Investigation of Mutual Relationship between Inflation Rate and Bank Deposits Interest Rate

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ABSTRACT

The present research tries to investigate relationship between inflation rate and interest rate of bank deposits and their impact on each other over 1986-2006 And has estimated pattern coefficients in the framework of econometricspatterns and after referring to central bank statistics and Iranian Statistics center, the relationship between inflation rate and bank deposits interest rate is measured. Then, the results are compared to each other. The results which are based on econometrics equations shows that: interest rate of bank deposits has a direct and positive impact on inflation rate and 10 percent increase in interest rate of bank deposits increases inflation rate by 2-7 percent. Passage of time had also positive impact on inflation ratethereforeimpacts of monetary variations on inflation rate is observable over a period of time.

KEYWORDS:inflation, bank deposit, interest, economic, money

1. INTRODUCTION

In the recent years, inflation rate has been increasing with a worrying rate and it has become the most important economic problem of Iran. The recent inflation in Iranian economy which has its roots in the early 1970 events began from producing companies and then covered products and despite severe fights against this destructive economic phenomenon and even Jihad against inflation, has become as grave as it is today. This economic virus is undoubtedly very costly for the economy and therefore, the government must try to reduce social, political and economic costs of this phenomenon with stabilizing prices level as the main goal of its economic policies. It is obvious that this goal is achievable only with identifying decisive causes of inflation. This study tries to identify inflation rate and interest rate of bank deposits decisive causes and their mutual impacts.

a) Monetary theories

Supporters of monetary theories believe that inflation is a phenomenon resulted from money supply increase. When supply of money is controlled by central bank (instead of being determined by gold), additional money distribution by central bank which is possibly done by government order will lead to inflation increase. Supporters of this theory believe that ≪the only way to control inflation is restricting money distribution by government≫.

In order to show the mentioned idea in mathematical form, Cambridge equation is used:

$$Ms=K.P.Y \qquad (1)$$

In which Ms is the nominal money supply, P is the general level of prices, Y is real income or productions and K is liquidity coefficient (inverse of money circulation velocity coefficient). Now if relationship (1) is written in logarithmic form and supposing K is constant and if we derivate from the equation with respect to time, then we will have:

$$M*S=P* \qquad (2)$$

The recent relationship shows that price level change rate is equal to change rate of money nominal supply. In fact, the main idea behind monetary theories is that in the long run, increase in money supply is the necessary condition for increasing prices level and money supply growth rate determines inflation rateon its own. Therefore, prices level change is resulted from money volume change and cause direction is from money growth towards inflation. It is obvious that if money growth does not have any impact on productions growth (Y) (i.e. money is super-neutral), increase in money supply growth rate (for example through open market policies of in order to remove government budget deficit) will increase inflation rate as much. Friedman, which is from the most important supporters of monetary theories, believes that many causes can be found for prices changes in the short term but in the long run, money volume of each country can determine inflation rate in that country. In fact, they believe that along with any inflation there will be increase in money volume in the long run.1 this means any motivation can be the cause for inflation but inflation cannot continue without money supply. In other words, money supply increase is the necessary condition for inflation.(John p. Judd and Glenn,1998:56)

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b) Theories which are basedon cost pressure

supporters of this theory which are opposite to monetary school believe that the main origin for inflation pressures are non-economic factors and believe that a more useful method for investigating inflation is a particular kind of sociological analysis of conflicts among social classes for receiving more share of national income.

Therefore a satisfactory understanding of inflation will be impossible without studying society framework in which salaries and prices are specified.

In fact, this group believes that inflation is the direct result of production costs increase (increase in rent, raw material, energy price and especially salary).

Hence, it once believed that inflation process with any particular reason is a salary increase helix which results in prices increase due to production cost increase and results in salaries and wages increase due to tendency to eliminate real incomes of workers. Income policies therefore aimed at breaking this helix.3

In the first inflation models presented by this theory's supporters, inflation helix was considered as a two-equation model in which one equation explained wages change rate and the other equation explained prices change rate.(Sergio perira V. Sundavajan,1990:345)

For short, cost pressure school supporters believe that explaining inflation is impossible without considering wage price determination method. Because prices and wages are determined in different market structures and by different institutes, therefore inflation causes are mainly non-economic.

c) Keynesian theories:

≪ introduction of Keynes into economy transformed the former beliefs of economists to the effect that inflation is a short-lasting phenomenon.4 the supporters of this school believed that they were somewhere in the middle of conflict between monetary school economists and cost pressure school supporters. Keynes presented inflation gap theory in order to specify inflation which has its roots in the existing situation of products market, while monetary school theories on inflation are based upon money market and theories of cost pressure school have been mainly based upon labor market.(Jamshidi, Abolghasem,2002:97) Inflation gap theory states that inflation emerges when equilibriom national income (YE) exceeds entire employment income (YEE) and this happens when demands for some products and service increase on some reasons (such as tax reduction, investors pessimism to future, increase in government and private sector expenditures, increase in net exportand also increase in money supply). Therefore, increase in money supply is not the only cause of inflation in Keynes inflation gap model but he believes that increase in money volume by other causes can result in inflation and determine inflation rate. In other words, increase in money supply is the adequate condition for inflation increase (and not a necessary condition). In general, inflation rate is a function of inflation gap size in Keynesinflation gap model and such inflation is due to demand elasticity..(John p. Judd and Glenn,1998:116) On the other hand, because Keynes regards money supply a determining factor in inflation total demand and in the case of absence of liquidity trap, the result of Keynes model becomes equal to monetary theories supporters model, therefore Keynes theory and monetary school theory are close to each other on when they opine on inflation, although the solutions provided by these two schools are not similar.inKeynes and his supporters opinion, restricting demand is the basis for any anti-inflation valid policy.Keynesianها believe that if income policies are not accompanied by demand threat policy, they will be pointless. These two policies must be executed with each other in order to reduce inflation rate tangibly..(Sergioperira V. Sundavajan,1990:145)

d) other theories

Other inflation theories are psychological theory, structural theory and import theory. Structural theory supporters believe that inflation is the result of fundamental defects and insufficiencies like work force shortage, absence of communicational devices and so on and such inflation is called structural inflation. Psychological theories supporters believe that inflation is the result of people expectations and fear from prices increase in future which is called psychological inflation. ≪different studies show that consumers only pay attention to inflation rate in the previous time periodconcerning perceptions of inflation.≫ 5

Although inflation expectations can be considered in different forms but the mentioned result shows that expectations are static. Static expectations can be stated as follows:

$$P_t^e = P_{t-1}$$

The above relationship state that expected inflation rate in each year (Pte) is equal to inflation rate in its previous year (P$_{t-1}$).

Some other theoreticians believe that inflation is the result of increase in imported products prices and attribute its weakness and intensity to imported amount of products and service in the society. This is called import inflation. It is obvious that in an open and interlocking economy, inflation pressures (at least in a constant currency regime) do not respect national borders.

In fact, import inflation means transfer of global economy inflation to internal economy through external commerce. 6

Increase in commercial products price, labor market and monetary expansion resulting froma payments balance surplusare the most direct channels of transferring global inflation into a country's economy with constant rates of currency.

Structure of determining interest rate in international banking system

In different economic schools, various reasons have been proposed concerning existence philosophy of interest such that according to capital marginal efficiency theory, interest is paid because capital is a productive element and loan-borrower can do productive work using the borrowed loan and share income with loan-provider.

Base interest rates in American market

In American market, two base rates are used to determine short-term and long-term deposits interest rate:

a) Short-terminterest rate of federal bank, this rate is actually nightly rate of providing inter-bank convenience. If a bank has shortage in its deposits, it receives convenience from other banks. This rate is the basis for determining deposit rate in American banks. Federal Reserve uses two devices to control this rate, it monitors banks deposits amounts and uses long-term bonds interest rate to determine base rate for long-term deposits and on the other hand, we have interest rate of bonds distributed by American government treasury .the government uses this means to cover its deficit. Therefore, many factors affect banks inflation rate in the long run.

b) Expected rate of return on investments and the expected inflation rate

In this case, central bank tries to reduce interest rate by reducing inflation rate. Banks use especial formula in determining their interest rates of their loans. The most important factor which is considered in determining interest rate is base rate. Another variable which plays role in this field is supply and demand. Like other products prices, interest rate changes based on demand level for credit compared with its supply in the market. In other words, if supply of granted loan is more than monetary policies, then banks try to influence on family consumption pattern and factories production and finally inflation through exercising such policies.

Structure of determining interest rate in the present usury-free banking system

At present, article 3 of executive regulations of chapter 4 of usury-free banking system law which has been approved by Money and Credit Council of central bank (Iran), has specified the minimum interest rate (return) for investment or participation plans and also the minimum or if necessary, the maximum expected interest rate or possible return for other kinds of loans. Supporters of interest reduction believe that high amounts of deposit interest rate encourages people not to invest in economic activities and turn their resources into bank deposits with confident and satisfactory interest without risk and tax. High interest rates increase investment and production and service costs and this will result in low competition power between products..(Sergioperira V. Sundavajan,1990:75)

Releasing interest rate in usury-free banking system

In this method, banks calculate banking costs in loans part instead of central bank. Therefore, banks must create ranking systems and credit risk measurement for customers and after calculating customer's credit risk and considering loan time (short-time, middle-time and long-time), they calculate their costs. Therefore, interest rate must be released in usury-free banking system through wider actions like financial system development and macro-economic policies. In other words, it must be noted that releasing interest rate is not possible in the case of prices level instability and unfavorable economic situation (high inflation rate, slow economic growth, high unemployment rate).

Econometrics analysis

Before analyzing estimated results and coefficients from econometrics point of view, it must be noticed that linear logarithmic relationship has been used in all estimated models.

These functions have the advantage of stopping many econometrics problems like heteroskedasticvariance and auto-correlation. Of course we used linear forms of functions at first and we concluded from estimated results that the above results are not trustable because coefficients (t) are very small and also Durbin-Watson statistic is less than acceptable value and in most cases, auto-correlation was present in regression which was due to errors in identifying models.(Najafi, Baha'oddin,1994:187)

Dependent and independent variables which have been used in the following patterns are as follows:

Cpi: price index of consumer products and service

Interest 1: one-year bank deposits interest rate

Interest 2: 2-year bank deposits interest rate

Interest 3: 3-year bank deposits interest rate

Interest 4: 4-year bank deposits interest rate

T: trend variable

Placing LL at the beginning of dependent and independent variables show the logarithm of that variable.

Testing bank deposits interest rate influence on inflation rate
5 patterns were used to test above hypothesis where bank deposits interest rate was one-year in the first pattern, 2-year in the second pattern, 3-year in the third pattern, 4-year in the fourth year and five-year in the fifth pattern.

First scenario
a) Estimation of influence of one-year bank deposits interest rate on inflation rate
in order to estimate influence of one-year bank deposits interest rate on inflation rate, the following pattern has been used:

$$LCpi = A_0 + A_1 LInterest1 + A_2 AR(1)$$

The above pattern had the following results after estimation:

$$LCpi = 9.94 + 0.53 LInterest1 + 0.97 AR(1)$$

$$T \qquad 1.92 \qquad\qquad 2.40 \qquad\qquad 69.74$$

$$R^2 = 0.99 \qquad\qquad R^2 = 0.99 \qquad D.W = 1.40 \qquad\qquad F = 3261.02$$

$\hat{A}_0$ which shows independent inflation rate equals 9.94 percent. In other words, if the coefficient of other independent variables is equal to zero, independent inflation rate equals 9.94 percent and we do not analyze it.

$\hat{A}_1$ which shows $\dfrac{\partial LCpi}{\partial LInterest1} \succ 0$ equals 0.53 percent. This means if one-year bank deposits interest rate increases 1 percent, inflation rate will increase 0.53 percent which indicates a direct and positive relationship between one-year bank deposits interest rate and inflation rate because increase in the interest rate will increase money in people's hands and encourages people to buy products and products prices will increase, therefore general level of prices is increased and this increases inflation rate.

Considering the calculated "t"s and their comparison with t in the tables with degree of freedom 19 which equals to 2.093, we can conclude that H_0 hypothesis is rejected and H_1 is statistically valid in 95 percent confidence level. Furthermore, considering the calculated f and comparing it with table f with 1 and 18 degree of freedom which equals 4.41, we can conclude that H_0 is rejected and H_1 is statistically valid in 95 percent confidence level. adjusted R squared is also equal to 0.99 percent which means 99 percent of dependent variable (inflation rate) changes has been explained by independent variable (one-year bank deposits interest rate) and the remaining part has not been explained. auto-correlation coefficient of Durbin-Watson (D.W) is also equal to 1.4 which is between $\begin{array}{c} d_u \prec D.W \prec 2 \\ 1.28 \prec 1.40 \prec 2 \end{array}$ and this shows that there is no auto-correlation in the regression. In other words, in this case the hypothesis P=0 is verified and $P \neq 0$ is rejected. Finally, regression is accepted from theoretical and statistical and econometrics aspect.

b) estimation of influence of one-year bank deposits interest rate on inflation rate in dynamic manner
in order to estimate influence of one-year bank deposits interest rate on inflation rate in dynamic manner, the following pattern has been used:

$$LCpi = A_0 + A_1 LInterest1 + A_2 T + A_3 AR(1)$$

The above pattern after estimation had the following results:

$$LCpi = -0.68 + 0.85 LInterest1 + 0.16T + 0.59 AR(1)$$

$$T \qquad -1.63 \qquad\quad 4.76 \qquad\quad 24.44 \qquad 3.00$$

$$R^2 = 0.99 \qquad\qquad R^2 = 0.99 \qquad D.W = 1.54 \qquad\qquad F = 2290.72$$

$\hat{A}_0$ Which shows independent inflation rate is equal to -0.68 percent which means if the coefficient of other independent variables equals zero, inflation rate will equal -0.68 and we do not analyze it.(Maxwell j. fry,1995:37)

$\hat{A}_1$ which shows $\dfrac{\partial LCpi}{\partial LInterest1} \succ 0$ is equal to 0.85 percent which means if one-year deposits interest rate is increased 1 percent dynamically, inflation rate will increase 0.85 percent which shows a positive and direct relationship between interest rate of one-year interest rate and inflation rate because increase in deposits interest rate will increase money in people's hands and people expect prices will increase due to deposits interest rate increase, therefore this encourages people to buy products and products prices, especially consumable products will increase.

$\hat{A}_2$ which shows $\dfrac{\partial LCpi}{\partial T} \succ 0$ is equal to 0.16 which means if trend variable (passage of time) is increased 1 percent, inflation rate will increase 0.16 percent which shows a positive and direct relationship between passage of time and inflation rate because as time goes by, people expect products prices are increased and this increases prices general level in future.

Considering the calculated "t"s and its comparison with "t" in the table with 19 degree of freedom which equals 2.093, we can conclude that H_0 is rejected and H_1 is verified in 95 percent confidence level. Furthermore, considering the calculated f and its comparison with table "f" with 17 and 2 degree of freedom which equals 3.59, we can conclude that H_0 is rejected and H_1 is statistically valid in 95 percent confidence level. adjusted R squared is equal to 0.99 which means 99 percent of dependent variable changes (inflation rate) is explained by independent variables (interest rate of one-year bank deposits) and the remaining part is left unexplained. auto-correlation coefficient of Durbin-Watson(D.W) is also equal to 1.54 which is $\begin{array}{c} d_u \prec D.W \prec 2 \\ 1.41 \prec 1.54 \prec 2 \end{array}$ and this shows that there is no auto-correlation in regression. In other words, P=0 is verified and $P \neq 0$ is rejected. Finally, regression is verified from theoretical and statistical and econometrics aspects.

Second scenario

Estimation of influence of two-year bank deposits interest rate on inflation rate

$$LCpi = A_0 + A_1 LInterest2 + A_2 AR(1)$$

After estimation, the above pattern will have the following results:

$$LCpi = 9.02 + 0.05 LInterest2 + 0.74 AR(1)$$

T	16.41	17.76	22.69

$R^2 = 0.98$	$R^2 = 0.97$	$D.W = 1.55$	$F = 290.78$

$\hat{A}_0$ which shows independent inflation rate equals 9.02 percent. In other words, if the coefficient of other independent variables is equal to zero, independent inflation rate equals 9.02 percent and we do not analyze it.

$\hat{A}_1$ which shows $\dfrac{\partial LCpi}{\partial LInterest2} \succ 0$ equals 0.05 percent. This means if two-year bank deposits interest rate increases 1 percent, inflation rate will increase 0.05 percent which indicates a direct and positive relationship between two-year bank deposits interest rate and inflation rate because increase in the interest rate will increase money in people's hands and encourages people less to buy products and therefore inflation rate increases with a lighter pace.

Considering the calculated "t"s and their comparison with t in the table with 12 degree of freedom which equals to 2.179, we can conclude that H_0 hypothesis is rejected and H_1 is statistically valid in 95 percent confidence level. Furthermore, considering the calculated f and comparing it with f in table with 1 and 11 degree of freedom which equals 4.84, we can conclude that H_0 is rejected and H_1 is statistically valid in 95 percent confidence level. adjusted R squared is also equal to 0.97 percent which means 97 percent of dependent variable (inflation rate) changes has been explained by independent variable (two-year bank deposits interest rate) and the remaining part has not been explained. auto-correlation coefficient of Durbin-Watson(D.W) is also equal to 1.55 which is $\begin{array}{c} d_u \prec D.W \prec 2 \\ 1.21 \prec 1.55 \prec 2 \end{array}$ and this shows that there is no auto-correlation in the regression. In other words, in this case the hypothesis P=0 is verified and $P \neq 0$ is rejected. Finally, regression is accepted from theoretical and statistical and econometrics aspect.

Third scenario

Estimation of influence of 3-year bank deposits interest rate on inflation rate in a dynamic way

In order to estimate influence of 3-year bank deposits interest rate on inflation rate in a dynamic way, the following pattern has been used:

$$LCpi = A_0 + A_1 LInterest3 + A_2 T + A_3 MA(1)$$

The above pattern had the following results after estimation:

$$LCpi = -0.86 + 0.78LInterest3 + 0.18T + 0.92MA(1)$$

$$T \quad -1.58 \qquad 3.91 \qquad 28.86 \qquad 13.80$$

$$R^2 = 0.99 \qquad\qquad R^2 = 0.99 \qquad D.W = 1.62 \qquad\qquad F = 1089.95$$

$\hat{A}_0$ which shows independent inflation rate is equal to -0.86 percent which means if the coefficient of other independent variables equals zero, inflation rate will equal -0.86 and we do not analyze it.

$\hat{A}_1$ which shows $\dfrac{\partial LCpi}{\partial LInterest3} \succ 0$ is equal to 0.78 percent which means if 3-year deposits interest rate is increased 1 percent dynamically, inflation rate will increase 0.78 percent which shows a positive and direct relationship between interest rate of 3-year interest rate and inflation rate because increase in deposits interest rate will increase money in people's hands and people expect prices will increase due to deposits interest rate increase, therefore this encourages people to buy products and products prices, especially consumable products and therefore inflation rate will increase..(Farhang, Makouchehr,1993:215)

$\hat{A}_2$ which shows $\dfrac{\partial LCpi}{\partial T} \succ 0$ is equal to 0.18 which means if trend variable (passage of time) is increased 1 percent, inflation rate will increase 0.18 percent which shows a positive and direct relationship between passage of time and inflation rate because as time goes by, people expect products prices are increased and this increases prices general level in future.

Considering the calculated "t"s and its comparison with "t" in the table with 16 degree of freedom which equals 2.120, we can conclude that H_0 is rejected and H_1 is verified in 95 percent confidence level. Furthermore, considering the calculated f and its comparison with table "f" with 14 and 2 degree of freedom which equals 3.74, we can conclude that H_0 is rejected and H_1 is statistically valid in 95 percent confidence level. adjusted R squaredis equal to 0.99 which means 99 percent of dependent variable changes (inflation rate) is explained by independent variables (interest rate of 3-year bank deposits) and the remaining part is left unexplained. auto-correlation coefficient of Durbin-Watson(D.W) is also equal to 1.62 which is $\begin{array}{c} d_u \prec D.W \prec 2 \\ 1.40 \prec 1.62 \prec 2 \end{array}$ and this shows that there is no auto-correlation in regression. In other words, P=0 is verified and $P \neq 0$ is rejected. Finally, regression is verified from theoretical and statistical and econometrics aspects.

Fourth scenario
Estimation of influence of four-year bank deposits interest rate on inflation rate in a dynamic way

In order to estimate influence of four-year bank deposits interest rate on inflation rate in a dynamic way, the following pattern has been used:

$$LCpi = A_0 + A_1LInterest4 + A_2T + A_3MA(1)$$

The above pattern had the following results after estimation:

$$LCpi = 1.39 + 0.22LInterest4 + 0.13T - 0.99MA(1)$$

$$T \quad 4.94 \qquad 2.61 \qquad 39.25 \qquad -3.99$$

$$R^2 = 0.99 \qquad\qquad R^2 = 0.99 \qquad D.W = 2.01 \qquad\qquad F = 1619.23$$

$\hat{A}_0$ which shows independent inflation rate is equal to 1.39 percent which means if the coefficient of other independent variables equals zero, inflation rate will equals 1.39 percent and we do not analyze it.

$\hat{A}_1$ which shows $\dfrac{\partial LCpi}{\partial LInterest4} \succ 0$ is equal to 0.22 percent which means if 4-year deposits interest rate is increased 1 percent dynamically, inflation rate will increase 0.22 percent which shows a positive and direct relationship between interest rate of 4-year interest rate and inflation rate because increase in deposits interest rate will increase money in people's hands and people expect prices will increase due to deposits interest rate increase, therefore this encourages people to buy products and products prices, especially consumable products and therefore inflation rate will increase.

$\hat{A}_2$ which shows $\dfrac{\partial LCpi}{\partial T} \succ 0$ is equal to 0.13 which means if trend variable (passage of time) is increased 1 percent, inflation rate will increase 0.13 percent which shows a positive and direct relationship between passage of time and inflation rate because as time goes by, people expect products prices are increased and this increases prices general level in future.

Considering the calculated "t"s and its comparison with "t" in the table with 7 degree of freedom which equals 2.365, we can conclude that H_0 is rejected and H_1 is verified in 95 percent confidence level. Furthermore, considering the calculated f and its comparison with table "f" with 5 and 2 degree of freedom which equals 5.79, we can conclude that H_0 is rejected and H_1 is statistically valid in 95 percent confidence level. adjusted R squaredis equal to 0.99 which means 99 percent of dependent variable changes (inflation rate) is explained by independent variables (interest rate of 4-year bank deposits) and the remaining part is left unexplained. auto-correlation coefficient of Durbin-Watson (D.W) is also equal to 2.01 which is $\begin{aligned} 2.00 \prec D.W \prec 4 - d_u \\ 2 \prec 2.01 \prec 2.62 \end{aligned}$ and

this shows that there is no auto-correlation in regression. In other words, P=0 is verified and $P \neq 0$ is rejected. Finally, regression is verified from theoretical and statistical and econometrics aspects.

Fifth scenario
Estimation of influence of five-year bank deposits interest rate on inflation rate in a dynamic way
In order to estimate influence of five-year bank deposits interest rate on inflation rate in a dynamic way, the following pattern has been used:

$$LCpi = A_0 + A_1 LInterest5 + A_2 T + A_3 MA(1)$$

The above pattern had the following results after estimation:

$$LCpi = 0.36 + 0.33 LInterest4 + 0.17T - 0.93 MA(1)$$

$$T \qquad 1.00 \qquad\qquad 2.18 \qquad\qquad 22.75 \qquad 28.39$$

$$R^2 = 0.99 \qquad\qquad\qquad R^2 = 0.99 \qquad D.W = 1.42 \qquad\qquad F = 1402.06$$

$\hat{A}_0$ which shows independent inflation rate is equal to 1.39 percent which means if the coefficient of other independent variables equals zero, inflation rate will equals 1.39 percent and we do not analyze it.

$\hat{A}_1$ which shows $\dfrac{\partial LCpi}{\partial LInterest5} \succ 0$ is equal to 0.33 percent which means if 5-year deposits interest rate is increased 1 percent dynamically, inflation rate will increase 0.33 percent which shows a positive and direct relationship between interest rate of 5-year interest rate and inflation rate because increase in deposits interest rate will increase money in people's hands and people expect prices will increase due to deposits interest rate increase, therefore this encourages people to buy products and products prices, especially consumable products and therefore inflation rate will increase.

$\hat{A}_2$ which shows $\dfrac{\partial LCpi}{\partial T} \succ 0$ is equal to 0.17 which means if trend variable (passage of time) is increased 1 percent, inflation rate will increase 0.17 percent which shows a positive and direct relationship between passage of time and inflation rate because as time goes by, people expect products prices are increased and this increases prices general level in future.

Considering the calculated "t"s and its comparison with "t" in the table with 20 degree of freedom which equals 2.086, we can conclude that H_0 is rejected and H_1 is verified in 95 percent confidence level. Furthermore, considering the calculated f and its comparison with table "f" with 18 and 2 degree of freedom which equals 3.55, we can conclude that H_0 is rejected and H_1 is statistically valid in 95 percent confidence level. adjusted R squaredis equal to 0.99 which means 99 percent of dependent variable changes (inflation rate) is explained by independent variables (interest rate of 5-year bank deposits) and the remaining part is left unexplained. auto-correlation coefficient of Durbin-Watson(D.W) is also equal to 1.42 which is $\begin{aligned} d_u \prec D.W \prec 2 \\ 1.41 \prec 1.42 \prec 2 \end{aligned}$ and this shows

that there is no auto-correlation in regression. In other words, P=0 is verified and $P \neq 0$ is rejected. Finally, regression is verified from theoretical and statistical and econometrics aspects. In view of the present economic structure of the country and what was said about real interest rate, we can conclude that individuals have four options to keep or convert their money. First is depositing money into bank, second is financing non-organized monetary market (usury transactions). Third option is converting cash into property such as housing, stocks … and the fourth option is keeping money in the form of cash. Inflation conditions of Iran at present dictates that the fourth option is the most unreasonable one because it is accompanied by negative real return equal to inflation rate. The third option is not expected to be considered by individuals because of high risk and unsteady nature. In spite of the fact that the second hypothesis has a high risk, its mechanisms is determined in market and illegal transactions have astronomical rate of return, it is tempting for dealers who are risk-taking and it can be a good option for such individuals. But it must be noted that most of individuals are classified in risk-

avertingclass and do not tend to enter non-organized monetary market, therefore the only option ahead of them is depositing money into commercial banks.(Ashraf, Ahmad, 1980;58) Therefore it can be concluded that considering negative real interest rate, most of people are in a situation in which they must suffer the loss of money value and of course they will respond to this loss. This response can be expressed as withdrawing money from bank accounts and assigning it to consumption. In fact, as inflation rate increases, the number of people who prefer to withdraw their monetary resources from bank accounts and spent them will increase and this can be inferred from Iranian economical data in the 20-year period. Therefore it can be concluded that determining nominal interest rate based on inflation rate will increase formal money market attractions for people and prevents from non-organized resources consumption with controlling total demand and it will help move towards controlling inflation. This is important because gradual control of inflation which is possible through this method can reduce production costs growth speed and many production plans that are not economically justifiable due to production costs pressure will step into activity cycle.(Farhang, Makouchehr,1993:145)

The quality of creating and strengthening non-organized market of money has another element which is important in deciding on requesting loans and that is final efficiency of capital which must be investigated carefully. This element is a function of endogenous and exogenous economicfactors and ignoring these items that is a custom practiced by imperative interest rate will help worsen money market balance. The main endogenousfactor which determines final efficiency of capital balance is the active physical capital in an economy. This factor's value is one of the main decisive factors in determining return rate of investment projects according to law of diminishing returns and consequently an important factor in determining proposed interest rates by loan borrowers. As active capital increases in an economy, final efficiency marginal efficiency and therefore theproposed interest rates will also decrease, therefore interest rate in a developing country in which active capital is low is not expected to be low in the market. Regulations that govern economic and commercial activities are considered as the main origin for the exogenous factors that determine interest rate. For example, a glance to unsteady policies in external commerce of Iran shows that from one aspect, many tariff and non-tariff obstacles have been set up ahead of imports with the slogan of supporting internal production and from another aspect; currency rate is fixed in low level with the slogan of facilitating low-cost production materials import. The result of these two opposing policies has many interesting and unfortunate effects on economy. Reducing currency rate beside inflation in the internal economy will stimulate consumers' taste to use external products which are becoming cheaper and cheaper each year with respect to internal counterparts and also import obstacles will result in price difference at the two sides of the borders and therefore smuggling will be encouraged, because smugglers are confident that he will have a good internal market.(Ashraf, Ahmad, 1980;53) This policy package dictates that capital rate of return increases in underground part of commerce which is not related to active capital volume in this part and is purely a function of import tariff level. This rate of return which might amount to 100 percent in some casesincreases proposed interest rates in non-organized money market and increases market interest rate directly or indirectly. Therefore influencing on nominal interest rate which is determinable in market is out of central bank control, because most of the exogenous factors have institutional nature and they must be solved through legal reforms. Therefore in the present circumstances, the proposed suggestions can prevent deposit-makers from becoming frustrated and also increase motivation for entering money formal market. On the other hand, this proposition does not remove imperative interest rate in Iran's monetary policy-making system and this increases the sensitivity of decision-making on executive mechanism for tis suggestion. In fact, central bank must use the advantage of having access to information over individuals to execute this policy. Doing so has many benefits and not doing so has many disadvantages. If the central bank approximate future period inflation rate well and consider it in determining interest rate, it will prevent people from not trusting in monetary system, distrustwhich might happen due to repetitive interest rate variations or lack of concordance between interest and inflation rates which is felt by individuals. It can also influence on inflation expectations of individuals and contribute to macro-economy stability, because individuals regard the interest rate announced by the central bank as a good approximation of future period inflation rate and base their economic activities on that when they see the nominal interest rate is concordant with inflation rate. Therefore the central bank can reach domination over individuals' economic expectations and increase its policy-making power. The results of analyzing relationship between bank deposits interest and inflation rate in Iran which has been conducted in the form of aeconometrics study, verifies our interpretation of this relationship. Therefore, the results of this study can be summarized as follows:

1. It must be noted that bank deposits interest rate had direct and positive impact on inflation rate in all estimated equations.
2. Bank deposits interest coefficient was positive and significant in all equations and this shows that a10 percent increase in bank deposits interest will increase inflation rate from 2 to 7 percent.
3. In view of the fact that trend variable has been used in all estimated equations, therefore passage of time has positive influence on inflation rate, therefore effects of monetary changes on inflation rate is observed over a period of time in Iran. As it can be deduced from estimated equations, bank deposits interest usually affects inflation positively after one year.

4. Because our country has started its fifth step of socio-economic development and one of the important parts which has been considered is banking system and deposits interest, therefore some practical strategies have been provided in order to reduce inflation rate and therefore bank deposits interest is improved.

Conclusion

1. Inflation rate and capital real interest rate are the main factors that determine bank interest rate. A necessary condition to decrease interest rates is reducing inflation.
2. Capital real interest rate is determined based on factors like shortage of capital and central bank's monetary policies. At present, this rate is about 4 percent which is very higher than real interest rate of banks.
3. Reduction in bank interest rate below 10 percent over several years through gradual decrease in inflation is possible. The political package presented in Fourth Plan article has provided the necessary tactics for achieving this important matter.

Recommendations

Reducing bank loans interest rate through reducing bank interest gap and without reducing bank deposits interest rate is a completely feasible affaire and is followed by investment encouragement in private sector, strengthening stock market, release of more resources in order to be used in basic constructional plans (in order to prepare for private sector investment profitability), reduction of banks interest rate difference with competing countries in non-petroleum export and strengthening internal exporters, decrease of production cost and therefore products and service costs and improvement of purchase power and public costs, obligation of banking system to having a better efficiency and using new e-banking systems in order to attract more deposits.Although this seems very pessimistic and away from the current realities in Iranian economy, but making loans interest rates logical will facilitate investment and occupation in the country and prices will not increase rapidly and uncontrollably and therefore it will result in inflation rate reduction because reduction of deposits and increase in loan requests can disturb banking system balance and banks will face some problems in supplying financial resources.

REFERENCES

Farhang, Makouchehr, concise dictionary of economic sciences, Tehran, Alborz Publications, 1993.

Sheshhani, Ahmad, econometrics pattern and its applications, Tehran: Tehran University publications, first edition, 1996.

Tanhayee, Hossein, Abolhasan and JavadNekhat, method of preparing thesis and dissertation, Arak, Zarrebin Publications, first published, autumn 1996.

Naderi, Ezzatollah and Maryam SeifNaraghi, research methods and their evaluation in humanities, Tehran: Badr research and publications office, 10th publication, autumn 1996.

Ashraf, Ahmad, historical obstacles ahead of investment growth in Iran, Zamineh publications, first published, 1980.

Economic affaires assistance office of Ministry of Economic Affaires, investigation of structure of econometrics pattern in Iranian macro-economy, publications of Ministry of Economic Affaires, first published, 1994.

Najafi, Baha'oddin, financial releasing and impacts of bank interest rates increase on private sector investment, fourth conference of monetary and currency policies, monetary and bank research institute, May 1994.

William H Branson, theory and policies of Macro-economy, second volume.

Economic policies and studies office, analysis of requirements in increasing bank interest rates, 2000.

Jamshidi, Abolghasem, monetary policy-makers, investment company of Iranian industrial development, January 2002.

Imani Rad, Morteza, macro-economy in developing countries, collage publications, 1992.

Maxwell j. fry, Money, Interest and Banking in Economic of Development, University of Birmingham, The Jone Hopkins University, 1995.

International Financial Statistics, International Monetary Fund, 2003

Sergio perira V. Sundavajan, "Issues in Interest Rate Management and Liberalization, IMF Staff Vol.37 No 1, December 1990.

John p. Judd and Glenn D. Rudebusch, Taylors Rule and Fed: 1970-1997, FRBSF Economic Review 1998, Number 3