# The independence of central bank in view of Rogoff: The Turkish experience

By

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**Abstract:**

*According to Rogoff, economic variables may fluctuate due to changes in economic policies. In the long run, economic policies result in increases in fluctuations in inflation rate without increasing average outp level. From the perspective of Rogoff, problems regarding inflation instability can be overcame by giving the authority of making monetary policy to an independent institution. This study analyzes "legal independency" of the CBRT according to the theoretical framework developed by Rogoff. In addition, we tested independency of the CBRT by using Cukierman index, and concluded that independency of the CBRT has increased after a new law introduced in April 2001. Our econometric tests indicated that there is a negative relationship between inflation rate and independency of the CBRT. We could not find, however, any evidence to accept or reject the hypothesis of "an independent central bank results in a stable output level."*

**Keywords:** *Independency of Central Bank, Monetary Policy, Time Inconstancy*
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"Law was not born of government, but everything belonging to governance was born of law" (Hayek)

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## 1. Introduction

In contemporary monetary policy, it is generally accepted that there is a positive correlation between the independence of central bank and stable inflation. While an independent, central bank grants success in fighting inflation, the real output brings instability along with it. As Rogoff (1985) emphasized with his prominent study on the subject, the fluctuations in the real output increase while an independent central bank/monetary authority possesses a lower inflation rate in average. According to Rogoff, such conservative monetary authorities can only achieve stability in inflation. Empirical studies found negative correlation between independent central banks and the rate of inflation (Pollard, 1993; Prast, 1996).

The relation between independent central bank and lower inflation is a subject of theory of business cycle. While the two models proposed by this theory, the relation between independent central bank and lower inflation rate is analyzed. The first model is called *choice approach, which* is perspective of Rogoff. According to his model, monetary policy power is left to a conservative central bank. A central bank disliking inflation does not need to consider the economic fluctuations, because it needs to create a low inflation rate. This choice will lead an independent central bank to be more successful in fighting with inflation. Thus, monetary policy should be free from political pressures. The second approach is Rrawls' approach that describes the basis of independent monetary authority with institutional/ constitutional arrangements. The understanding of justice and freedom of Rawls (1975) defines the necessity of why monetary authority should be independent. According to Rawls, the main problem is the distribution of wealth. It is not possible to create an absolute criterion for equality in the distribution of wealth. Social and economic inequalities must be designed according to following critera:

      i)      the less privileged ones will be more advantages

      ii)     duties and roles  should be clearly assigned under the conditions that holds equal opportunity.

In this sense, it is more logical to hand over political power to an independent monetary authority to execute economic policy so that it can fight inflation more effectively. Independent monetary authority will provide maximum benefit and equal opportunity by creating relatively low inflation for those who are least privileged. Consequently, according to Ralws' logic, it can be deduced that the independence of monetary authority should be maintained before the founding contract or constitution of a nation is being written (Hayo, 1997, 5).

The main aim of the study is not analyzing the Rawls' approach. The study of Rawls lays the intellectual foundation of independent monetary authority for lower inflation (Gorowitz, 1994, 267-281). According to both approaches, lower inflation and an independent monetary authority will maximize the social benefit. However, the approach of Rogoff will be our starting point in analyzing the relation between an independent monetary authority and inflation rate.

This paper consists of three parts. In the first part, Rogoff's model will be revealed after explaining how economic policies increase inflation. After that, the concept of independence of Central Bank of Republic of Turkey (CBRT) will be
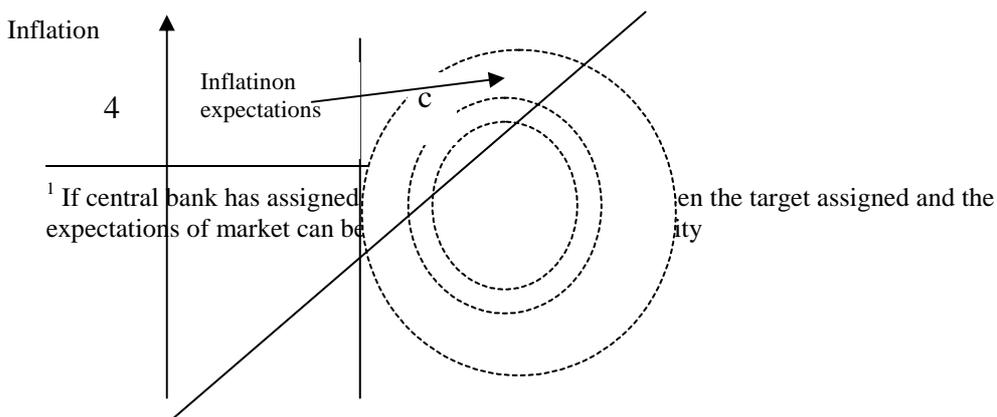
calculated and evaluated. The independence of central bank played a critical role in success of disinflation programs in 1990s. The more independent central banks become the more credibility they will have. Thus, as the credibility of central banks increases, it is going to be easier to reach the targeted inflation level. In third part, the empirical relation between the independence of monetary authority and output (or inflation) will be studied for 1990 - 2004 period.
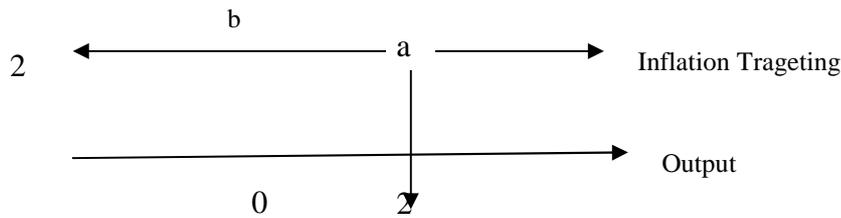
## 2. Time Inconsistency and Credibility in Monetary Policy

Credibility as a term means relying on the subject in practice. Even so, it is not easy to measure the credibility of monetary authority[1]. If a monetary authority is credible in its past policies, then, economic units trust the monetary authority. In the literature, credibility is defined three ways: i) strength of inflation hatred, ii) motivation of compatibility, and iii) declaration of monetary policy. In some economic models, credibility is defined as the degree that the monetary authority dislikes inflation. In some others, however, it is defined as following the commitments that monetary authority promises. According to some economist, as long as monetary authority does not bind itself with commitments, it is not reliable (Persson&Tabellini, 1990). Along with this, the degree of commitment of monetary authority to price stability is synonym of credibility as well. Blinder (1998) conducted a survey with 84 OECD country monetary authorities and found a correlation between credibility and targeting price stability.

The major factor influencing the credibility is time consistency. Time inconsistency is the change of policies laid down for the period (t+1) in period (t) (Blanchard&Fisher, 1989, 567). The reason that a time inconsistency arises is benefit maximization intention of political authority (McCallum, 1995).

A monetary authority depending on a political authority can maximize the benefit only by maintaining an output level over natural output level. The way to do this is to create an unexpected inflation. Thus, while real wages are falling, output will exceed natural output, however, since economic units are rational they will either perceive this attempt of monetary policy or conduct a strategy of punishment in a consistent game. The result will be a higher inflation with a growth as much as natural output level.



[1] If central bank has assigned ... en the target assigned and the expectations of market can be ... ity

2 ← b ——— a ———→  Inflation Trageting

——————————————→ Output

0        2

**Graph 1.Time Inconsistency**

Graph 1 shows the gains of monetary authority and targeted magnitudes. Dotted circles, indifference curves, represent the gains of monetary authority. As radius of indifference curve decrease, gain increases. The benefit of monetary authority depends on inflation and output growth.

Let us suppose monetary authority targets 2 % inflation. If economic units rely on the commitments of monetary authority, they will arrange their contracts accordingly. Consequently, the economy will be stabilized at the level of natural output at 2% inflation rate. Monetary authority aims to maximize benefits by bringing output up to a level exceeding natural output. To do so, an unexpected inflation must be created. Thus, inflation rate will go up to 4 % and the realized output exceeds natural output. The equilibrium will be maintained at a lower indifference curve and thus, the monetary authority will increase its gains. Although monetary authority aims a 2 % inflation rate, it exceeded this target in order to maximize its benefits. As a result, time inconsistency takes place[2]

Inflation

4        d

2        a
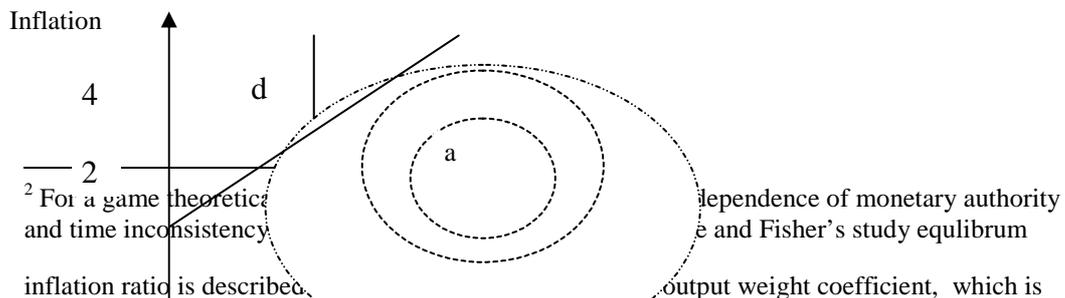
[2] For a game theoretica                    dependence of monetary authority
and time inconsistency                    e and Fisher's study equilbrum

inflation ratio is described.                    output weight coefficient,  which is

usually zero for a conservative monetary authority. In this case, the inflation ratio is expected to be zero otherwise, if $\mu$ is different than zero, the risk of surprise inflation emerges. In the proceeding parts notion b will be used in place of $\mu$. Because $\mu$ for a political authority having the above benefit will not be zero, there will always be inclination of political authorities to deceive economic actors. This is nothing but a time inconsistency.
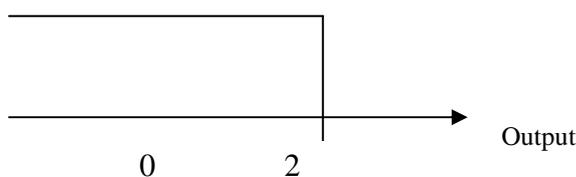
**Graph 2. Time Consistency**

As it is shown in Graph 2, economic units will notice this attempt and will not trust on the monetary authority. Therefore, they will form their expectations accordingly. As a result, the equilibrium will be maintained at point (d), a higher inflation will be obtained to target at (a) point and output will be realized as equal to its natural growth.

Distrust of economic units on monetary authority results from monetary authority's individual polices (unbinding policies). Policy makers are not committing themselves with individual policies, because such policy implementations have an inflation trend. In other words, they have a potential to create an unexpected inflation. Since rational economic units do not rely on the monetary authority, they shift their expectations according to the behavior of monetary authority. The result of such a process is inflation and instability.

In contemporary economic policies, the policy of promises or rules is proposed to overcome the issue of time inconsistency. The policy of rules is to formulate the growth of future money[3]  or putting monetary authority/policy under a legal obligation of a certain level of inflation. The action of monetary authority is designated beforehand with the rule. With such a policy, the issue of time inconsistency will be overcame and thus, credibility will be established.

### 3. A Simple Model for Independence of Monetary Authority

The model used in this paper is an extension of Rogoff (1985) model and the supply structure of economy or output growth rate (y) is determined according to Lucas supply curve.

$$y_t = \pi_t - \pi_t^e + \varepsilon_t \tag{1}$$

In above equation, $\pi$ is inflation, $\pi^e$ expectation of inflation, $\varepsilon$ is normally distributed shock term whose average is zero and variance is fixed. When $\pi_t = \pi_t^e$, the amount of output in economy will be equal to the amount of natural output. In this model, the expectations (especially, those about wages) are determined before shocks and policy makers' decision on the inflation rate. Thus,

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[3] Rule policy can be shown with an example. The amount of money will grow according to equation below; $\Delta M_t = 0.01 + 0.5(y_{t-1} - 0.05)$  (*)

if  (*) is valid for each t=1,2,3…. Period, the designated formula is a rule policy (Akçay)

with respect to timing, $\pi_t^e, \varepsilon$ come first and the policy variable, $\pi_t$, decided later by policy maker. Under these assumptions, equilibrium output growth rate in the economy, the policy maker determines inflation and expectations of inflation.

The aims of the policy maker, inflation and output growth rate, can be shown with the help of loss function. The loss function described by equation (2) shows targets of the policy maker. The coefficient $b$ in the loss function is output importance coefficient of political authority. Any deviation form these targets amplifies loss of policy maker.

$$L = \frac{1}{2}\pi_t^2 + \frac{b}{2}(y_t - k)^2 \qquad\qquad \text{b>0 \quad ve \quad k>0 \quad dır.}$$

(2)

When equation (1) is placed in equation (2), the values of $\pi_t, \pi_t^e, y_t$ are obtained by taking the derivative of $\pi_t$ and equalating it to zero under the assumption of rational expectations.

$$\frac{dL}{d\pi_t} = \frac{2}{2}\pi_t + \frac{2b}{2}(\pi_t - \pi_t^e + \varepsilon_t - k) = 0$$

(3)

According to assumption of rational expectation the equation (3) $\pi_t = \pi_t^e$ can be written as follows,

$$\pi_t + b(\pi_t - \pi_t^e + \varepsilon_t - k) = 0$$
$$\pi_t = -b\varepsilon_t + bk$$

(4)

If the expected value of equation (4) is taken:

$$E(\pi)_t = -bE(\varepsilon_t) + bk$$

As $E(\varepsilon_t) = 0$, the inflation expectations of rational individuals can be found as follows;

$$E(\pi_t) = \pi_t^e = bk$$

(5)

Since the economic units having rational expectations consider the inflationist impacts of economic policies into account (Hayo, 1997), the policy maker should consider this behavior while calculating the real inflation as well. Equilibrium inflation as a political variable which minimizes the loss function of policy maker can be found by putting inflation expectation $E(\pi_t) = \pi_t^e = bk$ in to equation (3).

$$\pi_t + b(\pi_t - bk + \varepsilon_t - k) = 0$$

If necessary adjustment is done, we have:

$$\frac{-(1+b)\pi_t}{-(1+b)} = \frac{b\varepsilon_t}{-(1+b)} - \frac{k(1+b)b}{-(1+b)}$$

$$\pi_t = kb - \frac{b}{1+b}\varepsilon_t$$

(6)

Equation (6) emphasizes two results about the outcomes of economic policies. First, the term "bk" shows the inflationist trend of economic policies.[4] Second part is a term of stability, which shows the diminishing impact of economic policies on inflation (Cukierman, 1994, 414-450).

Equilibrium income level can be calculated by putting the values obtained in equation (5) and (6) in equation (1).

$$y = bk - \frac{b}{1+b}\varepsilon - bk + \varepsilon$$

$$y = (\frac{-b+1+b}{1+b})\varepsilon$$

$$y = \frac{1}{1+b}\varepsilon$$

(7)

$$E(y) = \frac{1}{1+b}E(\varepsilon) = \frac{1}{1+b} = 0$$

(8)

Equation (7) and (8) show the result related to equilibrium income level according to the rational expectations assumption of Rogoff model. The expectation of economic units about equilibrium income level is equal to natural growth rate of the economy. It is necessary to look at variances of inflation and output in order to analyze the effects of economic policies on output and inflation.

$$\text{var}(\pi) = \frac{\sum(bk - \frac{b}{1+b}\varepsilon - bk)^2}{n} = \frac{b^2}{(1+b)^2}\frac{\sum(\varepsilon)^2}{n}$$

$$\text{var}(\pi) = \frac{b^2}{(1+b)^2}\sigma_\varepsilon^2$$

(9)

$$\text{var}(y) = \sigma_y^2 = E(y - E(y))^2 = \frac{\sum[(\frac{1}{1+b}\varepsilon) - 0]^2}{n}$$

$$\text{var}(y) = \frac{1}{(1+b)^2}\sigma_\varepsilon^2$$

(10)

Variances of both inflation and output depend on the coefficient "*b*" which is importance that policy maker put on the output. As "*b*" grows, the output is stabilized and inflationist trend is accelerated.

If policymaker declares policies to be implemented against the shocks at the beginning of the term, and behaves accordingly, the inflationist trend of economic policies is eliminated (Schultz, 1996). Nevertheless, assumption made

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[4] As political authority tries to grow the economy beyond limits, it creates budget deficit. When this deficit is met by source of monetary authority, inflationist trend emerges. See Fraser,1994, Kissmer&Wagner, 1998

in this paper accepts that policy maker has no such intention, because policy maker has incentive to divert from its commitments.

According to Rogoff, the inflationist trend in economic policies can only be overcome by empowering an independent representative in making monetary policy. Such an application will increase social welfare. Policy maker should replace the representative and policy at the end of the term or at the end of a designated period.

It is accepted that the importance the designated representative puts on the fluctuation on output ($\hat{b}$) is different from that of policy makers. The representative will determine its own policies according to the shocks that may appear. The policy that representative adopts is the best one for policy maker during that period. Consequently, the problem for the policy maker can be described by equation (11) below: policy maker will assign a representative that can minimize the loss function.

$$\min E\left(L\left(\hat{b},b\right)\right) = E\left[\frac{1}{2}\left(\hat{b}k - \frac{\hat{b}}{1+\hat{b}}\varepsilon\right)^2 + \frac{b}{2}\left(\frac{1}{1+\hat{b}}\varepsilon - k\right)^2\right]$$

(11)

The designated representative will follow the policy rule indicated in equation (6), but it will implement policy rule choosing $\hat{b}$ instead of b. If policy maker chooses a representative that will minimize loss function, fluctuations in inflation will slow down. If $\hat{b}$ in equation (11) is calculated, it is found that $0 < \hat{b} < b$.

$$E(L(\hat{b},b)) = \frac{1}{2}[\hat{b}^2 k^2 + 2\hat{b}\frac{\hat{b}}{1+b}Cov(k,\varepsilon) + \frac{\hat{b}^2}{(1+b)^2}E(\varepsilon^2)] + \frac{b}{2}[\frac{1}{(1+b)^2}E(\varepsilon^2) + 2\frac{1}{(1+b)^2}Cov(k,\varepsilon) + k^2]$$

$$Cov(k,\varepsilon) = 0,$$

$$\min E(L(\hat{b},b)) = \frac{1}{2}(\hat{b}^2 k^2 + \frac{\hat{b}^2}{(1+b)^2}\sigma_\varepsilon^2) + \frac{b}{2}(\frac{1}{(1+b)^2}\sigma_\varepsilon^2 + k^2)$$

$$\frac{dE(.)}{d\hat{b}} = \hat{b}k^2 + [\frac{\hat{b}^2(1+\hat{b}) + (1+\hat{b})^2\hat{b}}{(1+b)^4}]\sigma_\varepsilon^2 - \sigma_\varepsilon^2 b(1+\hat{b})^{-3} = 0$$

$$\hat{b}k^2 + [\frac{\hat{b}^2 + (1+\hat{b})\hat{b}}{(1+\hat{b})^3}]\sigma_\varepsilon^2 = \sigma_\varepsilon^2 b(1+\hat{b})^{-3}$$

$$\frac{\hat{b}k^2(1+\hat{b})^3}{\sigma_\varepsilon^2} + 2\hat{b}^2 + \hat{b} = b \quad \text{ise}$$

$$\text{ise} \quad b - \hat{b} = \frac{\hat{b}k^2(1+\hat{b})^3}{\sigma_\varepsilon^2} + 2\hat{b}^2 \quad \Rightarrow \quad \text{a>0, k>0, b>0}$$

(12)

$$b - \hat{b} > 0 \Rightarrow b > \hat{b}$$

(13)

Equation (13) clearly shows the deduction of Rogoff's idea, which is $0 < \hat{b} < b$. The output importance coefficient of policy maker is greater than that of independent representative. However, the fluctuations in inflation will be smaller for an independent monetary policy representative. The underlying reason for this is the empowerment of independent monetary higher inflation hatred coefficient. According to Rogoff, even if the independent monetary authority decreases fluctuations in inflation, it will increase the output fluctuations. Equations (9') and (10') below show this as follow:

$$\text{var}(\pi)' = \frac{\hat{b}^2}{(1+\hat{b})^2}\sigma_\varepsilon^2$$

(9')

$$\text{var}(y)' = \frac{1}{(1+\hat{b})^2}\sigma_\varepsilon^2$$

(10')

When var(y)<var(y)' then, var($\pi$)>var($\pi$)'.

## 4. The Independence of Monetary Authority in Turkey

In the first part of the paper, it has been revealed that inflation stability is maintained through the concept of independence of monetary authority with the help of theoretical framework developed by Rogoff. This model leaves the power to execute monetary policy to the monetary authority for a designated period. During this period, monetary authority is completely independent from political authority. From this perspective, the independence of central bank can be assessed according to legal and economic conditions (Baydur & Süslü, 2002). In order to maintain stability of inflation, laws related to central bank should authorize monetary authority/central bank to use freely monetary policy instruments. Being entitled by law will not itself be enough to grant the independence of monetary authority. Moreover, an independent monetary authority should not have financial difficulties and balance of payment problems.

CBRT is the single monetary authority in Turkey. Rediscount rate is not the only policy instrument that CBRT can use. Markets can be considered as an instrument of CBRT as well. CBRT can alter exchange and interest rates in

accordance with the targets. For example, CBRT has become an efficient actor of interbank markets with growing amount of public bonds by starting open market operations in 1986. Interbank monetary market became effective on April 1996. Foreign exchange markets opened in CBRT in 1988. CBRT has been able to influence exchange rates and interests with help of establishment of İstanbul Stock Exchange (ISE), development of secondary bond market and the other markets (Keyder, 2002, 78-98). The necessary legal framework was improved in the1990s and was complete in 2001. In other words, CBRT has full legal control of its instruments.

Even though the legal control over these instruments is absolute, using them efficiently for the aims of monetary authority depends on the economic conditions of monetary authority. In the period between 1980-1990 and 2000s, public deficit and balance of payments problems stayed as instability of Turkish economy and limited effective use of monetary policy.

Public deficit, foreign deficit and saving deficits have resulted in economic imbalance (especially instability in inflation) in Turkey for years. The misuse of fiscal, and monetary policies have been considered as the factors damaging the independence of CBRT. Therefore, some limitations were imposed on the use of source of CBRT by Treasury Office, which was secured by a protocol signed in 1997. From 1998 on, Treasury Office was prohibited to get loans from CBRT. The structural risks (banking sector and lack of social consensus) held by the austerity programme, which implemented in 1999, the abnormal depreciation in balance of payment caused by unpredicted external shocks (the rise in oil prices) and inconsistency between interest-exchange rate and inflation turned into a deep financial crisis in November 2000 and February 2001. These crises led to intensively use of CBRT sources as the final credit post. In 2001, a 21quadrillion TL was transferred to the banking sector.

The struggle to overcome the crisis of 2000 and 2001 led to signing a new Letter of Intention with IMF (Letter of Intention, 3-5-2001). This letter started a new initiative regarding to independence of CBRT. The willingness of CBRT to use the inflation itself as an anchor along with monetary anchor in this period accentuated the concept of independence. Because, as shown above, the importance that an independent monetary authority puts on inflation is greater then the political authority ($b < \hat{b}$) . "As the first major step of the process, the LAW of Central Bank was amended so as to grant operational independence to the Central Bank as part of its primary duty to maintain price stability. The amendment involves many significant prerequisite: assigning price stability as primary duty of CBRT; official reporting to the government the developments recorded in the implementation of this target; appointing to term of office of not only Central Bank President and Governing Board but also of Via-Presidents for a fixed term; and establishment of Monetary Policy Committee to recommend on planning and implementation of monetary policies. Above changes forbade CBRT to give any direct loan (including buying state bills from primary markets) after the transitory period that ended in the beginning of November 2001. The Central bank aims strengthening the technical infrastructure necessary for the implementation of inflation targeting, including the improvement of inflation

prediction techniques and the procedures of monitoring monetary policy and improvement of accountability" (TCMB, 2001)

All these requirements describe the transfer of the process of monetary policy implementation from political authority to an independent authority, which was achieved by a new law passed in 2001. According to Article 4 of the law passed on April 25, 2001, the primary mission of the CBRT stated as follow: "The primary mission of the Bank is to maintain price stability. To do so, the Bank decides on the monetary policy to follow and monetary policy instruments to use directly itself. The bank reinforces the growth and employment policies of Government on the condition not to conflict with the target of price stability.[5]

The CBRT is equipped with many rights to achieve the aims of fighting with the inflation. While the law passed in 2001 defines the primary duty of the CBRT as the fight against inflation, it renders the CBRT independent to decide on monetary policy. The new law can be seen as a developed version of the former one. The CBRT decides on the monetary policy with the political authority: The rights of the CBRT laid down by the law in 2001 as follow: "a) The privilege to issue banknotes is held by the Bank b) The Bank decides on the inflation target with the Government and monetary policy accordingly. The Bank is the only authority for the enforcement of the monetary policy and responsible for it c) The Bank is entitled to use the monetary policy instruments laid down by the this law or to decide on and apply the other monetary policy instruments which it finds necessary in order to maintain price stability d) The Bank is authorized to lend advances to saving and Deposit Insurance Fund in accordance with the terms and condition it will prescribe in case of extraordinary condition or shortage of source of this fund e) The Bank conduct credit lending function to the banks as the final credit authority f) The Bank has a right to request the banks to apply the interest rate on lending to the terms and conditions it will define g) The Bank is authorized to collect statically data and request necessary information form the Banks  and the other financial institutions and all the authorized organs in charge of monitoring and inspecting them" (The Law of CBRT , 2001).

As seen in the law, CBRT does not decide on the monetary policy separately from political authority.  But, after the policy, the CBRT is completely independent to fulfill the policy. The law establishes a Monetary Board within CBRT to inform other economic intuitions of the developments.[6] The law also describes the thing that the CBRT cannot do. According to Article 52 and 56, the monetary policy instruments are used in accordance with the monetary policy. CBRT cannot give any credit or advance to Treasury Office or other public intuitions. Consequently, the public sector is not allowed to use the source of CBRT by the law. However, this is frequently criticized, because the Bank is still authorized to lend advances to Saving and Deposit Insurance Fund on extreme

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[5] For details, see The Law of CBRT, 25,4, 2001

[6] Monetary Policy Board is comprised of Governor, Vice-Governors, a member elected from member of  Bank Board and a unanimously appointed  member with the recommendation of Governor. The undersecretary of Treasure or Vice-Undersecretary he will elect can attend the meeting without a voting right. Vice-Governor and Bank Board membership cease  being member of Monetary Policy Board {CBRT Law: 2001}

conditions as a final credit authority. This regulation does not deflect the inflation target of CBRT in an economy like Turkey with instabilities and high fragility. Because in an economy with massive public debts, tight monetary policy inhibits achieving inflation target (Baydur & Süslü, 2003).

The relation with political authority and monetary authority can be revealed by looking at the appointment of governor of CBRT. The governor of CBRT is appointed by the decision of council of ministers for a 5-year period. The frequency of changes of CBRT governors shows the impact of political changes on CBRT. When we look at the frequency in 1990s; Rüştü Saraçoğlu, who started in 1987 remained in office for 6 years until 1993; Bülent Gültekin, between 1993 and 1994; Yaman Törüner, between 1994 and 1995; Osman Cavit Ertan, as deputy governor, between 1995-1996, Gazi Erçel, between 1996 and 2001 (Turan, 1998). Süreyya Serdengeçti has been governor since 2001. Political authorities might influence the monetary policy by changing the governor of central bank. However, the political authority cannot dismiss him directly according to the new law. The appointment and dismissal of the governor of CBRT has been arranged in article 25 and 27. The governor may be dismissed by the decree of council of ministers according to the conditions laid down by article 27 and if he cannot conduct the duties conferred upon him. As seen in table 1, while frequency of change of CBRT governors is 25 %, frequency of change governments is 10 %. Therefore, the CBRT governors are more stable than the governments are.

**Table 1: Turkish Governments between 1990-2003**

| Government | |
|---|---|
| **47** Akbulut Hük. (09.11.1989-23.06.1991) | |
| **48** I. Yılmaz Hük. (23.06.1991-20.11.1991) | |
| **49** VII. Demirel Hük. (21.11.1991-25.06.1993) | KP |
| **50** I. Çiller Hük. (25.06.1993-05.10.1995) | KP |
| **51** II. Çiller Hük. (05.10.1995-30.10.1995) | |
| **52** III. Çiller Hük. (30.10.1995-06.03.1996) | KP |
| **53** II. Yılmaz Hük. (06.03.1996-28.06.1996) | KP |
| **54** Erbakan Hük. (28.06.1996-30.06.1997) | KP |
| **55** III. Yılmaz Hük. (30.06.1997-11.01.1999) | KP |
| **56** IV. Ecevit Hük. (11.01.1999-28.05.1999) | |
| **57** V. Ecevit Hük. (28.05.1999 - 18.11.2002 ) | KP |
| **58** Gül Hük. (18.11.2002 - 14.03.2003) | |
| **59** Erdoğan Hük. (14.03.2003 - ) | |

For Coalition Prothocol

The development of independence of CBRT can be calculated with the help of an index developed by Cukierman. This index displays the legal dimensions of the independence of CBRT after analyzing the law passed on 25 April 2001 (Berument & Neyaptı, 1999). This index measures the independence of central bank with all aspects. The main items in constructing the index: i-appointment of governor of central bank, ii-the goals of central bank, iii-establishment of monetary policy, iv whether any loan is given to the public sector. There are 59 sub- evaluation items (see Appendix 1). In order to construct the index, the law of CBRT passed on 4 April 2001 is analyzed. There are some differences constructing a relationship between the law of CBRT and the index. The criteria, in which these differences are found, are marked with asterisk in Appendix 1.

The reason of this detailed legal framework is to help understand better the criteria included by this index. It will helpful to compare the index values calculated by Cukerman for past years with the index values calculated by us in measuring to development of independence of CBRT. If monetary authority has a full independence, the index will be equal to one. If it has no independence, the index will be equal to zero. Under this logic independence coefficient of CBRT went up from 44 %[7] for the period between 1980 and 1989 to 64 % in 2003.

Whether the independence rates are statistically different, this is checked through test of ratio. The calculated t value is 2.24.[8] The $H_0$ hypothesis, which expresses the new CBRT law of 4 April 2001 and did not bring any renovation for the independence of CBRT, is rejected. Consequently, the independence of CBRT grew after crisis in 2000 and 2001. This growth of independence provided CBRT with greater opportunities in fighting the inflation and maintaining stability at output growth than the post periods. But, the index Cukierman developed is an index of legal independence. For economic independence, financial discipline and problems in borrowing remain to be environmental factors weakening the independence of CBRT. Changes in public debt stock given in Table 2 summarize the situation. The other factors worth considering are external dependence of Turkish economy and financing the deficit with short-term sources.

**Table 2: International Borrowings and Budgetary Indicators**

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[7] See Cukeriman, 1995

[8]

$$t_{hes} = \frac{P_2 - P_1}{\sqrt{\frac{P_1(1-P_1)}{n}} + \sqrt{\frac{P_2(1-P_2)}{n}}} = \frac{0,20}{\sqrt{\frac{0,2464 + 0,2304}{59}}} = 2,24$$

n: the number of all central independence criteria in Cukierman index. $t_{tablo,0.10} = 1.30$ and $t_{tablo,0,05} = 1.60$.

$H_0$= the amendments in 2001 are meaningless
$H_1$= the amendments in 2001 are meaningful

| Year | Budget Def/GNP | Domestic Barrowing Stock (Billion TL) | | | | | | | Domestic Barrowing Stock/GNP | Domestic Barrowing Interest Payments /GNP |
|---|---|---|---|---|---|---|---|---|---|---|
| | | Total | Debenture | (%) | Consolidated Debts | Bonds | (%) | Advances | | |
| 1990 | 3.35 | 57180 | 18801 | 32,9 | 30040 | 5469 | 9,6 | 2870 | 14.40 | 2.42 |
| 1991 | 5.28 | 97647 | 24678 | 25,3 | 41122 | 18258 | 18,7 | 13589 | 15.39 | 2.67 |
| 1992 | 4.30 | 194236 | 86388 | 44,5 | 34602 | 42247 | 21,8 | 31000 | 17.60 | 2.77 |
| 1993 | 6.70 | 357347 | 190505 | 53,3 | 31933 | 64488 | 18,0 | 70421 | 17.89 | 4.63 |
| 1994 | 3.91 | 799310 | 239385 | 29,9 | 133417 | 304230 | 38,1 | 122278 | 20.56 | 6.00 |
| 1995 | 4.03 | 1361007 | 511769 | 37,6 | 25940 | 631298 | 46,4 | 192000 | 17.33 | 6.05 |
| 1996 | 8.27 | 3148985 | 1250154 | 39,7 | 40 | 1527838 | 48,5 | 370953 | 21.02 | 8.87 |
| 1997 | 7.62 | 6283424 | 3570812 | 56,8 | 0 | 2374990 | 37,8 | 337623 | 21.38 | 6.73 |
| 1998 | 6.91 | 11612885 | 5771979 | 49,7 | 0 | 5840906 | 50,3 | 0 | 21.70 | 10.52 |
| 1999 | 11.55 | 22920145 | 19683392 | 85,9 | 0 | 3236753 | 14,1 | 0 | 29.28 | 12.55 |
| 2000 | 10.23 | 36420620 | 34362937 | 94,4 | 0 | 2057684 | 5,6 | 0 | 29.00 | 14.96 |
| 2001 | 16.18 | 122157260 | 102127926 | 83,6 | 0 | 20029334 | 16,4 | 0 | 68.06 | 21.25 |
| 2002 | 14.29 | 149869691 | 112849835 | 75,3 | 0 | 37019856 | 24,7 | 0 | 54.80 | 17.11 |

**Source:** Bekmez at. al. (2004)

### 5. Econometric Model

According to Rogoff, the inflation fluctuations will be lower with the existence of an independent monetary authority. Even though the independent representative reduces the inflation fluctuations, it will increase fluctuations in output. The equation (9') and (10') below explain this situation.

$$\text{var}(\pi)' = \frac{\hat{b}^2}{(1+\hat{b})^2}\sigma_\varepsilon^2$$

(9')

$$\text{var}(y)' = \frac{1}{(1+\hat{b})^2}\sigma_\varepsilon^2$$

(10')

The theoretical deduction of (9') and (10') using $\pi_t = kb - \frac{b}{1+b}\varepsilon_t$, $\pi_t = P_t - P_{t-1}$ transformation,

$$P_t = kb + P_{t-1} - \frac{b}{1+b}\varepsilon_t$$

(6')

will be tested by equation (14) and (14'), (15) and (15').

$$P_t = \beta_0 + \sum_{i=1}^{n} \beta_i P_{t-i} + \beta_k KUK + \varepsilon_t,$$

(14)

$$\varepsilon_t \qquad\qquad \sim \qquad\qquad N[0, (h : sabit)]$$

(14')

Equation (14) is an approach of time series, which tries to predict the inflation considering the past values of inflation and carries a dummy variable in it. In this paper, time series approach is preferred rather than a structural model for inflation. Although it is a simple testing procedure, it will be used here, because it serves very well for the purpose. Inflation tendency coefficient described as "*bk*" in equation (6') should change depend on independence of central bank. As the dummy variable measures these changes, it is an appropriate testing instrument (Gujarati, 1998:420-450). Along with this test, the relation between independence of CBRT and inflation can be checked by testing whether estimation has a variable variance. As emphasized in Equation (14'), it is accepted that the average of estimation is zero and its variance is fixed. If the economy has been exposed to a structural transformation to influence the independence, it is expected that variance and the average of inflation should change. Accordingly, the relation between the independence of CBRT and inflation will be probed by using White's variable variance procedure.

In this paper, the months of the years after 2000 are assigned the value of 1. While the independence of CBRT was supported by the protocol signed between Treasury Office and CBRT in 1997 and the Stand-By Agreement with IMF in 1998, the independence was reinforced with the law, which became effective in 2001. As a result, because the Letter of Intention in 1999 required the independence of CBRT as one of the structural measures, it is appropriate to give the value of 1 for 2000 and 0 for period beforehand. When such modeling is used, the time series used should be stationary. The stationary results are given in Table 3. For this reason, the stationary at all series has been tested and all series are found non-stationary from (I) difference at the level of 1 %.

**Table 3: Stationary Result**

|        | Level         | 1. Difference  |
|--------|---------------|----------------|
| TUFE   | -             | -7.936392(a)   |
| Income | -3.355008(c)  | -              |

Two criteria are taken into account in order to calculate the appropriate length of delay. First, the terms of error in equation should not carry autocorrelation. In order to test this, equations (14) and (15) are estimated separately under the lag taken from 1 to 12. Autocorrelation between residuals for each lag has been tested with LM test. Second, the sum of error squares should be minimum. For this reason, Scwartz Information Criteria is calculated under each lag. The length of lag is taken as the length of lag, which minimizes the information criteria. The length of lag from 1 to 12, probailities of LM test and AIC values are given in Table 4. It is suggested that error term in $H_0$ hypothesis in LM test have no autocorrelation. If the marginal significance level of test is lower

than the chosen significance level (0.05) of the test, $H_0$ has to be rejected. According to this, the most suitable length of lag for model (14) is 2. The regression results obtained are shown in Table 5.

**Table 4: Calculating the Length of Lag of Variables**

| Lag | LM-p value | AIC | LM-p value | AIC |
|-----|-----------|--------|-----------|--------|
| | TUFE | | INCOME | |
| 1 | 0,2478 | 4,6240 | 0,7539 | 5,3378 |
| 2 | 0,0024* | 3,8490* | 0,0000** | 5,3888** |
| 3 | 0,4723 | 3,7828 | 0,6541 | 5,0900 |
| 4 | 0,1653 | 3,8190 | 0,5396 | 5,2461 |
| 5 | 0,5327 | 3,8213 | 0,5869 | 5,2879 |
| 6 | 0,4139 | 3,8723 | 0,6404 | 5,3248 |
| 7 | 0,4084 | 3,9089 | 0,4507 | 5,3714 |
| 8 | 0,6736 | 3,9554 | 0,1672 | 5,4198 |
| 9 | 0,3641 | 3,9837 | 0,0061 | 5,4454 |
| 10 | 0,7812 | 3,9989 | 0,0021 | 5,4924 |
| 11 | 0,2953 | 4,0440 | 0,0000 | 5,4400 |
| 12 | 0,2842 | 4,0724 | 0,0000 | 5,4642 |

As seen in Table 5, two lagged values of inflation and dummy variable are significant. The chosen model can explain 43 % of the inflation. The F value is statistically significant. The possibility not to take place is zero for equation (14). The statistical significance of dummy variable and being negative render Rogoff's theoretical proposition valid for Turkey. The monthly averaged inflation of an independent central bank is different from the monthly average of inflation of a dependent central bank. The independence of CBRT can be tested by White's test. If any changing variance is found, as a result of changes of independence of CBRT, inflation and variance are expected to change. As can be understood from Table 5, $n*R^2 = 110*0.43 = 47$, as it exceeds 1 % threshold value with a degrees of freedom 4, it conforms with Chi square distribution. Relying on this trial, we can accept that there is variable variance. Such a trial seems to support that the inflation average changes in parallel with the independence of CBRT.

**Table 5: Inflation and independence of CBRT**

| Dependent Variable: TUFE | | | | |
|---|---|---|---|---|
| Method: Least Squares | | | | |
| Sample(adjusted): 1994:05 2003:08 | | | | |
| TUFE=C(1)+C(2)*TUFE(-1)+C(3)*TUFE(-2)+C(4)*KUK | | | | |
| | Coefficient | Std. Error | t-Statistic | Prob. |
| C(1) | 3.851368 | 0.433366 | 8.887104 | 0.0000 |
| C(2) | 0.356413 | 0.063458 | 5.616524 | 0.0000 |
| C(3) | -0.137890 | 0.063983 | -2.155105 | 0.0334 |
| C(4) | -1.650139 | 0.343288 | -4.806868 | 0.0000 |
| R-squared | 0.435878 | Mean dependent var | | 4.146791 |
| Adjusted R-squared | 0.420208 | S.D. dependent var | | 2.038148 |
| S.E. of regression | 1.551929 | Akaike info criterion | | 3.751935 |
| Sum squared resid | 260.1161 | Schwarz criterion | | 3.849024 |

| Log likelihood | -206.1084 | F-statistic | 27.81599 |
|---|---|---|---|
| Durbin-Watson stat | 1.449757 | Prob(F-statistic) | 0.000000 |

**Table 6: White Variable Variance test of Equation (14')**

| White Heteroskedasticity Test: | | | | |
|---|---|---|---|---|
| F-statistic | 3.526091 | Probability | | 0.001211 |
| Obs*R-squared | 24.07902 | Probability | | 0.002223 |
| Dependent Variable: RESID^2 | | | | |
| Variable | Coefficient | Std. Error | t-Statistic | Prob. |
| C | -3.023194 | 3.283103 | -0.920834 | 0.3593 |
| TUFE(-1) | 1.257781 | 0.773704 | 1.625661 | 0.1071 |
| TUFE(-1)^2 | 0.051935 | 0.022931 | 2.264787 | 0.0256 |
| TUFE(-1)*TUFE(-2) | -0.366121 | 0.138285 | -2.647577 | 0.0094 |
| YTUFE(-1)*KUK | 0.947095 | 0.537688 | 1.761422 | 0.0811 |
| TUFE(-2) | 0.986160 | 0.650463 | 1.516089 | 0.1326 |
| TUFE(-2)^2 | 0.066236 | 0.031587 | 2.096929 | 0.0384 |
| TUFE(-2)*KUK | -1.652113 | 0.536592 | -3.078898 | 0.0027 |
| KUK | 3.729014 | 2.731927 | 1.364975 | 0.1752 |
| R-squared | 0.214991 | Mean dependent var | | 2.322465 |
| Adjusted R-squared | 0.154020 | S.D. dependent var | | 4.361114 |
| S.E. of regression | 4.011230 | Akaike info criterion | | 5.693017 |
| Sum squared resid | 1657.267 | Schwarz criterion | | 5.911468 |
| Log likelihood | -309.8090 | F-statistic | | 3.526091 |
| Durbin-Watson stat | 1.692409 | Prob(F-statistic) | | 0.001211 |

$$y_t = \beta_0 + \sum_{i=1}^{n} \beta_i y_{t-i} + \beta_k KUK + \varepsilon_t,$$

(15)

$$\varepsilon_t \qquad \sim \qquad N[0,(h:fixed\ )]$$

(15')

We obtain the result in Table 7 if an equation similar to equation (14) for revenue and exposed to regression. Autocorrelation between residuals of each lag for proper length of lag has been tested with LM test and Schwartz Information Criteria has been calculated. The regression results are given in Table 7. The length of lag of consequent dependent model is taken as the length of lag, which minimizes the information criteria. The length of lag from 1 to 12, LM test possibilities and AIC are given in Table 4. It is suspected that there is no auto correlation in terms of error in $H_0$ hypothesis in LM test. If the marginal significance level of test is lower than the chosen significance level (0,05, 0,01), $H_0$ is rejected. Accordingly, the best length of lag for equation (15) is 2. Regression results obtained are given in Table 7.

**Table 7: Output and Independence of CBRT**

| Dependent Variable: Gelir(g) |
|---|
| Method: Least Squares |
| Sample(adjusted): 1994:04 2003:08 |
| Included observations: 113 after adjusting endpoints |
| Gelir(g)=C(1)+C(2)*G(-1)+C(3)*G(-2)+C(4)*KUK |

|  | Coefficient | Std. Error | t-Statistic | Prob. |
|---|---|---|---|---|
| C(1) | 0.240902 | 0.424138 | 0.567980 | 0.5712 |
| C(2) | 0.891871 | 0.095745 | 9.315042 | 0.0000 |
| C(3) | -0.019510 | 0.095725 | -0.203815 | 0.8389 |
| C(4) | 0.292202 | 0.647372 | 0.451366 | 0.6526 |
| R-squared | 0.766559 | Mean dependent var | | 2.778761 |
| Adjusted R-squared | 0.760134 | S.D. dependent var | | 6.846186 |
| S.E. of regression | 3.352999 | Akaike info criterion | | 5.292344 |
| Sum squared resid | 1225.443 | Schwarz criterion | | 5.388888 |
| Log likelihood | -295.0174 | F-statistic | | 119.3089 |
| Durbin-Watson stat | 1.791102 | Prob(F-statistic) | | 0.000000 |

The chosen model can explain 76 % of growth rate of output. The F value, which shows the appropriateness of this equation modeling inflation, is statistically significant. The statically insignificant of dummy renders Rogoff's theoretical proposition invalid for Turkey. The impact of an independent central bank on the stability of monthly output has been detected. Consequently, when we expose equation (15) to regression, as the rise in independence of CBRT changes the variance of error term, equation (15') can be tested with White Test. If any chancing variance is found, as a result of changes of independence of CBRT, variance of term of error is expected to change. In table 8, the variance does not change according to White Test. In this trial, there is no statically proof supporting the change of output growth rate in parallel independence of CBRT.

**Table8: White Variable Variance Test of Output Regression Equation**

| White Heteroskedasticity Test: | | | | |
|---|---|---|---|---|
| F-statistic | 0.574124 | Probability | | 0.797042 |
| Obs*R-squared | 4.779391 | Probability | | 0.780874 |
| Dependent Variable: RESID^2 | | | | |
| Variable | Coefficient | Std. Error | t-Statistic | Prob. |
| C | 18.95130 | 6.277449 | 3.018949 | 0.0032 |
| YY(-1) | -0.027763 | 1.328765 | -0.020894 | 0.9834 |
| YY(-1)^2 | -0.126972 | 0.116158 | -1.093097 | 0.2769 |
| YY(-1)*YY(-2) | 0.142248 | 0.197382 | 0.720671 | 0.4727 |
| YY(-1)*KUK | 0.007358 | 2.072246 | 0.003551 | 0.9972 |
| YY(-2) | 0.165560 | 1.319598 | 0.125463 | 0.9004 |
| YY(-2)^2 | -0.164213 | 0.169465 | -0.969010 | 0.3348 |
| YY(-2)*KUK | -0.998912 | 2.065300 | -0.483664 | 0.6296 |
| KUK | 3.808069 | 7.334535 | 0.519197 | 0.6047 |
| R-squared | 0.042295 | Mean dependent var | | 10.84463 |
| Adjusted R-squared | -0.031374 | S.D. dependent var | | 34.10665 |
| S.E. of regression | 34.63755 | Akaike info criterion | | 10.00405 |
| Sum squared resid | 124775.0 | Schwarz criterion | | 10.22127 |
| Log likelihood | -556.2288 | F-statistic | | 0.574124 |
| Durbin-Watson stat | 1.549361 | Prob(F-statistic) | | 0.797042 |

**5.Conclusion**

According to the theoretical framework developed by Rogoff, it is proposed that monetary policy should be handed over to an independent

representative for economic stability. According to Rogoff, transferring monetary policy to an independent representative has both advantages and disadvantages. While an independent monetary policy representative succeeds in the fight against inflation, it boosts the stability in output. Such representative of monetary policy is called conservative central bank in economic literature. In order to probe this theoretical deduction for Turkey, the independence of CBRT should be calculated. The independence coefficient of CBRT increased from 44 % between 1980 and 1989 to 64 % in 2003. In the equation of inflation described in Table 4, the coefficient of dummy variable which represents the independence of CBRT has been found -1.65 and the new fixed term of inflation equation is obtained when this value is subtracted from the fixed parameter of the equation expressed in Table 4. The value of this fixed term is 2.20. The independence of CBRT has changed level of average inflation. This means that independence decreases the value of output assigned by the CBRT. As Rogoff suggests, economic units determine their inflation expectations according to the importance monetary authority puts on output. In other words, output importance coefficient of an independent monetary authority is smaller: $0 < \hat{b} < b$. If asses the fixed coefficient of equation in Table 4 as the output importance coefficient, the output importance coefficient after April 2001 went down from 3.85 to 2.20. This meets the theoretical expectations. White's Variable Variance Test verifies the impact of CBRT independence on inflation. But, the hypothesis that central banks cause instability at output has been verified. The variance of output equations has not changed under White Variable Variance test.

Credibility is crucial element of all monetary policies or inflation targeting. It is apparent that the credibility of an independent central bank is high. For the CBRT, which targeted inflation below 12 % in 2004, independence is a vital political instrument to attain its goal. The observation of a negative correlation between inflation and the independence of CBRT is an empiric reality supporting the theory. Consequently, although the independence of CBRT has been reinforced by a legal adjustment, the structural problems of economy should be eliminated to maintain this independence, As long as the sustainability of public debts is not improved, the fragile structure in banking sector is not repaired, and the monopolistic trends of the markets are not halted, the increase in the independence of CBRT will not suffice.

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Appendix 1
## Table 1: General Index of Independence of CBRT

| *Grup: Legal Changes* | *Weight(%20) Weights of subdefinitions are equal[9].* | Variable Definitions | Degree | Coefficient | CBRT |
|---|---|---|---|---|---|
| *Contribution of Grup* | *Contributions of sub items* | | | | |
| | | **CBRT President Stays in Duty** | | | |
| | | | x>8 | 1 | |
| | | | 8>x>6 | 0,75 | |
| | (0,03) | | X=5 | 0,50 | 0,50 |
| | | | X=4 | 0,25 | |
| | | | x<4 | 0 | |
| | | **Who appoints the CBRT President** | | | |
| | | CBRT committee | | 1 | |
| | | Council | | 0,75 | |
| 0,11 | (0,03) | Assembly and Committee of Ministers | | 0,50 | 0.,50 |
| | | Prime Minister | | 0,25 | |
| | | Economy Minister | | 0 | |
| | | **Conditions that CBRT president stays in duty** | | | |
| | | 1-none | | 1 | |
| | (0,05) | 2- Non-political reasons | | 0,83 | 0,83* |
| | | 3-CBRT committee decision | | 0,67 | |
| | | 4- By a legal institution | | 0,50 | |
| | | 5- Institution without any conditions | | 0,33 | |
| | | 6- Political decisions | | 0,17 | |
| | | 7-No reason | | 0 | |
| *Grup: Political Formulation* | *(%15) Weights of subdefinitions are equal* | | | | |
| | | **Who determines monetary policy?** | | | |
| | | 1-CBRT itself | | 1 | |
| | (0,03) | 2-CBRT and government | | 0,66 | 0,66 |
| | | 3-CBRT recommendation | | 0,33 | |
| | | 4-Government | | 0 | |
| | | **Orders of Government and Solutions** | | | |
| | | 1-CBRT is the last authority | | 1 | 1 |
| 0,08 | | 2-Government is the last authority and it determines everything | | 0,8 | |

---

[9] Definitions of these weights are completely subjective (Cukierman, 1994:374).

| | | | | | |
|---|---|---|---|---|---|
| | (0,05) | 3-Consultation with CBRT representative | | 0,6 | |
| | | 4-Legal institution is the last authority | | 0,4 | |
| | | 5- Institution on duty is the last authority | | 0,2 | |
| | | 6-Institution on duty is the last outhority without any condition | | 0 | |
| | | **CBRT has active role in determings its own butdget** | | | |
| | | 1-yes | | 1 | |
| | (0) | 2-no | | 0 | 0 |
| | | | | | |
| *Aims of CBRT* | *(%15)* | | | | |
| | (0,15) | 1-Price stability os the only aim | | 1 | 1 |
| | | 2- mentioning price stability is the only aim | | 0,8 | |
| 0,15 | | 3- Price stability does not contradict with other aims | | 0,6 | |
| | | 4- price stability contradicts with other aims | | 0,4 | |
| | | 5-no aim | | 0,2 | |
| | | 6- price stability is not only aim | | 0 | |
| *Limitation of Debts* | | | | | |
| | *(%15)* | **Limitation of progress** | | | |
| | (0,15) | 1- Government puts limitations on debts | | 1 | 1 |
| | | 2-Progress is allowed but limited | | 066 | |
| | | 3- Government may alter the limits | | 0,33 | |
| | | 4- no limit | | 0 | |
| | *(%10)* | **Limitations of APİ transactions** | | | |
| | | 1- Government puts obsticales on debt increase | | 1 | |
| 0,25 | | 2-Debt increase is allowed but limited | | 066 | |
| | | 3- Government may alter the limits | | 0,33 | |
| | | 4- no limit | | 0 | 0 |
| | (0) | | | | |
| | *(%10)* | **Who controls debt increse** | | | |
| | (0,10) | 1- CBRT | | 1 | 1 |
| | | 2-Legally determined | | 0,66 | |
| | | 3-Law, CBRT, and other authorized institutions together | | 0,33 | |
| | | 4-Authorized institution only | | 0 | |
| | *(%5) weights of sub definitions are equal* | **Who barrows?** | | | |
| | | 1-Federal government only | | 1 | |
| | | 2-Federal and local governments | | 0,66 | |
| | (0,004) | 3-Institutions | | 0,33 | 0,33 |

| | | Private Sector | | 0 | |
|---|---|---|---|---|---|
| | | **Type of limit, if any?** | | | |
| | | 1-Cash amount | | 1 | 1 |
| | | 2- % of CBRT capital | | 0,66 | |
| | | 3-% of government incomes | | 0,33 | |
| | | 4-% of government expenditures | | 0 | |
| | | | | | |
| | | **Length of Credits** | | | |
| 0,052 | (0,016) | 1-6 months | | 1 | **1 |
| | | 2- 1 year max. | | 0,66 | |
| | | 3- more than 1 year | | 0,33 | |
| | | 4- no limit | | 0 | |
| | | **Limitations on Interest rates** | | | |
| | (0,016) | 1-CBRT loan interest rates cannot be higher than market rates | | 1 | 1 |
| | | 2- interest rates of CBRT cannot be less than that of min. interest rate in the market | | 0,66 | |
| | | 3-Credits cannot exceed a certain level | | 0,33 | |
| | | 4-no limitation | | 0 | |
| | | **Limitations on primary market debts** | | | |
| | (0,016) | 1- buying government share from primary market is limited | | 1 | ***1 |
| | | 2- no limit | | 0 | |
| **TOPLAM=0,642** | | | | | |

\* CBRT Law, Article 28

\*\* CBRT cannot do reescount more than 120 days and API more than 91 days.

\*\*\* Completely limited.