Influence of Rise in Volume of Money on Economic Growth in Iran during 1367-1387 (1988-2009)

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ABSTRACT

Of special note is that apart from whether monetary policy, as a monetary instrument, affects real economic variables or not, monetary policymakers use money, despite its neutrality, as an instrument to raise the level of production. This breeds inflation which may in turn influence other economic variables. This study tries to evaluate money neutrality in Iran's economy. Money Neutrality Hypothesis is rooted in Quantity Theory of Money. Neutrality of money is the idea that a change in the stock of money only affects nominal variables such as prices, wages and exchange rate, with no effect on real variables. According to Rational Expectations Hypothesis and flexibility of prices (equilibrium in markets) in macroeconomy, only unanticipated changes of volume of money influence real production.

In the phase of model estimation, first the growth rate of money is anticipated using AR4 and ARIMA methods, as well as regression model with the aim of selecting the best model. Later, Two-Stage Least Squares (TSLS) regression is estimated. The period under study covers 1367 through 1387 (1988-2009). Empirical results indicate that anticipated money is neutral while unanticipated money is not (over the short run).

JEL Classification: E58, E52, E47, E42, E17

KEYWORDS: Money Neutrality, Volume of Money, Adaptive Expectations, Rational Expectations

INTRODUCTION

The role of money and its effect on economic variables has special place in economic theories and so the power and weakness of money has been challenging for the economists on playing its role in economy. Not long ago the discussion between Keynesians and neoclassic economists examined the both sides of spectrum and now the monetarism, new classic and Keynesianism schools provoke it and there is always a case for disagreement and discussion between the economists. The view of rational expectations, based on neoclassic opinion, adds up the money neutrality absolutely or sometimes monetarism in short time and long time, also has highlighted for the last two decades.

This study is aimed to evaluate and test the achievement of new classical or Keynesian pattern and how money affects the macroeconomic variables. Thus it is necessary, at one hand, to introduce the theory and research the discussion about it and, at the other hand, examine the previous works and then using different patterns and adjusting and integrating it, present a model based on Iranian economic structure.

The main objective is to recognize the trial and error fitting of Iranian monetarism model optimally and, ultimately, to determine how much money and monetary policies effect the Iranian economic variables, or in other words, to evaluate the efficiency or inefficiency of monetary and financial policies and, at the other hand, to examine how money and monetary policies as the above theory affects the macroeconomic variables such as general price level, employment and production.

It will come to this conclusion that, eventually, the weakness and strength of economic policies are recognized as the model theory and therefore we could present, as a solution, optimized and efficient policies in order to modify the previous performance and policies. However the main objective to write this article, as the title says, would still remain the money neutrality test in Iran based on rational expectation theory and thus it is important that in this study we test the accuracy of theory from a theoretic point of view and using econometric methods, or in the other words, it will be an analysis the theory acceptability or unacceptability.

Theories

1- The anticipated money in Iranian economy reflects completely as current price levels.

A proportion of anticipated money In Iranian economy is reserved as the favorable demand.

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Questions
1- Is money neutral in Iran and expectations are formed rationally?
2- Is money neutrality in Iranian economy necessarily means to form the rational expectations?

The objectives
How money growth or change in money volume affects the total production in Iranian economy
1- The Theoretical

The monetary neutrality originates from the Quantity Theory of Money. It means the change in money has not any effect on all real variables (and returns to its original state) maybe a little bit after the time of transfer, and only leaves macroeconomic nominal effects (changes in prices and nominal wages). This theory has essential role in anticipating the monetary theories such as theory of inflation. Long-term money neutrality theories mostly regard money as a hypothesis, whereas they believe money could leaves real effect in short term. However, there are a lot of discussions about the short term neutrality of money. The monetarists, at one hand, offer opinions on its impact in short term and, at the other hand, the Real Business Cyclists (RBCs), present completely inconsistent opinions saying complete neutrality of money either in long or short terms. Among the reason why such disagreements happen, is how each of these schools sees the expectations arise amongst people. The monetarists all believe in formation of the adaptive expectations, thus until the expectations are completed in economy, the monetary policies can be effective.

On the other hand, the neoclassics, spite believing in formation of rational expectations and their immediate completion, still believe money may impact real variables in short term, excepting that on their eyes only that part of monetary policies which have not been anticipated could be effective for some time. Besides these schools, the new Keynesians exists and they, spite believing in rational formation of expectations, believe the impact of monetary policies and its neutrality in short term. There are price and wage stickiness in economy, incomplete and near rationality information to justify their claim. What is noteworthy about impact or non-impact of monetary policies as a political tool on real economic variables is that if, spite monetary neutrality, the policymakers inject this political tool into economy to improve the production, then economy encounters inflation, in turn could also impact many other variables. Therefore, as was briefly mentioned, since the *Wealth of Nations* by Adam Smith was published until now, over the last two centuries, there have been many different views arisen in macroeconomics which consider a different role to others for money in economy. So it is necessary, in the beginning, to examine every single view of these schools on how monetary policies impact in economy.

2- The background
Abroad studies

Barro (1976). Barro (1976) for the first time introduced a test based on the American statistics (1946-73) and used two essential relations. First he attributed the money growth to its past values, government expenses, and the unemployment rate with time interval and the second expressed as a distributed interval showing a specific function of unemployment rate in terms of unanticipated rate of money supply growth and substitute variables to estimate the normal unemployment rate. And ultimately he found that only unanticipated monetary growth has positive and meaningful effect on the product.

Attfield, Duck and Demery (1981 and 1983). Attfield, Duck and Demery (1981 and 1983) reacted simpler than Barro to the relations between monetary and financial policies, as they used the real government expenses instead of natural government expenses. They believe the best variable has been the public sector borrowing because it didn't face the problem of calculating the natural government expenses any longer. Also as Barro, given the past trends estimated the natural government expenses, in fact he had used adaptive expectations, however he had established his model based on the rational expectations. Other variable they calculated to determine the money growth during the studied period was the balance of payments surplus with a delay. It indicates that the British government cared about their foreign balance, as the considerable deficit led to take contractionary monetary policy and the surplus caused backfire. The results showed there was meaningful considerable unanticipated money growth which impacts the product directly and positively. As Barro had found these estimations showed that the sever money growth mostly shows in the first year, also the total coefficients of unanticipated money growth showed less impact (compare to the Barro's model) of unanticipated money shocks on the product. In the next phase they estimated both equations simultaneously to bind the coefficients simultaneously. The model they used in this relation ultimately showed the very similar results as OLS method.

Mishkin, Gordon, McGee and Stasic (1982). Mishkin, Gordon, McGee and Stasic (1982), at the time Attfield and others were testing the Barro's theory and matching the results with the Barro's results, Mishkin as one of the follower of Keynesianism, established a pattern exactly came about with the reversed results with the Barro's.

In 1982 he along with Gordon, McGee and Stasic, who were all against the monetary neutrality theory, tested the Barro's theory with American economy and found contradiction results with the Baro's. Meanwhile, Mishkin was the first who doubted it and found that anticipated money growth has deep impact on product and unemployment in America. He increased the money growth delays in the pattern and, for the nonlinear estimation of pattern, evaluated the monetary neutrality and rational expectations tests separately. The results from the model showed that with the high money growth delays, the results were contrary to the Barro's in American economy.

Pesaran, as one of other Keynesian follower, also in 1987 retested the Barro's pattern with a different hypothesis than the Barro's. He believed that Barro's hypothesis on correct anticipation of government expenses by people was not correct and it is not possible to anticipate the exact nominal federal expenses. The FEDV variable in Barro's pattern (which inserted in the money growth equation) couldn't be anticipated exactly unless they anticipate price levels completely. He also adds that people, with the government to inform its future plans, able to anticipate the nominal growth of government expenses exactly. Therefore, he estimated his model in two ways, thus as he believed the information were in accurate, establish his Keynesian pattern and approved against the Barro's pattern. Of course, to answer why the Barro's pattern has also developed in American economy, he claims the monetary policies in America in that period accompanied with the financial policies, and it has been the reason of impact of monetary policies.

Carr and Darby (1981). Carr and Darby (1981) in their article "*Monetary Shocks on Money in Short Term*" discussed the experimental test of theory of money as a shock absorber. They test the theory of money as shock absorber with the monetary anticipations (using ARIMA processes), as they are replaced by a partial adjustment of money equations. Carr and Darby concluded that a proportion of unanticipated changes in money supply in short term are reserved as money demand, while the anticipated changes in money demand reflect completely at price levels, therefore these anticipated changes will be neutral.

Mackinnon and Melbourne (1985). Mackinnon and Melbourne (1985) discuss that the Carr and Darby's equation (19) parameterized again to appear the endogenous logarithm variable of nominal money stock in time (t) only at the left side of equation. Though it seems that none of these writers were aware that if the nominal stock of money is endogenous people should behave irrationally, re-parameterizing the model, they get the opposite results to the Carr and Darby's.

Cuthbertson and Taylor (1986, 1998). Cuthbertson and Taylor (1986, 1998) also tested the theory of money as shock absorber. Cuthbertson and Taylor estimate the equation (21) for the US and England using the Two-Stage Least Squares (TSLS) method. Changing in the Carr and Derby's model they conclude that in US and England the rational expectations hypothesis with the monetary neutrality and also rational expectations hypothesis is rejected (even at one percent) without monetary neutrality. In TSLS method when testing the theory of money as shock absorber implicitly applies the limitations between the equations about rational expectations. Here Cuthbertson and Taylor accept the buffering money (or its neutrality).

Local studies

Vaghar (1975). Vaghar (1975) was among the first to study the neutrality of money in the country. In 1975 he tested the credibility of monetarism view in Iran and by regressing the GPD growth rate over the growth rate of money volume and government expanses he examined the neutrality of money. His data ranged between 1961 and 1974 and the variables he used were absolute level of GDP, money volume and government expenses as well as their ranking increment and subtraction. These variables were overly regressed in order and then it was decided to choose the optimized model given the results from each of these fitted relations. He then do the same job with the price levels and ultimately did all of these operations using the price levels instead of GDP (dependent variable). Estimating all these equations and their general evaluation showed that the monetary variables have not any impact on production and only affected the inflation, thus the recommendation he gave to the monetary policymakers has implied the necessity of decreasing money volume to control inflation.

Khataee and Danehkar (1992). Some years later Khataee and Danehkar (1992) used the model Khan Mohammad and Amer al-Saji applied upon the Barro's model for Iraqi economy and did their studies first with the money volume and next with liquidity. They did the same with money volume and found the results from calculating pattern and liquidity better having more matched with realities. Finally they reached to the impact of anticipated unanticipated monetary policies in economy. Their politic recommendation to the monetary officials was that in normal conditions and accepting rational expectations hypothesis and other new classical hypothesizes, they shouldn't use monetary policies to impact the unemployment rate and production regardless of their level.

Jalali-Naeeni and Shiva 1993. Two years later Jalali Naeeni and Shiva (1993) tested the Barro's theory. With a little change they used the Barro's basic model similar to the previous arrangement. These changes applied as the increase in process variable, increase in the period of intervals, structural failures, adding artificial variables of

Islamic Revolution and wartime and ultimately the last model chose as it found the answer better than other model and they concluded that increase in money volume and liquidity did nothing to help the production improvement and even create inflationary pressure. However, their studies also showed no rational expectations and they believed it was due to lack of government information and their clarity for economists.

Khotaee and Ghadiminia (1995). Two years later Khotaee and Ghadiminia (1995) using a more flexible model than the Barro's with both rational expectations and neutrality of money applied it for Iran and other oil exporting and Eastern Asia countries and showed that money was not neutral in Iran and doesn't form rationally either.

The estimation result also showed the neutrality of money (Khotaee and Ghadiminia, *Efficiency of Monetary Policies Based on the Rational Expectations Hypothesis, Adaptive Study on Oil Exporting and Eastern Asia Countries*).

Komeijani and Monjazeb (1996). Komeijani and Monjazeb (1996) also examined the monetary illusion based on the rational expectations hypothesis. Their results showed that there was monetary illusion in economy and expectations didn't form rational.

That year Monjazeb once again evaluated the tests did with Dr. Komeijani and this time he carried out the rational expectations tests with the development programs. The results showed the lack of rational expectations and neutrality of money. Meanwhile, rational expectations tests with the first and second development programs showed that the programmers didn't apply the information as optimized in the model.

Mehrara (1998). Two years later Mehrara (1998) examined the interaction between monetary and real sectors of economy estimating a VAR model and using analysis of variance. The results approved the closed cycle hypothesis of foreign currency – money volume and price in Iranian economy. It means the policymakers worry about the negative impact of devaluation on production implementing adjustment policies in short term has been justified. Consequently the monetary easing has been used to offset the negative impact of devaluation on production. It caused increase in inflation and necessity of more devaluation in next periods and this process was creating an inflationary closed cycle. Then the analysis of variance was used to examine the relative exogenous variables. Analyzing the variance of anticipation error showed the fluctuations of each variable interacting with incoming shocks to the pattern variables. Using the variance function, the anticipation error was found for each variable and contribution of other variables in this error during the time of measurement. The results also showed that the money volume has not intervened on fluctuations in production, but the foreign currency contributed 7% in long term. These results showed exogenous production in Iranian economy. Also production as a lead variable has had the most contribution in justifying other variables. Production has had 36% (short term) and 38% (long term) of variance error in money anticipation. Even the production shocks have had the most contribution in the fluctuations of price rather than money volume and foreign currency. Consequently the price cycles in Iran have been mostly resulted from real cycles.

Abrishami (2002). Dr Abrishami (2002) proved the superneutrality of money using the 28-year seasonal data as 1971 (1) – 1995 (4) on Iranian economy. He has used three variables as GDP (production index of big industrial companies), liquidity of private sector and consumer price index. To prove neutrality and superneutrality of money, he started his analyses from the quality theory of money and working on it he approved the neutrality of money theoretically. As for the used methodology in terms of econometrics, he used seasonal convergence test to determine the relationship between money with real production and price levels. The results from applying Johansson's convergence method on these variables also has been examined as lack of long term relationship between money and national production showed lack of convergence between these two variables and a short term and long term relationship between money and price levels showed a convergence between these two variables.

Yadavari and Asgharpoor (2002). Yavari and Asgharpoor (2002) also analyzed some general equilibrium on neutrality of money and they had Neo-Keynesian view on their mind and ultimately concluded that money at least is effective in economy in short term due to the time interval between input and output levels.

Shafiei and Abbassinezhad (2003) examined the neutrality of money in Iranian economy. Using data for the years 1960 – 2002 and applying techniques such as two-stage regression, self-regressive time series patterns with distribution interval they have carried out their studies. The results from their model show that both internal money and external money variables have very tiny nonzero but symmetric effect on production in economy. They approve the money neutrality hypothesis in Iran.

Tashkani and Shafiei (2005) tested the money neutrality hypothesis and rational expectations in Iran using the Seemingly Unrelated Regression (SURs) for the years 1959 – 2003. The results show that anticipated and unanticipated monetary policies are neutral. Also the rational expectations hypothesis has not been rejected for Iran.

3- Model presentation

In this section, at first, using Pesaran, Cuthbertson and Taylor recommended method and giving the Iranian economic features the neutrality of money in Iran is tested. In the next step, before estimating the time series model, we examine the data in terms of being final and possibility of having unit roots, thus first the money growth rate, using different methods such as ARIMA and AR4, and regression model are anticipated and then the best model will be chosen. Next in the second stage of Two-Stage Least Squares (TSLS) regression method the given pattern is estimated and the diagnostic tests for each model are carried out separately. Next we interpret the pattern results in Iranian economy.

Research technique

To estimate the model, first the money growth rate, using different methods such as ARIMA and AR4, and regression model are anticipated and then the best model will be chosen. Next in the second stage of Two-Stage Least Squares (TSLS) regression method the given pattern is estimated.

The econometrical patterns
Money demand pattern as a shock absorber

One of important discussions in monetary economics is the role of money as shock absorber. In fact, the monetary balance acts as an absorber against the unexpected shocks of money supply. It is discussed that expected changes in money supply reflects in price levels, so that the real balance of money is fixed. But unexpected changes in money supply in short term impact the real money supply. This hypothesis could be defined by two equations:

$$(m - p)_t = \beta \, X_t + \alpha \, (m_t - m_t^a) + \delta \, m_t^a + u_t \tag{1}$$

$$m_t = m_t^a + u_t = \gamma \, Z_{t-1} + \eta_t \tag{2}$$

in which m_t is the logarithm of nominal money stock in time (t) and p_t is the logarithm of price level and X_t is a vector of money demand determinant variables (e.g. income, interest rate and intervals of real money balance). The m_t^a variable shows the expected money supply defines by the equation (2). The Z_{t-1} is the variables which have systematic impact on money supply. The theory of money as shock absorber implies that anticipated money completely reflects at the current prices ($\delta=0$) and a proportion ($0<a<1$) of unanticipated money is maintained as good demand of money. The equation of money supply can be written as the reversed price equation:

$$p_t = - \beta X_t + (1 - a) \, (m - m^a)_t + (1 - \delta) \, m_t^a + u_t \tag{3}$$

In the above equation, the theory of money as a shock absorber is seen more clearly. If $\delta=0$ then the anticipated money has appropriate impact on price. While the unanticipated shocks increase the real money balance in short term.
Cuthbertson (1988) and Taylor (1986) estimate the equation (1) or as the equation (3) for the United States and England using Two-Stage Least Squares (TSLS) method.

The equation (2) expressed indifferent forms (such as AR (4), ARIMA and regression model) and $\hat{m}_t$ and unexpected monetary shocks $m_t - \hat{m}_t$ are calculated. Then these values are replaced m_t^a and $(m_t - m_t^a)$ in equation (1) and the resulted equation is estimated using OLS method.
Cuthbertson and Taylor accept the theory of money as shock absorber ($\delta=0$ and $a>0$) using the above mentioned method. The Two-Stage Least Squares (TSLS) method can only test the neutrality of money ($\delta=0$) but a common estimation of equations (1) and (2) using NLS and ML method make it possible to test both the theory of money and rational expectations separately or commonly. So the estimation of following equation is considered:
$$(m - p)_t = \beta \, X_t + \alpha \, (m_t - \gamma \, Z_{t-1}) + \delta \, \gamma Z_{t-1} + u_t$$

$$\tag{4}$$

$$m_t = \gamma_2 \, Z_{t-1} + \eta_t$$

The neutrality of money as before requires $\delta=0$. Additionally the rational expectations is tested by the theory of $\gamma_1 = \gamma_2$. The above equation can be estimated and two theories can be tested separately or commonly. The Wald Test (W) is usually used for this purpose. In Two-Stage Least Squares (TSLS) method the inter-equation restrictions are applied implicitly implying the rationality of expectations ($\gamma_1 = \gamma_2$), because $\hat{m} = \gamma \, Z_{t-1}$ is replaced for $\hat{m}_t^a$.

Estimation of money demand pattern as shock absorber for Iranian economy
Pattern estimation by Two-Step (TS) method
A- The first stage of anticipating money volume using Autoregressive (AR) and Autoregressive Integrated Moving Average (ARIMA) and a regression model.
1: Autoregressive Process
The Autoregressive order process AR (P)P is a univariate time series pattern expressing a variable behavior based on its past values. The number of proper intervals for each pattern could be obtained through different methods such as using Partial Autocorrelation Function (PACF).
2: Autoregressive Integrated Moving Average (ARIMA) Process
If it is necessary a time series to be differentiated d-time and until it is stabled and presented as a ARIMA (p, q) pattern, it is said the initial time series is a ARIMA process and is shown as ARIMA (p, d, q); in which (p) is the number of autoregressive expressions; (d) is the number of times the initial time series should be differentiated until it is stabled and (q) is the number of moving average expressions. In this section the Box Jenkins methodology was used in order to choose the best pattern and will be examined in the appendix.
3: Pesaran Regression Model for Money Anticipation

$$M_t^e = \alpha_0 + \alpha_1 M_{t-1} + \alpha_2 M_{t-2} + \alpha_3 GC_t + \xi_t^m$$

Among the patterns, AR (4) showed the best results on liquidity anticipation (using the Box Jenkins in the appendix) and thus the results from this pattern will be used in the next sections.
B) The diagnostic tests to ensure the best possible pattern for money anticipation
1- Cointegration regression Durbin Watson (CRDW)
The CRDW test has been used to examine the existence and nonexistence of a long term relationship between fitted variables. It is simply compares the CRDW statistics from the initial regression with the critical value presented by Sargan and Bhrgava. (Based on 10,000 simulations from 100 observations and critical values (for CRDW test) at the meaningful levels of 1%, 5% and 10% for the real (d=0) are 511%, 386% and 322%. Therefore if the calculated (d) is less than the critical value, the non-static theory is rejected.) The comparison of this statistics with CRDW value is shown in the following table:

CRDW	Critical quantity in 10%	Critical quantity in 5%	Result
2.05	0.323	0.386	Null Hypothesis rejected

Table 1 – CRDW versus the Critical value

Comparing the CRDW and critical value, stationary of waste expression is verified.
H0:d=1
H1:d#1
DW=2(1-P)

3. Rendering model
At first we could use boy's suggestion method and Cuthbert son and Taylor by paying attention to economic properties of Iran, by using money neutralization in economics of Iran. In next step before estimating available data time series model in respect of consistency, there is one possibility of unit root in then that have been studied. However for estimating model at first, money development rate was predicted by different methods like AR4, ARIMA and regression model, after that the best model will be selected. After that, in second stage two-stage regression model (TSLS), mentioned pattern have been evaluated and distinguishing examines relate to each of this model will be done. Then we pay attention to interpreting pattern results about economics of Iran.
Art and technique
In evaluating model, at first we predict money development rate by using different methods like AR4, ARIMA, and regression model. After that the best model will be selected. Then in second stage, regression pattern – two stages have been considered.
Applied evaluating economic pattern in research.
Money demanding pattern as a receiving pulse.
One of the most important discussions about money economic is money role as a shock absorber. In fact, money balance as receiving pulse against un respected shock. So we discuss that mentioned changes about giving reflect completely in price level. so real balance of money remain constant but un respected changes in giving money have influenced on. Real money demand this hypothesis recognize by 2 equations.

$$(1) \qquad (m-p)_t = \beta X_t + \alpha(m_t - m_t^a) + \delta m_t^a + u_t$$

(2) $\qquad m_t = m_t^a + u_t = \gamma Z_{t-1} + \eta_t$

That m is money name logarithm in t time and pt is logarithm of price level and and $x_{t\ is}$ vector from determined variable of money demands (such as income, share rates and real money of interval balance). m_t^a Is giving money that is determined by equation (2). Z_{t-1} is viable vectors that have systematic influence on giving money .money hypothesis as a shock absorbent element show that predict money completely in pricing level ($\delta=0$) and relative ($0<a<1$) from non-predictive money as a suitable demand for keeping money. Demand equation for money can be written as reverse equation.

(3) $\qquad p_t = -\beta X_t + (1-a)(m - m^a)_t + (1-\delta)m_t^a + u_t$

In above equation, rational for money hypothesis as an absorbent shock become clear .if $\delta=0$, predicted money have suitable influence on price so unpredicted money shock, increase money real remaining in short time (Cuthbertson,1988)and (taylor,1986) or equally equation(3)estimate united state and England by using two step method.

Equation (2) describe in different shapes (like AR,ARIMA) and regression model and calculate $\hat{m}_t$

and money unexpected shock $(m_t - m_t^a)$ then this value estimate instead of m_t^a and $(m_t - m_t^a)$ in equation (1) and result equation estimate by OLS method.

Cutheberson and Taylor accept money hypothesis as an absorbent shock $-\delta=0$ and $a>0$ by mentioned way. In two step method we could examine neutralization hypothesis of money means $\delta=0$ but: 1)estimating common equation and 2) we could provide by NLS or ML method that hypothesis of money neutralization and rational of expected examine individually or in common .for this ,we consider to evaluation set below:

(4) $\qquad (m-p)_t = \beta X_t + \alpha(m_t - \gamma_1 Z_{t-1}) + \delta\gamma_2 Z_{t-1} + u_t$

$\qquad\qquad m_t = \gamma_2 Z_{t-1} + \eta_t$

Being neutralization of money like before need is $\delta=0$ addition to expected rational by $\gamma_1=\gamma_2$ hypothesis can be examined .we could evaluated above set and examine above two hypothesis individually or in common .for this, we could parent examination in two step method, money hypothesis examination act as an absorbent shock between equation of expected rationale($\gamma_1=\gamma_2$) become

$\hat{m} = \gamma Z_{t-1}$ **In constituted** $\hat{m}_t^a$.

Evaluating demand pattern for money as a pulse for economic of Iran evaluating pattern by two step method.

A) first step :predicting money volume by using self explaining process and collective self explaining process and regression model.

1. Self explaining process

This process of AR (P) P is one pattern of single variable time series that explain on variable behavior on the basic of past value

Suitable interval number for each patter obtains by different methods such as using detail subsidiary correlation.

2. Collective self-explained movement mean process:

If it is needed that one series time explained load until it become constant , then it is said in one pattern ARIMA (p.q) that the first time series is one series time explained with mean movement that have been shown as a ARIMA (p.d.q) . P is the number of self-explained sentences, d, the number time that first time series should be explained until it become constant. In this part box junkie method has been used as best selection pattern that explain in appendix.

3. Boy regression for predicting money:

Among above pattern, AR (4) has shown the best result for predicting changing money and so obtained result has been used from this pattern in the next part of research.

B. Recognized examination for confidence from selective pattern for predicting money:

1. Camera examination – collective regression vats on (CRDW)

For studying presence and absence of long time relationship between variable from camera examination – collective , regression vats on simply , this examination of camera statistic of vats on which obtain from primary regression with crisis value.

Comparing this statistic with camera – vats on value explain below:

Table1: camera statistic – vats on and crisis quantity		
Vats on camera value obtained from regression	Crisis quantity in level	Quantity in level 5%
		Zero rejection

Whit comparing camera statistic and vats on and crisis quantity have been verified.

C. Estimating second stage: according equation (1) and (2) model money demand as a pulse. Obtained result from estimating is followed.

Table2 : obtained result from estimating money demand			
Variable	Coefficient	statistic.	Meaningful
	possibility	level equation	as a pulse
Constant element : Predicting growth of money volume Unpredicting growth of money volume Influence money demand with one interval Determined coefficient Adapted coefficient F statistic			

Vats on camera statistic

In relation whit this pattern, there has been done examination

1. Vats on camera statistic , CRDW

Comparing this statistic with vats on camera value is explained as follow:

Table3 : vats on camera statistic and crisis quantity CRDW			
Vats on camera quantity obtained from regression	Crisis quantity in level 5%	Crisis quantity in level 100%	Result
			Zero rejection

With comparing vats on camera and manage crisis quantity have been verified.

2. Normality examination

This histogram examination residuum sentence and jarque-Bera statistic for normality addition to self-correlation.

Table 4: normality examination	
Zero suppose	Absence of self-correlation
Jarque-bera statistic	Acceptance possibility 44%

H0: p= 0

Because it possible, wrong is in relationship with before area.

3. Serial-correlation LM

This examination is Beryosh-gadfery examination that have used for determined being and not being problem of serial correlation.

Table5: result of examination	
Zero supposition	Absence of serial correlation
Statistic f	Possibility acceptance
Statistic 2	Possibility acceptance

As statistic has shown that there is not any problem of serial correlation of residuum sentences.

4. Secret examination:

This examination apply for wrong explaining regression pattern that weather is many variable or not or there is an important variable that has been eliminated.

That zero hypotheses were verified

Table 6 : secret examination result	
Zero hypothesis	Absence of wrong determine model
Statistic f	Acceptance possibility model
Statistic 2	Acceptance possibility model

Explaining pattern results:

As we state in explaining model, we discuss about accepted changes in rendering money in prices level as money real balance become constant but non-accepted rendering money changes have influence in short time for money real demand money hypothesis show shock absorbent that money predicting reflex in current prices (s=0) and relative (0<a<1) from un unpredicting money as a money suitable demand.

Unpredicting money growth coefficient was meaningless (0.001) and this means , predicting growth money during studied years not only influence on demand but also predicting money have suitable influence on pricing but relation of unpredicting money growth have been kept as an influence demand.

And has increased remained money real. Sir predicting money have several influences on demand of money and in other word is inactive domestic non-pure production growth have positive influence in real price without oil with constant prices in 1376 Although correspondence have positive influence but meaningful influence on demand and doesn't have increased remained money real that of course this result have matched with obtained result from katherson and Taylor estimating model simultaneously.

Although we have started ,we examine in 2 stage methods natural hypothesis of money s=0 but common estimating equation (1) and (2) in NIS or ML method was allowed to examine natural money hypothesis and excepted rationed individually or common examination for this, model write below :   1 ....

Being natural money like before need s=0 addition to examine rationale from $Y_1=Y_2$ hypothesis. In other word, above setting give simultaneous hypothesis. So related Coefficient show, money is natural.

A. examination hypothesis of rational expected.

Table 7 main examination result of	
Zero hypothesis	expectation form rationally
Statistic 2	Expectation acceptance possibility

As we show that 10% confidence level form rationally but in confidence distance, 5% of this hypothesis rejected. Forming expected have shown rationally that economic elements of its expected form according to all available information which is accessible boys pattern and its evaluation for economic of Iran boys have been used as one 2 stage pattern that this pattern follow:

In this equation, is predicted money volume, money volume, internal non_pure production and is governmental costs but in second equation, predicted money growth rate and non-predicted in neoclassic and Kinzian governmental costs add to second equation, so this pattern has shown that in the first stage money volume predicted by using first equation and study by money natural second equation.

Neoclassic pattern examination in relation with money neutralism.

In this pattern are 2 stages and use predicated money logarithm in calculated previous part, for this, we used from below pattern:

H

After evaluating this relationship for obtaining confidence from careful is necessary like below:

In this pattern, the mean of EDPSA76 is internal non-pure production without oil, LV is not predicted money volume and LHAT is value that has been considered for predicted growth of money volume. The result of estimating this pattern have summarized in 4-10 tables

So this table have shown that in Iran economic, predicted growth of money volume doesn't have influenced on real national non-pure production and unpredicted growth of money volume have very influences.

Table 8 : result from estimating product relationship according to meaning full level confident statistic
Neoclassic pattern
Variable
Constant element
Liquidity predicted growth
Liquidity predicted growth with one delay area
Liquidity predicted growth with two delay area
Liquidity unpredicted growth
Liquidity unpredicted growth with one delay area
Determined confident
Balanced determined confident
Vat son camera statistic

It is clear; there isn't important influence on read non-read production in predicted and non predicted money grout in constant price in 4386.

1. Vat son camera statistic and crisis quantity.

For studying absence and presence of long time relationship between variable from

Variable From Regression vatson – camera examination

Table 9: vatson – camera statistic and crisis quantity

result	Crisis quantity in 10 % level	Crisis quantity in 5 % level	Value of vatson – camera from regression
Re impose zero	0/323	0/386	2/53

With comparing vatson – camera statute and menace crisis quantity has been verified.

2. giving condition examination for original examination coffined for obtaining confidence from neutralism of predicted money policies and neutralism of non – predicted money polices in long term , have been acted condition that current results have been summarized in table 6

Table10 No Wald test

All coefficients equal to zero, monetary policy has been predicted Single monetary policy coefficients are predicted to Human zero.			Imposing zero
0/46	Likely to accept	0/95	F Statistics
0/44	Likely to accept	4/78	K2 Statistics

So this hypothesis zero doesn't reject and predicted and none predicted money policies natured in long term. Keynesians pattern examination in relationship with money natured in this stage we should examine, lionize in relationship with money nitration this pattern have different with previous pattern and certainly government costs will enter.

However, if is determined that whether money policies have influence in production and government costs have influence on product used pattern is like relation Obtained result from this evaluating is in table 7 .

$$LGDSAIL76 = C_1 + \sum_{I=0}^{3} LU_{t-i} + \sum_{I=0}^{3} LHAT_{T-1} + LG$$

so above table have been determined , predicted and non – predicting money policy .

Table 11. Results of the estimation of the Keynesian model

Surface potential Significant	T statistic	Coefficient	Variable
0/033	2/18	1/37	Constant element
0/22	-1/23	-12/81	Liquidity predicted growth
0/11	-1/66	-8/08	Liquidity predicted growth with one delay area
0/28	-1/07	-2/47	Liquidity predicted growth with two delay area
0/14	-1/47	-0/0005	Liquidity unpredicted growth
0/50	-0/67	-0/0003	Liquidity unpredicted growth with one delay area
		0/7	Determined coffined
		0/69	Balanced determined coffined
		10/12	F statistics
		2/53	Watson statistic camera

We see, money changes don't have influence on read interned non – pure growth and only governmental cost growth have influence on variable

1. Vatson camera statute and crisis quantity CRDW

For studying present and absent of long term between vans able from regression vat son camera examination.

Table 12: vatson camera station and crises quantity

Vatson camera value result from regression	Crises quantity in 5 % level	Crises quantity in 5 % level	Vatson camera value result from regression
Re impose zero	0/323	0/386	1/82

2. Giving condition examination on original coffined for confidence from predicted money policy and long term natural from un predicted money policy , we have rated condition that have summarized in table 10

Table 13: original examination result

3. Sun of predicted money policy coffined is equal to zero 4. Government cost have any influence on			Zero hypothesin
0/44	Likely to accept	0/85	Statistic f
0/46	Likely to accept	3/78	Statistic 2

So this zero hypothesis doesn't have rejected and un predicted money policy is being natural in long term but government cost have influence of production

In Y variable movement mean process in T – time with constant value addition to movement mean in from current and post is equate

$$Y_t = \mu + \beta_0 U_t + \beta_1 U_{t-1} + \beta_2 U_{t-2} + ... + \beta_q U_{t-q}$$

And finally, ARIMA model that combine from 2 above method is show like below

$$Y_t = \gamma + \alpha_1 Y_{t-1} + \beta_0 U_t + \beta_1 U_{t-1}$$

4–Conclusion:

The results of the study Present Conventional two-stage econometric approach was the result can be expressed in the following format:

1: The demand for money as a buffer (Katbrthon and Taylor model) showed that:

A: Effective demand for money in Iran's economy has not only affected by anticipated monetary policies and the proportion of the money expected to affect the demand for money will be recorded. This ratio is between zero and one positive impact from its production and investment will increase.

B: The anticipated changes in monetary liquidity are not only effective demand for money has no effect on Not fully reflected in the general price levels. This is clearly visible in the Iranian economy many years one of the main causes of inflation in the economy, increasing liquidity has been. Increase in the price level with a negative impact on people's purchasing power Lead to inflation and devaluation of domestic versus foreign currency is and The foreign goods more expensive than domestic goods. If the export to Iran as part of, an act he The exchange rate could increase to improve the trade balance, and even help increase national production.But the production of export goods The overall manufacturing sector in the economy very much depends on imports to Iran of intermediate goods and capital And imports of these goods become more expensive relative to the rising exchange rate and will definitely decrease This causes the production can be affected countries. Thus in a period of long-term production levels will be reduced. However, this effect is negligible the extent of the positive effects of the amount of liquidity the money will be recorded as the effective demand will be neutral. Thus, in general, does not affect the money in the economy of Iran.

2- Patterns of boys also showed that:

In the neo-classical monetary policies in the face of unexpected monetary policies are expected to influence national production policies are expected to influence national production. The intensity of this effect was negligible and only after period of one year and reaches zero. However under the terms of the Keynesian model showed that during the evaluation of resource is an important effect of changes in the righteousness of the economy to work ststretched Bode AST The problem with comparing the coefficient of elasticity of gross domestic product to government spending and monetary policy was expected government spending and monetary policy was expected

5- Feedback:

1: Change in central bank money as a tool for the middle is its success depends on having a strong link exists between the levels of production in the economy. But according to the theories set forth, and the analysis of the validity of these theories, this means long-term impact in the middle tends to zero. It is clear that changes in money produced no significant effect on the price level affects. The central bank can control inflation and influence the level of production and employment rather than take advantage of this tool.

2: Since one of the main reasons for the growth of government debt to increase liquidity in Iran's central bank, to achieve the above goal of central bank independence is necessary. To ease its monetary instruments in order to provide the best possible use.

3: Since that were not anticipated monetary policies Only in the short term and long term will be neutral to slightly influence on production levels are, Therefore, the central bank must when using these tools is necessary to achieve certain goals This variable is also sufficient attention to short-term consequences. It is possible to disturbances in the short term.

4-Now that the monetary policies of central banks to assess the patterns of policy (policy models), policy rules (policy rules) and the trade-off policy (policy trade-off) should be prepared for the country.

A: Since monetary policy affects the economy of the entire performance Moreover, rational expectations requires a full economic model to describe how the formation of expectations Patterns of policy by central banks in different countries so far have been designed and used, are the similarities and differences. The main similarity is that the rational expectations hypothesis as part of mainstream policy assessment is used. The patterns of policy should be determined by the rules of politics. Patterns of policy by central banks in different countries so far have been

designed and used there are similarities and differences the main similarity is that rational expectations hypothesis as part of mainstream policy assessment are used. And All these models also include a monetary transmission mechanism and Usually takes place via the exchange rate. The patterns of political the rules of the policy were. The rule provides policy advice to government policy decision Monetary and fiscal policies they change the status Helps to achieve the desired. This causes the Based on the hypothesis of rational expectations, People's expectations of a policy, Changes in policy instruments will have a major impact on

B: Therefore, in order to evaluate the effect of a policy, in the context of a likelihood function, Type of policy will determine the future. . The likelihood function of the probability is related to the type of economic policy the same rule is nothing but political. After this step will be to determine how an exchange policy

C: after setting off for monetary policy, the monetary base to select the right tools. Diagnosis and choice of monetary policy among the various options, the rules of monetary policy is Today in most countries the starting point of monetary policy rules, inflation is setting goals.

5: As the results to estimate the production function In the case of the Keynesian government spending can impact on national production are more. It seems that the use of policy instruments in monetary policy could be useful

6: one of the main policy tools of central banks around the world interest rate and the Central Bank of Iran Also in accordance with paragraphs 3, 2, **1** and **4** of Article **14** of the Monetary and Banking The ability to use this policy tool, but is recommended as a useful and efficient to use legal means to pay. However, Taylor points out that if measuring the real interest rate Yes there is high confidence and the real interest rate is difficult If the investor is faced with a high shock Money and money means interest rates are better than To examine

B: patterns of trade policy by central banks and the selection of variables must be examined. This model - including the three equations of inflation, money is generated and the performance goals with the goals of inflation compared to the money.

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