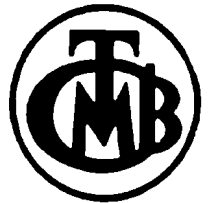# Open Market Operations in Turkey
July 2002

OPEN MARKET OPERATIONS IN TURKEY

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JULY 2002

ABSTRACT

Monetary policy aims to ensure price stability that may help long-term sustainable growth, low unemployment levels and equitable income distribution. Open market operations are the most important monetary policy instrument of central banks. It is flexible in terms of timing and transaction volume when compared to alternative monetary policy instruments. In the last years, Central Bank of Turkey's most important monetary instrument has become open market operations. And in the near future, it will continue to use open market operations frequently during the inflation targeting monetary policy implementation. Central Bank of Turkey will use overnight interest rate as the main monetary instrument. For a proper functioning of open market operation requires a net shortage of funds in the banking system. The Central Bank of Turkey is not ready to use open market operation instrument to get desired goals. It should be net creditor from banking system for successful implementation of inflation targeting monetary policy.

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1.INTRODUCTION

Monetary policy and central banking subjects are evolutionary concepts in economics literature. The number of publications related monetary theory and policy implementation is increasing day by day. This study examines "open market operations" (OMO) which is the most important monetary policy instrument in the monetary policy implementation. The aim of study is to give basic information about monetary policy and its instruments especially open market operations by considering Central Bank of Turkey's implementation.

The outline will be as follows. In section 2, I will mention about some fundamental concepts of monetary policy. The following section is related transmission mechanism of monetary policy. The monetary policy instrument will be subject of 4th section. Section 5 will focus on open market operations of Central Bank Republic of Turkey. Classifications of open market operations will be subject of 6th section. In section 7, I will mention about open market operations methods used by Central Bank Republic of Turkey (CBT). In the following section, a brief history of open market operations of Central Bank Republic of Turkey will be discussed and section 9 will consist of conclusion.

2.BASICS OF MONETARY POLICY

Monetary policy is roughly adjusting and satisfying economy's liquidity requirement to realize economic and financial transactions. Monetary policy aims to ensure price stability that may help long-term sustainable growth, low unemployment levels and equitable income distribution. Price instability or inflation has many economic costs. The basic costs of inflation (Gray, Hoggarth and Place , 2000) may be analyzed as costs of unexpected inflation and costs of expected inflation.

There are some microeconomics and distributional costs of unexpected inflation. As it is known, price signals are tool of resource allocation in market economies. If price signals are distorted as a result of inflation, efficient resource allocation may not be realized and economy may go away from Pareto efficiency. In an inflationary environment economic actors may not guess or separate general price increases from relative price increases

correctly. In addition to that, inflation may cause real interest rate calculations unreliable, and investment and consumption spending may decrease as a result of high uncertainty in economic life. All these negative developments may make economy to produce less than it's potential output level.

Inflation may also distort income distribution. Fixed income earners' purchasing power may decline, borrowers' real debt may decrease and so savers may loose. Therefore high inflation may decrease saving tendency or marginal propensity to saving of society. Declining savings may harm investment spending, capital accumulation and economic growth in developing countries such as Turkey.

Some costs of expected inflation may be classified as shoe-leather costs, menu costs and costs related to tax system. Inflation makes people to hold cash as possible as minimum. Therefore economic actors should spend a considerable time to visit banks. Increasing number of bank visits are called shoe-leather costs. Menu costs are related producers and retailers who need adjusting upwards their selling prices. Lastly, inflation also yields tax system distortions. If there is no fully indexation of inflation of tax bands in a progressive income tax system, increase in taxpayers' nominal income may carry them to upper tax band and so taxpayers' real tax burden increase.

As a result of these harmful effects of inflation in the economy, low and stable inflation became main goal of monetary authorities in developing and developed countries. Unfortunately, monetary authorities can't control inflation directly with the instruments they have. Therefore they consider channels of monetary policy to affect prices and output in the economy. These various channels are discussed next section briefly.

3.TRANSMISSION MECHANISM

Monetary policy affects nominal and real variables in the economy via different channels (Chart 1) such as interest rate, expectations, liquidity, and asset prices. In nowadays, Central Bankers in all around the world aim to ensure price stability. They think low and stable price level may assist long-term economic growth and expansionary monetary policies may promote economic growth only in a short period. In the medium term, economy returns the natural levels but with a higher level of inflation. Therefore in the long term money

is neutral. Money that is a nominal variable does not affect real variables such as unemployment level, real interest rates and real wages.

As mentioned above, monetary policy affects nominal and real economic variables in the short run via different transmission channels. There are mainly three channels. These are interest rate channel, credit channel and asset price channels that are performed especially via exchange rates.

Interest rate channel of transmission mechanism depends on traditional Keynesian IS-LM framework. According to that view, monetary policy affect economy as a result of changes in real (not nominal) interest rates. An expansionary monetary policy decreases real interest rates, so investment spending and aggregate demand increases. In the last stage, growing aggregate demand spurs economic activity and production level in the economy increases. Sticky prices or rigidity in the prices play dominant role in working of that channel. Expansionary monetary policy decreases nominal interest rates and so real interest rates as a result of price rigidity.$^{\varphi}$

Exchange rate channel of monetary transmission mechanism includes also interest rate channel effects. Decrease in the domestic real interest rates makes foreign financial assets more attractive than domestic financial assets. Therefore demand for foreign assets and foreign currency increases. Selling of domestic currency to buy foreign currency causes depreciation of domestic currency. Cheaper domestic currency in terms of foreign currency increases competitiveness of domestic goods and services and net export of country increases. That channel is quite important for small open economies.

The last main channel of transmission mechanism is credit channel. Credit channel works via bank credits and balance sheet effect sub-channels.

At the bank credits sub-channel bank reserves and deposits are important. For example, an expansionary monetary policy increases bank reserves and bank deposits, so the amount of liquidity that may be used for credits increase, competition among banks to

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$^{\varphi}$ According to simplest form of the Fisher Equation; Nominal interest rate: Expected inflation rate+ Real interest rate

sell excess liquidity in the form of credit causes decrease in credit interest rates. Decreasing credit interest rates yields increasing consumption, investment spending and production.

Balance sheet effect sub-channel is related financial position of credit demanders. As it is known, firms that have weak financial position pay higher credit interest rates than others. Higher credit interest rates may tend weak financial position firms to take risky investment projects. Banks may respond that moral hazard problem by decreasing their credits, and so investment spending and production may decrease.

Chart 1: Monetary Transmission Mechanism
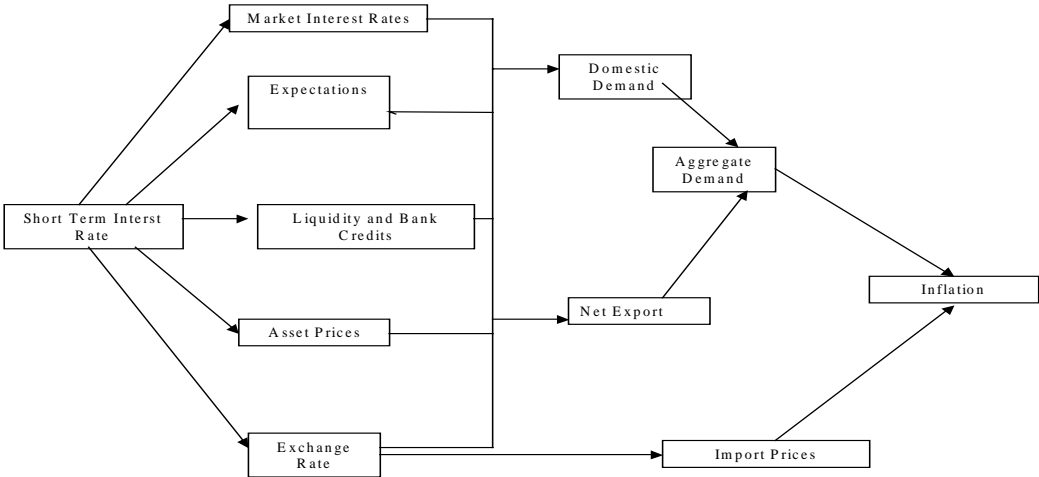
4.MONETARY POLICY INSTRUMENTS

As mentioned above, monetary authority aims to price stability by targeting some aggregates by using their instruments. Central banks target some aggregates such as exchange rate, monetary and inflation and these aggregates or targets work as nominal anchors.

Table 1: The Main Monetary Policy Instruments

THE MAIN MONETARY POLICY INSTRUMENTS	
DIRECT	INDIRECT
Interest rate controls	Reserve Requirements
Credit Ceilings (bank by bank)	Rediscount Window
Statutory liquidity ratios	Public sector deposits
Selective credit controls	Credit auctions
Moral suasion	Open market operations
Rediscount quotas	Foreign exchange swaps
	Overdraft window

Monetary policy instruments (Table 1) may be classified as direct and indirect (market related) instruments. Direct instruments are direct controls on the financial prices such as interest rates or quantities such as deposits or credits of financial institutions. Direct instruments may be very effective tools for central bank in the crisis periods. They are effective in the less developed financial markets countries. Direct controls have two disadvantages. They eliminates competition among banks, for example efficient banks may not give higher deposit interest rates or demand lower credit interest rates. Therefore many inefficient banks or financial intermediaries survive in the financial system. In addition to that, direct controls' effectiveness declines in the highly open and integrated financial markets in the world.

Indirect (market related) instruments mainly work via central bank's own balance sheet or adjustment of any basic monetary instrument of Central bank. Then these changes affect behavior of financial institutions. In that framework, central bank controls its liabilities price or quantity (not both of them simultaneously) and aims to affect other interest rates and quantity of money and credit volume of financial system. Indirect instruments may be classified as reserve requirements, open market operations and standing facilities roughly. As financial market develops countries implement indirect instruments instead of direct ones. The general tendency of monetary authorities in developed and developing countries is implementing indirect instruments.

The most important monetary policy instruments are "reserve requirements, open market operations, discount window and moral suasion" in central banking.

Reserve requirements consist of reserves of banking system. Commercial banks are obliged to hold a set of their deposits in the form of legal reserves in their central bank account. Reserve requirement instrument is not flexible and compulsory for financial market participants. An increase (decrease) in reserve requirement ratio makes banks to hold more (less) reserves in their central bank account. Therefore an increase in reserve requirement reduces money multiplier, banks' ability to extend credit and create broad money via deposit expansion diminishes. In the last years reserve requirements are started to apply on average over a period instead of daily application. In that new application, aim is to reduce daily volatility of overnight interest rates. Reserve requirement instrument may be very effective in the case of structural liquidity shortage or surplus problems in the market. Lastly, they increase cost of banks if they don't paid interest at a market level interest rate.

Open market operations (OMO) are referring broadly to the purchase and sale of specified assets by central bank. Generally government bonds and Central bank securities in some countries are traded. They are realized in voluntary basis and more flexible than other monetary instruments. For example, if monetary authority aims to withdraw currency from circulation or decrease the excess reserve in the banking system, it engages in open market sales and for an expansionary monetary policy it buys bonds from economic agents. Open market operations can be classified as repurchase agreements (repo), reverse repo, outright purchases and outright sales.

Rediscount window is related monetary authority's lender of last resort role. Central bank lend reserves to banks and charges discount rate. For example, if central bank aims to expansionary policy, it diminishes price (discount rate) of its credit. Discount rate also has announcement effects that send signals to markets about stance of monetary policy. A higher discount rate can be used to indicate a more restrictive policy, while a lower rate may signal a more expansionary policy. Central bank may also determine the type of acceptable collateral to affect banks' sectoral credit allocation.

Moral suasion consists of monetary authority's verbal demands over commercial banks to affect their decisions such as reserve level and amount of lending.

5.OPEN MARKET OPERATIONS AND CENTRAL BANK REPUBLIC OF TURKEY

Central banks can expand and contract the amount of reserves in the banking system by buying or selling bonds; bills and other financial instruments in the open market and then the amount of bank reserves may affect financial conditions and money supply that in turn affect output, employment and prices. Government securities don't bear credit risk and so they are the most suitable instruments for open market operations.

OMO are flexible in terms of timing and transaction volume. In practice, central banks implement active open market operations or passive open market operations. In the active approach, central bank determines quantity of banking system's reserves and allow interest rate to fluctuate. In the passive approach, central bank determines price of reserves and let quantity of reserves to fluctuate freely. In the less developed financial markets active approach may be more effective than passive approach. In addition to that, active approach may help more transparent central bank.

To reach monetary ends by implementing open market operations needs required limitations on discount window monetary instrument. Otherwise, open market operations could not be used as the basic monetary instrument for controlling bank reserves. For

example, banks may get funds from discount window when a contractionary open market operation has realized. But monetary authority should consider unanticipated liquidity demands stem from system. Some countries used discount window policies to discourage short-term borrowing at the central bank. In sum, central bank should determine linkages among monetary instruments very carefully.

Reserve requirement instrument may assist open market operations of central bank. Central bank may send more clear signals by using open market operations with reserve requirement.

Reliable market for government securities is essential for OMO. Participants should feel secure that counter parties will perform their obligations. Therefore, central banks establish performance standards for market participants and they should be also screened and monitored by monetary authority.

Central banks aim to operate in a transparent market in which trades continuously. It communicates about OMO to participants promptly. It defines its purposes clearly. Central bank needs developed interbank market, designed market instruments, trading infrastructure, provided financing facilities, established criteria for dealing with its open market function, collecting and disseminating statistics, and encouraging a safe payments and clearing mechanism, and an active interbank is no doubt quite important. Central bank should ensure required technical assistance and develop transfer and settlement mechanism.

CBT uses only Treasury securities as a collateral in the implementation of Open market operations. On a daily basis, the CBT forecasts the market liquidity needs by considering shortage or excess of bank reserves and then engages in open market operations.

The initial link between monetary policy and the economy occurs in the market for reserves. Central banks' policies influence the demand for and/or supply of reserves at banks and through this market, the effects of monetary policy are transmitted to the rest of the economy. Therefore one should understand function and structure of reserves market to know how monetary policy is related to the economy. Before the implementation of open market operations, central bank should have information and statistics about demand for and supply of bank reserves. Demand for reserves consists of required reserves and excess

reserves generally. The required reserves are a fraction of predetermined deposits and the fraction that is called required reserve ratio, determined by monetary authority. So total required reserves expand or contract with the level of deposit volume subject to required reserves and required reserve ratio. Generally, depository institutions hold required reserves in the form of vault cash and required reserve balances in their central bank accounts. Depository institutions also use their accounts clear many financial transactions. In addition to required reserves, some depository institutions may prefer to hold additional balances in the form of excess reserves that is second component of demand for reserves.

Many factors outside of monetary authority affect supply of reserve in the system. Among the most important such factors are changes in currency holdings of the public, the treasury's cash balances at central bank. Currency demand is the largest factor that requires reserve injections to the system. Changes in currency demand may come from swings in business activity and seasonal factors such as payments of salaries or holiday shopping seasons. Most short term variations in currency movements are predictable and central bank attempts to offset seasonal swings in currency thanks to open market operations. So disturbing volatility in the short-term interest rates are circumvented.

In general treasury maintains its working balances at the central bank accounts for making and receiving payments. Increases in these balances absorb reserves from system and decrease in these balances injects reserves to banks. Any central bank also considers treasury balances during the daily liquidity management. Therefore, high-level cooperation among central bank and treasury should be ensured.

When forecasts of reserves indicate that the supply of reserves will probably continue to need adjustment, the central bank may engage in outright purchases or sales. When projections indicate only a temporary need to alter reserves, either because the technical factors affecting reserves such changes in currency in circulation or treasury balances is expected to be reversed or off set or because the near term outlook for reserves is uncertain, the central bank may engage in transactions that only temporarily affect the supply of reserves. As a result of these temporary transactions, fluctuations of reserves may be diminished.

The accuracy of monetary authority's estimates may be judged by using money market and/or interbank interest rates. Changes in these may reveal pressures in the markets. In addition to that, Central bank should be communicating continuously market participants with the aid of OMO desk's traders. So it may get information about liquidity level or abnormality in the market as soon as possible.

Depository institutions may trade reserves held at the central bank accounts among themselves, usually overnight. The benchmark rate of interest charged for the short-term use of these funds is called the federal funds rate in USA, Interbank O/N in Turkey. Changes in that rate reflect the basic supply and demand conditions in the market for reserves. Equilibrium is satisfied in the reserves market if demand for bank reserves is equal to supply of reserves. Allowing to interest rate changes and/or changes in reserve amount in the system may eliminate disequilibria in the reserves market.

As mentioned above, central banks supply reserves to banking system mainly in two ways. They lend through discount window and buying government securities. In the first case, loans are provided to depository institutions at a cost of interest rate that is called discount rate. (In the Fed system, first of them is called borrowed reserves, and the latter is called nonborrowed reserves). Discount window loans are uniquely suited to the task of meeting the temporary liquidity needs of individual banks. But open market operations are better suited to implementing the short-term adjustments to the availability of aggregate reserves that are necessary in conducting monetary policy. In addition to that, adjustments to the basic discount rate can be important in signaling and conducting monetary policy.

The main rationale for reserve requirements was ensuring insurance to deposit withdraws. But the rationale for reserve requirements changed over time. In addition to its' old rationale, at the present reserve requirements aid in conduct of open market operations by helping to ensure a stable, predictable demand for reserves and so they increase the central bank's control over short-term interest rates. Without reserve requirements, banks would still hold some balances at the central banks to meet their clearing needs. But actual amount of clearing balances will fluctuate erratically and central banks may not forecast them. By making reserve requirements the binding constraint on banks' demand for reserves, the central banks may more accurately determine the banking system's demand for reserves. Thus, it can more readily achieve a desired degree of pressure on bank reserve position by manipulating the supply of reserves. In many countries, to provide flexibility in

meeting reserve requirements to banks, central banks requires banks to hold an average amount of reserves over predetermined maintenance period rather than a specific amount on each day. Banks use this flexibility by substituting reserves on one day of the period, when reserves are expected to be less costly, for those on another day, when reserves are expected to be more costly.

The open market operations may create loss for central banks. For example, the market prices of eligible securities may change during the life of open market operations. Any fall in the price of a security would pose a credit risk to the central bank if one of counter parties were fail to complete the second leg of repo transaction. Therefore, central banks may demand securities with a greater market value than the amount of liquidity provided.

As mentioned above, the aim of OMO is adjusting reserve level and so money supply and liquidity in the economy. In the CBT applications, the OMO market opens at 10:00 o'clock and transactions finishes at 16:00 o'clock. When CBT decides to realize OMO, it announces relevant information about OMO Auction at 10:00 o'clock in auction day. Offers are accepted till 11:00 o'clock. CBT may also announce planned amount of auction. CBT, Banks and brokerage firms are participants of any OMO.

Article 52 in the CBT Law related to OMO of CBT. According to the article 52, The Bank may, with an aim to effectively regulate the money supply and liquidity in the economy within the framework of monetary policy targets, conduct open market operations against Turkish Lira such as outright purchase and sale of securities, repurchase and reverse repurchase, lending and borrowing securities and lending and borrowing of Turkish Lira deposits, and act as an intermediary in these operations. The open market operations to be carried out by the Bank and their procedures and conditions, and the instruments bearing high liquidity and low risk levels which shall be subject to open market operations shall be determined by the Bank.

The Bank, in the scope of open market operations, may issue liquidity bills whose maturity shall not exceed 91 days and that shall be tradable in the secondary markets, for its own account and behalf. However, the matters such as the prevention of the liquidity bills from being a permanent alternative investment tool, and the limitation of the issuance of the said bills so as merely to promote the effectiveness of open market operations shall be taken

into consideration. The agreement period of repurchase, reverse repurchase and Turkish Lira deposit transactions of the Bank shall not exceed 91 days; the initiation of the period shall be the value date of the transactions.

The Bank shall be authorized to designate establishments and institutions subject to the operations described in this article, from among banks and intermediary institutions specified in Law No.2499 on Capital Markets, by taking the nature of the operation into consideration.

Open market operations shall be conducted only for monetary policy purposes and shall not be conducted to provide credit to the Treasury, to public establishments and institutions, or to other establishments and institutions.

6.CLASSIFICATION OF OPEN MARKET OPERATIONS

OMO can be categorized as outright purchase, outright sale, Repurchase Agreements (Repo) and Reverse Repo. Although outright purchase and Repo injects liquidity into banking system, outright sale and reverse repo withdraws liquidity from banking system.

Outright Purchase: That kind of OMO is realized when there is structural or permanent liquidity shortage in the economy. First of all, CBT decides about what kind of government securities (GS) that have maturity less than one year will be purchased. Then CBT declares its intention to the market participants. Then CBT starts to purchase predetermined GS. Banks and brokerage firms that want sell specific GS to CBT call OMO Department of CBT and announce their offers. CBT evaluates market participants' offers by considering desired or planned amount of outright purchase. Then CBT announces results of outright purchase auction. Auction winner participants' TL accounts in the CBT are credited and CBT's relevant TL accounts are debited. (Related government securities accounts move oppositely.) As a result of outright purchase, banking system's and brokerage firms' reserves increase permanently.

Repurchase Agreement (Repo): Repo is realized when there is temporary liquidity shortage in the economy. CBT aims to increase banking system's reserves temporarily. Repo is a forward transaction and it consists of spot purchase of an asset and simultaneous forward sale of the same asset. In that framework, repo can be thought as collateralised lending. Interest rate, lending rate or repo rate is difference between purchase price and sale price of the related government security. During repo transaction, repo rate and sale date determined in the spot date (purchase date). Steps of a repo transaction as follows. In the spot date (first leg), CBT decides about what kind of government securities (GS) that have maturity less than one year will be subject on repo transaction. Then CBT declares repo auction to the market participants. Then CBT starts to purchase predetermined GS. Banks and brokerage firms that want sell specific GS to CBT call OMO Department of CBT and announce their offers. CBT evaluates market participants' offers by considering desired or planned amount of repo purchase. Then CBT announces results of repo auction. Auction winner participants' TL accounts in the CBT are credited and CBT's relevant TL accounts are debited. As a result of first leg of repo transaction, banking system's and brokerage firms' reserves increase. In the forward date (second leg), CBT sells GS at predetermined price and so reserve level in the system decreases. The maturity of repo transactions can't be longer than 91 days.

Outright Sale: It is reverse of outright purchase and it is realized when there is structural or permanent excess liquidity in the economy. CBT decides about what kind of government securities (GS) that have maturity less than one year will be sold. Then CBT declares its intention to the market participants. Then CBT starts to sell predetermined GS. Banks and brokerage houses that want buy specific GS from CBT call OMO Department of CBT and announce their offers. CBT evaluates market participants' offers by considering desired or planned amount of outright purchase. Then CBT announces results of outright sale auction. Auction winner participants' TL accounts in the CBT are debited and CBT's relevant TL accounts are credited. As a result of outright sale, banking system's and brokerage firms' reserves diminishes permanently.

Reverse Repo: As the name demonstrates, that operation is reverse of repurchase agreement. Reverse repo is realized when there is temporary excess liquidity in the economy. CBT aims to decrease banking system's reserves temporarily. Reverse repo is also forward transaction and it consists of spot sale of an asset and simultaneous forward purchase of the same asset. Repo rate is difference between sale price and purchase price

of the related government security. As in the case of repo transaction, repo rate and purchase date determined in the spot date (purchase date). Steps of a reverse repo transaction as follows. In the spot date (first leg), CBT decides about what kind of government securities (GS) that have maturity less than one year will be subject on reverse repo transaction. Then CBT declares reverse repo auction to the market participants. Then CBT starts to sell predetermined GS. Banks and brokerage firms that want purchase specific GS to CBT call OMO Department of CBT and announce their offers. CBT evaluates market participants' offers by considering desired or planned amount of reverse repo purchase. Then CBT announces results of reverse repo auction. Auction winner participants' TL accounts in the CBT are debited and CBT's relevant TL accounts are credited. As a result of first leg of reverse repo transaction, banking system's and brokerage firms' reserves decrease. In the forward date (second leg), CBT purchases GS at predetermined price and so reserve level in the system increases. The maturity of reverse repo transactions can't be longer than 91 days.

Repos and reverse repos are suitable for offsetting short-term fluctuations that affect bank reserves. They are also useful to eliminate large changes in liquidity caused by capital movements.

7.OPEN MARKET OPERATIONS METHODS USED BY CBT

There are two methods used by Central Bank Republic of Turkey in the case of open market operations. These are quotation and auction methods.

QUOTATION METHOD

CBT determines and announces interest rate, maturity of OMO and related government securities, banks and brokerage firms participates auction by considering CBT's announcement. In sum, price determined by CBT, market determines quantity. CBT consider market conditions during determination of repo rates.

AUCTION METHOD

In general, auction method includes determination of repo rate by market participants and auction quantity by CBT. Auction method is classified into three categories such as Quantity auction, Dutch auction (Last price auction) and Traditional auction.

At the quantity auction, central bank announces amount of auction. Then market participants make their offers by considering predetermined auction amount. Bank offers are collected by CBT. Then CBT determines offers and announces the results of auction.

At the Dutch auction, offers are listed by considering their prices and interest rates then CBT determines amount of auction arbitrarily. Then offers are accepted till the CBT's desired amount of auction will be reached. Then all winning offers' prices and interest rate rates are treated as same as the last winning offer's price or interest rate. In other words, last winning offer's rate becomes current interest rate of auction.

Traditional auction method also lists offers by considering their prices or interest rates. But at the traditional auction, auction winner offers rates may change. All auction winner participants' interest rates are what they have offered.

8.A BRIEF HISTORY OF OPEN MARKET OPERATIONS OF CBT

The Central Bank started open market operations as of February 4, 1987. Although the purpose of open market operations is to control the liquidity of the banking system and implement monetary policy, these operations also contribute to the sale and purchase of government securities, to the formation of a secondary market for the Government Bonds and pursuit of domestic borrowing policy in conformity with daily requirements.

The open market operations policy of the Central Bank is formed in conformity with the economic policies implemented by the Government. During the implementation of

operations, deviations of the realized magnitudes of both narrow money supply (Ml) and broad money supply (M2X), from their predicted values, are taken into account.

Since the start of the open market operations on February 4, 1987 to nowadays open market operations are directed by taking into account the liquidity of the economy, either by increasing the liquidity level through direct purchases of Government bonds or through repurchase agreements, or by decreasing the level of liquidity through direct sale of the said bills or through reverse repurchase agreements.

Average interest rates for open market operations reflects the liquidity condition of the economy.The open market operations of the CBT ensured a reallocation of liquidity level in the economy and also enable banks to manage their securities portfolios rationally.
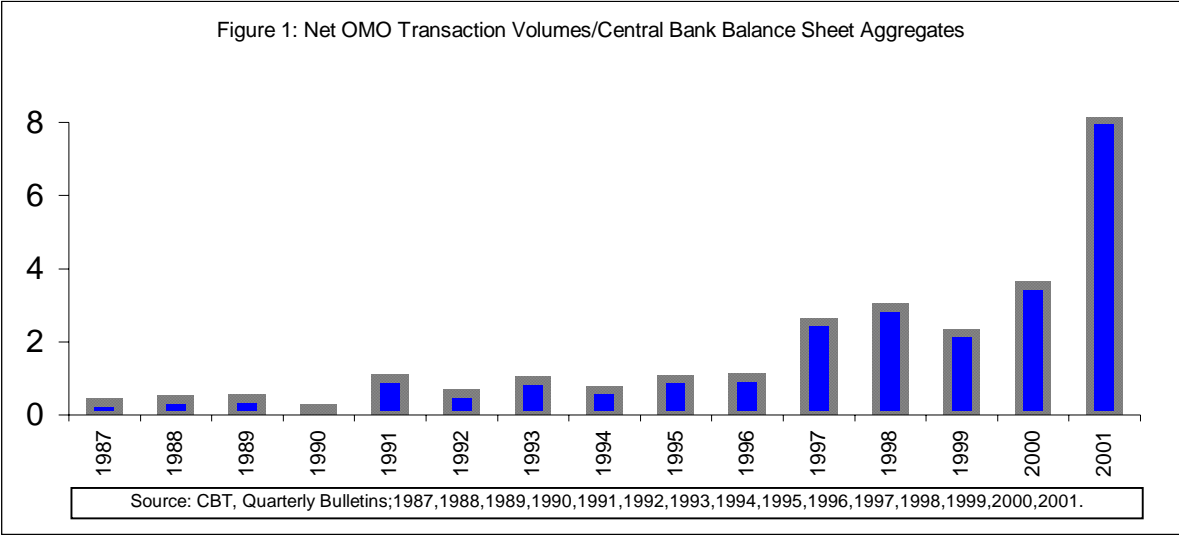
To realize OMO, The Open Market Operations Desk established a portfolio of government securities to do reverse repurchases, direct sales and direct purchases. The Desk would rather do reverse repurchases when the market is very liquid such as at the maturity dates of government securities in order to mop up the excess liquidity and would prefer to bring the maturity of the transaction to a day when the market is in need of cash. If this is not possible, in order not to increase the liquidity of the system, the desk would prefer to roll over by the amount of maturing volume. Usually, the open market operations rates for the same maturity are lower than interbank rates due to different tax structures in the two markets.

Until September 1, 1991, the prices in direct sales and purchases, and the interest rates for repos and reverse repos were determined by the Central Bank. After that date, the Central Bank started arranging auctions for direct sales and purchases. The purpose of this procedural change was to allow the prices to be formed in the market. In doing so, it was hoped that the prices would follow a stable trend and reflect the market conditions. An important procedural change in the reverse repo transactions occurred when the system changed from a quotation system to an auction system on January 22nd, 1992.

Central Bank uses open market operations sometimes together with the interbank money market and the foreign exchange market and sometimes alone to manage the liquidity in the market in accordance with the implemented monetary policy and to preserve

the stability of the markets. CBT uses OMO extensively during the liquidity squeeze resulted from capital outflows.

In last decade Central Bank Republic of Turkey started to use open market operations intensively. As the Figure 1 shows, volume of open market operations engaged by the Central Bank Republic of Turkey increases especially after 1996.

Figure 1: Net OMO Transaction Volumes/Central Bank Balance Sheet Aggregates

Source: CBT, Quarterly Bulletins;1987,1988,1989,1990,1991,1992,1993,1994,1995,1996,1997,1998,1999,2000,2001.

Over night (O/N) interest rates are affected by economic environment and especially liquidity conditions in the economy. As the figure 2 demonstrates, during the implementation of exchange rate based stabilization program that announced predetermined basket values of exchange rates, O/N rates decreased as a result huge amount of capital inflows (hot money) to economy. Then interest rates started to increase as a result of recent economic crisis and capital outflows.

Figure 2: O/N Repo Weighted Average Interest Rates

Source: CBT, Quarterly Bulletins;1987,1988,1989,1990,1991,1992,1993,1994,1995,1996,1997,1998,1999,2000,2001.
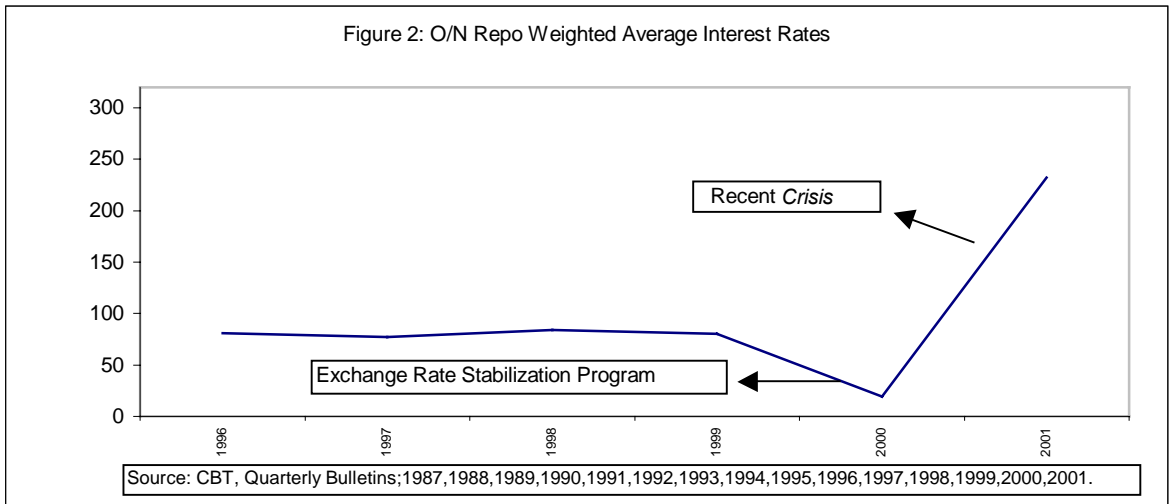
Figure 3 shows the ratios of net outright purchases, net outright sales, net repo and net reverse repo volumes to central bank balance sheet aggregates in the 1987-1995 period.

Figure 3: Selected OMO Transactions/Central Bank Balance Sheet Aggregates

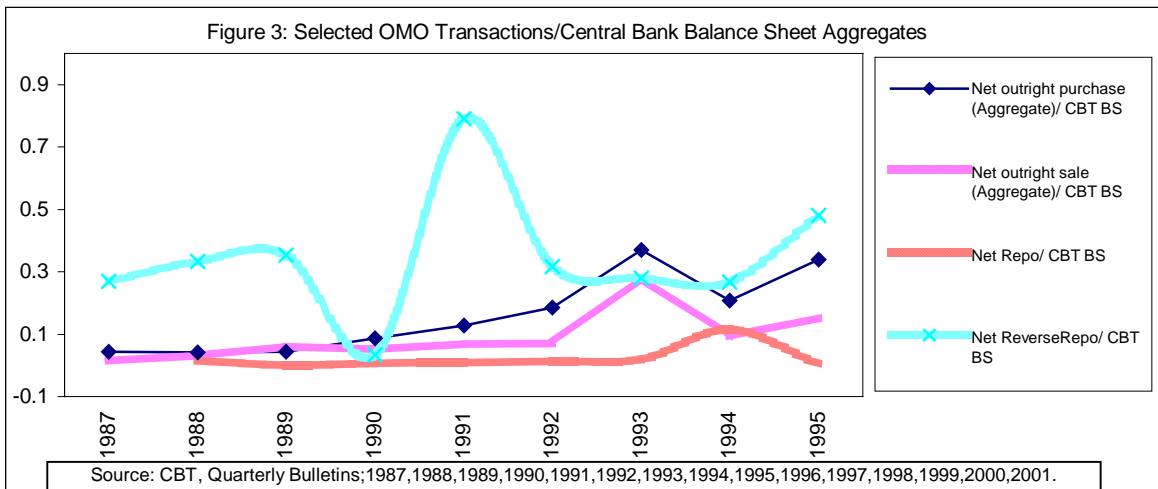Source: CBT, Quarterly Bulletins;1987,1988,1989,1990,1991,1992,1993,1994,1995,1996,1997,1998,1999,2000,2001.

Figure 4 shows the ratios of net outright purchases, net outright sales, net repo and net reverse repo volumes to central bank balance sheet aggregates in the 1996-2001 period. As the figure demonstrates net outright sale has not been realized in the years of 2000 and 2001, net reverse repo has not been realized in the year of 2000.

Figure 4: Selected OMO Transactions/Central Bank Balance Sheet Aggregates (1996-2001)

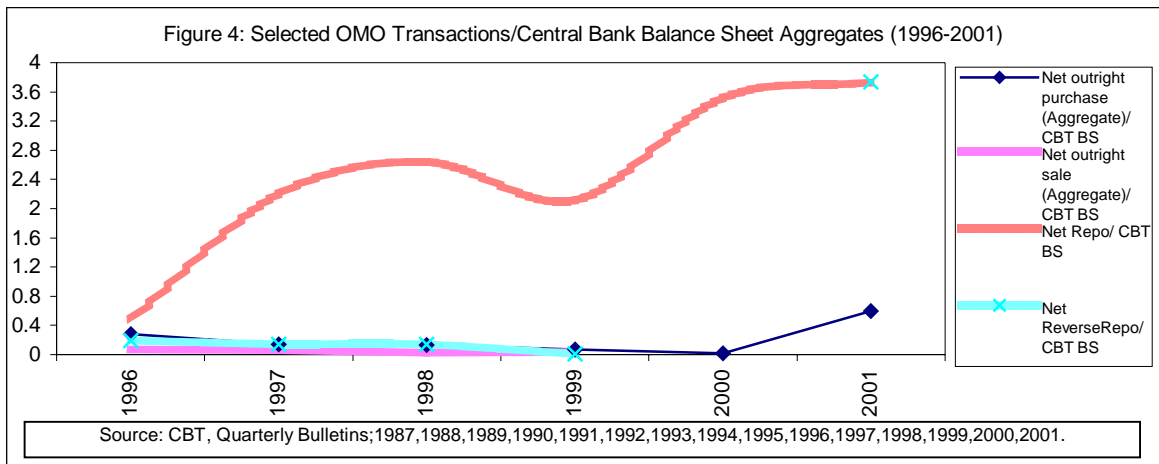Source: CBT, Quarterly Bulletins;1987,1988,1989,1990,1991,1992,1993,1994,1995,1996,1997,1998,1999,2000,2001.

Figure 5 shows the ratios of net outright purchases and net repo volumes to central bank balance sheet aggregates in the 1996-2001 periods. The share of net repo volume is higher than net outright purchase.

Figure 5: The Ratio of Net Outright Purchases and Net Repo Volumes to Central Bank Balance Sheet Aggregates

Funding the banking system

Net outright purchase from Saving Deposit and Insurance Fund Banks and State Banks

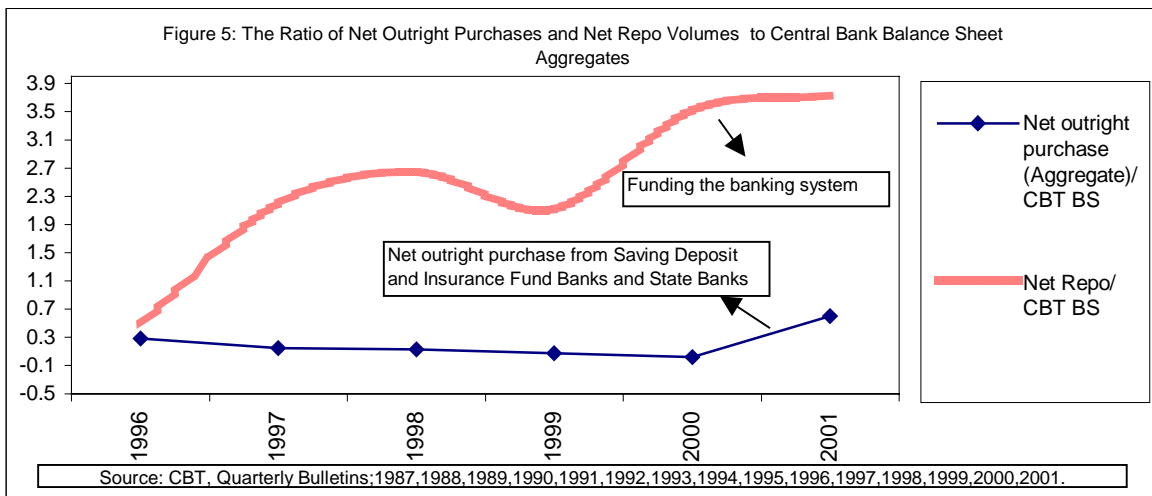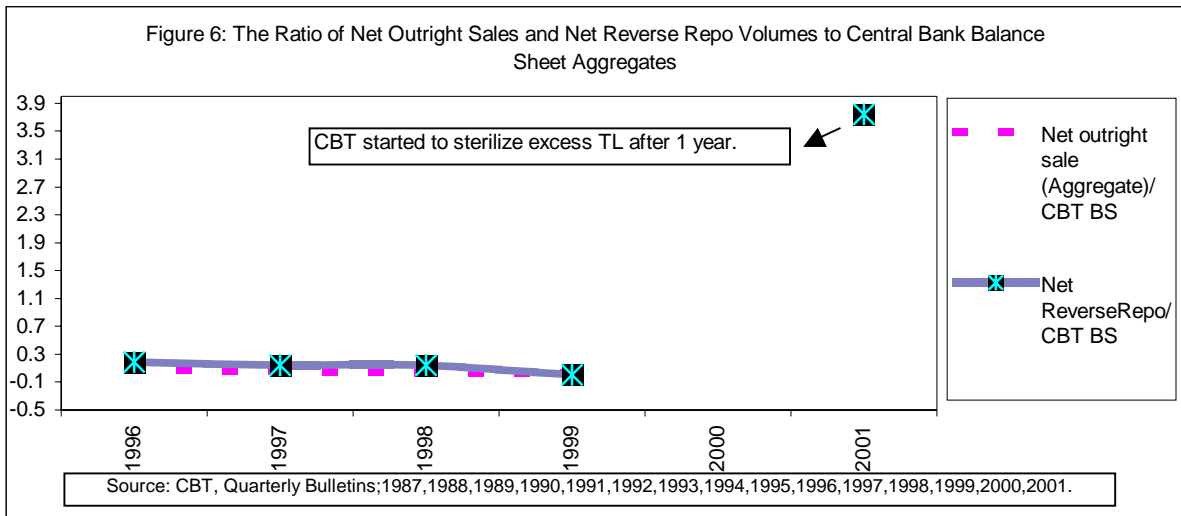Source: CBT, Quarterly Bulletins;1987,1988,1989,1990,1991,1992,1993,1994,1995,1996,1997,1998,1999,2000,2001.

Figure 6 shows the ratios of net outright sales and net reverse repo volumes to central bank balance sheet aggregates in the 1996-2001 periods. As the figure shows net reverse repo operations has engaged by Central Bank Republic of Turkey after one year later in the 2001-year. That operation has realized to eliminate excess liquidity. That excess liquidity has occurred as a result of financing of Saving Deposit and Insurance Fund banks and State banks by Treasury.

Figure 6: The Ratio of Net Outright Sales and Net Reverse Repo Volumes to Central Bank Balance Sheet Aggregates

CBT started to sterilize excess TL after 1 year.

Net outright sale (Aggregate)/ CBT BS

Net ReverseRepo/ CBT BS

Source: CBT, Quarterly Bulletins;1987,1988,1989,1990,1991,1992,1993,1994,1995,1996,1997,1998,1999,2000,2001.

9.CONCLUSION

In the last years, CBT's most important monetary instrument has become open market operations. They are realized in voluntary basis and more flexible than other monetary instruments. In that perspective, it has also preferred by Central bankers in all around the world.

CBT uses open market operations sometimes together with the interbank money market and the foreign exchange market and sometimes alone to manage the liquidity in the market in accordance with the implemented monetary policy and to preserve the stability of the markets.

CBT uses OMO extensively during the liquidity squeeze resulted from capital outflows.

The open market operations of the CBT ensures a reallocation of liquidity level in the economy and also enable banks to manage their securities portfolios rationally.

In the near future, CBT will continue to use open market operations frequently during the inflation targeting monetary policy implementation. CBT will use overnight interest rate as the main monetary instrument. Monetary policy committee (MPC) will set interest rates for

different maturities, and OMO desk of CBT will engage in transactions that yield desired liquidity level in market in order to achieve inflation target. Open market operations will be main instrument to ensure equilibrium in the demand for bank reserves and supply of bank reserves.

Any central bank gets its influence over interest rates in the wholesale money markets from its monopoly supply of the central bank money. There is natural demand for central bank money that ensures final settlements in the economy. For a proper functioning of OMO requires a net shortage of funds in the banking system. So monetary authority may influence repo rates by considering monetary goals. In that framework, CBT is not ready to use OMO instrument to get its' goals. As it is known, CBT continues to withdraw huge amount of excess liquidity (approximately in an amount of monetary base) in the market via reverse repo and Interbank operations. And so CBT is net debtor to markets and it does not has sufficient authority to determine repo rates by considering inflation targets. Therefore, CBT should be net creditor from banking system and then try to use OMO to implement inflation targeting monetary policy. I think it is vital for successful implementation of forthcoming inflation targeting monetary policy.

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APPENDIX

Appendix 1: CBT OMO-OUTRIGHT PURCHASE- (TL,Billion), Source:CBT Bulletins.

DATE	O/N to 1 month			1 to 3 months			3 to 6 months			6 to 9 months			9 to12 months			Aggregate OMO	
	Nominal	Net	Weighted Average Int. Rate	Nominal	Net	Weighted Average Int. Rate	Nominal	Net	Weighted Average Int. Rate	Nominal	Net	Weighted Average Int. Rate	Nominal	Net	Weighted Average Int. Rate	Nominal	Net
1987	129.2	125.2	43.37	170.1	154.8	42.45	274.5	230.5	44.04	339.1	259	46.72	232.5	163.5	46.61	1145.4	933
1988	41.4	40.6	66.06	470	414.3	57.33	342.5	265.5	58.59	585.5	405.4	58.76	793.5	489.4	61.01	2232.9	1615.2
1989	98.2	97.7	88.82	110	99.8	40.63	476.4	382.2	47.21	735.1	513.8	55.19	1638.9	1039.9	57.43	3058.6	2133.4
1990	240.9	234.5	45.78	1474.2	1365.9	41.78	1496.4	1255.2	44.77	1337.6	1048.2	43.19	2330.7	1725.9	40.43	6879.8	5629.7
1991	999.5	986.3	62.76	846.3	3336.1	63.24	2642.7	2029.1	64.97	2263.7	1501.8	67.42	7625.8	5246.6	51.49	14378	13099.9
1992	152.8	147.5	91.84	3536	3076.8	70.35	8020.7	6260.9	68.77	12181.8	8371.1	69.64	25119.8	16889.7	57.4	49011.1	34746
1993	503.3	491.3	75.88	15935.3	13890.3	66.62	23830.7	18008.3	68.99	19745.4	13398.7	73.98	88058.1	66618.8	45.99	148072.8	112407.4
1994	11726.8	10344.2	177.13	30719.8	26230	98.92	54299.3	47632.2	83.02	59720.2	44939.2	104.73	36080.8	28641.5	52.17	192546.9	157787.1
1995	0	0	0	74784.4	63204.6	75.31	178242	149176	53.54	180719.7	154582.8	51	190399.6	138091.1	42.81	624145.7	505054.5
1996	0	0	0	48266.9	44581.2	57.44	419624.3	363949.5	42.25	192129	160917.2	54.13	292541.4	278753.6	63.84	952561.6	848201.5
1997	0	0	0	18555.4	17949.9	80.28	45164.6	33230	92.24	30328.8	19839	92.21	1043952.5	892572.9	63.56	1138001.3	963591.8
1998	1.5	1.4	148.55	10.9	9	95.26	61591	46191	97.67	256097.2	227643.3	68.59	1389069.3	1249109.9	61.02	1706769.9	1522954.6
1999	0	0	0	194735	169687	80.1	91449.3	68327.7	87.91	172251.0	110634.6	83.93	1275120.7	1126521.0	59.06	1733556	1475170.3
2000	165	180.8	indexed	63751.4	58559.4	55.01	3308.8	2965.5	91.41	76419.3	58074.9	39.66	452909.5	429312.5	56.3	596554	549093.1
2001	834157.1	777142.3	indexed	4454.9	2655.5	indexed	317695.9	266587	indexed	10068.2	4064.3	indexed	48938851.3	48660898.1	indexed	50105227.4	49711347

CBT OMO-OUTRIGHT SALE- (TL,Billion)

1987	197.9	194.4	36.68	48.9	45.8	40.2	52.1	46	41.94	9.1	7	43.71	42	29.1	45.16	350	322.3
1988	508.8	499	46.84	468.4	427.1	51.91	181.8	147.5	57.94	128.7	94.2	58.04	76.8	48	62.92	1364.5	1215.8
1989	193.1	188.9	40.33	903	835.5	48.04	585.8	497	50.13	850.4	620.8	54.67	1197.1	806.8	57.62	3729.4	2949
1990	18.9	18.3	42.41	357.4	322.6	44.72	1393.2	1145.4	48.38	1329.1	990.7	50.26	1254.9	846.1	50.78	4353.5	3323.1
1991	781.2	756.8	61.98	1988.1	1722.3	65.09	899.4	707.1	63.01	2572.7	1800.4	66.88	3100	1987.5	66.29	9341.4	6974.1
1992	379	360.4	67.13	5703	4951.3	71.94	7232	5653	73.15	1165	776.1	73.25	2753.8	1671.8	74.18	17232.8	13412.6
1993	1330.9	1272.2	71.39	33327.3	29214.9	68.14	32057.1	24563.6	72.29	18003.5	11707.2	78	36086.6	19605.8	84.52	120805.4	86363.7
1994	7888.6	6960.5	151.66	36636.8	30739.7	101.89	41994.3	30600.5	117.88	1560.5	779.5	139.57	3418.9	1399.9	132.85	91499.1	70480.1
1995	22634	21607.4	78.83	92971.1	82722	82.79	124471.1	99216.9	86.25	25435.2	15600.6	87.79	13640.9	6915.9	101.2	279152.3	226062.8
1996	13057.3	12521.4	86.04	94005.3	83458.5	80.33	111308.1	83787.9	90.3	17683.3	11460.6	98.97	31339.4	22891.5	98.77	267393.4	214119.9
1997	28585.4	37713.6	65.9	72217.9	72217.9	70.47	73183.4	56142.3	84.55	130651.9	87573.3	91.34	287557.4	158387.6	100.57	592196	412034.7
1998	2166.3	4026.3	104.87	25637.4	25637.4	91.82	63403.9	46251.9	97.54	93631.7	57653.8	99.23	429913.7	198061.4	121.35	614753	331630.8
1999	40305.7	59408.1	33.26	52581.2	52581.2	44.43	128657.5	125300.7	76.73	197870.2	158044	78.41	520407.9	359762.7	92.32	939822.5	755096.7
2000	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2001	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Appendix 2: CBT OMO-REPO- (TL,Billion):Source: CBT Bulletins.

	O/N			1 to 14 days			15 days to 1 month			1 to 2 months			2 to 3 months			Aggregate OMO	
	Nominal	Net	Weighted Average Int. Rate	Nominal	Net	Weighted Average Int. Rate	Nominal	Net	Weighted Average Int. Rate	Nominal	Net	Weighted Average Int. Rate	Nominal	Net	Weighted Average Int. Rate	Nominal	Net
1987																0	0
1988	462.4	414.1	76.18	177.5	158.4	75.01	0	0	0	0	0	0	0	0	0	639.9	572.5
1989	0	0		23	20.3	55.54	0	0	0	64	55	56.77	0	0	0	87	75.3
1990	0	0		0	0	0	0	0	0	669	500.2	58	0	0	0	669	500.2
1991	2.5	1.8	67	817.3	632	68.5	240	200	67	0	0	0	0	0	0	1059.8	833.8
1992	0	0		2726.4	2596.6	68.07	0	0	0	0	0	0	0	0	0	2726.4	2596.6
1993	679.5	757.5	82.62	4753.4	4080.9	83.89	160.6	187	65.5	0	0	0	338	469.2	68	5931.5	5494.6
1994	72069.9	61620	316.42	23580.2	22386.5	336.15	3616.6	1776.5	267.79	890.8	1068.9	324.44	331.6	238	103.08	100489.1	87089.9
1995	0	0		8097.9	6099.1	76.4	0	0	0	0	0	0	0	0	0	8097.9	6099.1
1996	548679	416222.2	80.93	1111964.6	1021518.4	78.98	0	0	0	1940.9	3000	81.23	0	0	0	1662584.5	1440740.6
1997	12895492.9	9185882.3	77.5	7771177.7	5853637	76.84	0	0	0	0	0	0	0	0	0	20666670.6	15039519
1998	9912124	7201600.5	84.35	34090152.4	23513321.4	84.77	0	0	0	0	0	0	0	0	0	44002276.4	30714922
1999	4210776.4	2862154.8	80.57	53701317.3	40396998.5	83.25	0	0	0	0	0	0	0	0	0	57912093.7	43259153
2000	1514382.6	1464600	19.29	135629418	107236707.1	40.24	0	0	0	0	0	0	0	0	0	137143800.6	108701307
2001	105540512	41018166.9	231.95	539598691	266231628.6	91.36	3101463.7	1273600	79.5	0	0	0	0	0	0	648240666.5	308523396

CBT OMO-REVERSE REPO- (TL,Billion)

	O/N			1 to 14 days			15 days to 1 month			1 to 2 months			2 to 3 months			Aggregate OMO	
1987	1976.9	1645.6	37.79	3635.2	3025.7	38.55	1102.1	915.6	42.79	191.5	155.5	48.83	0	0	0	6905.7	5742.4
1988	6631.3	5102.7	50.6	3904.7	3097.1	51.39	2723	2177.3	54.6	1495.5	1184.9	55.33	1568.3	1161.5	59.27	16322.8	12723.5
1989	12652	9889.2	31.04	5176.9	3989.9	32.27	2169.9	1707.1	42.99	1414.9	1080.2	45.58	1127.9	830.2	50.22	22541.6	17496.6
1990	1190.1	1162.1	68.49	966.3	889.4	39.79	103.5	100.1	43.49	79.9	66.1	41	3.2	2.6	44	2343	2220.3
1991	70758.2	54295.7	60.6	21482	16481.7	63.02	1193.7	833	64.23	5089.1	3720	64.58	7039.9	5110.8	66.22	105562.9	80441.2
1992	0	0	0	3158.8	2311	62.99	5181.9	4367.9	67.05	17502.8	13568.3	69.04	54991.5	39259.6	70.94	80835	59506.8
1993	0	0	0	12221.3	9833.9	61.65	287.3	260	60	12603.3	10413.9	65.67	89534.2	64365.4	66.87	114646.1	84873.2
1994	196896.3	118526.4	100.37	99961	58822.2	103.56	8966.2	4153	118.42	22976.5	12986	121.77	10428.7	7664	108.35	339228.7	202151.6
1995	285681.6	243155.2	78.19	166570.9	127040.5	80.96	21466.1	15403.4	88.32	151688.5	110396.9	81.37	307111.3	217542.4	80.99	932518.4	713538.4
1996	173071.1	148832	66.96	133370.3	152090.6	69.1	22466.1	14117	119.13	66381.6	60392	92.9	193623.1	199434.6	95.46	588912.2	574866.2
1997	438104.8	440297.9	64.45	298685.2	323487.5	68.33	11663.8	14150	70.87	65917.8	77165	68.86	140491.6	127893.5	78.68	954863.2	982993.9
1998	608550.3	473496.5	75	375889.3	282298.3	68.25	0	0	0	97465	129000	58.75	749093.6	789699.9	72.87	1830998.2	1674494.7
1999	135211.5	137799.5	64.46	32981.9	30399.9	62.45	0	0	0	0	0	0	0	0	0	168193.4	168199.4
2000	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2001	216221845	220288824.1	74.4	85679921	88815578.2	73.32	143806.6	138499.1	79.5	323194.2	305899.2	84.06	0	0	0	302368766.6	309548801