

# How to Influence Alternative Assets of Undemanding Deposit in the Quantity of Deposits of Non-state Banks

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## ABSTRACT

Nation's banking network has an important role in aiming country's development goals due to the fact that nowadays banking and money has a sensitive and critical role in economic growth. Gathering and absorbing various kinds of deposits and allocating them to support financial needs are main purpose of the banking. In other words, banks are intermediates between depositors and facilities applicants, and using their resources and peoples' deposits begin to give facilities. In this paper our aim is to survey impact of the inflation variables, GDP, stock index, housing index and interest rate of participation bonds on the amount of the state founded banks invisible deposits in Iran. In addition, for aiming this goal, a model based on Friedman portfolio theory is designed to interconnect cited variables with invisible deposits amount (for the period of ten years from 1373 to 1383). In this paper we used seasonal data. Results of the model estimation show that visible deposit active model moves toward its long term model. Error correction model that identifies relation between deposit amount and independent variables in short term, shows that adjusted coefficient toward equivalency is 36% for these deposits. In fact, annually 36% of the invisible deposits unbalance in a period gets balanced in the next period.

**Keywords:** *banking network; economic growth; inflation variables*

## 1. INTRODUCTION

Economically, increasing growth of the continuous, positive and net investment prepares basics for development and provides technical capital for the case. Gathering such capitals (investment in major fields such as road and transformation network construction and so on) makes increase in capital production and consumption rate possible. But investment needs financial support.

Nowadays, as economic gets money dependent, some instruments are needed for transferring funds from one who has extra capital to one whom needs this amount [1].

In fact, financial markets (such as stock market and participation bonds) and financial agents (such as banks and financial institutions etc.) act as a main agent of financial system that has the duty of transfer funds from who has extra capital to whom needs this amount. In other words, markets and fund intermediates are financial tools for transferring savings and convert them into the investment. Essential need for reaching economical growth and on the other hand, lack of the capital and experience for this capital made developed and developing countries to establish agents for directing investment nation's economic development in the form of banks and developmental organizations.

In the markets of most countries, banks has done more for the case and has special role in accelerating economic circle using financial resources for creating and developing manufacture units and employment plans and completing under work plans. As banks are state founded and gets most of their resources from their own depositors' deposits, depositors' determination of choosing their

shopping assets can have a great effect on the bank's deposit volume [2].

So in this paper, using individuals' assets portfolio we will study some alternatives for money such as stock and participation bonds, and their effects on investments volume in the state founded banks (including exclusive and commercial ones.)

## 2. THEORETICAL ASPECTS

We will use the Friedman's money demand theory-which is based on resources limits on individual money demand principal-for releasing theoretical aspects of the way of effects of the deposit alternative assets on deposits volume in the Iranian state founded banks and accepting that the deposit volume like money depends on another alternative assets. We will economically study how deposit alternative assets efficiency affects the deposits volume in the Iranian state founded banks-of course knowing that not only economical aspects but also many political agents affect economical activities including banking and deposits rate, and it is beyond the scope of this paper to be included here.

Amount theory is only a demand theory for money; and not an income theory, nor money income or prices level. Any comment on these variables needs combining amount theory with characteristics of money release and some other variables.

In money demand models that have investigated by Kinz, Tobin and Bamuel, differences between deal demands and agitate is of consideration.

But Friedman studied money demand in the fields of microeconomics' traditional theories on consumer behavior and producer demand for production characters.

He said that consumers save money because holding money has pleasure for them, in fact holding money enables them facilitate pay money instead of frequently meet bond market mediators and encounter risks in fall of those bonds. As consumer demand in absence of money illusion is a demand for real consumption goods regardless of their money value, money demand should be demand for real balances. Because money like good is demanded for its desirability credit. Apparent and nominal balance is not demanded. Real balance demand depends on real income level (like good demand) and another ways of assets holding such as bond holding and purchasing lasting goods (as price of the alternative goods).

Producers also hold money as a generator asset which makes their payments and expenditure routine possible. Their demand for real capital services depends on real product level and capital relative price and as well their demand for real money depends on product or real income and relative income of other ways of saving money (securities, banks deposits and so on). In fact, Friedman's money demand theory is based on resources constrains for individual's money demand and is calculated with supposing saving money revenue same as other substitutes for holdings revenue. Money revenue is obtained by its invisible services in transactions financial support and making confidence against bankruptcy; while other holdings' revenue is possible to be calculated with nominal and real terms. Although principles and basics of the theory is like quantitative theoreticians' ideas before Keniziians; but however, Friedman's analysis is much more accurate, complete and subtle.

Most of the Friedman's work is on describing skillful troubles and few details of the nature of the holdings revenue as a substitute for money and also financial (budget) troubles and limitations. So, he considered different assumptions to obtain money nominal demand function,

$$M^d = P \cdot f \left( r^B, r^E, \overset{\circ}{P}, h, y, u \right)$$

where  $M^d$  is money nominal demand,  $P$  is prices level,  $r^B$  is bonds interest rate,  $r^E$  is market equality rate,  $\overset{\circ}{P}$  is inflation rate (nominal rate of the holdings revenue),  $u$  is taste,  $y$  is real income and  $h$  is human resource. We can modify equation above as

$$p, \quad r^B \quad \frac{M^d}{P} = f \left( r^B, r^E, \overset{\circ}{P}, h, y, u \right) \quad \text{and} \quad r^E \quad \text{are variables}$$

showing nominal revenue of the holdings that can be saved instead of money.

According to Friedman's theory, money demand is a positive function of wealth or permanent income or a

negative function of other holdings' expected efficiency rate.

In Friedman's money demand function (shopping asset model) saving money as a substitute for other kinds of wealth (goods, bond and stock) is for choosing financial schedule or portfolio. It's done when people begin to choice money holding or other financial assets, goods or services where factors such as interest rate, bond efficiency, inflation rate etc. are in work.

As reducing consumption rate in the present for saving a part of income for future uses is a kind of saving that depends on other kind's amount of efficiency, we can suppose that choosing any kind of saving depends on other kinds efficiency too. Bank deposits are another way of saving that considering Friedman's money demand theory factors such as inflation rate, GDP, stock efficiency, bond efficiency rate etc. can be considered in work.

In other words, any factor that can affect individual's income and consumption pattern in their life time, will affect their savings amount too (both fundamental and implicit factors). But supposing money to be comparative with other kinds of holdings means that Friedman's theory is emerged from stock and not flow.

In fact the last variable will be budget trouble. Individuals will be able to determine about a part of the wealth saved as money by comparing other kind of alternative's efficiencies. So it doesn't specify logic and rational level, but introducing wealth volume (with its relative efficiency) make it possible and real income will work as an agent of wealth trouble.

This can be confusing because real income is a flow where saving kind choice trouble is an accumulation variable. For clarity, Friedman put income as a proxy for real total wealth accumulate variable. In other words, he put income as wealth efficiency in which

$$y = \overline{rW}$$

$$\overline{W} = \frac{y}{r}$$

Here we can substitute  $y/r$  as wealth in right hand side of the Friedman's equation supposing that holding efficiencies are functions of each other.

Due to the presence of the variable  $u$  in the equation, Friedman's theory is based on maximizing desirability (which is a special case for neoclassic); that individuals maximize their desirability considering budget trouble with clear and specified level of tastes. Budget trouble determinates with total wealth (approximate) and holdings relative efficiency (relative price which was used in consumption theory).

So Friedman's equation will be money demand function which constitutes from: the interest rate variable, the real income and the other components. This function can be written as "speed of the money circle" equation as:

$$V = \frac{Py}{M^d} = g(r^B, r^E, P, h, y, u)$$

New money terms theories, unlike Kinzins that have used interest rate as a fundamental variable in money demand, uses permanent income variable. The permanent income is something different from current and computable income; permanent income is: weight average of the expected future incomes.

If we show individual's real wealth in time one with  $w_1$ ,  $y_{1,t}^e$  will be the wealth's expected real value that we obtain in time i.e ,

$$W = \frac{y_1}{(1+r)} + \frac{y_{1,2}^e}{(1+r)^2} + \frac{y_{1,3}^e}{(1+r)^3} + \dots + \frac{y_{1,i}^e}{(1+r)^i} + \dots + \frac{y_{1,n}^e}{(1+r)^n}$$

Where r is reduction rate. If we suppose this reduction rate to be equal with wealth efficiency rate, then permanent income in current time can be obtained as

$$y_1^P = r \cdot \overline{w_1}$$

An important feature of the permanent income is that it is not the same as the current income and its way will be different in a long while.

In fact the permanent income is more lasting than current income, as it is clear in the Friedman equations. Equation (4) states that the permanent income obtains from product of the wealth in the efficiency rate. If we suppose r to be constant, we should study the relation between the permanent and the current income with the wealth to find their interrelation. In equation (4), if we suppose r to be specified, then the wealth can be obtained from the expected and current income. If  $y_1$  be the only variable, because of the other components invariability, the wealth fluctuates slightly at that direction. As wealth changes less than  $y_1$  and r is supposed to be constant, so the permanent income will encounter less fluctuations.

Let's have a review on following equation

$$M^d = P \cdot f(r^B, r^E, \overset{\circ}{p}, h, \overline{y}, u)$$

Friedman claims that the permanent income variable should be replaced with y and the permanent price with prices level. So the individual's money demand is not affected by prices level; and it will be a function of the expected permanent price.

We can rewrite equation (1) as

$$M^d = P^P \cdot f(y^P, Z)$$

Where  $P^P$  is the permanent prices,  $y^P$  is the permanent income and z includes all the variables in the right hand side of the equation (1) except y and p. If we suppose that the variable in z has not great effect on the money demand, then for simplifying the model can rewrite equation (6) as

$$M^d = P^P \cdot f(y^P)$$

We can modify this as it show the speed of the money circle

$$V = \frac{Y}{M^d} = \frac{Y}{Y^P} \cdot y(y^P)$$

As we have

$$P^P \cdot y^P = Y^P \Rightarrow V = \frac{Y}{Y^P \left( \frac{f(y^P)}{y^P} \right)}$$

$$V = \frac{Y}{M^d} = \frac{Y}{Y^P} \cdot y(y^P)$$

Friedman proposed equations (8) and (7) in 1959 for money demand. The difficulty of working with equation (8) is that we can not calculate the permanent income directly and easily in experimental investigations. So we should look for a compatible proxy for it. Friedman introduced anticipated income except permanent income. So we have

$$M^d = P^A \cdot f(y^A)$$

$$V = \frac{Y}{Y^A} \cdot g(y^A)$$

Even with doing this, problem exists yet because amount of this kind of income is not available, so we should add a complementary into this theory. Friedman's solution is called "error adjustment hypothesis".

In this method we suppose that future's expected income  $y_T^A$  in time T is the sum of the previous expected income and the previous error adjustment ( $y_{T-1}^A$ ), as follows

$$y_T^A = y_{T-1}^A + B(\overline{y}_T - y_{T-1}^A) \quad 0 < B < 1$$

$$y_T^A = B[\overline{y}_T + (1-B)\overline{y}_{t-1} + (1-B)^2 \cdot \overline{y}_{t-2} + \dots + (1-B)^n \cdot \overline{y}_{t-n}]$$

According to the equations (11) & (12), ( $y_T^A$ ) is the previous real income's weight average with geometric reduction, where current years' income has a great effect on it- when we compare it with remote past.

Passed years' income is defined and invariable and any current measurable income reduction will affect only the first part of the equation (12), and this hold income relatively constant and this change will be partial and negligible.

Now we are going to introduce Friedman's final equation. If we summarize equation (12) as

$$y_T^A = B \sum_1^n (1 - B)^i \cdot \bar{y}_{t-i}$$

It will be possible to have a similar equation for the expected price:

$$P_T^A = B \sum_0^n (1 - B)^i \cdot p_{t-i}$$

By substituting equations (13) and (14) into the equation (4) we will have

$$M_T^D = P_T^A \cdot f(y_T^A)$$

and money circle speed equation will be as

$$V_T = \frac{P_T \bar{y}_T}{P_T^A y_T^A} \cdot g(y_T^A)$$

So, at this study using Friedman's money demand theory, we will survey some variables' effects on the deposits volume.

### 3. PRESENTING MODEL AND ANALYZING RESULTS

The presented model is estimated using ARDL technique for the years 1373 to 1383. In this model, in addition to estimating long term model coefficients, error adjustment model is also presented to survey that, how the short term equilibrium error can be modified to the long term one.

For this reason, effects of many variables on the deposits volume evaluated considering basic rules, and finally a model presented that accompanied the best results. At this model, variables that are as a substitute for the invisible deposits volume or in fact are effective on it are the followings: housing index, stock index, participation bonds interest rate, GDP and inflation. Here, affects of other variables such as currency rate, coin price and liquidity on the deposits volume evaluated, but whereas their results were not important and meaningful, they got eliminated from the model [4].

In this model we considered stock, housing and participation bond, holdings as a substitute for deposit, of course amongst these three factors, stock wasn't meaningful and eliminated from the model and the model tested again.

It's expected from GDP to have a positive effect on the deposit volume. In fact increasing this factor means increase in the income and will increase the deposit. And in contrast, inflation rate will reduce money cost which means negative effect on deposit volume.

We can write the general form of the surveyed model as:

$$l\ ndd = f(lbond, lh, lstock, lgdp, linf)$$

Where:

lndd is the invisible volume of the state founded banks,  
lbond is participation bonds interest rate,  
lh is housing index, l  
stock is stock index, l  
gdp is GDP and linf is inflation rate.

In equation (1) coefficients are logarithmic. According to what we have said, ARDL form of the above two models are to be as:

$$l\ ndd_t = \theta'_0 + \sum_{i=0}^{s'_1} \alpha'_i l\ ndd_{t-i} + \sum_{j=0}^{n'_1} \theta'_{1j} lbond_{t-j} + \sum_{j=0}^{n'_2} \theta'_{2j} lstock_{t-j} + \sum_{j=0}^{n'_3} \theta'_{3j} lh_{t-1} + \sum_{j=0}^{n'_4} \theta'_{4j} l\ gdp_{t-j} + \sum_{j=i}^{n'_5} \theta'_{5j} linf_{t-i} + u_t$$

Using Microsoft software and choosing three intervals the two above relations are estimated. The number of the estimated regression can be calculated as

$$(d + 1)^{k+1} = 4^6 = 4069$$

The estimation will have more degree of freedom as Schwartz-Bazin lowers the number of the intervals and according to the little volume of sample, we will use Schwartz-Bazin to be chosen the best relation.

The selected active model for state founded banks' invisible considering Schwartz-Bazin is as:

$$l\ ndd = 0.35 + 0.58l\ nnd(-1) + 0.02\ lstock - 0.03\ lh + 1.45lh(-1) \quad (2.08) \quad (7.72) \quad (1.37) \quad (-0.11) \quad (2.67)$$

$$-1.16lh(-2) - 2.62lbond + 0.15lgdp + 0.01\ linf \quad (-3.51) \quad (-2.95) \quad (4.45) \quad (0.56)$$

$$R^2 = 0.96 \quad \bar{R}^2 = 0.95$$

**ARDL(1,0,2,0,0):**

It's clear that in this model the stock index is not meaningful again. As we said earlier this is because of the huge number of functions in the stock market during study period.

So, eliminating stock index variable we test the new model again. Results of our estimation is as

$$l\ ndd = -0.17 + 0.63l\ ndd(-1) - 0.23lbond + 0.13lh + 1.40lh(-1) \quad (-2.10) \quad (8.73) \quad (-2.75) \quad (0.43) \quad (2.53)$$

$$-1.26lh(-2) + 0.16\ gdp + 0.02\ linf \quad (-3.88) \quad (4.55) \quad (1.11)$$

**ARDL(1,0,2,0,0):**

$$R^2 = 0.98 \quad \bar{R}^2 = 0.97$$



In this model,  $R^2$  and  $\bar{R}^2$  are 0.98 and 0.97 respectively that says, 0.98 of the deposits volume changes are explained with explanation variables of the model. Accuracy tests of the model are of perfect results of the estimation, including F tests of the ARDL that according to the estimated numbers we can not reject ARDL. Normalized test talks about normal distribution of remainders and according to variance inequality test we can say that all remainders have same and constant variance. So we can conclude that classic assumptions in the used model are of consideration in this study.

For finding long term relation it is needed to examine co-accumulation between variables of the model. As we said, necessity of the variable co-accumulation is that sum of the variables coefficients with related interval that appeared as explanation variable, be less than one, as results of the estimation prove it.

Now we can estimate invisible long term deposits volume relation. Its results are summarized in the table below.

As we can see, participation bonds' interest rate in a long term such as short term one has a negative relation with invisible deposit volume. Coefficients of the GDP also show a meaningful and positive relation with the invisible deposit volume. Positive and meaningful coefficient of the housing index shows its positive relation with invisible deposits volume. As we can see inflation rate in a long term hasn't meaningful relation with invisible deposits volume.

Coefficients of the equation ECM of the invisible deposits volume is shown in the table below.

Variable coefficient  $ecm(-1)$  in short term model is -0.36 that statistically is meaningful. According to the amount of this coefficient we can say that 36 percent of the disequilibrium will be modified in the next period.

So, in a general expression, outcomes of the model estimation do not show meaningful relation between the stock index and the deposits volume. As we said it is because of the relatively high amount of fluctuations in the stock market at that period. For example, the volume of the transacted stock volume at bourse has increased from 1880.6 billion in 1374 to 9176.7 billion in 1379.

Comparing transactions volume with liquidity volume at those years, one can find that transactions volume increased from 2.2 percent liquidity in 1374 to 3.7 percent in 1379. But considering national gross saving volume to the current price at those years (which is 62170.4 billion at 1374 and 231554.1 billion at 1379), it is clear that in 1379 3.36 percent of the deposit volume has spend on the transactions on bourse, that shows bourse have not has a great role in absorbing deposits and directing them into the stock purchase and investment. So these deposits move toward informal markets or bourse on housing, gold, currency etc. that causes inflation increase and limits economic growth.

Negative relation between participation bonds interest rate and total volume of the deposits and also invisible deposits volume, both in long and short term, does not reject the hypothesis that says participation bonds interest rate has inverse proportion with deposits volume.

Housing index coefficient, in a long term, shows a positive and meaningful relation with invisible deposits volume. In fact, in a long term with increasing housing index, total deposits volume and invisible deposits are increased too. We can describe this as: be cause of the peoples' low power to have house, some of them substitute bank deposits with it in their shopping assets and some others begin deposit their assets in bank for house loan, in which both of them end to the cited result.

In fact, considering expanded definition of the opposition between invisible deposit and visible deposit. In fact, invisible deposits is a resource for fund accumulation for purchasing lasting holdings, positive and meaningful coefficient of the GDP, both in long and short term, shows direct relation between this variable and the invisible deposits volume.

In the money demand theories, such as Friedman's one, with concentration on limited definitions of money (paper money, visible deposit) we expect inverse relation between inflation and housing index with money demand. But when consider wider definitions for money, opposition between invisible deposit and visible deposit will be obtained. That is, invisible deposit is as a fund accumulation for purchasing lasting holdings. So, considering this wide definition of money we can expect the inflation rate and housing price index results in increase in invisible deposit (where people tend more to hold money resources) so, these positive coefficients can be accepted considering these facts.

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