit rates. As suggested by the time series analysis in Figure 5 and estimation results in Table 1, the difference between upper bound of the corridor and the policy rate has significant effect on loan-deposit spread. As shown in Table 1, this result can be explained by the fact that loan rates are more sensitive to the upper bound of the corridor, while deposit rates mostly respond to the policy rate and overnight market rates. These results indicate that interest rate corridor could be an effective instrument for controlling the loan-deposit spread when needed.

Table 2. Estimation Results for Commercial Loan-Deposit Spread * (November 2010-December 2012)

	(1)	(2)
Commercial Loan-Deposit Spread $_{(t-1)}$	0.758***	0.768***
	(0.035)	(0.032)
Difference between Upper Bound and Policy Rate$_{(t-1)}$	0.128**	0.113***
	(0.049)	(0.041)
Width of Corridor	-0.044	
	(0.047)	
Reserve Requirement Ratio	0.085***	0.079***
	(0.026)	(0.025)
NPL ratio	0.546**	0.540**
	(0.255)	(0.261)
Constant	-0.041	-0.223
	(0.309)	(0.244)
Number of Observations	338	338

*Dynamic panel (Arellano and Bond, 1991; GMM) estimation results are presented. Except NPL ratio, all variables are in level, and to proxy for flow variable, NPL ratio is in first difference (basis point). Standard errors are given in parenthesis and adjusted for heteroskedasticity. *** p<0.01, ** p<0.05, * p<0.1.

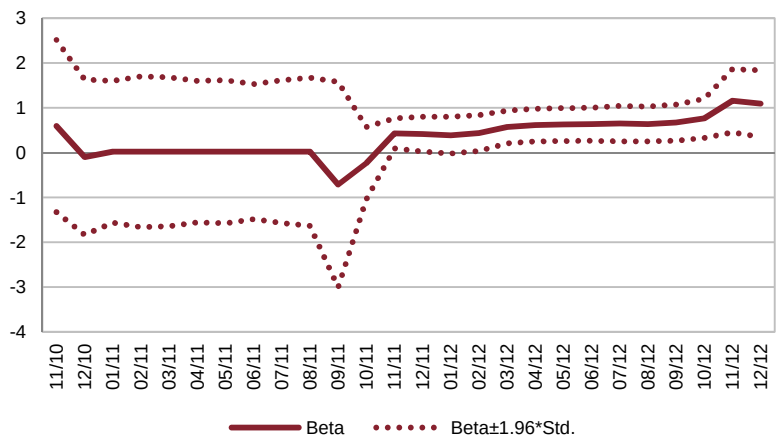
VI. Has the Sensitivity of Commercial Loan Rates to the Corridor Changed in Time?

Although we find that commercial loan rates are very sensitive to the upper bound of the corridor in recent years, the question of when this sensitivity has started becomes important to have a better assessment of policy tools. Accordingly, to see the time varying behavior of the sensitivity of commercial loan rates to the upper bound of the corridor, we estimate a two-variable panel model in 12-month rolling windows. The coefficient defining the relation between the upper bound of the corridor and the loan rate and its 95 percent confidence interval are plotted in Figure 6. Until the end of 2011, there is no observable significant relationship between the upper bound of the corridor and the commercial loan rates. Although the absence of a significant variation in the upper bound of the

[9] Non-performing loans is calculated as the ratio of total non-performing loans to gross loans (non-performing loans+active loans) using balance sheet items. Since the loan-deposit spread is a flow variable and the monthly values of balance sheet items are stock variables, we use monthly changes in the non-performing loan ratio.

corridor makes it difficult to interpret the results, the upper bound of the corridor seems to have become an important determinant of the loan rates since October 2011 when CBRT started to use the interest rate corridor explicitly as a policy tool. In fact, during this period, the CBRT implemented an active liquidity policy by increasing the funding uncertainty occasionally through a reduction in liquidity provision.[10]

Figure 6. Comovement of Commercial Rates with the Upper Bound of the Corridor (Moving Window Analysis)*



Source:CBRT.
* A panel fixed effect model with two variables including commercial loan rate and upper corridor is estimated as 12-month rolling window, and the coefficient for upper corridor (beta, solid line) and 95 percent confidence intervals (dotted lines) are reported.

VII. Conclusion

The CBRT has reformulated its monetary policy strategy in recent years by adopting financial stability as a supplementary objective and enriching the set of policy instruments. The findings of this study indicate that the use of multiple instruments has increased the degree of freedom of the CBRT to influence market interest rates. For example, commercial loan rates have become more sensitive to the upper bound of the interest rate corridor, while deposit rates respond mainly to the policy rate. These findings imply that, by making the appropriate adjustments using its policy toolkit, the CBRT may have some leverage over the loan-deposit spread, and hence credit supply of the banking system.

The finding that loan-deposit spread has the potential to be used as a macro-prudential instrument is important. The interest rate spread often shrinks during times of rapid credit growth as competition among banks increases and risk perceptions improve due to expansion in economic activity. In such periods, preventing (or limiting) the contraction in loan-deposit spreads would tighten the credit supply and curb the appetite for excessive credit growth, thereby making an important

[10] As shown in Binici et al. (2013), the increase in the upper bound of the corridor with active liquidity management policy has contributed to a significant slowdown in credit growth.

contribution to financial stability. Moreover, having an additional policy instrument to influence lending-deposit interest rate spread, and therefore credit supply, may mitigate the trade-off between price and financial stability. [11]

[11] Başkaya, Gülşen ve Kara (2012) show that there is no deterioration in the formation of inflation expectations following the adoption of the new policy framework.

References

Alper K., H. Kara, and M. Yörükoğlu (2013), “Reserve Options Mechanism”, *Central Bank Review*, 13 (1), 1-14.

Arellano, M., and S. Bond (1991), “Some Tests of Specification for Panel Data: Monte Carlo Evidence and An Application to Employment Equations”, *Review of Economic Studies*, 58: 277-297.

Başkaya S., E. Gülşen and H. Kara (2012), “Inflation Expectations and Central Bank Communication in Turkey”, Central Bank Review, 12 (2), 1-10

Bernanke, B., M. Gertler and S. Gilchrist, (1996), "The Financial Accelerator and the Flight to Quality," *The Review of Economics and Statistics*, MIT Press, 78(1), 1-15.

Binici, M., Erol, H., Özlü, P. and D. Ünalmış (2013), “Unconventional Monetary Policy Tools and Credit Growth", unpublished manuscript.

Curdia, V., and M. Woodford (2010), “Credit Spreads and Monetary Policy”, *Journal of Money, Credit and Banking*, 42, 3-35.

Fendoğlu, S. (2011). Optimal Monetary Policy Rules, Financial Amplification, and Uncertain Business Cycles, TCMB Tartışma Tebliği, No.1126.

Gertler, M., N. Kiyotaki and A. Queralto (2012),"Financial crises, bank risk exposure and government financial policy*," Journal of Monetary Economics*, 59(S), S17-S34.

Gertler, M., and P. Karadi (2011), “A Model of Unconventional Monetary Policy”, *Journal of Monetary Economics*, 58, 17–34.

Gilchrist, S., and E. Zakrajšek (2011), “Monetary Policy and Credit Supply Shocks”, *IMF Economic Review*, 59(2), 195-232.

IMF (2012), “The Interaction of Monetary and Macroprudential Policies”, Background Paper, December 2012.

Kara, H. (2012), “Küresel Kriz Sonrası Para Politikası”, İktisat, İşletme ve Finans, 26 (302), 9-25.

Maudos, J., and J. Fernández de Guevara (2004), “Factors Explaining the Interest Margin in the Banking Sectors of the European Union”, *Journal of Banking and Finance*, 28, 2259-2281.

Özdinçer, B., and C. Özyıldırım (2010), “Türkiye Bankacılık Sektöründe Net Faiz Marjlarının Belirlenmesinde Etkin Faktörler: Türkiye analizi”, *İktisat İşletme ve Finans,* 25(292), 9-27.

Saunders, A., and L. Schumacher (2000), “The Determinants of Bank Interest Rate Margins: An International Study”, *Journal of International Money and Finance*, 19, 813–832.

TCMB (2012), “Interest Rate Spread and Determinants in Turkish Banking Sector”, Financial Stability Report, Special Topic, IV.2., November 2012, Volume 15.

Ünsal, F. (2013), “Capital flows and financial stability: Monetary policy and macroprudential responses”, *International Journal of Central Banking*, Volume 9 (1).

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