MONETARY TRANSMISSION MECHANISM IN TURKEY

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İSTANBUL BİLGİ ÜNİVERSİTESİ
SOSYAL BİLİMLER ENSTİTÜSÜ
FİNANSAL EKONOMİ YÜKSEK LİSANS PROGRAMI

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2012

THANKS

I would like to express my sincere gratitude to my advisor, Prof. Dr. Ege Yazgan, for his continuous guidance, suggestions and patience during the course of my work.

ABSTRACT

The banking sector of Turkey has been passed a serious test during the crisis of 2001, after these period, it's been put into practice changeovers in banking sector. Firstly, the applications of Central Bank has begun to change and it has determined its main object as price stabilization. It has begun to apply the transition period from fixed rate regime to floating rate, devaluating TL, directing market interests of policy interest after these period. Central Bank has begun to create the necessary infrastructure to direct market expectations after these period. 2002-2010 is a period that has been tried to stabilise Turkish economy and to constitute new and various applications.
In these study, it has been tried to explain monetary policy applications of Republic of Turkey Central Bank and its effects of base interest rate that Central Bank used to direct market in the period of 2002-2010.

ÖZET

2001 krizi sürecinde Türkiye'deki bankacılık sektörü ciddi bir sınav vermiş, bu dönemden sonra bankacılık sektöründe köklü değişimler uygulamaya konulmuştur. Öncelikle Merkez Bankası'nın uygulamaları değişmeye başlamış, ana amacını fiyat istikrarı olarak belirlemiştir. Sabit kur rejiminden dalgalı kur rejimine geçiş süreci, TL'nin devalüe edilmesi, politika faiznin piyasa faizlerine yön vermesi bu dönemden sonra uygulamaya başlamıştır. Merkez Bankası bu dönemden sonra piyasa beklentilerine yön vermek için gerekli altyapıyı oluşturmaya başlamıştır. 2002-2010 dönemi Türkiye ekonomisinin istikrara oturtulmaya çalışıldığı, çok yönlü yeni uygulamaların yürürlüğe konulduğu bir dönemdir.
Bu çalışmada 2002- 2010 döneminde Türkiye Cumhuriyet Merkez Bankası'nın uyguladığı para politikasının ve bu çerçevede Merkez Bankasının piyasaya yön vermek için kullandığı gösterge faiz oranının piyasalara etkileri açıklanmaya çalışılacaktır.

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ABBREVIATION LIST

CB	: Central Bank
CBTR	: Central Bank Republic of Turkey
IMF	: International Money Fund
SDIF	: Saving Deposit Insurance Fund
OMO	: Open Market Operations
CPI	: Consumer Price Index
IS – LM Model	: Investment-Saving/ Liquidity preference- Money Supply
CBIR	: Central Bank Interest Rate hangi oran?
MIR	: Mortgage Interest Rate
AIR	: Automobil Interest Rate
LIR	: Lending Interest Rate
CIR	: Commercial Interest Rate
VAR	: Vector Auto Regressive
VECM	: Vector Error Correction Model
ON	: Over Night

1. Introduction

After the crisis that had been experienced in February 2001, IMF-supported "The Program of Transition to Strong Economy" was explained by the government of that period in May 2001. This program was including preventions towards fundamental arrangements in banking sector, structural reforms and financial discipline to be provided. The new program was divulged in April 2001 and inured in May in the same year. Financial discipline was targeted with this new program, monetary discipline was promised to be provided and especially re-configuration of the banking sector was brought up. As an indicator of the seriousness about the issues of taking preventive actions, the law of central bank was changed before the program was divulged. In the law changed, it was stated that the main purpose of the monetary policy was price stability. These two improvements said increased the confidence of economic program in the markets. Besides, right after the February 2001 crisis, the Central Bank explained that permanency of the application of "exchange basket" that was consisting of the US dollar and Euro which is the main factor of the IMF-supported stability program that had been applied since the beginning of the year 2000 was no more possible because the confidence for the stability program was lost, so floating exchange rate regime would be used and with time, inflation targeting regime would be embraced as a monetary policy; after this, Turkey passed to the regime of floating exchange rate. Following this, the economic stability program that was started to be applied by the government of that period aimed to decrease the inflation rate to the level of 12% in three years (2002-2005) first and then to the single-digit numbers; afterwards a new economic stability program which was consisting inflation targeting and covering the years of 2005-2008 was made.

The monetary policy that has been conducting in Turkey after the 2001 crisis focused on the purpose of reaching to price stability. With the transition of the floating exchange rate regime, since the date of February 22, 2001, the priorities of the Central Bank are: Exchange rates to become controllable by the Central bank in terms of the efficiency of the monetary policy, payment systems to work and financial stability to be yielded and decrease the pressure on the public debt by financing the liabilities in the public banks and banks that was assigned to the Saving Deposit Insurance Fund (SDIF) with more long-term

and lower rate of interest. So, a new period in terms of monetary and exchange policy has started in Turkey.

Developments that had been experienced before and after the change of policy interest rate, in other words, benchmark interest rate, which undertake the role of affecting the market by the Central bank in 2000s, will try to be explained and positive and negative outcomes of the changes in interest policy will be analyzed.

In the first section of the research, strategies of the CBRT operations during 1990s will be mentioned. In the second section, CB monetary policies that were applied during 2000s will try to be explained. In the third section, the development of CBRT interest policy will be reviewed. In the fourth section, monetary transfer mechanism of the CBRT between 2002-2010 will be explained and in the next section, information on the interest rate transitivity and its situation in Turkey will be given. In the last section, the relationship between policy interest rate of the CBRT and some other interest rates will during the years 2002-2010 will be reviewed. Thereby, phases of the interest policies of the CB since 1990s and its negative and positive consequences will be betrayed and the instruments that it affected and which it was affected will be mentioned.

2. The Operations of Central Bank of the Republic of Turkey during 1990s

With the 'January 24 Consistency Provisions' that were started by the CB at the beginning of 1980; the foundations of borrowing of the Treasury by tender, its composition of markets in its own constitution, removal of the controls on the interest, start of the transition to convertibility and allowance of latitude for the capital movements were all laid.

When it came to the beginning of the 1990s, in addition to the reforms in the Consistency Provisions, the monetary program was prepared in the way of these provisions and it was declared to the public opinion. Consequently, the balance sheet of the CB was tried to become more transparent with this program and a new balance sheet structure which can better struggle with inflation in the medium term was started to be composed. The decisive targets of the CB in 1990s can be summarized as: Contributing to the adjustment of the confirmed problems in economics and preventing the current economic balances from any corruptions. In this period, the CB hesitated between different strategies.

One of these strategies is to prevent the further rise of the foreign trade deficit which has already been ruling high. For this to happen, the bank would either prevent reel valuation of the TL by providing the balance of inflation and devaluation or it would keep devaluation under the level of interest return and make the foreign investment finance the current account deficit. The other strategy was to make the government finance high current account deficit with the lowest interests possible. For this, the bank would either decrease budget deficit by decreasing the bill interest rates, or it would keep devaluation and short term interest rates under the bill interest rates and provide a certain return level for the investors to create demand for internal and external bills and so provide sustainability of this.

To balance the strategies that are mentioned above, the CB first chose the way of making changes in the interest operations and it took the action of 'influencing' by arranging the short term interest rates instead of making purchases and sales in the bill market. The determination of the short term interest rates, was started to be made by the balance of demand and supply of the funds that were purchased and sold in interbank markets and ISE repo market.

The second interest rate operation occurred when the CB affected the liquidity in the market in the short term with repo-reverse repo or with repo tenders and direct the balance of demand and supply. These operations (transactions) were called Open Market Operations (OMO).

For the aim of applying its strategies, the CB secondly went the way of foreign exchange operations. When the market was intervened by being purchased foreign exchange, the TL was put into the market in response so liquidity was increased and short term interest rates was decreased. As the adverse of this situation, TL outflow occurred and this pulled the short term interest rates upwards. Besides, with the application of 'Obligatory Exchange Rate', Central Bank brought the obligation of investing 14% of their foreign exchange purchases to the CB with the obligatory exchange rate for the banks.

The Central Bank used its interest and foreign exchange operations to provide monetary balance in the market.

2.1. Monetary Programs in 1990s

The year 1989 is very important for the policies of the CB. Since this year, the CB has been following the policy of controlling its own balance sheet growth and it has been trying to actualize this. The main reasons of this are instabilities that were experienced in financial sectors and chronic inflation that has been going on for years.

When the Central Bank went to changes in the structure of its balance sheet, what its own monetary policy would be also started to be argued and the necessity of programs that give directions to markets was highlighted. The CB summarizes the situation faced with these words:

> *".....The Central Bank can only do one work successfully in the medium term in consideration of its operations and works. That is, to provide stability in the internal and external value of the monetary. Central Banks cannot be an instrument of adjusting the payment balance or providing growth in the long run. The Central Banks should not be used as a part of the encourage policy. At the same time, when looked with the right approach, the Central Banks cannot be seen as the institutions assigned to solve the foreign exchange problems of the countries. Because the Central Banks*

need foreign exchange only for keeping it as a reserve for their own use. Central Banks are not such institutions that use foreign exchange or make imports"[1].

Until the beginning of the 1990s, it was seen that the structure of the CB had still not become independent and the sources of the CB had been used uncontrolled by public institutions without any auditing. For this reason, monetary programs that were planned to be made could not be successful at the end.

We can see that the most important element of the monetary policies before the period of 1990s influencing the volume of circulation was caused by the increase in the credits that were given to the public institutions. However in the years between 1990 and 1996, increase experienced in the foreign exchange reserves took the first place in the monetary policy. This is because the Treasury trended towards markets instead of using the CB for its borrowings. This means the Treasury put the CB out of the system. Obviously during this period, effects blocking emission to expand have occurred and the deposits in the CBRT increased.

The deposits of banks of Turkey in the CB consist of free and obligatory compensations. Decrease of liquidity position rate to 30% in 1980s and reserve requirements from 20% to 6% and 8% respectively shows how the CB lowered the importance of reserved ratios which are one of the most important elements of the monetary policy and it can be said that increase in the deposits of the banks results from the increase in free deposits. In accordance with this, we can say that in this period the CB tended towards open market and interbank operations.

Another development that occurred during these years is that the banks showed tendency towards different monetary products such as asset-backed securities and repo apart from deposits; and they required to get out of the effect area of the monetary policy. Also, another important development that occurred in this period is that the Gresham Law[2]

[1] Rüşdü Saracoğlu, **Türkiye Cumhuriyet Merkez Bankası Parasal Programı Hakkında Dr. Rüşdü Saracoğlu Tarafından Verilen Brifing Metni**, TCMB, Başbakanlık Özel Bürosu, Ankara 16 Ocak 1990, s. 3-4.

[2] Gresham Law: In situations that bimetallism system is valid, when the official parity determined among gold and silver is not equal to the market rate or when different rates are implemented among bimetallist countries, withdrawal of the metal which has higher market price (gold) and stay of the metal having the

operated on the contrary in Turkey. Namely, TL deposit rates stayed far behind the foreign exchange rates. With the marginalization which came from the economic market, Turkish Lira was expelled from the market and Dollar and Mark were put instead of it[3].

As it can be understood from the explanations that has been made up to this point, a short term preference that is based on the affected growth was pointed at issue after 1990; and this process put the economy in such a structure that is dependent and cyclical. Reminding 1990s with frequently-faced crisis is the result of this plot. At this point, it is observed that the government makes the economy of the country depend on the encouragement of short term capital inflows; so it loses its function of 'guiding' by ignoring the priorities of the economy which are reforms and stability. While the process has been exhibiting an outlook consisting of an economic structure in which social income distributions are disrupted, public sector debt service is unsustainable, public sector is unable to make investments and private sector is shifting from reel sector to rent-seeking speculatives; implementing reform strategies in all areas severely has come up to the agenda at the beginning of 2000s

2.2. Monetary Policy in 2000s

It had not been possible for Turkey to implement short term or long term programs since the country experienced short-term governments' period between 1995 and 1998 which increased political uncertainty. Both internal political instabilities and external crisis can be given as the main reasons of this situation. It can be said that Turkey's economy started to downsize in this period.

The financial crisis that Southeast Asian countries faced in 1997 affected the whole world and one year after that, crisis emerged in Russian Federation. At this period, foreign capital started to leave Turkey and Russia, Turkey's trade operations with Russia almost stopped and the whole reel sector got affected from this.

As a result of these crises, Turkey had to tend to internal resources; consequently compound interest rates increased to the levels of 106% and the country came to the point

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lower price (silver) in circulation. Shortly, it is sending the 'good money' out of the market by the 'bad money'.

3 Rıza Kandiller, ''1990'lı Yıllarda İzlenen Para Politikaları ve Değerlendirilmesi'', **Hazine Dergisi**, Sayı 7, Temmuz 1997, s.3-4.

of hyperinflation. After the election that was made in 1999, the coalition government came to the table with IMF to prevent extraordinary course; but the stand-by borrowing agreement was just a follow-up of the former agreements[4]. Towards the end of 1997, they came to the table with IMF again and looked for a mid-term stand-by borrowing agreement. Following this, "Close Monitoring Agreement" was made with IMF at the beginning of 1998 and stand-by process started as the commitments were met[5]. However, this process was held on because of the immediate election in 1999 and the implementation of "Close Monitoring Agreement" started again in July-August-September as a follow-up of the current process with the triple coalition government that came to power. In December 1999, three-year mid-term stand-by agreement that covers 2000-2002 was signed. Following this period, in January 2000, "Program of Decreasing Inflation" was started which had been the head of structural transformations that had become the biggest problem in financial sector[6].

The program of decreasing inflation had cut because of the crises that were faced in November 2000 and February 2001, "Program of Transition to Strong Economy" was brought into force and a new stand-by borrowing agreement was signed after it was reviewed at the beginning of 2002.

2.3. The Implementation Path of the Monetary Policy

2.3.1 2002-2005 Period : Stability Program and "Implicit Inflation Targeting"

The Central Bank did not pass to the regime of "open economy inflation targeting" starting from the beginning of 2000 until 2005; and it reflected this period as "implicit inflation

[4] Nadir Eroğlu, **Türkiye'de Parasal Kesim ve Merkez Bankası İşlemlerinin Analizi**, Der Yayınevi, İkinci Baskı, İstanbul 2008, s. 107.
[5] "Close Monitoring Agreement" is an IMF-supported program consisting regulatory precautions in framework of determined targets before the stand-by agreement and it covers the period of 2000-2002.
[6] CBRT based its exchange rate policy on daily exchange rate adjustment regarding inflation in the period of first 18 months for the aim of making Money and exchange rate developments more predictable in the context of "Program of Decreasing Inflation". Exchange rate basket increase rate that has been watched as 1 US Dollar = 0,77 is explained in daily-basis as covering the time of 1 year; all transactions are made on the basis of previously-determined values. It was assured that this implementation would end between July 2001 and December 2002 and gradually-widening band system would be transmitted; also it was explained that speed of basket exchange rate increase would be provided to move within the determined band; however, because of the crisis experienced, the program and so the relevant implementation is given up.

targeting". It can be said that this period, in which an obvious targeting of inflation was not made, had been a step for passing to open economy inflation targeting.

It was thought that passing to the targeting phase before providing the required pre-conditions would abuse the reliability of the monetary policy of that period. It was targeted to remove the factors decreasing the effectiveness of the monetary policy. Open economy inflation targeting that was brought in force in 2006 had been the period which required conditions were met.

Main reasons of why open economy inflation targeting regime could not be set up are:

- ✓ Irregularities in Banking Sector,
- ✓ Turkey's way of using inflation (practice of pricing based on the past inflation),
- ✓ Changes in the exchange rate to affect inflation directly,
- ✓ To be under pressure in terms of finance.

The CB's opinion defending that it is not safe to pass inflation targeting regime before the obligatory conditions are met had a strong influence on transmitting to inflation targeting regime. So it was decided to pass to floating exchange regime firstly and then open economy inflation targeting gradually.

At this period, the CB seek the way of assessing the main policy instruments, so it used the short-term interest rates to struggle with the inflation in this framework; and stretched the principle of monetary base also. In short, the CB tried to find a new convenient way for transition to inflation targeting.

In 2002-2005 Period the Central Bank:

- ✓ Reached all of its inflation targets,
- ✓ Decreased public debt stock to foreseeable levels,
- ✓ Decreased the of the fragile structure of financial markets,
- ✓ Decreased volatility in exchange rate and markets; decreased risk premium,
- ✓ Focused its attention to the Turkish Lira in its portfolio preferences,
- ✓ Removed six of the 'zero's at the end of the TL,
- ✓ Increased full membership negotiations with Europe with the agreement made with IMF,

- ✓ Provided positive progress in the institutional structure of the CB and the bank became independent, transparent and accountable.

With all these developments written above, it was aimed to such a structure that could manipulate the inflationist expectations.

In the framework of all these developments, 2005 was the last preparation period for transmitting the inflation targeting regime by the Central Bank. In the explanations that was made by the authorities, it was highlighted that the Central Bank's decision of not transmitting to inflation targeting immediately and leaving it for a preparation process first was a very sound and artful decision.

Year-end inflation targets were declared under implicit inflation targeting in the period of 2002-2005; but it fell short of the mark for three years repetitively. Although this situation was perceived as a negative development, reaching single-digit numbers in inflation rate showed that the process actually succeeded and the success would continue in the next periods.

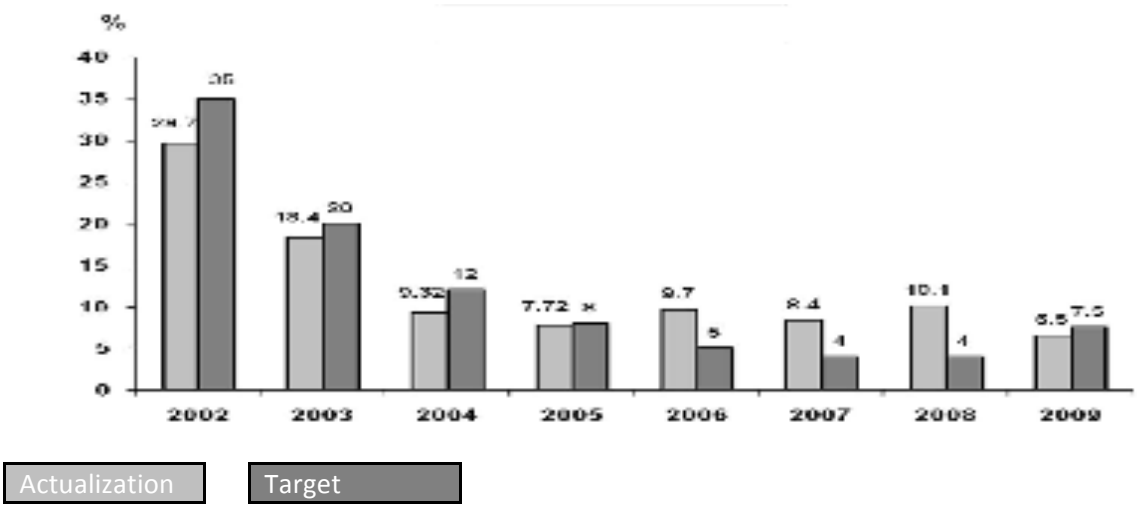
2.3.2 2006- 2009 Period: Transition to Inflation Targeting and Aftermath of It

The CB declared officially that it transmitted to open economy inflation targeting in 2006. It also preferred Consumer Price Index (CPI) as an indicator of the inflation rate. The reason of this was because CPI measured the cost of living best and it was easy to watch. The base year was taken as 2003 by the CB.

The period in which it was transmitted to open inflation in Turkey faced a sequence of shocks because of the crisis emerged in the world. The main reason enjoining the decrease in inflation rate from 2006 to 2008 is that international capital conditions changed disadvantageous to developing countries and as a result, considerable amount of capital outflows emerged in Turkey and most of other developing countries.
During this period, inflation rates that the Central Bank declared stayed far behind the actual inflation rates.

Although inflation rates did not match, with positive developments that were experienced in Turkey's financial markets, the risk profile of the country improved, volatility in the interest rates decreased, and the Turkish Lira became stable. However, crisis emerged in 2008 changed all the set of the balances.

Graphic 2.1 : Inflation targets and actualizations in Turkey (2002-2009)



Resource: CBRT, http//www.tcbm.gov.tr, (15/07/2010)

2.3.3. Reasons for Failure in Inflation Targeting

Inflation targets that actualized over the expectations between 2006 and 2009 aroused out of the reasons that occurred out of the Central Bank. During this period, targets getting further away repetitively weakened the idea that inflation targeting was an indicator for the expectations. As in all developing countries, high rates of food in the consumer price index increased volatility in Turkey as well.

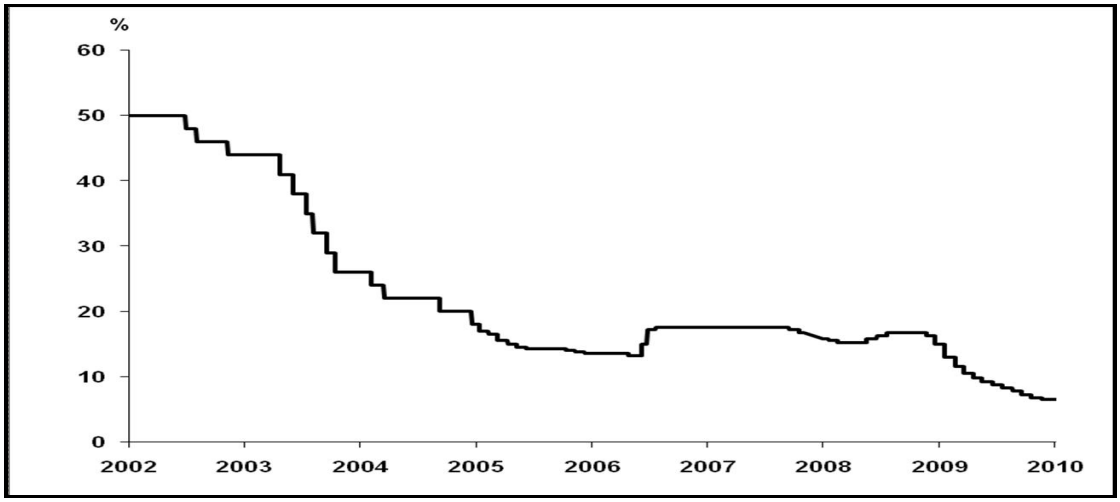
In this period, it was seen more clearly in Turkey and other countries that inflation targeting had been a difficult strategy. In 2009, it became even more acceptable for the economy authorities that inflation targeting was a harder policy than it was thought it would have been. Actually, main reasons of this idea are; economic disruptions that international markets, faced increase in oil prices, and changes in the perception of global risk.

2.3.4. Liquidity Management of the Central Bank during 2002-2009

Main policy instrument of the CB after 2001 has been short-term interest rate (Interbank money market debt ratio of the CB). During the crisis period in 2001, Central Bank purchased government debt securities at the amount of 14 billion TL to meet the liquidity needs of public banks and the banks under the structure of Saving Deposit Insurance Fund. Liquidity surplus stem from the reason of exchange purchases between 2003 and 2005 continued in 2006 and 2007. The Central Bank withdrew this surplus in overnight-term with TL repurchase agreements in interbank money market that operates under its own structure and with TL repurchase agreements in repo-reverse repo market under İstanbul Stock Exchange; so overnight market interest rates stayed at the level of the Central Bank's borrowing interest rate.

Operation process of the CB that is mentioned above continued during 2008 period. The Central Bank started to provide liquidity need with one-week-term repo biddings. With this, it prevented overnight interest rates of the CB to come up over the reference interest rate which is borrowing interest rate of the CB; so it enabled liquidity to be allocated healthily between the banks. Consequently, borrowing interest rate of the CB started becoming the policy interest rate.

Graphic 2.2 : CB Overnight Interest Rates (2002-2009)



Resource: CBRT, Summary transactions of Interbank money market (Labor day, thousand TL or %), http//evds.tcbm.gov.tr, (30/06/2010)

3. Interest Policy of the Central Bank During 2000-2010

3.1. 2000-2004 Period

In the process started with the letter of intent in December 1999, the goal of the program was to prevent instable growth and weak economic structure which aroused from the inflation that had been going on for 25 year. So '*..decrease in reel interest rates and inflation will not only increase the growth expectations of Turkey but it will lead economic resources to be allocated more equally and effectively at the same time…*[7] ' statement was said by the CB, and it was clearly aimed to decrease reel interest rates and inflation and provide growth as a result.. With this aim, as stability measures, inflation rate reached single-digit numbers at the end of three years, reel interest rates decreased, public sector borrowing requirements decreased and strict exchange rate policy instruments (anti-inflationary policy based on exchange rate) started to be used; and with 2002-2004 stand-by agreement that was renewed after 2000 and February 2001 crisis in the program, it was changed to floating exchange rate policy now.

Structural reforms leg of the program covers banking law (constitution of Banking Regulation and Supervision Agency), change of Social Security Institution law and increase in premium rates, removal of the rural support and the arbitration law. Relevant reform commitments are all fulfilled. The reason of this might be explained with the crisis in 2000 and 2001. However, it is also possible to say that especially the first of the relevant crisis was created by the program, and the second one was a consequence of the first one. For example, fixed exchange rate of the 2000-2002 program and operations of the CB based on net domestic assets constraints (monetary policy similar to currency board) removed[8] CB's function of being the last authority to lend and this inactivated the CB also; and these emerged as the reasons starting the crisis and made it hard to control it. The Central Bank could not intervene markets via open market operations because with the stand-by agreement as from the beginning of 2000, it committed not to exceed net domestic assets ceiling apart from the increases in external assets. So expansion of inconvenience in the markets via an increase in the capital outflow and lack of sufficient

[7] Please see 31st and 32nd paragraphs of the Letter of Intent dated 9 December 1999.

[8] Regarding the monetary policy of CBRT running at the beginning of 2003, in 33rd paragraph of the assessment named as ''Framework of Monetary and Exchange Policy of 2003" in the press release, it is clearly stated that 2000-2002 stand-by monetary policy is " a similar monetary policy to currency board". Hence, it is known that IMF and the World Bank suggested starting the implementation of currency board to prevent inflation in Turkey.

exchange surplus by banking public led to a liquidity crisis in November. Rapid growth in the interest rates disrupted financial structures of public and private banks even more, so confidence for the program was shook. Then especially excessive liquidity needs of the public banks caused lock ups in the payments; and exchange crisis emerged in 2001 again. Thereon, "Program of Decreasing Inflation" was left in April 2001 and "Program of Transmitting Strong Economy" was put in use which was paying great attention to financial stability as a priority.

"Program of Transmitting Strong Economy" includes a sequence of preventions in the framework of public finance, incomes policy, privatization, banking, monetary policy and urgent legal regulations. In the framework of legal regulations and structural renewal part of the program, some clauses of the law of the Central Bank of Turkish Republic had changed; with this, the CB was aimed to gain a more autonomous structure. (The regulation has taken affect in 2001 with the law nr. 4651) The package was determined as three phases considering negative developments that November and February crises created in financial markets, especially in the banking sector. These phases are: Overcoming the crisis atmosphere rapidly with the measures taken regarding the banking sector, preparing a mid-term perspective for the economic units by means of providing stability in interest and exchange rates, and providing consistent growth by establishing macroeconomic stability. The program aimed transiting to the system of inflation targeting in the long run and the CB took the first step of it by declaring yearly inflation targets[9].

''Program of Transmitting to Strong Economy" has been implemented in 2003 as well. Besides, the political party that came to power alone as a result of general elections in November 2002, promised to adhere to the agreements and commitments of IMF and implement a set of measures in such fields as education, infrastructure investments, reel sector, monetary policy, banking, privatization, incomes policy and public finance under the name of "Emergency Action Plan". At the end of year 2004 which started with the "Program of Decreasing Inflation" and went on with "Program of Transmitting to Strong Economy" and in which the stand-by process with IMF finished, the government ran to the schedule mainly.

[9] Eroğlu,a.g.k., s. 109-110.

The monetary policy which stepped in, in 2002, aimed to implement the strategy of "implicit inflation targeting" which focuses on the inflation rate of the future periods. Developments regarding the inflation of future periods became decisive in monetary policy decision process; besides, it was put the targets of periodic money base related to the inflation target. Also, short-term interest rates that are the main policy instrument under the implementation of floating exchange rate regime were used actively only for the main target of price stability.

In 2003 also, under the regime of floating exchange rate, the Central Bank used short-term interest rates as a main policy instrument to struggle with inflation on one hand, and on the other hand it watched indicatory targets and monetary performance criteria in the framework of the program that had been running with IMF.

3.2. 2004-2008 Period

In 2004, the Central Bank continued the regime of implicit inflation targeting within the concept of the regime of floating exchange rate. While short-term interest rates were used as the main policy instruments, indicatory targets and monetary performance criteria of the IMF program had been watched. In respect of the end of 2004, targets were reached regarding the indicatory targets (net internal assets) and performance criteria which are Money Base and Net International Reserve.

Table 3.1 : Year 2004, Performance Criterias, Targets and Actualizations

	Money Base Upper Limit		Net Internal Assets Upper Limit		Net International Reserve Level	
	Trillion TL		Trillion TL		Million US Dollars	
	Target1	Actualization	Target1	Actalization	Target2 (p)	Actualization
31 March 2004	16.100 (p)	16.948	29.600 (G)	27.321	-2000	748
30 April 2004	17.500 (p)	17.508	31.600 (G)	26.076	-2000	1.791
31 August 2004	20.500 (p)	19.301	34.600 (G)	28.015	-2000	1.629
31 Dcember 2004	20.900 (p)	19.19	35.000 (G)	30.121	-2000	229

Resource: CBRT

(1) Upper limits, will be calculated by the average of the stocks in relevant dates and stocks in five labor days ending with each of these dates.

(2) Lower Limit

(P) Performance Criteria

(G) Indicatory Value

Since October 2004, TL deposit purchase auctions were stopped, and within the framework of exchange policy the Central Bank declared that it could intervene directly to the exchange market if it saw any excessive floatings in both ways; although it kept its principle of being attentive to exchange rates to occur according to the market conditions. Moreover, it declared to public opinion that it could make exchange purchases with the method of auctions aimed at strengthening exchange reserves on condition of not affecting the natural balance value and long-term tendency of the exchange rate. Also, the money base was used as an additional anchor. In 2004, the money based increased by 35,8% compared to 2003. This increase is much higher than total inflation and reel growth rate that actualized in 2004. This is because the confidence atmosphere which emerged related to the financial deepening and decrease in inflation rate created an increase in money demand[10]. Additionally, reverse currency substitution accelerated this process in the first half of 2004.

Emission shows the amount of notes that the Central Bank issues, and theoretically-if we think that the bank does not finance public- it is determined by cash demands of the economic units. Also, it is the main component of the money base. Increase of the money demand of economic units depends on the recoveries in reel economy, progress in expectations and stable and low inflation rate. So, in 2004, emission increased by 26,1% compared to the end of the former year. However, in the second half of 2004, due to relative slowdown in development rate and stop in reverse currency substitution process, only a limited raise occurred. After all, money base for the year 2004, actualized as 19,19 quadrillion TL by using average of the last five labor days of December, and it stayed 1,7 quadrillion TL behind the targeted value[11].

Two other components of the money base are TL required reserves that banks keep in the Central Bank and free deposits. In 2004, required reserves increased by 36,1% and free deposits increased 89,6% compared to the end of the former year.

Main determinants of net internal assets which is the indicatory target have been; treasury debts, deposits of the public in CBRT which is followed as Turkish Lira and exchanges,

[10] CBRT, Annual Report 2004, p. 78.
[11] CBRT, Annual Report 2004, p. 78-79.

open market operations and valuation account. As from the year-end, net internal assets became 10,4 quadrillion TL by increasing 34%[12].

At the beginning of 2005, a significant step has taken regarding the monetary unit by removing six of the 'zero's at the end of the currency. Moreover, the CBRT declared transmitting to the open inflation targeting gradually in its declaration in 20th of December 2004; beginning of 2006 was determined as the date of transmitting to inflation targeting and year 2005 was declared as the period of transmission. In this context, implicit inflation targeting continued under the regime of floating exchange rate in 2005.

In 2005, interest decisions started to be created in the light of assessments made in the meetings of Monetary Policy Committee of which the dates had been declared to public opinion before, at the aim of running the implementations of transparent and foreseeable monetary policy which builds up the essentials of inflation targeting regime. The decision of interest was declared on the labor day following the meeting, and at the latest in two labor days the reason of the interest decision was explained together with the assessments of the Central Bank regarding general outlook of the economy with the press release titled "Inflation and Outlook". Then, while transmitting to open inflation targeting, it was foreseen to complete the process of institutionalization of decision making mechanism consequently by changing the position of Monetary Policy Committee from a suggestion-giving position to decision-making position, making decisions with voting system and starting to publish the summary of the meetings[13].

Table 3.2 : Year 2005, Performans Criterias, Targets and Actualizations

	Money Base Upper Limit		Net Internal Assets Upper Limit		Net International Reserve Level	
	Trillion TL		Trillion TL		Million US Dollars	
	Target1	Actualization	Target1	Actualization	Target2 (p)	Actualization
31-May-05	23.600 (p)	22.976	37.700 (G)	31.315	2.000	5.835
30 June 2005	23.600 (p)	22.598	37.700 (G)	23.987	2.000	10.455
30 September 2005	24.700 (p)	26.835	37.800 (G)	23.7	2.800	13.169
31 December 2005	29.200 (p)	28.756	25.500 (G)	12.587	14.000	22.393

Resource:CBRT

(1) Upper limits, that will be calculated by the average of the stocks in relevant dates and stocks in five labor days ending with each of these dates.

[12] CBRT, Annual Report 2004, p. 80.
[13] CBRT, Annual Report 2005, p. 74.

(2) Lower limit

(P) Performance Criteria

(G) Indicatory target.

In 2005 also, short-term interest rates were used as the main policy instruments and indicatory targets and performance criteria was watched in the context of IMF program. Within the framework of the program determined by the letter of intent dated 26 April 2005, all the objectives were accomplished regarding months May and June. However, need for revising the targets of the second half of 2005 emerged in June as a consequence of the raise in the money base which continued to grow rapidly in 2005 also. Besides this, IMF did not renew monetary targets because the process of revising had not been finished yet. After all, money base exceeded the upper limit in September and net internal assets and net international reserves objectives were both accomplished.

The emission volume increased at quite a high rate, by 45,6%, compared to the previous year in 2005. Increase in monetary demands of the individuals and stability in the reel economy to keep its recovery during the year contributed significantly to this development. In other words, a structural change had been experienced in the monetary demands of the individuals. At the same time, with the contribution of the financial deepening also, another sub-component of the money base-bank deposits- increased as a result of individuals' tendencies towards YTL investment tools, especially towards YTL-type of deposits. With regard to this, bank deposits component increased 91,8% at the end of 2005 compared to the year 2004. This situation occurred as a result of balance sheet regulations made at the year-end, because they kept their free account balances high in CBRT on the last day of the year[14].

As a result of all these developments, money base increased 61% compared to the end of the previous year. Money base actualized as 28.756 million YTL with the average of the last five labor days of December 2005 and it stayed behind the target of December which was 29.200 million YTL[15].

During 2005, the component of net internal assets which is the indicatory target, decreased significantly and fell to the level of -2.179 million YTL at the end of the year, especially

[14] CBRT, Annual Report 2005, p. 81-82.
[15] CBRT, Annual Report 2005, p. 83.

because the balance account of the Treasury in the Central Bank was high and open market operations component was in high as a result of liquidity surplus in the market[16].

Parallel to the reach of net external assets account (which was followed by fixed exchange rates and which makes up the asset part of the balance sheet of CBRT) to 25,8 billion US dollars by increasing 18 billion US dollars, a rise in net international reserves (which was followed as the performance criteria) occurred and it exceeded the target value by reaching 22,4 billion US dollars at the end of the year. The biggest determinants in this rise were direct exchange interventions and exchange purchase auctions going almost up to 22 billion US dollars[17].

After all, as it is stated in the press release titled "Monetary and Exchange Policy in 2002 and Probable Developments" dated 2nd of January 2002, CBRT started to withdraw gradually from its brokerage operations in currency and effective markets; it issued its operations in currency stock market-currency and effective markets for the last time on 26th of December 2005 and consequently the Central Bank withdrew completely from brokerage operations in the markets.

Central Bank of the Republic of Turkey transmitted to the regime of open inflation targeting in 2006. Its main policy instruments are short-term interest rates that have been implemented in interbank money market and İstanbul Stock Exchange repo and reverse repo markets. Inflation targets are determined together with the government regarding the percentage changes in consumer price index in three-year periods. Targets are 5% for the end of 2006 and 4% for 2008.

Inflation target of 2006 was declared around the point target with two-point interval of uncertainty in both directions as in three-months path and this path was considered as the performance criteria for three-months revisions of the IMF program.

As it is seen, upper limits of the path have been exceeded frightfully since June. The Central Bank has sent open letters to public opinion in the context of accountability and transparency conditions of open inflation targeting for the government and IMF.

[16] CBRT, Annual Report 2005, p. 83.
[17] CBRT, Annual Report 2005, p. 85.

Fluctuations that emerged in financial markets in May and June and erosion of YTL, increase in the prices of commodity and non-processed food effected the inflation expectations in negative way. The Central Bank held on daily foreign currency purchase auctions to resolve mobility in exchange rate by restricting foreign currency supply. Also Monetary Policy Committee increased policy interest rates 175 basis point first, and then it increased 225 basis points again.

Table 3.3 : Monetary Policy Committee Meetings in which Changes Made in Interest Decisions in 2006

Dates of the Meetings	Interest Decision	Interest Rate
27 Nisan	-0.25	13.50
7 Haziran	1.75	15.00
25 Haziran	2.25	17.25
20 temmuz	0.25	17.50

Resource: CBRT Annual Report 2006, p.40, table nr. 6.

While fluctuations in financial markets left its place to relative stability in May and June, the Central Bank has started again to the auctions of foreign currency purchases in November which it held on before. During the relevant fluctuation, within the framework of liquidity management, by using open market transactions, the bank entered one and two-weeks forwarded deposit purchase auctions as from 26 June 2006 at the aim of decreasing YTL liquidity surplus in overnight-term. This situation was kept until 25th of August. Consequently, "Notification Regarding Liquidity Bills" which was promulgated as number 26310 in 5 October 2006 was declared as it was thought to provide flexibility in liquidity management. So it was provided to use CB liquidity bills also, term up to 91 days[18].

In 2007 also, it was continued to implement inflation targeting regime under the free floating. Within this framework, target-matching inflation path and actualizations are given in the table below.

[18] CBRT Annual Report 2006, p. 42.

Table 3.4 : Target-matching Inflation Path of 2007

	2007 March	2007 June	2007 September	2007 December
Suspension Interval Upper Limit	11.2	8.7	7.3	6.0
Target-compatible Path	9.2	6.7	5.3	4.0
Suspension Interval Lower Limit	7.2	4.7	3.3	2.0
Actualizations	10.86	8.6	7.12	8.39

Resource: CBRT Annual Report 2007, p.38.

As in 2006, three-month inflation path has become the performance criteria of three-month revisions of IMF together with net international reserves in this year also. At the end of 2007, the Central Bank sent letters shared with public opinion to the government and IMF because the upper limit of uncertainty interval was exceeded.

In this period, Central Bank implemented cautious interest rate cuts thinking that inflation expectations were still strict. During the year, overnight borrowing interest rate fell to the level of 15,75% from 17,50% with 175 basis point reduction in total[19].

The bank declared a path having lower and upper limit of two points that is compatible with the inflation target for 2008 also, in its report named "Monetary and Exchange Policy in 2008" which it published in 18th of December, 2007.

In the first quarter of 2008, inflation rate resulted in 9,15% exceeding the upper limit target as a consequence of the effects of the rise in the prices of oil, food and other commodities, mobility in global financial markets as well as erosion in YTL[20].

In recent years, loses that the crisis which started in mortgage loan market of the USA economy and expanded to money and capital markets created has not been clear yet. However, successive deficits that international banks and investor institutions declared more clearly presents that the world economy is about to come across a danger of recession. In this framework, it is seen that investment flows to the developing countries are slowing down.

[19] CBRT Annual Report 2007, p. 40.
[20] CBRT, Annual Report 2008, p. 1.

In May 2008, with the end of the latest stand-by agreement that was signed with IMF, Turkey stayed alone with the decision of drawing her own path in terms of economics. At this point, the Central Bank highlighted the vital importance of financial discipline and sustainable structural reforms by insisting on its price stability target in the current conjuncture.

4. What is Monetary Transmission Mechanism?

As from the beginning of 1990s, reflections and outcomes of the changes made through monetary transmission mechanism under the implementation of effecting short-term interest rate as a main policy instrument after and during the transmission process to inflation targeting were observed.

In this section, components and operations of the monetary transmission mechanism in an economy which short-term interest rates are used as the main policy instrument will be explained.

4.1. Monetary Transmission Mechanism

Monetary Transmission Mechanism is the mechanism showing to what extend and through which channels the effects of the decisions of the monetary policy on reel economic variables such as aggregate demand and outcome and price movements actualized, in other words, the interaction between monetary policy and reel economy. Bernarke and Gertler (1995) define the reflection mechanism of the monetary policy implementation to the reel economy as a "black box" and they think that it is impossible to know exactly what is going on in the black box. Understanding the operations of this complex mechanism is to make it easy to reach monetary policy targets for the central banks by providing right assessments about the timing of the policies and their effects on the economy.

The ability of the monetary policy to affect reel economy which is one of the most important problems of the economic theory started to be examined heavily as from 1980s and a lot of studies were published regarding the operations of the monetary transmission mechanism. Although there is a consensus among economists about the effects of the monetary policy on reel economy in the short-run, it has been subject to arguments and researches how and in what ways this effect actually occurred. Views regarding the

operations of the monetary transmission mechanism are generally examined within the framework of Keynesian and Monetarist approaches in literature. While Keynesian economists believe that monetary transmission is operated through interest rates, monetarist economists argue that changes in the prices of other assets also play an important role in monetary transmission (Kasapoğlu, 2007).

European Central Bank (2004, s.44-49) explains the operation of monetary transmission mechanism as following: Transmission mechanism starts when the central bank changes the interest rates which it uses for its own operations for the aim of pulling liquidity surplus and addressing fund needs of the banks. This situation affects money market conditions and so funding costs of the banks. Changes occurring in interest rates of the money market have different levels of impact on interest rates of banking and other markets. While transitivity to short-term interest rates occurs directly, transitivity to long-term interest rates occurs indirectly. Main factor affecting long-term interest rates is the expectations regarding the developments of policy interest rates in future. In other words, if changes in policy interest rates do not create any change in market expectations regarding long-term economic tendencies; change is very difficult to happen for long-term interest rates.

Effects of the changes in policy interest rates on expectations and financial conditions in the economy change interest rates as well as the prices of other assets such as stocks and currencies. These changes in interest rates and financial assets prices have impact on saving, expenditure and investment decisions of the firms and households. For example, increase in interest rates will decrease firms' willingness of using credits for consumption and investment; this will cause households to tend towards saving rather than consuming. Also, because raised interest rates increase the risk of default for the credits of some borrowers, banks' willingness to make extensions decrease; so credit supply will decline eventually.

Movements in the prices of assets might also affect consumptions and investments through income and wealth effect. For example, while capital prices decline, income and consumption of the households who own stocks decrease. Also, if insured values of the assets decrease, both credits become more expensive as a result of the raise of the risk premium that banks demand for credits, and usable credit amount decrease proportional to

the insurance; so investments and expenditures decline.

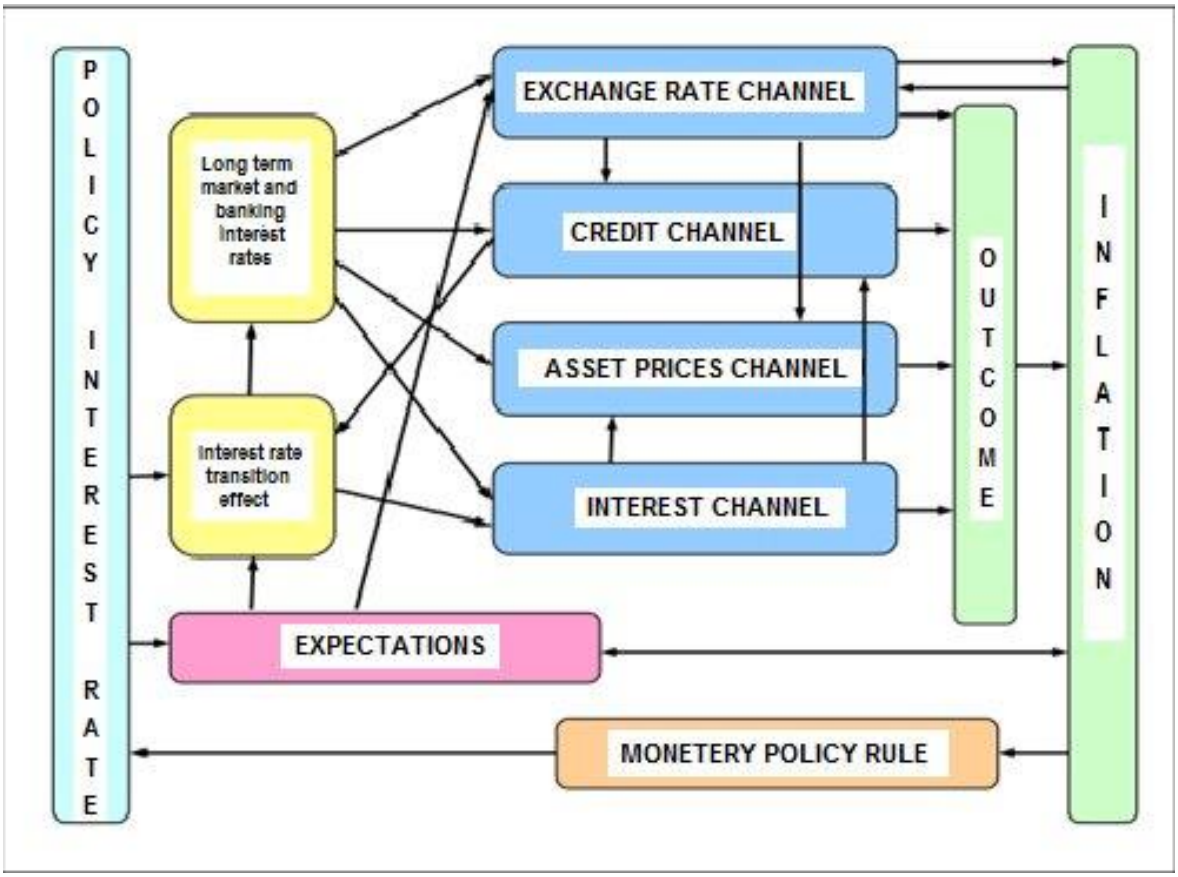
As a result of changes in consumption and investment, domestic demand level of goods and services change in terms of domestic supply level. If demand exceeds supply, an upside pressure emerges on the prices. Also, changes in aggregate demand create expansion or shrinkage in labor and intermediate good markets and affect the evolution of wages and prices.
Changes in exchange rates affect inflation in three ways: First, movements of exchange rates affect domestic prices of imported goods directly. Second, if imported goods are used as inputs in production, low input prices makes prices of final goods even lower. Third, exchange rate developments affect competitiveness of domestically produced goods in international markets; so it affects external demand.

A Central Bank which has high credibility manipulates expectations of economic units regarding future inflation; so it manipulates their behaviors determining wages and prices and it creates a strong effect on price developments.

Effects of monetary policy implementations on price developments actualize with long, floating and unknown defaults. Strength and magnitude of different effects changes according to the situation it is in. Also, exogenous shock such as oil prices and fiscal policies make transmission mechanism more complex and it makes things even more difficult for the central banks. To manipulate and control policy implementations in such a complex structure, central banks use some practical policy rules such as Taylor rule.

Égert and MacDonald (2009), similar to the definitions of European Central Bank (2004), summarize the process of monetary transmission mechanism and the relationship between transmission channels in this mechanism, in an economy in which short-term nominal interest rates are used as monetary policy instrument as in Figure 4.1:

Figure 4.1 : Monetary Transmission Mechanism[21]



Resource: Égert and MacDonald (2009)

As it is seen in Figure 4.1, changes made in policy interest rates firstly change other short-term interest rates and expectations; changes in short-term interest rates affect long-term market and bank interest rates together with the changes in expectations. Expectations and changes occur interest rates affect aggregate demand and outcome level through transmission channels. Expectations, level of exchange rates, aggregate demand and the level of outcome shortage also determine the level of inflation. When deviations from targeted inflation rate occur, required policy changes are made through monetary policy rule determined by the central banks and transmission mechanism comes into action.

According to this; effect of expectations of policy interest rates on other interest rates is the first step of the monetary transmission mechanism. Effectiveness of transmission channels

[21] Although Égert and MacDonald (2009) do not show a relationship between outcome and inflation, an arrow is added showing that there is a relationship between outcome and inflation regarding on the fact that transmission channels affect aggregate demand and have impact on prices so there is a relationship between outcome gap and inflation.

and Central Bank's ability to affect outcome and inflation is as high as the magnitude of this effect.

On the other hand, some economists consider pass-effect of interest rate as a part of the interest channel and define expectations as another transmission channel. They explain interest rate pass-effect and effect of expectations on other transmission channels as the idea of transmission channels affect each other.

4.2.Components of the Monetary Transmission Mechanism

It is possible to classify relationships in monetary transmission mechanism in four groups:

1) Transitivity of interest rates,

2) Expectations,

3) Transmission channels (interest channel, exchange rate channel, asset prices channel and credit channel),

4) Rule of monetary policy.

4.2.1. Transitivity of the Interest Rate

Transitivity of changes that the Central Bank make in short-term nominal interest rates towards short-term and long-term reel interest rates is the first step of transmission mechanism. This change that monetary policy makes in reel interest rates is transmitted to the reel sector via transmission channels.

The reason why transmission of policy interest decisions in the transmission mechanism is thought as the first step of transmission to financial markets; is because over-night interest funding is only done by the banks, and the reel economy reacts to longer-term interests, stock prices, exchange rates and risk premiums instead of over-night interests.

So, for the Central Banks to have an impact on reel economy, monetary policy decisions first have to affect market interests which play a role in the decisions of economic units and other financial variables. (Aktaş and others, 2008)

In literature, there is a consensus on that aggregate demand is related to long-term interest rates more than short-term interest rates. Ability of short-term policy interest rates to affect long-term interest rates reflects the strength of the Central Bank to manipulate not only

aggregate demand but also expectations. For this reason, while effectiveness of monetary policy is being examined, relationship between short-term policy interest rates and long-term interest rates must be considered. (Başçı and others,2007)

Degree and monetary policy interest decisions' transitivity time to other interest rates in the economy determines effectiveness of all transmission channels either directly or indirectly; so it plays a fatal role for the monetary transmission mechanism to operate healthily.

4.2.2.Expectations

Modern macroeconomic theory puts great emphasis on the expectations of firms and households about future. Monetary transmission mechanism is affected by these expectations directly or indirectly. For example, investment decisions of firms and consumption and saving decisions of households depend not only on current rate of interest but on future expectations of interest rates. Exchange rates are also shaped according to the future exchange rates and interest rate expectations. Consequently, monetary policy affects economy not only through level of current rate of interest but through expectations regarding the level of future interest rate as well. Demand of consumption and investment goods depend on future consumption and investment expectations; and current inflation depends on future expectations of inflation. For this reason, central banks publish their expectations regarding important variables and they help firms and households to shape their future expectations. (Hopkins and others, 2009)

Effects of monetary policy implementations on expectations of economic units shorten the time of reactions that they show to policy changes of economy; and they increase effectiveness and rapidness of monetary transmission mechanism channels.

Especially management of expectations which is one of the most important components of inflation targeting, depend on the Central Banks to gain persuasiveness in the eyes of public opinion and be able to shape decisions of economic units in line with monetary policy targets rather than inflation of past periods.

4.2.3. Monetary Transmission Channels

Monetary policy implementations affect reel economy through monetary transmission channels as well. The idea is common among economists that transmission channels have impact on each other and they complete each other; so it is impossible to separate them from each other with strict lines. Although there are differences in classification of transmission channels in literature, three channels are mentioned mainly: interest channel, asset prices channels and credit channels. (Mishkin, 1996).

Because exchange rate channel that take place in asset prices channel has a special importance in monetary policy transmission and its effects are different from other assets, it is considered as a separate transmission channel in some studies in this classification. (Mishkin, 1995; Kamin and others, 1998; Loayza and Hebbel, 2002).

In some studies, expectations channel is considered as a fifth channel. (Horvàth and Maino, 2006; Pruski and Szpunar, 2008). However, in general, expectation is not considered as a transmission mechanism; rather it is examined as a transmission mechanism factor directly affecting inflation and determining effectiveness of transmission channels. (Égert and MacDonald, 2009; Loayza and Hebbel, 2002).

Apart from these, transmission channels can be given different names such as monetary channel, cost channel, wealth channel, income channel and substitution channel. (For example, Van Els and others, 2001).

In this study, channels of monetary transmission will be examined in four categories parallel to the classification that Mishkin made (1995) : 1)Interest, 2)Exchange Rate, 3)Asset Prices, 4)Credit Channels.

4.2.3.1. Interest Channel

The most traditional approach showing the relationship between monetary policy and reel economy is the interest rate channel which is explained by Keynesian IS-LM model. Interest channel which is also known as “money channel” or “money view” in literature,

works with the effect of changes in short-term and long-term reel rate of interest on fund demand and supply.

In the working of interest channel, increase in reel interest rates (iR) increase the cost of the capital; and this decreases investment expenditures (I) and aggregate demand eventually. Although Keynes says that this channel works through investment decisions of the firms, researches made afterwards show that durable goods and housing expenditures (C) of consumers are affected by reel interests.(Mishkin, 1995). According to this, movements of reel interest rates change borrowing and lending costs of firms and households as well as cash and time preferences of them; so they affect consumption, saving, investment decisions and so eventually affect aggregate demand (AD), production (Y) and inflation (π) (Horvàth ve Maino, 2006).

iR ↓ ⇒ I ↑ ve C ↑ ⇒ AD ↑ ⇒ Y ↑ ⇒ ð

On the other hand, changes in reel interest rates bring double-contradictory effect. While an increase in interest rates raises incomes and consumptions of the ones owning assets bearing interest (income effect), higher interest rates causes economic units to tend towards saving rather than consumption (substitution effect) (Égert and MacDonald, 2009).

In theory, increase in reel interest rates causes prices of the goods purchased today to become more expensive than the prices of goods that will be purchased in future. Also, there are strong empirical evidences on that both consumption and investment have reverse relationship with reel interest rates. It is found out that durable consumer goods expenditures, fixed trade investments, housing investments and even stock investments have reverse relationship with the reel interest rates in many countries (Taylor 1995).

In spite of Taylor's (1995) arguments considering interest rate as a strong transmission channel, evidences showing that effect of monetary policy on reel variables cannot be only explained by traditional interest channel is based on capital cost directed economists towards searching for additional channels in diagnosing effects of monetary policies on economics.

Meltzer (1995) perceives transmission process based on traditional interest channel as quite mechanical and restrictive comparative to the views of monetarist economists. He

also stated that, monetary policy does not only affect reel interest rates, but also prices of domestic and foreign goods; so he emphasized on the importance of asset prices channel in monetary transmission.

Another channel is the credit channel which is argued within the framework of credit view that promotes that monetary policies have impact on credits that are opened by the banks. Firstly, points that interest channel cannot explain are tried to be explained through credit channel with the credit view which was developed by Bernaanke and Blinder's (1988) credit additions to traditional IS-LM model. I

4.2.3.2. Exchange Rate Channel

Exchange rate channel runs with foreign trade transactions which reel value changes between domestic currency and foreign currency create. Importance of exchange rate channel has increased with the rise of flexible exchange rate regimes and globalization. Exchange rate channel does not work in an economy in which fixed exchange rate regime is implemented; and as out-ward degree of economy increases, effectiveness of exchange rate channel increases as well (Mishkin, 2001).

Exchange rate channel works through affecting both aggregate demand and aggregate supply. When it is looked from the view of demand, according to back interest parity, when domestic reel interest rates (iR) decline, investing with domestic currency loses its attraction, investments with foreign currency increases; so the value of domestic currency (E) decrease. Also, decrease in domestic reel interest rates causes capital outflows from the country, and this decreases the value of domestic currency as well. When domestic currency loses value, this causes the prices of products produced domestically decline compare to the prices of foreign products; and this increases demand on these products. This situation causes increase in net export (NX) and production (Y). (Mishkin, 1995; Loayza and Hebbel, 2002). Because movements of exchange rates affect prices (π) indirectly here, this effect is called "indirect pass-through effect".

$iR \downarrow \Rightarrow E \downarrow \Rightarrow NX \uparrow \Rightarrow AD \uparrow \Rightarrow Y \uparrow \Rightarrow \eth$

When we look from the view of supply, we see that monetary depreciation of domestic currency (E) causes increase in the prices of imported goods (Pi) in terms of domestic

currency and this increases inflation (π) directly. Also, rise in the prices of imported intermediate goods increase marginal costs in production and this causes increase in the prices of both domestic and foreign goods (Loayza and Hebbel, 2002). This situation is called "direct pass-through effect" in which movements in exchange rates affect prices directly.

$iR \downarrow \Rightarrow E \downarrow \Rightarrow Pi \uparrow \Rightarrow \pi \uparrow$

On the other hand, especially in developing economies, movements of exchange rates can affect aggregate demand by having impact on the balance sheets of financial and non-financial firms of which an important part of the debts includes foreign currency. Depreciation of domestic currency (E) causes increase in debt burden of relevant firms and when these debts are not covered with assets in terms of foreign currency, net value (NW) of the firms decrease. This disruption in balance sheets increases adverse selection and ethical risk problems and causes decline in loans (L); consequently it causes decrease in production (Y) and investments (I) (Mishkin, 2001).

$iR \downarrow \Rightarrow E \downarrow \Rightarrow NW \downarrow \Rightarrow L \downarrow \Rightarrow I \downarrow \Rightarrow Y \downarrow \Rightarrow \pi$

4.2.3.3. Asset Prices Channel

Asset prices channel, which is called wealth channel in some studies, is based on the effect of monetary policy implementations on the economy by changing the prices of domestic assets such as stocks price or housings. Meltzer (1995) criticizes the Keynesian approach which considers interest rates as the only asset in economics or Taylor's (1995) two-asset model (interest rate and exchange rate) and he argues that monetary policy affects economy through relative prices of other assets and through the way of reel wealth as well.

In the process of asset prices channel, effect of monetary policy on investment is explained with Tobin's "q theory" where its effect on consumption is explained with Modigliani's hypothesis of life-cycle analysis.

Tobin (1969), explains impacts of monetary policy on economy through stock prices values with "q theory". Tobin defines q as the ratio of market value of the firm to cost of

replacing capital. If q value of a firm is high, this means that market value of that firm is larger than its cost of replacing capital. In this situation, the firm can increase its investment expenditures because income that it will generate from issuing shares will be higher than costs of capital investments that it will make (Mishkin, 1996).

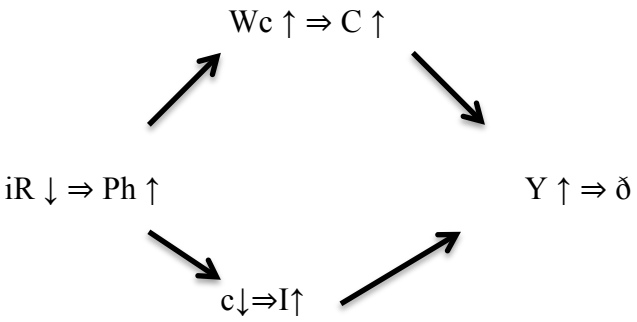
The most important point in Tobin's q theory is the relationship between stock prices and investment expenditures. According to this relationship, when reel interest rates (iR) fall as a result of monetary policy implementations, bonds and bills market loses its attraction and demand to equity. Rise in demand increases prices of securities (Ps) so it increases rate of q. This means firms can purchase high amount of investment goods with low amount of securities that they issue; so this decreases capital costs of the firms. Consequently, increase in the price of shares increases investment expenditures (I) and this increases production level of the economy (Y) (Mishkin, 2001).

$iR \downarrow \Rightarrow Ps \uparrow \Rightarrow q \uparrow \Rightarrow I \uparrow \Rightarrow Y \uparrow \Rightarrow ð$

Impact of monetary transmission mechanism on consumption through stock exchange channel is explained as wealth effect. According to Modigliani's (1971) life-cycle hypothesis, wealth of the consumers which they generate during their life time determines the consumption expenditures. When stock prices (Ps) which are one of the most important components of financial wealth raise, wealth of consumers (Wc) increase. This situation increases consumption expenditures(C), and so aggregate demand and production (Y) increase eventually (Mishkin, 1996).

$iR \downarrow \Rightarrow Ps \uparrow \Rightarrow Wc \uparrow \Rightarrow C \uparrow \Rightarrow Y \uparrow \Rightarrow ð$

Other factors building up wealth are housing and piece of land. Decline in interest rates decreases financing costs required to obtain housing. In this situation, housing demand increase and prices of housing raises (Ph). Increase in market value of houses, causes house-owners to become richer (Wc) and this increases their consumption expenditures(C). If Tobin's q theory is implemented on house market, increase in prices of houses causes a relative decline in house production costs (c), construction companies start to produce more houses; so investment expenditures (I) increases (Mishkin, 1996).



4.2.3.4. Credit Channel[22]

It is criticized that magnitude, timing and composition of the effect of monetary policy on production and aggregate demand are trying to be explained only by traditional interest channel and it is argued that interest rate variations affect economy through credit channel also. This approach which is known as "credit (loan) view" in literature, did not occur as an alternative to the traditional interest channel, rather it consists of factors strengthening and widening the effects of traditional interest channel.

In credit (loan) view, a special importance is given banks because they decrease asymmetric information costs in financial markets; and by contrast with traditional channel which emphasizes on banks' functions of creating money only, function of creating loans is considered as well.

While big firms have the opportunity to provide funds via stock and bond markets apart from bank loans; small firms and households need the intermediation of banks while meeting their fund needs because of the problem of asymmetric information. Because height of bankruptcy risk and costs of obtaining information about small firms increase costs for lenders. Banks' expertize in obtaining information and watching loans let them to lend small firms with lower interest rates. For households also, bank loans have no exact substitution. For these reasons, households and small firms are dependent to banks.

Dependency of a large part of the economy to bank loans makes monetary policy affect the economy through credit channel. However this situation causes small-size firms which are

[22] Studies of Gertler and Gilchrist (1993), Bernanke and Gertler (1995), Bernanke and others (1996), Mishkin (1996), Oliner and Rudebusch (1996), Çakmaklı (2005), Kasapoğlu (2007), Aklan and Nargeleçekenler (2008b) are benefited while composing this part of the study.

dependent to bank loans to get affected from changes in credit supply more than large-size firms do.

According to the credit channel theory, changes that will be made in monetary policy affect loan market through two channels: 1) bank loans channel and 2) balance sheet channel.

Bank loans channel works through the impact of changes in monetary policy on credit supply of banks. For example, expansionary monetary policy causes rise in credit supply of banks; and consumption and investment expenditures increase as firms and households use more credits, eventually production level increases.

On the other hand, with a decline in credit supply as a result of contractionary monetary policies, credit demand exceeds credit supply and this increases interest rates. As interest rates increase, safe borrowers who forgo using credits and invest in projects that have less yield and less risk create adverse selection problem for the banks. Borrowers who will invest in more risky projects keep their credit demands, and they even become more willing to pay high interests to be able to take loans. High probability of not being able to pay back the credits which were given to risky projects brings banks face to face with the problem of ethical risk. In this situation, banks make credit assessments and prefer to decrease credit supply rather than increasing interest rates.

As a result of financial developments and improvements that is being experienced in recent years, banks' role in monetary transmission and dependency of economic units to bank loans started to decrease, so effectiveness of bank credit channel has started to decline gradually (Mishkin, 1995, p.7). However, because financial markets in developing countries such as Turkey have not been improved exactly, and especially small-size firms have been dependent to bank loans, it is seen that the credit channel has been working effectively.

Balance sheet channel works as monetary policy variations change net value of the firms, their cash flows, liquid assets and the value of assets that they can use as insurance and as these variations affect borrowing costs. Balance sheet channel which emerges from asymmetric information problem in loan markets is based on the fact that external

financing premium-which is defined as the difference between cost of funds that firms can find from outside and cost of funds that firms can provide with their own resources- is related with the financial situation of firms.

According to credit channel theory, direct effect of monetary policy on interest rates becomes stronger with its effect of changes that it creates in external financing premium. Change that monetary policy creates in short-term interests causes change in external financing premium on the same way and this affects borrowing costs of the firms. So, impact of monetary policy on reel expenditures and reel activities become even stronger.

External financing premium has a reverse relationship with net value of borrower. Decrease in the values of cash flows, liquid assets and insurance values of a firm resulting from a negative shock in economics causes a decline in the net value of the firm. Decline in net value increases external financing need and external financing premium; so it becomes harder for the firms to find loans because of the problems of adverse selection and ethical risk. This situation strengthens the effect of the first shock and causes decline in aggregate demand and production in investments and expenditures of the borrower. This effect is named as "financial accelerator" in literature.

4.2.4. The Rule of Monetary Policy

It has been argued for years in literature whether Central Banks must act according to the situation or according to a certain rule while they are reaching their monetary policy targets. The ones who follow Keynesian policies after World War II have been in tendency of running situation-based policies. However, high inflation that was experienced during 1970s and 1980s as a result of situation-based policies prompted a deep economic recession in 1974 and 1980-1982. After recession period, central banks and economists have re-started to think about the benefits of monetary policy rules; and policy rules have become one of the issues that have been examined heavily in the field of macroeconomics recently. In these researches, it is concluded that it is not necessary to follow certain and specific rules in implementation of preferred policy rules. Besides, policy rule does not mean determining monetary policy instruments strictly or mechanically. Rather, it is suggested for the ones who implement policies to use monetary policy rules as advisor and to consider that additional preventions can be needed to take according to the situation of

the economy sometimes while implementing a policy rule (for example; economic shock, financial chaos and in situations where unforeseen changes occur) (Kaytancı, 2008).

As most of countries have transmitted to inflation targeting starting from 1990s, parallel to credibility of implemented monetary policies to gain importance, studies regarding monetary policy rules have increased[23]. In these studies, it is emphasized on the necessity of implementing rule-based monetary policies for the aim of affecting expectations of economic units positively. Because according to these models, current period production and inflation levels are mainly determined according to expected values of these variables in future. At this point, with reference to monetary policies that are implemented in current period, expectations regarding monetary policies that will be implemented in future gain importance. Expectations of economic units regarding future values of variables get affected by implementations of situation-based monetary policy negatively (Aklan and Nargeleçekenler, 2008a).

According to Taylor (1998), if economic units have future-oriented expectations, policy rules- showing what future policy movements will be- are needed in this situation. There is not any way of predicting these expectations regardless of a policy rule. Apart from this, there are many reasons why rule-based policies are preferred more than situation-based (arbitrary) policies: These reasons can be listed as: policy rules solve the problem of time inconsistency[24], they provide more understandable explanations regarding policies, they are exposed to less political pressure, their accountability increase, future uncertainty decreases, so inflationist expectations are prevented.

Monetary policy rules are separated into two groups in literature as “instrument rules” and “target(ing) rules”. Arguments regarding the issue of whether instrument rules or targeting rules must be used have been made since 1970s among economists who advocate rule-based policies[25].

Instrument rules are basic rules that formulate monetary policy instrument as a function of measurable variables. Best-known basic instrument rule is interest rate rule which was suggested by Taylor (1993). This rule defines short-term interest rate which is a policy

[23] For example, Taylor (1993), Clarida and others (1998) and Svensson (1999, 2003).
[24] Studies made about time inconsistency Show that situation-based policies can cause economic instability; so current and future monetary policies must be determined according to the rule.
[25] For example, McCallum and Nelson (2005) and Svensson (2005).

instrument as a linear function of inflation gap (difference between targeted and actualized inflation) and outcome gap (difference between potential and actualized outcome). Another example to instrument rule is the rule of monetary base in which monetary base variations that McCallum (1988) and Meltzer (1987) suggest is used as the main policy instrument.

According to Taylor rule, short-term policy interest rates are determined in accordance with inflation's deviation from its targeted value and from potential level of production. Inflation's exceed of targeted value or/and potential level of production is an indicator of demand pressure. Central Banks try to provide macroeconomic balance by increasing nominal interest rates to prevent demand pressure. Taylor (2000), states that central banks should not implement this rule of monetary policy in a mechanical style; and monetary policy rule can be set up according to the changes in economic conditions.

Target(ing) rules are rules that are obtained from a lost function that minimizes deviations of targeted variables from targeted levels. In literature which Svensson leads, it is argued that use of target rules gives better results especially for targeting-based policies such as inflation targeting. According to Svensson (1999), in real life, central banks do not make decisions mechanically with a limited set of data that was determined before related to a single-instrument rule, they use more information because their decisions include basic instrument rules; and they optimize their decisions again after they review current data continuously. Svensson (2003) criticizes that only inflation and production gaps are given place and other variables are not considered in Taylor rule. For example, he emphasized that reel exchange rate, terms of trade, foreign production and domestic interest rates are also important variables for an outward-oriented economy and these must take place in policy rule as well.

5. Transitivity of Interest Rate and the Factors Affecting Transitivity

Together with the regime of inflation targeting that has been started to implement since 1990s, short-term interest rates have been started to use as the main policy instrument; and a large literature has been built up about the issue of transitivity from policy interest rates to market and banking interest rates. While some of empirical studies made are regarding determination of level and transitivity speed towards market and bank interest rates in

various countries, factors affecting transitivity are tried to diagnose in other part of the studies.

In this section, transitivity from policy interest rates to market and baking interest rates will be examined.

5.1. Interest Rate Transitivity

Interest rate transitivity which is the first step of transmission mechanism is defined as the speed and degree of reaction that market and banking interest rates (loan and deposite interest rates) show to changes in monetary policy interest rates. Especially in countries where inflation targeting is implemented, transitivity of changes made in short-term nominal interest rates which are used as the main policy instruments towards long-term market and banking interest rates; has a significant place in the process of monetary transmission mechanism.

Changes in monetary policy interest rate firstly affect financial markets by changing market interest rates; then start to affect investment, saving and consumption decisions of the reel sector through monetary transmission channels by changing deposit and credit interest rates of the banks.

For this reason, ability of monetary policy implementations to affect market and banking interest rates is very important for effectiveness of monetary transmission mechanism.

In studies where interest rate transitivity is examined, three factors are generally mentioned:

1) Short-term transitivity effect is the first effect of changes in policy interest rates on banking interest rates and it shows the effect which occurs in such a short period such as 1 month.

2) Long-term transitivity effect explains to what extend do changes in policy interest rates reflect to banking interest rates in the long run, meaning the last effect on banking interest rates.

3) Transitivity speed shows whether the transitivity is fast or slow, meaning time length of the reflection of changes in policy interest rates towards banking interest rates.

5.2. Factors Affecting Transitivity

Under conditions of perfect information and perfect competition, it is expected for changes in policy interest rates to reflect banking interest rates fastly and completely. However, some factor such as; macroeconomic conditions which economy is in, monetary policy implementations, structure of the financial system and factors special to banks affect the level and speed of transitivity. Although there is not a certain consensus on the issue of factors affecting transitivity; lot of factors are mentioned such as; monetary policy regime, competition, improvement of money markets and financial system, financial disclosure, ownership structure of banking system and size and rigidity of banking costs.

Table 5.1 : Some Factors Affecting Transition Speed and Directions of Effects

	Expected effect	Calculated Effect
Concentration (HH)	-	-
Market Power (RoE)	-	-
Credit Risk (returns)	+/-	+
Interest Rate Risk (maturity mismatch)	+/-	-
Liquidity Surplus of the Banks	-	-
Income Diversification (non-interest rate)	+/-	+
Capital surplus of the banks	-	-
Share of the Deposits	-	-
Credit Demand (GDP Growth, housing prices)	+/-	+/-

Resource: Sørensen ve Werner (2006)

Some important factors affecting speed and level of market and banking interest rates are explained below.

5.2.1. Macroeconomic Conditions

Level ad speed of transitivity of interest rates change related with the direction of cyclical movements in economics. Under suitable economic conditions such as fast economic development it is easier and faster for the banks to change deposit and credit interest rates. Banks which are not willing to make credits used because of credit risk in periods of

economic downsizing, do not reflect policy interest rate declines to credit interest rates. In such periods, increases in problematic credits in banking sector and decreases in profitability can direct banks to raise their profitability by widening the difference of credit-deposit interest rates. In this situation, while banks reflect decreases in policy interest rates to deposit interest rates immediately, they do not reflect to interest rates immediately or they might reflect later (Chimlewski, 2003; Égert and MacDonald, 2009).

5.2.2. Monetary Policy Applications

Banks' speed and degree of adapting to changes made in policy interest rates may vary according to these changes' specifications such as; expected, unexpected or permanent, temporary. Banks adapt more quickly to expected changes in policy interest rates, and they can even reflect this expected change to their own interest rates even before in some situations. Also, because bank face adjustment costs every time they change interest rates, they do not prefer to change interest rates very often and they only reflect the changes which they believe are permanent to their own interest rates. Perception that occur in banking sector regarding changes in policy interest rates to be temporary causes a decline in speed and level of transitivity (Bredin and others, 2002; Horvàth and others, 2004).

5.2.3. Financial Structure

The structure of financial system directly affects transitivity from policy interest rates to banking interest rates. There are a lot of factors determining the structural specifications of financial system such as; Improvement and depth of financial markets, existence of alternative financing sources, competition in banking sector, effectiveness of law system, maturity structure of financial contracts and height of asymmetric information costs and adjustment and transition costs.

5.2.4. Factors Special to Banks

In literature, there are studies showing that characteristics special to banks and structural differences among banks cause rigidity in interest rates as well. Profit maximization behaviors of banks create up-ward-directed rigidity in deposit interest rates and down-ward-directed rigidity in credit interest rates. While banks are adapting credit and deposit

interest rates to changes in policy interests, they make cost-benefit analysis and if expected return exceeds cost, they change interest rates. When banks make the relevant analysis, they make decisions by considering their own weak and strong points as well together with structural characteristics of financial system and economic conditions. Within this framework, lots of factors affect interest rate transitivity in bank-base such as: Size of the banks, their opportunities to reach external financing sources, structures of balance sheet and income-expense, profitability, liquidity situations, capital adequacy, quality of active assets and customer relations.

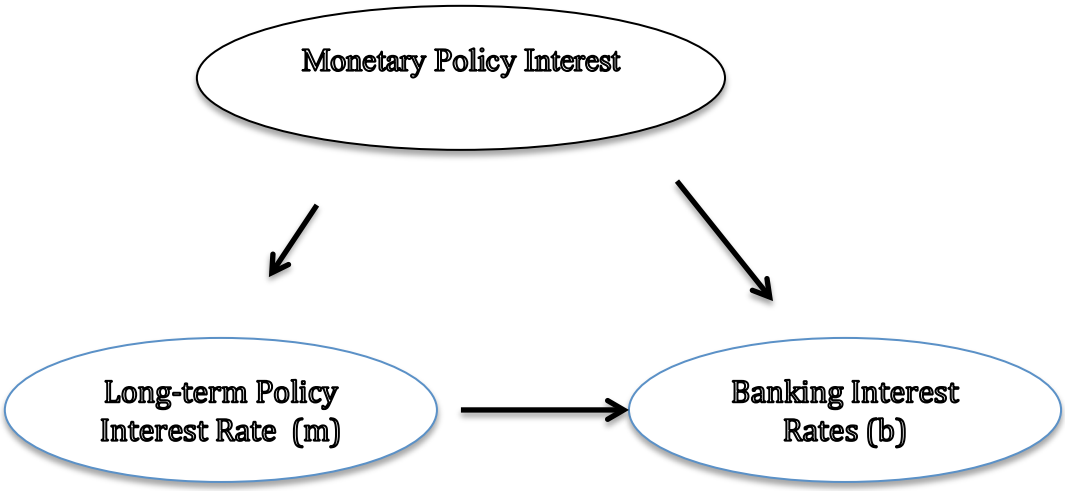
6. Measurement of the Effects and Transitivity of the Changes in the Policy Interest Rates on Other Interest Rates

In this section of the study, considering data and methods used in literature, impacts of changes in policy interest rates in Turkey on interest rates of automobile, mortgage, consumer and commercial loans will try to be measured.

6.1 Scholar

In studies measuring transitivity of policy interest rates towards bank interest rates, two main approaches are mentioned in general. First of them occurs when policy interest rates directly affect banking interest rates; and the second one occurs when policy interest rates affect market interest rates first and then indirectly affect banking interest rates.

Figure 6.1 : Interest Rates Transmission Mechanism



Resource: Egert and MacDonald (2009)

As it is stated in the diagram above, Egert and MacDonald (2009) divided interest rate transmission mechanism into three parts in their studies: First of them is direct impact of monetary policy interest rate changes on banking interest rate and this is named as "monetary policy approach"; second of them is the measurement of transitivity from market interest rate to comparable-due-date banking interest rate and this is named as "fund cost approach"; finally third of the approaches is named as "consolidative approach." This approach consists of two phases; transition from monetary policy interest rate to market interest rate and then transition to banking interest rates.

Another study that is faced in literature is an empirical study made by Sander and Kleimeier (2004) for the area of Euro. According to this study, speed and level of transitivity is measured by using both monetary policy and funding cost approach. However, monetary policy approach is used in analysis regarding factor affecting transitivity. They explain the reason of this as maturity structures of credit and deposits vary among countries.

Donnay and Degryse (2001), state in their studies that monetary policy instruments may change with time so a single policy interest rate is not sufficient to explain transitivity. They also stated that market interest rates are better able to reflect the policies of the Central Bank; so they base on the returns of money market interest rates and treasury bills in their studies.

One of the most important studies made in literature is the one made by Bondt (2002, 2005). In his studies, he explains the relationship between market and credit interest rates through banks' model of marginal cost pricing model that they use for determining price. Equality reached according to this study is as following:

$b = \mu + \beta\, m$

In equality, β coefficient showing adaptation of banking interest rate to market interest rate is the long-term transitivity coefficient. For perfect transitivity, it is 1; where it means there is lost transitivity if it is smaller than 1 and if it is greater than 1 this means that change in banking interest rates is higher than change in funding costs. μ represents profit margin of the bank and it is added to funding cost. According to Bondth and others (2005), regarding

this equality, banks stated that long-term interest rates are healthier to use because of the risk of interest rate that is created by the mismatch between assets and liabilities of the banks. In consolidative approach, however, transmission from policy interest rates to market interest rates and transmission from market interest rates to banking interest rates are explained by Bondt (2002-2005) and Bernstein and Fuentes (2003).

6.2 Relationship of Policy and Market Interest Rates in Turkey and Implementations of CBRT

To obtain effective and flexible liquidity management starting from February 2001 crisis, CBRT has assured over-night interest rates to emerge close to the level of the Central Bank borrowing interest rate and it has provided borrowing interest to possess interest rate qualification in terms of monetary policy[26].

With its effective liquidity management that it tries to implement, while the Central Bank assures short-term market interest rates to emerge close to the level of policy interest rates by decreasing interest fluctuations on one hand, it tries to keep the curve of return by using expectations management and improvements in risk perceptions on the other hand. So the Central Bank made it easier for long-term interests to follow policy interests more closely and it assured policy interest changes to come up as an important determinant of funding costs.

It actualized in quite a difficult process for policy interest to become the main policy instrument of the Central Bank. A lot of regulations are made to provide this after 2001 crisis. Disciplined situation of the fiscal policy, transition of the Central Bank to implicit inflation targeting and adjustments made to rise up the banking sector have all eased this regulation to be implemented in real life.

İnal (2006) concluded in his studies that a clear relationship has been occurring between interest decisions of CBRT and government debt securities.

[26] Inflation Report 2008-III.

6.3 Selection of the Model and the Data

Parallel to the aim of the study that will be made, monetary policy approach will be used in determining speed and level of transitivity towards banking interest rates; and weekly average of monetary policy reference interest rate and CBRT over-night borrowing interest rate (compound) will be taken as a base point for explanatory variable.

Lending loan interest rates, automobil loan interest rates, mortgage loan interest rates and commercial loan interest rates are used to measure the transitivity of changes in policy interest rate that had been used under structure of CBRT since 2002 to interest rates of the banks.

Small cash (lending) loans (LIR) are shorter-term loans with relatively high interest rates because they do not include assurances such as automobil or house and they are used to meet short-term cash needs of consumers such as education, vacation or health. Automobil loans (AIR) and mortgage loans (MIR) are loans with relatively high values, longer-terms, assured and they have lower rate of interest. Commercial loans are short-term credits that are freely used to firms for their short-term cash needs within a limit of credit.

Credit interest rates that will be used in the analysis are weighted-average interest rates that are calculated by association of credit values that are made used actually at Turkish Lira during the relevant week in bank-base in Turkish banking sector and interest rates that are implemented to credit in consumer-base. (Weighted-average interest rates that are applied to credits which are opened at TL by the banks.)

Data used in this study are obtained from Electronic Data Distribution System of CBRT and credit interest rate notifications that banks make to CBRT.

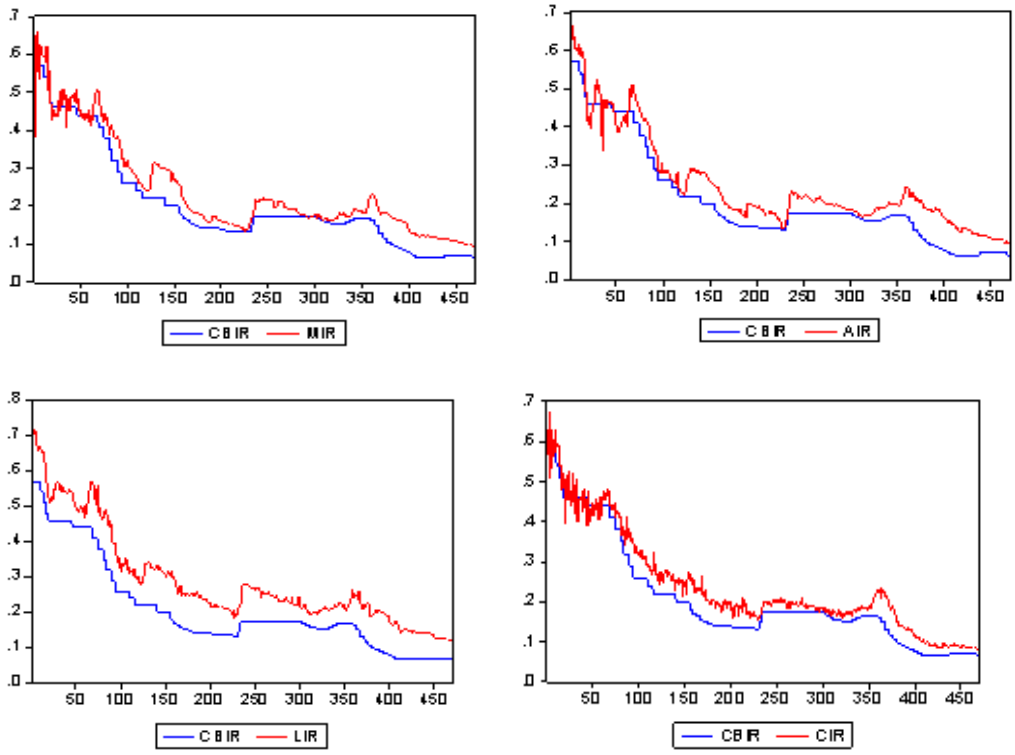
The set of data consists of interest rates between 2002 and 2010.

Table 6.1 : Used Data Set Information

Interest Rates	**Data Range**	**Sample Number**	**Codes**
Central Bank Interest Rate	04.01.2002-31.12.2010	470	CBIR
Mortgage Interest Rates	04.01.2002-31.12.2010	470	MIR
Automobil Interes Rates	04.01.2002-31.12.2010	470	AIR
Lending Interest rates	04.01.2002-31.12.2010	470	LIR
Commercial Interest rates	04.01.2002-31.12.2010	470	CIR

Over-night borrowing interest rate of CBRT (ON) and progress of every single credit interest rate are given in Graphic 6.1:

Graphic 6.1: Over-night borrowing interest rate of CBRT (ON) and the progress of each credit interest rates.



Resource: EViews Workfile

6.4 Results of Analysis and the Method

In literature, generally, Vector Auto Regression (VAR) models are used in measuring the impact of monetary policy changes on economic variables.

However, because a long-term relationship is expected between policy and banking interest rates in term of the effectiveness of monetary policy implementations, more co-integration analysis are made in literature regarding interest rate transitivity; and Vector Error Correction Model (VECM) is predicted.

Firstly, reactions that banking interest rates give to changes in policy interest rates will be measured with VAR analysis.

In this assignment, time series of 4 interest rates: CBIR (Central Bank interest rates), MIR (Mortgage interest rates), AIR (Automobile interest rates), LIR (Lending interest rates), and CIR (Commercial interest rates) will be used.

It is expected to construct VAR system and examine Pairwise Granger Causality between Central Bank interest rates and other interest rates. Further, impulse responses of CBIR resulted from one standard deviation shock to other rates will be interpreted.

a) VAR Model:

A VAR model describes the evolution of a set of k variables (called endogenous variables) over the same sample period (t = 1, ..., T) as a linear function of only their past evolution.

VAR-Models themselves do not allow us to make statements about causal relationships. However, VAR-Models allow interpretations about the dynamic relationship between the indicated variables.

b) Granger Causality:

Granger Causality is a much weaker argument than normal causality. It is a test approach to proof if a time series X contribute to the prediction of another series Y. Another words, X Granger causes Y if lagged values of X help to predict current and future values of Y. But it is not full explanation of Y but it only shows the contribution of X to predict Y.

c) Impulse Response:

The impulse response test shows the effects of an exogenous shock on the whole process over time. Therefore, one can detect the dynamic relationships over time.

6.4.1 Stationary Test

Before examining the relationship between policy interest rate and bank interest rate, whether interest rate series are stable or not must be searched. In analysis where instable series are used; problem of spurious regression may occur, t and F values which do not

reflect the real relationship between series and high R^2 value may be obtained and effects of temporary shocks may become continuous in these type of series.

Unit toot test of all series is made in the study; and first degree difference is taken to stabilize series.

Unit Root Test - LCBIR (Central Bank Interest Rate)

Table 6.2 : Unit Root Test for LCBIR

Null Hypothesis: D(LCBIR) has a unit root				
Exogenous: Constant				
Lag Length: 5 (Automatic based on SIC, MAXLAG=17)				
			t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic			-5.485630	0.0000
Test critical values:	1% level		-3.444250	
	5% level		-2.867563	
	10% level		-2.570041	

Resource: EViews Workfile

As we look at the probability value, it is shown that log return of CBIR does not unit root at confidence interval at alpha 0,05.

Unit Root Test- LMIR (Mortgage Interest Rate)

Table 6.3 : Unit Root Test for LMIR

Null Hypothesis: D(LMIR) has a unit root				
Exogenous: Constant				
Lag Length: 13 (Automatic based on SIC, MAXLAG=17)				
			t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic			-4.989693	0.0000
Test critical values:	1% level		-3.445267	
	5% level		-2.868011	
	10% level		-2.570281	

Resource: EViews Workfile

As we look at the probability value, it is shown that log return of MIR does not unit root at confidence interval at alpha 0,05.

Unit Root Test - LAIR (Automobil Interest Rate)

Table 6.4 : Unit Root Test for LAIR

Null Hypothesis: D(LAIR) has a unit root				
Exogenous: Constant				
Lag Length: 0 (Automatic based on SIC, MAXLAG=17)				
			t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic			-26.41446	0.0000
Test critical values:	1% level		-3.444280	
	5% level		-2.867576	
	10% level		-2.570048	

Resource: EViews Workfile

As we look at the probability value, it is shown that log return of AIR does not unit root at confidence interval at alpha 0,05.

Unit Root Test - LLIR (Lending Interest Rate)

Table 6.5 : Unit Root Test for LLIR

Null Hypothesis: D(LLIR) has a unit root				
Exogenous: Constant				
Lag Length: 0 (Automatic based on SIC, MAXLAG=17)				
			t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic			-23.66405	0.0000
Test critical values:	1% level		-3.444280	
	5% level		-2.867576	
	10% level		-2.570048	

Resource: EViews Workfile

As we look at the probability value, it is shown that log return of LIR does not unit root at confidence interval at alpha 0,05.

Unit Root Test - LCIR (Commercial Interest Rate)

Table 6.6 : Unit Root Test for LCIR

Null Hypothesis: D(LCIR) has a unit root				
Exogenous: Constant				
Lag Length: 13 (Automatic based on SIC, MAXLAG=17)				
			t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic			-4.339970	0.0004
Test critical values:	1% level		-3.445267	
	5% level		-2.868011	
	10% level		-2.570281	

Resource: EViews Workfile

As we look at the probability value, it is shown that first difference of LCIR does not unit root at confidence interval at alpha 0,05.

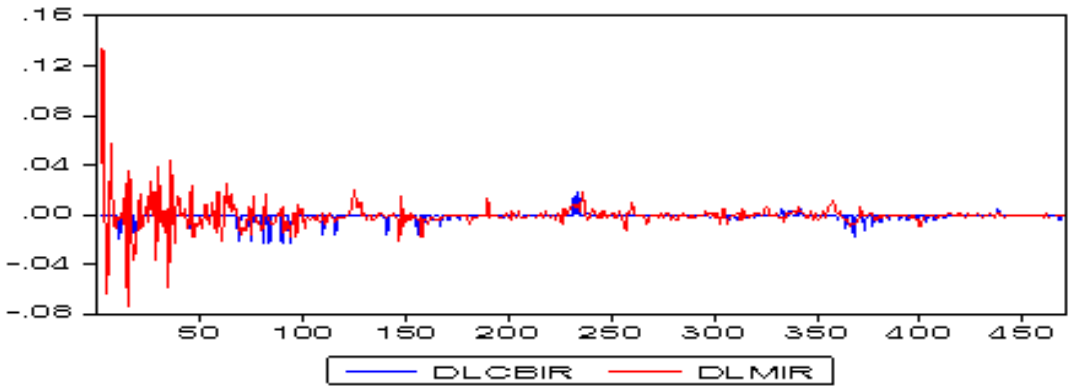
Results of the unit-root test show that not all interest rate series are in stability level; but they stabilize after their first differences are taken.

6.4.2 Vector Autoregressive Model

A-1) DLMIR - DLCBIR

As we look at the graph 3, it is shown that log return of DLMIR and DLCBIR mostly in same direction and volatility.

Graphic 6.2 : DLCBIR and DLMIR Changes.



Resource: EViews Workfile

A-2) Correlation and Covariance Analysis of Log Return of MIR-CBIR

- The correlation between DLMIR and DLCBIR is % 17 and the direction is positive.

Table 6.7 : Correlation of DLMIR & DLCBIR

	DLCBIR	DLMIR
DLCBIR	1	0.171444983
DLMIR	0.171444983	1

Resource: EViews Workfile

- The covarinace between DLMIR and DLCBIR is not strong.

Table 6.8 : Covariance of DLMIR & DLCBIR

	DLCBIR	DLMIR
DLCBIR	1.54E-05	7.68E-06
DLMIR	7.68E-06	0.0001305

Resource: EViews Workfile

A-3) Determination of Lag Length of DLMIR-DLCBIR

Before estimating VAR, we have to decide the maximum lag lenghts. We can base on any of the information criteria to determine the appropriate lags.

Table 6.9 : VAR Lag Order Selection Criteria of DLMIR-DLCBIR

VAR Lag Order Selection Criteria						
Endogenous variables: DLCBIR DLMIR						
Exogenous variables: C						
Date: 12/04/11 Time: 01:07						
Sample: 1 470						
Included observations: 444						
Lag	LogL	LR	FPE	AIC	SC	HQ
0	3312.297	NA	1.15e-09	-14.91125	-14.89280	-14.90397
1	3334.168	43.44583	1.06e-09	-14.99175	-14.93640	-14.96992
2	3347.403	26.17261	1.01e-09	-15.03335	-14.94110	-14.99697
3	3355.346	15.63435	9.96e-10	-15.05111	-14.92196	-15.00018
4	3371.822	32.28575	9.42e-10	-15.10731	-14.94126*	-15.04183
5	3374.559	5.336927	9.47e-10	-15.10162	-14.89867	-15.02158
6	3386.095	22.39671	9.16e-10	-15.13556	-14.89572	-15.04098
7	3387.615	2.937654	9.26e-10	-15.12439	-14.84765	-15.01526
8	3413.943	50.63912*	8.37e-10*	-15.22497*	-14.91132	-15.10128*

Resource: EViews Workfile

As seen from VAR Lag Length selection criteria, we can select lag =8 based on final prediction error, Akaike information criterion and Hannan-Quinn information criterion.

A-4) Pairwise Granger Casuality Test of DLMIR-DLCBIR:

Table 6.10 : Pairwise Granger Casuality Test for DLMIR-DLCBIR

Pairwise Granger Causality Tests			
Date: 12/04/11 Time: 01:09			
Sample: 1 470			
Lags: 2			
Null Hypothesis:	Obs	F-Statistic	Probability
DLMIR does not Granger Cause DLCBIR	459	2.65684	0.07126
DLCBIR does not Granger Cause DLMIR		10.4703	3.6E-05

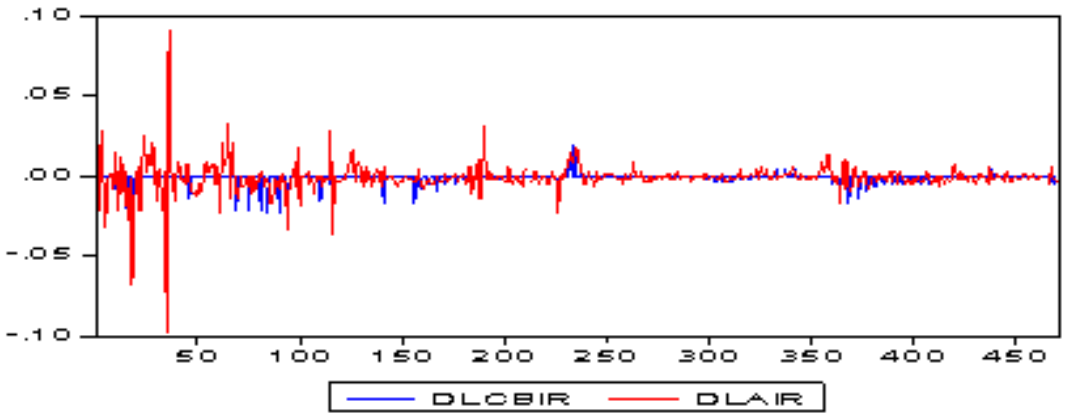
Resource: EViews Workfile

Probability value approximately equals to zero, we reject the null hypothesis, it means that DLCBIR does Granger Cause DLMIR.

B-1) DLAIR - DLCBIR

As we look at the graph 1, it is shown that log return of DLAIR and DLCBIR mostly in same direction and volatility.

Garphic 6.3 : DLCBIR and DLAIR Changes



Resource: EViews Workfile

B-2) Correlation and Covariance Analysis of DLAIR-DLCBIR

- The correlation between DLAIR and DLCBIR is % 17 and the direction is positive.

Table 6.11 : Correlation of DLAIR & DLCBIR

	DLCBIR	DLAIR
DLCBIR	1	0.175147654
DLAIR	0.175147654	1

Resource: EViews Workfile

- The covarinace between DLAIR and DLCBIR is not strong.

Table 6.12 : Covariance of DLAIR & DLCBIR

	DLCBIR	DLAIR
DLCBIR	1.54E-05	6.87E-06
DLAIR	6.87E-06	9.99E-05

Resource: EViews Workfile

B-3) Determination of Lag Length of DLAIR-DLCBIR

Before estimating VAR, we have to decide the maximum lag lenghts. We can base on any of the information criteria to determine the appropriate lags.

Table 6.13 : VAR Lag Order Selection Criteria of DLAIR-DLCBIR

VAR Lag Order Selection Criteria						
Endogenous variables: DLCBIR DLAIR						
Exogenous variables: C						
Date: 12/04/11 Time: 01:16						
Sample: 1 470						
Included observations: 444						
Lag	LogL	LR	FPE	AIC	SC	HQ
0	3244.703	NA	1.55e-09	-14.60677	-14.58832	-14.59950
1	3269.569	49.39580	1.41e-09	-14.70076	-14.64541*	-14.67893
2	3278.185	17.03686	1.39e-09	-14.72155	-14.62930	-14.68517
3	3283.353	10.17349	1.38e-09	-14.72681	-14.59767	-14.67588
4	3296.378	25.52221	1.32e-09	-14.76747	-14.60142	-14.70199
5	3296.983	1.179643	1.34e-09	-14.75217	-14.54923	-14.67214
6	3318.815	42.38705	1.24e-09	-14.83250	-14.59266	-14.73792*
7	3324.108	10.22840*	1.23e-09*	-14.83833*	-14.56158	-14.72919
8	3326.687	4.960065	1.24e-09	-14.83192	-14.51828	-14.70824

Resource: EViews Workfile

As seen from VAR Lag Length selection criteria, we can select lag =6 based on final prediction error, Akaike information criterion and Hannan-Quinn information criterion.

B-4) Pairwise Granger Casuality Test of DLAIR-DLCBIR

Table 6.14 : Pairwise Granger Casuality Test for DLAIR-DLCBIR

Pairwise Granger Causality Tests			
Date: 12/04/11 Time: 01:17			
Sample: 1 470			
Lags: 2			
Null Hypothesis:	Obs	F-Statistic	Probability
DLAIR does not Granger Cause DLCBIR	459	0.88850	0.41199
DLCBIR does not Granger Cause DLAIR		16.3093	1.4E-07

Resource: EViews Workfile

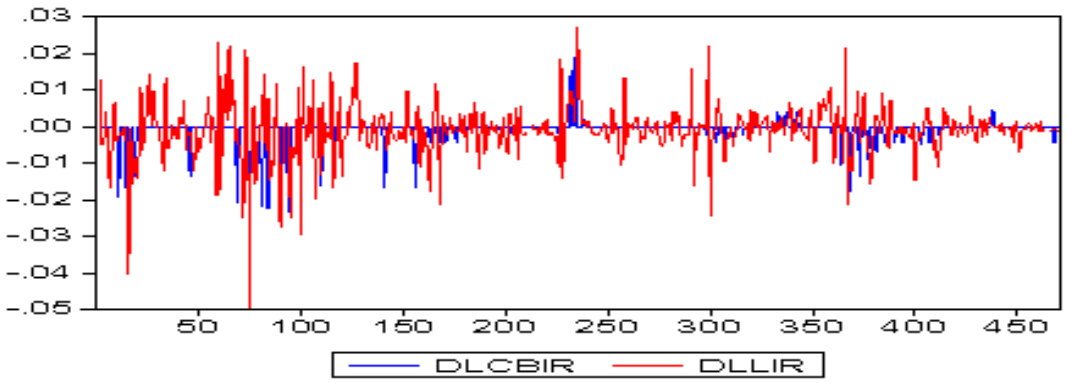
Probability value approximately equals to zero, we reject the null hypothesis, it means that

DLCBIR does Granger Cause DLAIR.

C-1) DLLIR - DLCBIR

As we look at the graph 1, it is shown that DLLIR and DLCBIR mostly in same direction and volatility.

Garphic 6.4 : DLCBIR and DLLIR Changes



Resource: EViews Workfile

C-2) Correlation and Covariance Analysis of DLLIR-DLCBIR

- The correlation between DLIR and DCBIR is % 17 and the direction is positive.

Table 6.15 : Correlation of Log Retun of DLLIR & DCBIR

	DLCBIR	DLLIR
DLCBIR	1	0.179632722
DLLIR	0.179632722	1

Resource: EViews Workfile

- The covarinace between log return of DLLIR and DCBIR is not strong.

Table 6.16 : Covariance of Log Return of DLLIR & DCBIR

	DLCBIR	DLLIR
DLCBIR	1.54E-05	5.38E-06
DLLIR	5.38E-06	5.83E-05

Resource: EViews Workfile

C-3) Determination of Lag Length of DLLIR-DCBIR

Before estimating VAR, we have to decide the maximum lag lenghts. We can base on any of the information criteria to determine the appropriate lags.

Table 6.17 : VAR Lag Order Selection Criteria of DLLIR-DLCBIR

VAR Lag Order Selection Criteria						
Endogenous variables: DLCBIR DLLIR						
Exogenous variables: C						
Date: 12/04/11 Time: 01:19						
Sample: 1 470						
Included observations: 444						
Lag	LogL	LR	FPE	AIC	SC	HQ
0	3358.282	NA	9.32e-10	-15.11839	-15.09994	-15.11111
1	3382.148	47.40996	8.52e-10	-15.20787	-15.15252*	-15.18605
2	3391.289	18.07569	8.32e-10	-15.23103	-15.13878	-15.19465
3	3403.484	24.00686	8.02e-10	-15.26795	-15.13880	-15.21702
4	3413.352	19.33627	7.81e-10	-15.29438	-15.12833	-15.22890
5	3414.554	2.343994	7.91e-10	-15.28178	-15.07883	-15.20174
6	3442.207	53.68691	7.11e-10	-15.38832	-15.14848	-15.29374*
7	3448.660	12.46942*	7.03e-10*	-15.39937*	-15.12262	-15.29023
8	3448.829	0.324970	7.16e-10	-15.38211	-15.06847	-15.25843

Resource: EViews Workfile

As seen from VAR Lag Length selection criteria, we can select lag =6 based on final prediction error, Akaike information criterion and Hannan-Quinn information criterion.

C-4) Pairwise Granger Casuality Test of DLLIR-DLCBIR

Table 6.18 : Pairwise Granger Casuality Test for DLLIR-DLCBIR

Pairwise Granger Causality Tests			
Date: 12/04/11 Time: 01:20			
Sample: 1 470			
Lags: 2			
Null Hypothesis:	Obs	F-Statistic	Probability
DLLIR does not Granger Cause DLCBIR	459	3.95845	0.01976
DLCBIR does not Granger Cause DLLIR		23.5281	1.9E-10

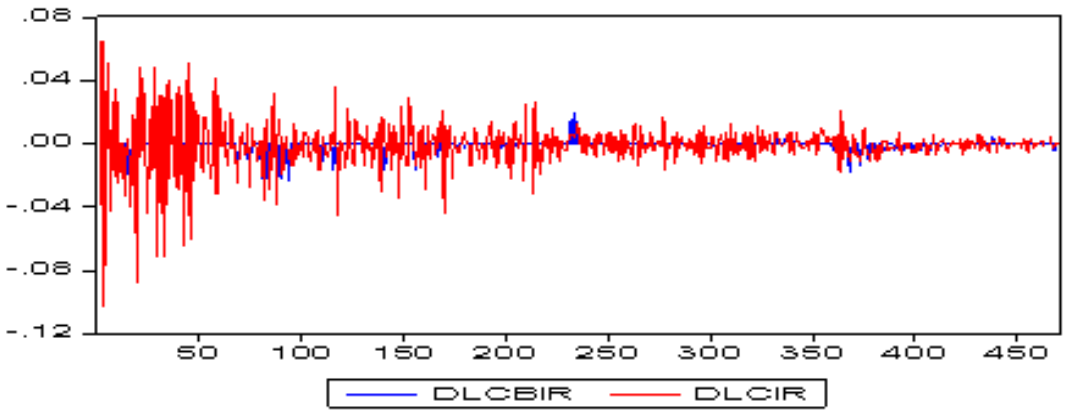
Resource: EViews Workfile

Probability value approximately equals to zero, we reject the null hypothesis, it means that DLCBIR does Granger Cause DLLIR.

D-1) DLCIR - DLCBIR

As we look at the graph 1, it is shown DLCIR and DLCBIR mostly in same direction and volatility.

Garphic 6.5 : DLCBIR and DLCIR Changes



Resource: EViews Workfile

D-2) Correlation and Covariance Analysis of DLCIR-DLCBIR

- The correlation between DLCIR and DLCBIR is %12 and the direction is positive.

Table 6.19 : Correlation of DLCIR & DLCBIR

	DLCBIR	DLCIR
DLCBIR	1	0.126100635
DLCIR	0.126100635	1

Resource: EViews Workfile

- The covarinace between DLCIR and DLCBIR is not strong.

Table 6.20 : Covariance of DLCIR & DLCBIR

	DLCBIR	DLCIR
DLCBIR	1.54E-05	8.08E-06
DLCIR	8.08E-06	0.000266762

Resource: EViews Workfile

D-3) Determination of Lag Length of DLCIR-DLCBIR

Before estimating VAR, we have to decide the maximum lag lenghts. We can base on any of the information criteria to determine the appropriate lags.

Table 6.21 : VAR Lag Order Selection Criteria of DLCIR-DLCBIR

VAR Lag Order Selection Criteria						
Endogenous variables: DLCBIR DLCIR						
Exogenous variables: C						
Date: 12/04/11 Time: 01:27						
Sample: 1 470						
Included observations: 444						
Lag	LogL	LR	FPE	AIC	SC	HQ
0	3062.212	NA	3.54e-09	-13.78474	-13.76629	-13.77746
1	3146.031	166.5050	2.47e-09	-14.14428	-14.08893	-14.12246
2	3168.481	44.39543	2.27e-09	-14.22739	-14.13515	-14.19102
3	3179.260	21.21683	2.20e-09	-14.25793	-14.12878	-14.20700
4	3199.871	40.38766	2.04e-09	-14.33275	-14.16671*	-14.26727
5	3201.560	3.292846	2.07e-09	-14.32234	-14.11939	-14.24231
6	3214.386	24.90188*	1.98e-09*	-14.36210*	-14.12225	-14.26752*
7	3217.489	5.995864	1.99e-09	-14.35806	-14.08131	-14.24892
8	3220.844	6.452676	2.00e-09	-14.35515	-14.04151	-14.23146

Resource: EViews Workfile

As seen from VAR Lag Length selection criteria, we can select lag =6 based on final prediction error, Akaike information criterion and Hannan-Quinn information criterion.

D-4) Pairwise Granger Casuality Test of DLCIR-DLCBIR

Table 6.22 : Pairwise Granger Casuality Test for DLCIR-DLCBIR

Pairwise Granger Causality Tests			
Date: 12/04/11 Time: 01:37			
Sample: 1 470			
Lags: 2			
Null Hypothesis:	Obs	F-Statistic	Probability
DLCIR does not Granger Cause DLCBIR	459	1.96513	0.14133
DLCBIR does not Granger Cause DLCIR		11.4256	1.4E-05

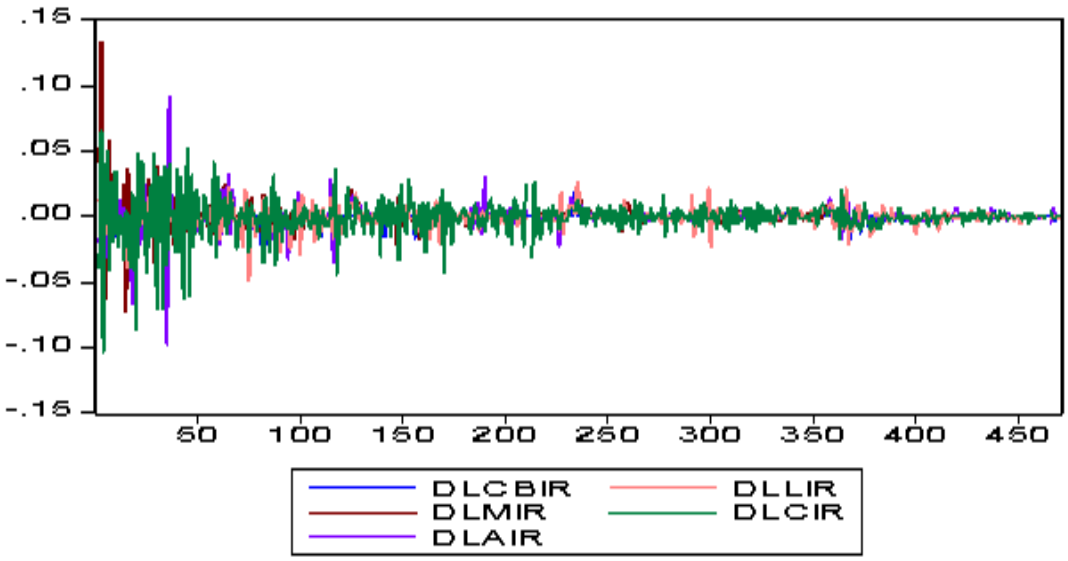
Resource: EViews Workfile

Probability value approximately equals to zero, we reject the null hypothesis, it means that DLCBIR does Granger Cause DLCIR.

E-1) DLMIR- DLAIR- DLLIR- DLCIR – DLCBIR Changes

As we look at the graphic 6.6, it is shown that DLMIR, DLAIR, DLLIR, DLCIR, and DLCBIR mostly in same direction and volatility.

Garphic 6.6 : DLLMIR- DLLAIR- DLLLIR- DLLCIR – DLLCBIR Changes



Resource: EViews Workfile

E-2) Correlation and Covariance Analysis of DLMIR- DLAIR- DLLIR- DLCIR- DLCBIR

- The correlation between log return of all series is positive.

Table 6.23 : Correlation of DLMIR- DLAIR- DLLIR- DLCIR- DLCBIR

	DLCBIR	DLMIR	DLAIR	DLLIR	DLCIR
DLCBIR	1	0.171444983	0.175147654	0.179632722	0.126100635
DLMIR	0.171444983	1	0.442200604	0.113389592	-0.018552165
DLAIR	0.175147654	0.442200604	1	0.254046642	0.199471591
DLLIR	0.179632722	0.113389592	0.254046642	1	0.056483277
DLCIR	0.126100635	-0.018552165	0.199471591	0.056483277	1

Resource: EViews Workfile

- The covarinace between all series is not strong.

Table 6.24 : Covariance of DLMIR- DLAIR- DLLIR- DLCIR- DLCBIR

	DLCBIR	DLMIR	DLAIR	DLLIR	DLCIR
DLCBIR	1.54E-05	7.68E-06	6.87E-06	5.38E-06	8.08E-06
DLMIR	7.68E-06	0.0001305	5.05E-05	9.89E-06	-3.46E-06
DLAIR	6.87E-06	5.05E-05	9.99E-05	1.94E-05	3.26E-05
DLLIR	5.38E-06	9.89E-06	1.94E-05	5.83E-05	7.04E-06
DLCIR	8.08E-06	-3.46E-06	3.26E-05	7.04E-06	0.000266762

Resource: EViews Workfile

E-3) Determination of DLMIR- DLAIR- DLLIR- DLCIR- DLCBIR

Before estimating VAR, we have to decide the maximum lag lenghts. We can base on any of the information criteria to determine the appropriate lags.

Table 6.25 : VAR Lag Order Selection Criteria of DLMIR- DLAIR- DLLIR- DLCIR- DLCBIR

VAR Lag Order Selection Criteria						
Endogenous variables: DLCBIR DLMIR DLAIR DLLIR DLCIR						
Exogenous variables: C						
Date: 12/04/11 Time: 01:48						
Sample: 1 470						
Included observations: 444						
Lag	LogL	LR	FPE	AIC	SC	HQ
0	7599.092	NA	9.58e-22	-34.20762	-34.16150	-34.18943
1	7798.329	393.0888	4.37e-22	-34.99247	-34.71573	-34.88334
2	7903.094	204.3390	3.05e-22	-35.35178	-34.84441*	-35.15169*
3	7939.687	70.54921	2.90e-22	-35.40400	-34.66601	-35.11297
4	7980.971	78.66205	2.69e-22	-35.47735	-34.50874	-35.09537
5	8017.647	69.05613	2.56e-22	-35.52994	-34.33071	-35.05702
6	8072.098	101.2995	2.24e-22	-35.66260	-34.23276	-35.09874
7	8115.598	79.94604	2.06e-22	-35.74594	-34.08547	-35.09112
8	8154.031	69.76756*	1.94e-22*	-35.80645*	-33.91536	-35.06069

Resource: EViews Workfile

As seen from VAR Lag Length selection criteria, we can select lag =2 based on final prediction error, Akaike information criterion and Hannan-Quinn information criterion.

E-4) Pairwise Granger Casuality Test of DLMIR- DLAIR- DLLIR- DLCIR- DLCBIR

Table 6.26 : Pairwise Granger Casuality Test for DLMIR- DLAIR- DLLIR- DLCIR- DLCBIR

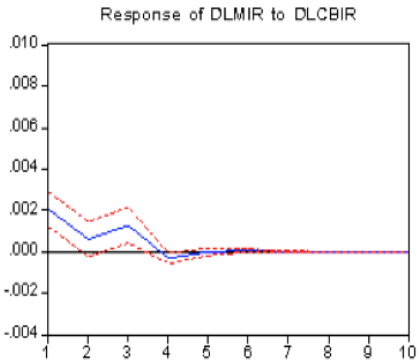
Pairwise Granger Causality Tests			
Date: 12/04/11 Time: 01:50			
Sample: 1 470			
Lags: 2			
Null Hypothesis:	Obs	F-Statistic	Probability
DLMIR does not Granger Cause DLCBIR	459	2.65684	0.07126
DLCBIR does not Granger Cause DLMIR		10.4703	3.6E-05
DLAIR does not Granger Cause DLCBIR	459	0.88850	0.41199
DLCBIR does not Granger Cause DLAIR		16.3093	1.4E-07
DLLIR does not Granger Cause DLCBIR	459	3.95845	0.01976
DLCBIR does not Granger Cause DLLIR		23.5281	1.9E-10
DLCIR does not Granger Cause DLCBIR	459	1.96513	0.14133
DLCBIR does not Granger Cause DLCIR		11.4256	1.4E-05
DLAIR does not Granger Cause DLMIR	459	9.19496	0.00012
DLMIR does not Granger Cause DLAIR		8.02513	0.00038
DLLIR does not Granger Cause DLMIR	459	20.6152	2.7E-09
DLMIR does not Granger Cause DLLIR		11.6126	1.2E-05
DLCIR does not Granger Cause DLMIR	459	17.7900	3.6E-08
DLMIR does not Granger Cause DLCIR		2.41588	0.09044
DLLIR does not Granger Cause DLAIR	459	18.9087	1.3E-08
DLAIR does not Granger Cause DLLIR		18.5591	1.8E-08
DLCIR does not Granger Cause DLAIR	459	13.0158	3.2E-06
DLAIR does not Granger Cause DLCIR		4.35209	0.01342
DLCIR does not Granger Cause DLLIR	459	3.69854	0.02551
DLLIR does not Granger Cause DLCIR		5.04046	0.00684

Resource: EViews Workfile

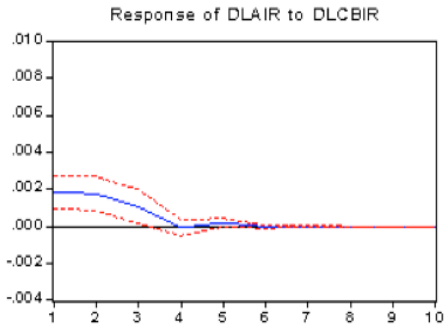
- Probability value approximately equals to zero, we reject the null hypothesis, it means that DLCBIR does Granger Cause DLMIR.
- Probability value approximately equals to zero, we reject the null hypothesis, it means that DLCBIR does Granger Cause DLAIR.
- Probability value approximately equals to zero, we reject the null hypothesis, it means that DLCBIR does Granger Cause DLCIR.
- Probability value approximately equals to zero, we reject the null hypothesis, it means that DLCBIR does Granger Cause DLLIR.

E-5) Impulse Response of DLMIR- DLAIR- DLLIR- DLCIR- DLCBIR

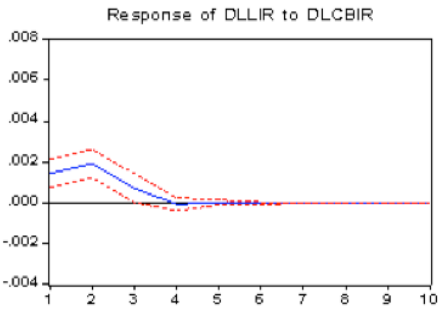
Graphic 6.7 :Impact of shocks that come to CB interest rates on other interest rates



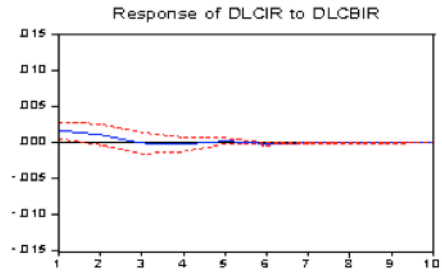
Reaction that mortgage loan interest rate show to change in Central Bank policy interest rate is shown on the graph. Which mortgage interest rate is high at the beginning of 2002 is seen. With the decline in Central Bank policy interest after February 2002, mortgage interest rate starts to fall as well. This means fall of policy interests affects mortgage interest rate positively on the direction of decline. We can see the effect of each policy interest fall on mortgage loan interest.



Reaction that automobile loan interest rate shows to the change that is made in Central Bank policy interest rate (shock) can be seen on the graph. Down-ward fall movement in policy interest rates is seen in automobile loan interest rates as well. Automobile interest rates create downward positive effect on changes in policy interest rates. Downward and slow transition is observed which is different from mortgage interest rates.



Reaction that consumer loan interest rate shows to the change that is made in Central Bank policy interest rate can be seen on the graph. With the shock coming to the policy interest rate, Consumer loan interest rate; starts to move upwards. After 1 period starts to move downward. The transition of policy interest rates to lending loans more delayed and at a lower level.



Reaction that commercial loan interest rate shows to the change that is made in Central Bank policy interest rate can be seen on the graph. Commercial loan interest rate starts to move downwards with the positive shock that comes to policy interest rate.

Resource: EViews Workfile

6.5 Result and Suggestions

Changes made in monetary policy interest rates affect financial markets by changing market interest rates; and then they start to affect consumption, saving and investment decisions of the reel sector through monetary transmission channels as banks change their deposit and loan interest rates. Length and strength of monetary policy implementations to affect market ad banking interest rates is very important for the effectiveness of monetary transmission mechanism.

There is not a certain consensus on the factors affecting interest rate transitivity. However, lots of factors are mentioned in literature such as; competition among banks, improvement of money markets and financial systems, financial openness, asymmetric information, adjustment and shifting (transition) costs, ownership structure of banking system and balance sheet structure.

Together with the regime of inflation targeting that had been implemented since 1990s, short-term interest rates are started to be used as a main policy instrument; and a wide literature has been built up. The main conclusion obtained from empirical studies made about this topic is that effects of interest rates are not seen often in the short run, this means that they do not respond to changes exactly. Transitivity occurs highly in the long run; but a certain conclusion is not obtained about it. Also, it is observed that transitivity speed and level vary from country to country and according to the type of the deposit or the loan.

In this study, transitivity from changes in CBRT over-night borrowing interest rate which is the reference interest rate to the loan interest rates of the banks (mortgage, automobile, lending and commercial) in the period starting from 2002 to 2010 in which inflation targeting has started being used in Turkey is examined.

When we look at the relationship between the Central Bank Interest Rates and Mortgage Interest Rates, we observe that the fastest transitivity speed belongs to the mortgage credits. This situation is a result of relatively faster increase of mortgage credit demand and supply compared to other credits and of mortgage credit market to be more competitive than other markets.

When we look at the relationship between the Central Bank Interest Rates and Automobile Interest Rates, long term transitivity speed is lower than other consumer credits, policy interest reductions cannot be reflected to these credits because risk of starting legal proceedings in credits in automobile credit market is lower and effects of policy interest reductions are trying to be reflected by lower speed of transitivity.

When we look at the relationship between the Central Bank Interest Rates and Lending Interest Rates, it is observed that the level of transitivity speed becomes lower as consumer loans started to be used after the 2000s. Since consumers wanted to use these loans to pay off more debts, demand elasticity decreased for this type of credit; and it caused banks to reflect changes in policy interest rates to consumer loans at a lower level and more slowly.

When we look at the relationship between Central Bank Interest Rates and Commercial Interest Rates, in these loans, short-term transitivity level and transitivity speed is high in commercial interest rates like mortgage credit interest rates. This is because downwards movement in policy interest rates is relatively perceived as good and positive effects are experienced together with recovery in economic activities.

Consequently, it can be said that in the period when credit interest rates are analyzed, transitivity to interest rates actualizes fast and high in the long run in Turkey. In this period where policy interest rate generally falls, it is observed that transitivity to credit interest rates is in high levels.

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