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TÜRKİYE CUMHURİYET MERKEZ BANKASI

ECONOMIC NOTES

Reserve Options Mechanism[1]

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Abstract: Recently, Central Bank of Turkey designed new policy instruments in order to reduce the adverse impact of volatile capital flows on macroeconomic and financial stability. This note aims to introduce one of the new instruments: "Reserve Options Mechanism" (ROM). We describe the transmission channel of the ROM and compare it with alternative instruments. Our analysis concludes that ROM has the potential to be a useful policy tool for macroeconomic and financial stability.

Özet: Bu çalışmada, sermaye hareketlerindeki aşırı oynaklığın makroekonomik ve finansal istikrar üzerindeki olumsuz etkilerini sınırlamak amacıyla Türkiye Cumhuriyet Merkez Bankası'nın (TCMB) geliştirdiği araçlardan biri olan "Rezerv Opsiyonu Mekanizması" (ROM) tanıtılmaktadır. Çalışmada, ROM'un öngörülen işleyiş biçimi ele alınmakta ve olası etkileri alternatif araçlarla karşılaştırılmaktadır. Değerlendirmeler, ROM'un makroekonomik ve finansal istikrara yönelik faydalı bir araç olarak kullanılabileceğine işaret etmektedir.

Introduction

The heigthened volatility of the capital flows and the increasing awareness of financial stability concerns have induced central banks to adopt alternative policy instruments recently. Against this backdrop, the Central Bank of the Republic of Turkey (CBRT) have adopted financial stability as a supplementary objective and started using new instruments to increase the resilience of the economy against external finance shocks.[2] One such instrument recently designed by the CBT is the Reserve Options Mechanism (ROM). This note introduces ROM and describes the basic transmission channels. Moreover, the note also aims to contribute to the communication of monetary policy, by shedding light to recent discussions regarding ROM.

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1 We are indebted to Erdem Başçı, Mustafa Kılınç, Özgür Özel and Doruk Küçüksaraç for useful discussions.

2 Başçı and Kara (2011) provides a detailed exposition of the new policy framework implemented by the Central Bank of Turkey.

General Framework of ROM

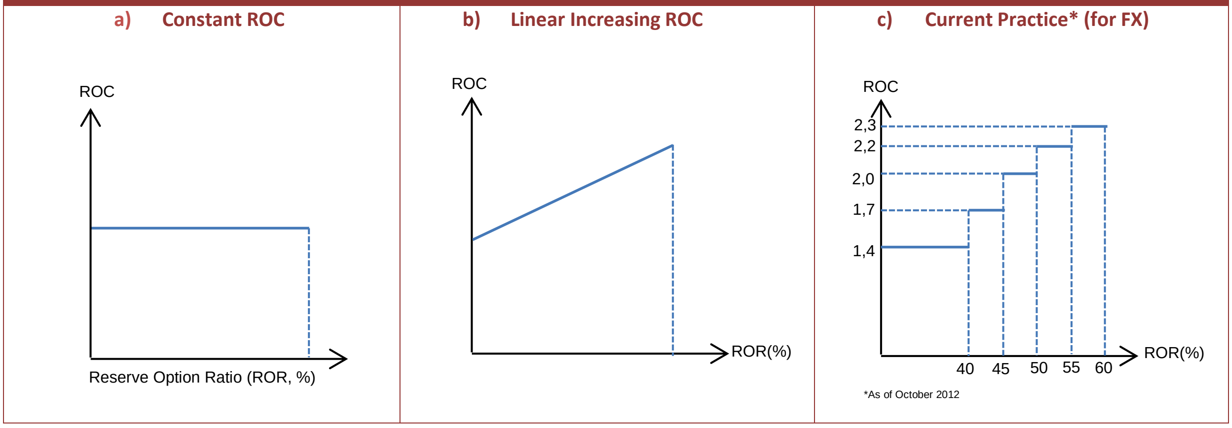
ROM is basically a mechanism that allows banks to keep a certain ratio of their Turkish lira (TL) reserve requirements in foreign exchange (FX) and/or gold. The fraction of TL required reserves that can be held in FX or gold is set by the reserve option ratio (ROR). The amount of FX or gold that can be held per unit of Turkish lira is called the reserve option coefficient (ROC). For example, if the ROC is 2, banks have to hold 2 liras worth of FX or gold per 1 TL reserve requirement if they wish to utilize the ROM facility.

A simple example would help to understand the mechanism. Suppose that banks' have to hold 100 TL reserve requirements in total for their TL liabilities. Let us assume that reserve option ratio for FX is 90 percent (i.e., banks can hold up to 90 percent of their TL reserve requirements in FX) and ROC is 1 (banks can hold 1 TL equivalent of FX per unit of TL reserve requirement). Let us further assume that the exchange rate for USD/TL is 1.8. In this case, if the bank prefers to use the facility fully in USD, it has to hold 90 TL equivalent of USD, which is 90/1.8 = 50 USD. If this is the case, banks will hold 50 USD (90 TL) plus 10 TL to fulfill their 100 TL of total reserve requirements. If the ROC is set as 2 instead of 1, the banks will have to hold 2 TL equivalent of FX per 1 TL. In this case, if the banks wish to utilize the facility fully, they will hold 90*2=180 TL equivalent of FX for their 90 TL reserve requirements, which amounts to 180/1.8=100 USD.

In the example above, for simplicity purposes, ROC is assumed to be uniformly distributed across the whole reserve option facility (up to 90 percent in our example). Needless to say, ROC does not have to be constant across all tranches. For example, when ROR is 90 percent, it is possible to set ROC, say, at 1 up to first 40 percent tranche, and 2 for the remaining 50 percent. In fact, as we will explain in the following sections, increasing ROC across tranches may lead to a more efficient system under certain conditions.

The charts below present some examples on how ROC can be set alternatively. The first graph in Chart 1 depicts the case of a constant ROC, which corresponds to the example above. In the second graph, ROC increases linearly across reserve option ratios. In this case the banks have to hold higher amounts of FX per unit of TL as reserve option ratio increases. The last graph demonstrates the current practice by the CBRT. Currently, the ROC increases with respect to reserve option; however, for practical implementation, the whole facility is divided into sections (tranches) and ROC is set as constant within each tranche.

Chart 1: Some Examples for the Setting of ROC



The TL equivalent of the FX withdrawn by the ROM (if utilized fully) can be calculated by multiplying the area under the each curve in Chart 1 by total amount of TL reserve requirements. For example, if the 60 percent of facility is used fully in the case of Chart 1-c, the TL equivalent of the FX withdrawn from the market can be calculated by using the following formula:

[Total TL Reserve Requirements][0.4*1.4+0.05*1.7+0.05*2.0+0.05*2.2+0.05*2.3]*

Dividing this amount by the exchange rate will yield the total amount of FX liquidity withdrawn from the system via ROM.

Depending on the conditions, the banks may not prefer to use the facility fully. For example, they may prefer to use up to 55 percent rather than 60 percent facility shown in Chart 1-c, in which case the last term (0.05*2.3) in the formula above will be dropped when calculating the total amount withdrawn from the market.

Factors Affecting the Utilization of ROM by the Banks

As argued above, banks may not always opt to utilize the ROM facility in full. Up to what fraction banks will use the ROM depends on the relative cost of FX funding to TL funding. For example, in the case of ROC equal to 1, the banks will use the ROM facility fully if FX borrowing is less costly than TL borrowing, provided that there is no quantity constraint for FX denominated borrowing. On the other hand, in the case of an increasing ROC across reserve option ratios, the banks will prefer not to use the facility fully if the ROC is “sufficiently high” at the highest tranches. The “threshold ROC”, the level of ROC that makes banks indifferent between using and not using the facility, will depend on the relative cost of FX and TL funding. For example, if the cost of Turkish lira funding is 6 percent and the cost of FX funding is 3 percent (including the expected depreciation), the threshold ROC will be 2. In other words, banks are expected to use the ROM up to a point where ROC is equal to 2. Technically, the threshold ROC can be expressed as follows:

$$ROK^{tr} = \frac{r_t^{\ TL}}{r_t^{\ YP} * \frac{E(e_{t+1})}{e_t}} \qquad (1)$$

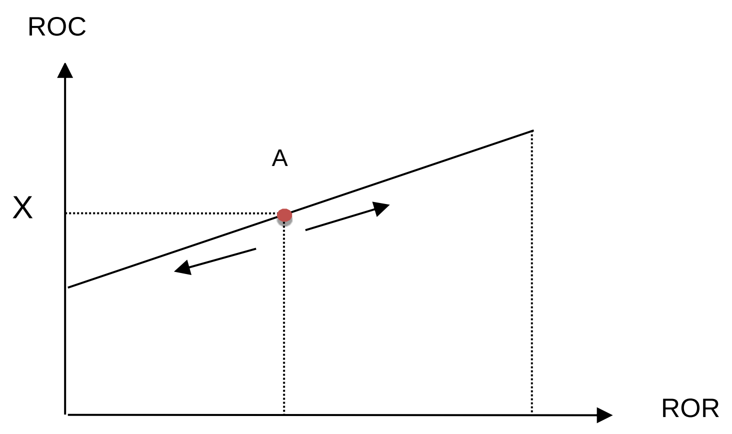
In the equation ROC^{tr} denotes threshold ROC, $r_t^{\ TL}$ denotes the cost of TL funding, $r_t^{\ FX}$ is the cost of FX funding, e_t is the spot exchange rate at the beginning of the maintenance period, $E(e_{t+1})$ is the expected exchange rate for the end of the maintenance period. In this formula, $r_t^{\ TL}$ is the cost the bank incurs if it prefers to maintain the Turkish lira reserve requirements by borrowing in TL. The term in the denominator, $(r_t^{\ YP} * E(e_{t+1})/e_t\ )$ denotes the bank's expected cost at the end of the maintenance period (denominated in TL), should it choose to use the ROM and fulfill the Turkish lira reserve requirement through FX borrowing.

It should be noted that the formulation presented above is a simplified one. Under current practice, banks' relative borrowing cost will not only depend on the interest rates or expected exchange rate but also on the other costs such as reserve requirements.[3]

ROM as an Automatic Stabilizer

Each bank's treshold ROC will depend on the relative funding cost shown in Equation (1). The fact that every individual bank can solve its own maximization problem (depending on the relative costs and availability of credit) is critical, as it facilitates the system to work as an automatic stabilizer in the face of external funding shocks. In order to understand the mechanism, a simple example will help to see how the funding conditions may alter the threshold ROC automatically.

Chart 2: The Impact of the Change in TL-FX Relative Funding Costs on the Threshold ROC



[3] See Küçüksaraç ve Özel (2012) on the details of how to compute the treshold ROC under different assumptions.

Let us assume that the ROC is linearly increasing in reserve option ratios as in Chart 2, and the point “A” shows the threshold ROC at a certain period. The automatic stabilizer is expected to function as follows:

During an acceleration in capital inflows: These periods are typically characterized by a decline in FX funding costs relative to TL funding costs and/or a relaxation of quantity constraints. In case of a relative fall in FX borrowing costs, threshold ROC will increase, inducing the banks to hold a higher ratio of their TL reserve requirement liabilities in FX. In other words, profit maximization behavior will lead the banks to use the ROM facility more intensively, increasing the “ROM utilization ratio”. Accordingly, point A will shift to the right along the line, increasing both the threshold ROC and thus the utilization ratio. In this case, a fraction of the foreign exchange inflows will be withdrawn, since they will be placed at the CBRT accounts of the banks as reserve requirements. This will not only contain the appreciation pressure of TL but also limit the conversion of the FX inflows into bank lending. On the other hand, if there are quantity constraints on bank borrowing, accelerating capital inflows will lead to a relaxation of these constraints, and once again shift the point “A” to the right. This means that utilization ratio will increase again and thus some of the inflows will voluntarily park at the CBRT. In both cases, some TL liquidity wil be injected into the system. Yet the amount will be less—and thus sterilization costs will be lower—than the case of direct FX purchase by the CBRT, as long as ROC is higher than 1.

During a deceleration in capital inflows: These periods are typically characterized by an increase in FX funding costs relative to TL funding costs and/or a tightening of external borrowing constraints, which will shift the point “A” in Chart 2 to the left. This will lead to a fall in the utilization of the ROM and release some of the FX liquidity held by the banks at the CBRT, limiting the depreciation pressures and lowering the possibility of a credit squeeze.

In sum, the ROM has the potential to limit both the volatility of the exchange rate and the market liquidity through the automatic stabilizer mechanism.

It should be noted that in order for the ROM to operate as an automatic stabilizer, the threshold ROC under “normal” conditions has to be lower than the maximum reserve option ratio. For example, in the current practice, the ROC for the upper end has to be high enough so that banks will not prefer to use the ROM facility to the full extent. In fact, the CBRT has been taking this condition into consideration during the build-up phase of the ROM.

Construction of ROM

The build-up phase of the ROM is engineered at a gradual pace in order to smooth the transition process of the banks. As a first step, banks are allowed to hold a fraction of their TL reserve requirements in foreign exchange or gold with a uniform ROC at 1. The system was enhanced and further developed in time to construct a mechanism that will work as an automatic stabilizer eventually. To this end, in line with the guidance provided in the previous section, the CBRT has changed the ROC levels by setting higher coefficients for higher reserve option ratios.

Chart 3: Construction of ROM for FX in 8 Steps

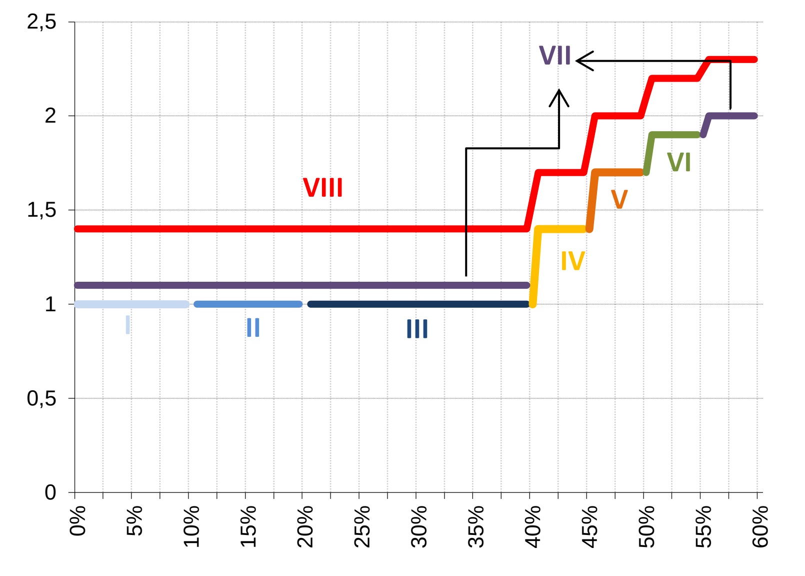
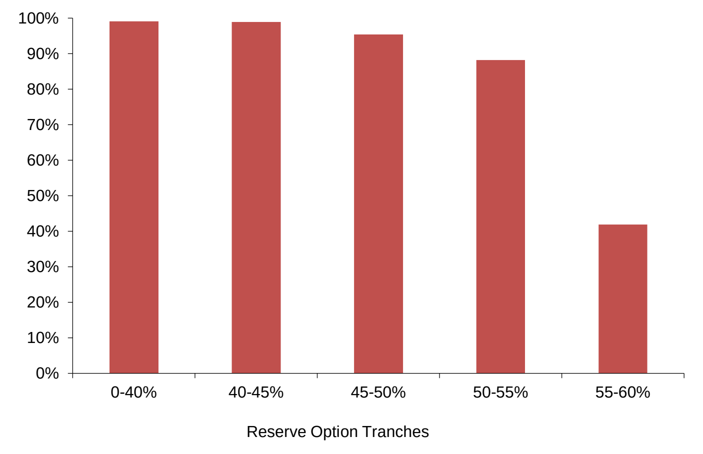


Chart 3 summarizes the build-up phase of the ROM in 8 steps. The construction of the ROM (for FX) has started in September 2011 by setting the reserve option ratio at 10 percent; i.e., allowing the banks to hold 10 percent of their TL reserve requirements in foreign exchange (I). Reserve option ratio was raised to 20 percent in October (II) and further to 40 percent in November (III). Up to this point, the ROC was uniform (and equal to 1) across all tranches. Differentiation of ROC from 1 started in June 2012 when the reserve option mechanism was increased to 45 percent from 40 percent, with a ROC of 1.4 for the incremental 5 percent (IV). Afterwards, the reserve option ratio was increased to 50 and 55 percent in two consequtive steps and ROC was set at 1.7 and 1.9, respectively, for each additional 5 percent tranches (V and VI). In the next step, the reserve option ratio was raised to 60 percent with a ROC of 2 for the incremental 5 percent. Moreover, with this move, ROC for the 0-40 percent tranche was increased to 1.1 from 1 (VII). Finally, in September and October 2012, ROC was increased by 0.2 and 0.1 percentage points, respectively, for all tranches (VIII).

Whether the existing coefficients are high enough to ensure the automatic adjustment mechanism remains to be seen. As of the end of September, some banks do not use the facility fully, suggesting that we may have reached the threshold level for the upper end (Chart 4).

However, one has to be cautious regarding this statement, since the underutilization of ROC may be reflecting quantity constraints on external borrowing rather than breach of the threshold level.

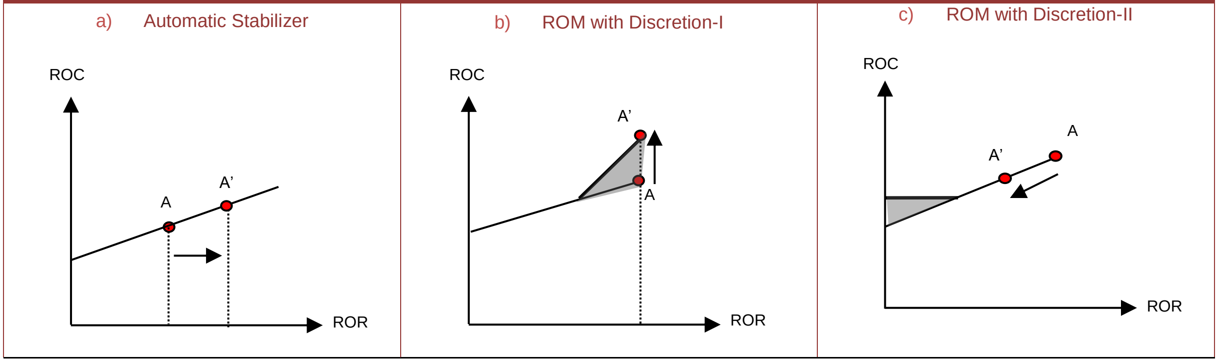
Chart 4: Utilization Ratio for ROM across Tranches (as of September 28, 2012)



Applications of ROM: Some Examples

ROM essentially aims at reducing the detrimental effects of volatile capital flows on domestic markets by smoothing the gap between supply and demand of foreign currency. The mechanism is planned to function as an automatic stabilizer once the build-up process is completed. However, depending on the circumstances, the parameters can be changed in a discretionary manner. Chart 5 presents examples for both cases.

Chart 5: ROM under Automatic Stabilizer versus Discretionary Policies



In the first panel of Chart 5, banks do not utilize the ROM fully. The utilization ratio (shown by the horizontal component of point A), hence the amount of the foreign exchange withdrawn from the market, solely depends on banks' own decisions. In this case, a decline in the cost of foreign borrowing, *ceteris paribus*, would result in higher utilization ratio.

Panels (b) and (c), on the other hand, correspond to the cases where the central bank actively changes the reserve option coefficients at a point when banks fully utilize the ROM. In panel (b) CB increases the coefficients at the upper end of the ROC scheme. If the option remains to be utilized to the full, the amount of foreign currency drawn would rise in proportion to the shaded area while Turkish Lira liquidity would be left intact. However, if there are quantity constraints for FX borrowing, the hike in the coefficients would induce the banks to reduce their utilization ratios. In this case, TL liquidity needs of the banks would increase, but the sign of the amount of net foreign currency withdrawn is ambiguous, since it could either rise or fall depending on the relative cost of TL versus FX resources and the extent of the increase in the ROC.

In the final panel of the Chart 5, the central bank increases the coefficients at the lower end of the ROC scheme. If there are no quantity constraints on banks' access to international markets, in other words if banks can borrow more from abroad without a change in their borrowing costs, such an increase in ROC would raise the amount of foreign currency withdrawn from the market. Since the utilization ratio of ROM will not change, there will be no impact on the amount of TL liquidity in the market. In this case, point A in Chart 5-c will stay intact. On the contrary, if the cost of foreign borrowing is a function of the amount borrowed and/or quantity constraints for external borrowing are binding, a hike in the ROC would require banks to scale down the utilization of the option while the demand for TL liquidity goes up. The shift from point A to point A' corresponds to this situation.

ROM and Alternative Tools: A Balance Sheet Analysis

Table 1 illustrates the functioning of ROM and its comparison with alternative policy tools using a representative aggregate balance sheet of the banking system. For all four cases in the Table, we assume that domestic banks borrow 100 units of foreign currency (for the sake of simplicity, exchange rate is assumed to be 1 and reserve requirement ratio for FX liabilities is assumed to be 0).

The first panel of the Table describes a situation where there is no interference into the system, i.e., neither ROM nor FX intervention is used against capital inflows. Under this scenario, 100 units of capital inflows are directly converted into 100 units FX denominated credit, and consequently the rise in the supply of foreign exchange would exert appreciation pressure on domestic currency.

Table 1: The Effects of Capital Flows on the Balance Sheet of the Banking System

a) Base Scenario

Assets	Liabilities
Loans +100	Due to Foreign Banks +100

b) Sterilized Intervention

A	L
Loans +50	Due to Foreign Banks +100 Due to CB (Repo) -50

c) ROC=1

A	L
Loans +50 TL RR (ROM) +50 Due from CB -50	Due to Foreign. Banks +100 Due to CB (Repo) -50

d) ROC=2

A	L
Loans +0 TL RR (ROM) +100 Due from CB -50	Due to Foreign Banks +100 Due to CB (Repo) -50

The second panel in Table 1 represents a situation where the central bank purchases 50 units of FX while simultaneously sterilizing the excess liquidity injected to the market. With this policy, the central bank contains some of the appreciation pressure on domestic currency. Moreover, domestic interest rates stay intact because of the sterilization. Compared with the base case scenario in panel (a), there would be less credit growth, yet the banks' borrowings from the central bank would be reduced proportionally.[4]

The last two panels of the Table are used for analyzing a scenario where the ROM is used to absorb capital inflows and there are no direct FX purchases. In panel (c) ROC is equal to 1 whereas in the final panel ROC is set at 2. We assume that under both scenarios, the central bank withdraws the amount of FX that is necessary to fulfill 50 TL of reserve requirements. When ROC is 1, 50 units of the total 100 unit of inflow is deposited to Central Bank in order to fulfill the 50 TL reserve requirements. In the first case (panel c), increased use of the ROM result in 50 units of excess domestic currency liquidity (as ROC equal to 1), and as in the previous case, CB mops up the excess liquidity via open market operations. Therefore, only half of the capital inflows (banks' foreign borrowings) is used for credit expansion. Moreover, as in the sterilized intervention case, the banks' borrowings from the central bank decreases. Therefore, from an aggregate balance sheet perspective, consequences of sterilized intervention and the ROM are quite similar (especially when ROC is set at 1).[5]

[4] If there are restrictions on open positions of banks, in practice sterilized intervention would lead to open positions in non-bank domestic agents' balance sheets—not in the bank balance sheets as in this example. However, regardless of the ownership of the open positions, the consequences of the central bank's actions in terms of exchange rate, domestic interest rates and the net open market operations would be equivalent. Therefore, for simplicity purposes, we prefer to assume open position appear in the bank balance sheets.

[5] However, as explained in detail in the following section, these two tools differ substantially in terms of their signaling effects.

The balance sheet appearing in panel (d) reflects a case where ROM is used to absorb capital inflows but this time the ROC is 2. This is unsurprisingly almost a duplicate of the balance sheet in panel (c) except for the magnitudes of the changes appearing in the balance sheet items. When ROC is higher, that means the central bank can withdraw a higher amount of FX from the market per unit of the fullfilment of the TL reserve requirements. Translating to our case, banks deposit 100 units of FX to the central bank in exhange of 50 units of domestic currency deposits.[6] Therefore, all the 100 units of FX inflows are absorbed by ROM and there is no additional credit expansion by the banks.

In sum, ROM with an effective ROC of greater than 1 is likely to be more efficient than the sterilized intervention in smoothing the effects of fluctuations in the supply of foreign currency on the domestic markets. Nevertheless, one should note that ROM has important advantages over other alternative tools in terms of communication and efficiency aspects, as we will discuss in the following sections.

ROM and Sterilized FX Intervention

ROM is a mechanism for smoothing exchange rate and balance sheet effects of capital flow volatility. FX intervention is often used for this purpose as well. Therefore, it would be useful to compare these two instruments as alternative policy tools. An advantage of ROM compared to sterilized FX intervention is its automatic stabilizer nature. In other words, while direct intervention decisions are mostly discretionary by nature, withdrawal of FX liquidity from the market through ROM is an outcome of inividual optimization policies of banks, which makes ROM a more efficient system in terms of resource utilization.

ROM is also easier to communicate compared to discretionary tools such as FX intervention. For example, an FX intervention aiming to smooth the exchange rate volatility may be (mis)perceived as an attempt to defend some exchange rate level or as a change in monetary policy stance. On the contrary, withdrawal or injection of FX liquidity through ROM (assuming that it operates as an automatic stabilizer) does not pose such a problem since it is an outcome of the optimization decisions by the banks. Moreover, unlike direct intervention procedures, ROM does not run the risk of provoking speculative FX demand.

At this point, it should be underscored that ROM will ease, but not completely remove, the need for interventions. Abrupt swings in capital flows and/or unhealty price formation in the FX market may still necessitate the use of intervention as a supplementary instrument.

[6] Instead, if we had assumed that the amount of FX liquidity deposited to the central bank by the banks is the same for ROC=1 and ROC=2, then the amount of TL liquidity injected to the market would be less under ROC=2 case.

ROM and FX Reserve Requirements

Another instrument that can be used to affect the FX liquidity is changing reserve requirement ratios for FX liabilities. Since using this tool will not have any direct impact on the TL liquidity of the market, it is more convenient compared to sterilized intervention in terms of managing liquidity. However note that, unlike ROM, changing the FX reserve requirements will impose all the banks to adjust their FX liquidites in the same way, which may lead to problems for liquidity constrained banks. Therefore, from a financial stability perspective, ROM will yield better results compared to FX reserve requirements.

ROM and Interest Rate Corridor: Substitute or Complementary?

ROM has been adopted to increase the resilience of the banking system to FX liquidity shocks and thus to smooth the exchange rate volatility to some extent. Meanwhile, interest rate corridor, which is another instrument designed within the new monetary policy framework, is used for similar purposes. In this context, it would be useful to discuss whether these instruments are substitutes for each other. Although, these instruments have common features in terms of managing the volatility of exchange rate, their transmission works through different channels. Interest rate corridor affects exchange rate volatility by directly altering short-term portfolio behavior of economic agents. On the other hand, ROM changes the way FX flows are channeled into (or out of) domestic balance sheets. Still, as far as exchange rate smoothing is concerned, ROM reduces the need for a wide interest corridor.

However, it should be noted that interest corridor has other functions, especially for credit transmission channel and active liquidity management. First, interest rate corridor can be used to control the spread between lending and deposit rates, since banks take the upper bound of the corridor as a benchmark while pricing their loans. Therefore, unlike ROM, the corridor can have a direct impact on banks' lending behavior and credit conditions. Second, the corridor provides a flexibility to adjust policy stance at a high frequency by changing the liquidity conditions.

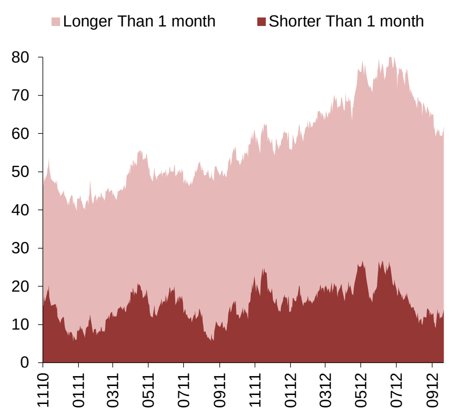
In sum, while ROM reduces the need for a wide interest rate corridor in terms of smoothing exchange rate volatility, it does not completely remove it since interest rate corridor has other functions as a monetary policy tool.

The corridor and ROM can also work as complementary tools in certain occasions. For example, the presence of the corridor provides a flexibility in terms of sterilization of the liquidity movements within the use of ROM. In the standart inflation targeting framework, the TL liquidity injected into the system through FX withdrawals has to be almost fully sterilized since the central bank commits to keep short term interest rates close to a pre-announced policy rate. On the other hand, under the existing corridor system, the short term interest rates can fluctuate freely within the corridor, providing some flexibility in terms of sterilization. For example, during a surge of capital inflows, the central bank will have the option of not fully sterilizing the liquidity withdrawn through ROM, by letting short term interest rates to decline. Furthermore, a fall in short terms interest rates may discourage short term capital inflows in such case, fostering the role of ROM as an exchange rate smoother.

The Impact of the ROM on Cross Currency Swaps and Reserves

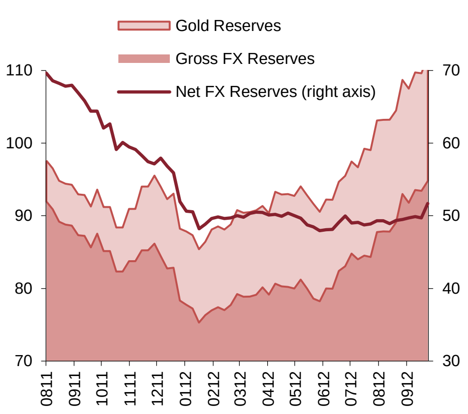
An indirect effect of the ROM during the build-up stage has been a reduction in cross-currency swap positions of the banks. The option to hold a fraction of the Turkish lira reserves in FX has allowed the banks to substitute some of their cross currency swap positions with ROM, as it was more optimal to fulfill their TL liquidity needs through ROM rather than swaps. In fact, there has been a significant reduction in cross currency swaps recently, as depicted by the shrinkage in the off-balance sheet positions of the banks, especially for the short term contracts which display substantial volatility (Chart 6). This development supports financial stability, as it has the potential to limit exchange rate volatility against sharp movements in the risk appetite.

Chart 6: Short Term Swap Positions (BillionTL)



Source: CBRT.

Chart 7: CBRT Reserves (Billion USD)



Source: CBRT.

The adoption of ROM has increased the gross reserves of the CBRT but did not have an impact on net reserves. Chart 7 shows that gross reserves have increased gradually after the introduction of ROM in the last quarter of 2011, while net reserves displayed a flat course. However, this should not give the impression that the benefits of ROM are limited. The increasing share of private sector in the holding of gross reserves increases the resilience and the efficiency of the financial system. After all, it is the private sector that holds most of the external debt, not the public sector. Therefore, a system where reserves are largely held by the private sector may lead to a more efficient outcome regarding the use of reserves. Moreover, it is also worth to mention that under the ROM system, banks' reserves at the CBRT accounts will grow broadly in line with the liabilities of the banking system. The speed of this growth is likely to be higher than the growth rate of CBRT's total reserves.

CONCLUSION AND FINAL REMARKS

This note introduces reserve option mechanim (ROM), which is a new tool developed by the CBRT. ROM is designed as an automatic stabilizer which induces banks to adjust their reserves endogenously in the face of external shocks. The fact that each bank can solve its own maximization problem leads to a more efficient tool compared to other alternatives such as FX interventions or FX reserve requirements. However, it should be noted that the parameters of ROM may also be adjusted exogenously, if deemed necessary. For example, a structural shift in the relative cost of domestic versus external borrowing or availability of funding may necessitate a revision in the coefficients.

Overall, our analysis suggest that ROM has the potential to be a useful policy tool to support macroeconomic and financial stability. This system helps the CBRT to disentangle FX liquidity management from TL liqudity management. In that sense, it may be superior against other alternatives, especially in terms of alleviating the adverse effects of capital flow volatility on the exchange rates and FX denominated loans. However, at this point, it is too early to make conclusive statements about the practical implementation, since ROM–as all innovations–needs to be tested against different shocks through time.

References

Başçı, E. and Hakan Kara (2011), "Finansal İstikrar ve Para Politikası (Financial Stability and Monetary Policy)", CBRT Working Paper, No:11/08.

Küçüksaraç, D. and Özgür Özel (2012) "Rezerv Opsiyonu Mekanizması ve Optimal Rezerv Opsiyonu Katsayılarının Hesaplanması", CBRT Working Paper, No: 12/32.

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