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Monetary and Financial Policies in Iran's Economy through Using Money Neutralization Tests

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Abstract

This study investigates being neutral and non-neutral monetary and finance policies (anticipated and not anticipated) and also the test of rational expectations hypothesis for the period between 2004-2011 through Seemingly Unrelated Regressions (SUR) econometric technique. The results of the study indicate that the anticipated and unanticipated monetary policy is neutral but the anticipated financial policies have positive and significant effect on the real production level. Also, taking into account the significance of anticipated monetary policies and the unanticipated monetary policies not being significant, we cannot accept the hypothesis of rational expectations for Iran's economy. On the basis of the gained results regarding policy making we can emphasize the fact that, in order to excite production in Iran's economy, we can seek help from financial policies although we should not overlook the sanction effects of this policies.

Keywords: money neutralization, financial and monetary policies, production, rational expectations hypothesis, SUR method

Introduction

Monetary policies and their affecting real variables in economy were argued about among economists from a long time ago. The importance of this issue is because in any economy we must first make sure of how monetary policies are influential and even not influential and then take measures in applying them. because the monetary policies which are not influential are not only equal to useless expenses for executing the policy but they also impose expenses on the economy in future periods such as a rise in the prices (creating sanction). Also the frameworks adopted by these policies are also important, in other words it is possible that active monetary policies (unanticipated) are influential in an economy while the same policies may not have that much effect as a principle (anticipated). Therefore it is necessary to study monetary policies regarding their effectiveness and also the nature of this effectiveness. This could definitely a suitable guide in monetary policies affairs.

Through this definition, the present study investigates neutrality or non- neutrality of applying monetary policies on real production in Iran's economy and the hypothesis being tested in this study is monetary neutrality (money not influencing the real variables). In addition through entering the government's expenses (as an instrument for applying financial policies) neutrality and non- neutrality of financial policies will also be studies. In general, the aim of this study taking into account the presented hypothesis could be presented as searching for an answer to the following questions: 1) is executing monetary policies effective on real production in Iran's economy? 2) Is executing financial policies effective on real production in Iran's economy? 3) Is the rational expectation hypothesis accepted in Iran's economy?

A glimpse at Iran's economy realities

First, in this section, the general process of some major variables of economy and then the amount of correlation between cash amount (as an instrument of monetary policy) and the expenses of the government (as an instrument of financial policy) will be evaluated along with price and production variables.

Studying the process of the movement of the variables of the model

The general process of the variables of the used model in this study (the amount of cash, govern-

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ment's expenses, the general level of price and domestic gross production) will be evaluated and studied in this section.

Studying the process of cash movement

Cash had an ongoing ascending trend along the period 1959- 2011 (this variable has always experienced two- digit growth rate except for the years 1960, 1961 and 1962). The growth of this variable in 1974 was at its climax (approximately 57 percent) and in 1963 in its lowest (almost -5.9 percent) point. In 1954 because of oil shock, the money foundation increased greatly as a result of a net increase in foreign net assets from exporting oil and so the cash growth rate on nearly 57 percent was experienced. In 1963 (the beginning of the third developmental plan) also the cause of a very low growth of cash, the severe deficiency in the budget of the government and executing monetary contraction policies was done through the Central Bank.

Investigating the process of domestic gross production

Real domestic growth production was increasing in an almost stable rate (approximately 8.8 percent in a year) before revolution, but after revolution and especially during the years of war this process had a descending growth. During the beginning years of revolution, creation of gross stable capital had a descending process (the creation of domestic stable capital to the stable prices in year 1997 and year 1976 had a significant increase in comparison to the years before it but from this year forth a descending process begun and in the years 1977 and 1978 and 1979 it had a negative growth) with one such heritage and the change in the government through the revolution and because of strikes and other problems stemming from that, production decreased significantly. After a few years from the revolution, the start of Iran and Iraq's war in Mehr of 1980 another strike hit Iran's economy body in a way that during the years of 1977, 1978, 1979, 1980 and 1981 the production growth rates -2.3, -7.4, -.15.2 and -4.4 were successively experienced in Iran's economy. After these years, the production growth rate was positive but it was low until the years 1993, 1995 and 1995 when again production growth rate, due to the regnant conditions and executing unsuitable foreign currency policies reached 1.5, 0.5 and 2.9 percent in the years 1993, 1995 and 1995 from 4 percent in the year 1993. The continuous decrease in the price of oil in the globe's markets in the years 1997 and 1998 and after that the continuous decrease of the national gross production growth in the mentioned years reminded everyone that Iran's economy has not yet been able to free itself from being dependent on oil. When this crisis passed and the prices of oil increased once more the domestic gross production growth increased and reached approximately 7.6 percent in the year 2013.

Investigating the correlation between cash amount and government's expenses with price and production

We will attend to investigate the correlation between cash and the government's expenses with the general level of price and production variables in this section with the aim that executing monetary policies (through increase and decrease in the amount of cash) and financial (through increase and decrease of government's expenses) which lead to production change.

Investigating the correlation between cash amount and production and price variables

In the time period between 1959- 2011 the cash amount increased by 118461 percent (the cash amount in the mentioned period increased by 1015.6 times) also the numbers indicate an average growth of 23.3 percent annually in the mentioned period. The index of goods price and used services to the stable prices of 1997 also grew 28926 percent in the mentioned period (in the mentioned period the prices became 290 times more) the index of price grew by 13.8 percent in average every year in this period. Domestic gross production to the constant prices of 1997 in the mentioned period had a growth of 763 percent (in the considered period production increased 7.7 times) the numbers indicate that production in Iran's economy in average 5 percent every year.

The correlation between the variables cash amount and price index (for the period between years 1959- 2011) was equal to 0.98 and the correlation between the growth rates if these two variables is equal to 0.3. In graph (1) the growth rate of cash amount and the index of goods' price and services used are shown. The correlation between the variables cash amount and production (for the period 1959- 2011) is equal to 0.71 and correlation coefficient between the growth rates of these two variables is equal to 0.04.

Investigating the correlation between the government's expenses and price and production

In the time period between 1959- 2011 the government's expenses grew by 765802 percent (the expenses of the government in the considered period increased 7659 times) and the numbers indicate that the expenses of the government experienced a growth of 22.5 percent in average each year.

The correlation between the government's expenses and price index (for the period between 1959-2011) is equal to 0.93 and the correlation between the growth rates of these two variables is equivalent to 0.23. In graph (3) the growth rate of cash amount and the goods prices and used services indexes are shown. The correlation between the government's expenses and production (for the period between 1959- 2011) is equal to 0.68 and the correlation between the growth rates of these two variables is equal to 0.28.

The correlation between cash amount (government's expenses) and price was obtained to be 0.98 (0.93), and the correlation between the cash amount (government's expenses) and production was obtained to be 0.71 (0.68). Also the correlation between the cash amount (the growth of government's expenses) and price growth was obtained to be 0.3 (0.22) and the correlation between cash amount (government's expenses) and production was calculated to be 0.04 (0.28). These coefficients indicate that monetary policies (in comparison to financial policies) had a higher correlation with price and on the other hand financial policies (in comparison with monetary policies) have a higher correlation with production.

The literature Review

In general, various researches have been conducted in relation with neutrality of money which is different from each other regarding the model and the utilized method and the results gained. In a general classification we can divide these studies into two groups of TS (two- stage) models and non-TS models. We will attend to review the carried out studies inside and outside the mentioned classification in this section.

The studies done based on TS models

Mishkin (1982) was against the monetary neutrality hypothesis and who was the first one who looked at this hypothesis with doubt and understood that the component of the expected monetary growth has a strong effect on the level of production and unemployment in America. In this research he increased monetary growth gaps in the model and evaluated monetary neutrality tests and rationality of expectations separately in the non- linear estimation of the model. The great delays of monetary growth in the model resulted in outcomes which were the opposite of Barro's results in America's economy.

In a shared study Yamak and Yakup tested the monetary neutrality hypothesis of new classics for Turkey's economy. In this study using the seasonal data of the period between 1980: 1- 1395:1 an autoregressive model with 5 variables including real production, money amount, government's expenses, the price of foreign currency and the general level of prices were used to analyze.

Two- stage models. TS models are the models which obtain the anticipated and unanticipated money in the first stage and then in the second stage production on the anticipated and unanticipated money is regressed.

The results of the study indicate that the unanticipated part of money does not affect the level of real production but the anticipated part of money has a significant impact on the real production. Also the results indicate that both anticipated and unanticipated parts of financial policies (government's expenses) have a significant effect on economic real activities.

Khatayi and Ghadiminiya (1995) used a more flexible version of Barro's model regarding both premises of creating expectations rationally and monetary neutrality and used his model for Iran and other countries exporting oil and for the South East Asia and showed that Money is not neutral in Iran and creating expectations is not done rationally.

Kamijani and Monjazeb (1996) studied the existence of monetary illusion on the basis of rational expectations hypothesis and the results of their study also indicated the existence of monetary illusion in economy and that expectations are not created rationally.

The studies done with non- TS models

In his study project, for the period between the years 1900- 92, Jefferson (1987) considered nominal and real national production, the price index of domestic gross production, and also sight deposits and monetary base as variables and estimated them in the framework of a VAR model. In the estimation which resulted from this models there were evidences based on the non- neutrality of the domestic money.

Yavari and Asgharpoor (2002) have carried out analyses in relation with monetary neutrality in the framework of public balance (these people approached the problem using Neokinzi's viewpoint) and they eventually came to the conclusion that because of the gap between the level of input and output, money is effective in economy at least in short- term.

Empirical study of monetary neutrality

This section attends to the empirical study of neutrality or non- neutrality of financial and monetary policies through the annual information 1959- 2003. Econometric analyses were carried out using Eviews4 software.

The used model in this study was inspired from a model Mc Gee R. and Stasiak used. The general form of this model which is in the form of an autoregressive system and included 5 endogenous variables as follows:

$$\begin{bmatrix} GDP_t \\ M_t \\ G_t \\ CPI_t \\ E_t \end{bmatrix} = \begin{bmatrix} a_{11}(L) & a_{12}(L) & a_{13}(L) & a_{14}(L) & a_{15}(L) \\ a_{21}(L) & a_{22}(L) & a_{23}(L) & a_{24}(L) & a_{25}(L) \\ a_{31}(L) & a_{32}(L) & a_{33}(L) & a_{34}(L) & a_{35}(L) \\ a_{41}(L) & a_{42}(L) & a_{43}(L) & a_{44}(L) & a_{45}(L) \\ a_{51}(L) & a_{52}(L) & a_{53}(L) & a_{54}(L) & a_{55}(L) \end{bmatrix} * \begin{bmatrix} GDP_t \\ M_t \\ G_t \\ CPI_t \\ E_t \end{bmatrix} + \begin{bmatrix} e_{1t} \\ e_{2t} \\ e_{3t} \\ e_{4t} \\ e_{5t} \end{bmatrix}$$

GDP: domestic gross production with the stable prices of 1376.

M: cash amount

G: government's expenses

CPI: used services and goods' prices index with the stable price of 1376.

E: the price of foreign currency in the free market

Aij: are the parameters which have to be estimated

L: lag operator

eij: the residues from the equations

The considered autoregressive system is estimated through SUR (Seemingly Unrelated Regression) method. As it can be seen from the autoregressive system, production was considered as a dependent variable in the first equation. Financial and monetary policies are neutral on the basis of this equation if the government's expenses and cash amount coefficients are not significant.

The results from estimating the model

In this section we will attend to study the results from estimating the model. As it was mentioned the model used in this investigation is an equation model including 5 equations. The considered model was estimated through SUR method and the obtained results are as follows:

$$\begin{cases} LGDP=3.7+0.51LGDP(-1)+0.04LM+0.2LG-0.34LCPI-0.13LER \\ (2.09)^{*}\ (2.9)^{*}\ (0.65)\ (4.1)^{*}\ (-3.7)^{*}\ (-2.4)^{*} \\ LCPI=1.4+0.51LCPI(-1)+0.08LM+0.19LG-0.32LGDP+0.23LER \\ (1.82)^{*}\ (8.1)^{*}\ (2.9)^{*}\ (4.5)^{*}\ (-3.9)^{*}\ (5.6)^{*} \\ LM=-2.6+0.9LM(-1)+0.3LGDP(-1)+0.003LG(-1)+0.1LCPI(-1)-0.01LER(-1) \\ (-2.8)^{*}\ (26)^{*}\ (2.5)^{*}\ (0.03)\ (0.77)\ (-0.14) \\ LG=-7.6+1.1LGDP(-1)-0.15LM(-1)+0.45LG(-1)+0.98LCPI(-1)-0.34LER(-1) \\ (-2.9)^{*}\ (3.5)^{*}\ (-1.47)\ (2.5)^{*}\ (3.3)^{*}\ (-2.1)^{*} \\ LER=-0.59+0.15LER(-1)+0.002LM-0.58LG+1.39LCPI-0.63LGDP \\ (-0.21)\ (0.76)\ (0.01)\ (-3.9)^{*}\ (4.09)^{*}\ (2.03)^{*} \end{cases}$$

a) Production equation:

Taking into account the results of the first equation (production equation) the following results could be extracted:

The coefficient of cash amount is 0.04 which is not significant statistically. On the other hand the coefficient of government's expenses variable was obtained to be 0.2 which shows that in case the expenses of the government grows by one percent production will grow in average 0.2 percent. The coefficient of price index variable (-0.34) shows that one percent growth in the price index causes reduction in production by an average of 0.34 percent. The price of foreign currency also has a coefficient equal to -0.13 which shows that a one- percent increase in the price of foreign currency reduces production 0.13 percent. Therefore taking into account the estimated model the following results could be derived:

1) Cash has no significant effect on production therefore executing monetary policies cannot affect the real section of economy.

2) Government's expenses have a positive and significant effect on production therefore applying financial policies can affect the real section of economy.

b) Price index equation:

Taking into account the results of the second equation (price equation) the following results could be extracted:

The coefficient for cash amount variable was obtained to be 0.08 which indicates that in case of a one- percent increase in the cash amount, the general level of prices will increase in average of 0.08 percent. On the other hand government's expenses

* Asterisk indicates statistically significant at the 5% level.

variable index is 0.19 which indicates that a one-percent increase in the government's expenses can increase the prices 0.19 percent in average. The coefficient for production and foreign currency variables also were obtained to be -0.32 and 0.22 which indicates that there is a positive relationship between the price of foreign currency and price and there is a reverse relationship between price and production.

Therefore taking into account the estimated model we can conclude the followings:

1) Cash has a positive and significant effect on the general level of prices.

2) Government's expenses have a positive and significant impact on prices.

c) Foreign currency price, government's expenses and cash amount equation:

The third, fourth and fifth equations show equations of cash amount, government's expenses and the price of foreign currency respectively. Taking into account the fact that cash and government's expenses variables are considered as policy- making variables, these two variables are presented as the functions of gapped amounts of other variables.

Investigating the neutrality or non- neutrality of financial and monetary policies

In the previous section, the result obtained was that financial and monetary policies (anticipated) are as neutral or non- neutral (in other words monetary policies do not affect production but the financial policies can affect the level of production). In this section we will investigate the neutrality and non- neutrality of unanticipated financial and monetary policies.

We used Pesaran and Timmermann statistic in order to carry out neutrality or non- neutrality of financial and monetary policies in this section. This statistic (under the null hypothesis) puts the dependency of two variables against the independency of the issue which is tested. If the calculative statistic is bigger than 1.96 (regarding absolute value), the null hypothesis based on the independency of the two variables is rejected. (2. This is a two- tailed test and was carried out using Microfit4 software)

Taking into consideration the 4 models estimated, all the resulted residues from the equation can be considered as the unanticipated components. For instance all residues resulted from monetary equation can be considered as unanticipated monetary policies and all resulted residues from the government's expenses as unanticipated financial policies. With these explanations we can test the Pesaran and Timmermann test for the residue sentences (resulted from government's expenses and money equation) and the production. The results of this test are presented in table (1).

Results

Table 1. Statistics of Pesaran and Timmermann test

	Residue sentence of monetary equation (the unanticipated component of money)	Residue sentence of government's expenses equation (the unanticipated component of government's expenses)
Production logarithm	1.2	-1.01

Taking into account that none of the calculative statistics are not bigger than 1.96 regarding absolute value therefore we can conclude that the null hypothesis based on the dependency between two series of variables is accepted. Therefore the results of this section could be summarized as follows:

1) The unanticipated monetary policies have no effect on production

2) The unanticipated financial policies have no effect on production

Simulation

In this section, we considered simulation to test and evaluate the authenticity of the model. One of the indexes which were used for identifying the closeness degree of the simulated amounts to real amounts was the index of the root mean square error (Fair, 1971, Smith, 1978). This index is defined as follows:

$$RMSE = \sqrt{\frac{\sum (A_t - P_t)^2}{T}}$$

A indicates the real amounts of endogenous variable, P the simulated amounts of the endogenous variable and T the number of observations.

The RMSE criterion for simulations of price index logarithm, production logarithm, cash amount logarithm, government's expenses logarithm and foreign currency price logarithm was calculated to be equal to 0.03, 0.007, 0.021, 0.036, and 0.038 respectively. Comparing these criteria with the endogenous variable indicates the fitting being well.

Conclusions

It got clear in investigating the process of the model's variables and calculating the correlation coefficient

that the growth rate of cash amount and the expenses of the government have coefficients of 0.3 and 0.23 respectively with the growth rate of the general levels of process and the correlation coefficient 0.04 and 0.28 with the production growth rate was real. From these correlation coefficients we can reason that monetary variable (cash amount) is more compatible with (correlated) the growth rate of the prices in comparison with the financial variable (the government's expenses) and on the other hand the correlation between financial variable is higher than with monetary variable. The empirical results only approve of the positive and significant effect of the financial variable (government's expenses) on the real production level (in other words anticipated financial policies have a significant effect on the real production level). Also through using Pesaran and Timmermann it was determined that none of the unanticipated financial and monetary policies have a significant effect on the real production level.

Taking into account the anticipated and unanticipated monetary policies not being significant we cannot accept the rational expectations hypothesis for Iran's economy.

Considering these results we can answer the questions posed in the introduction section as follows:

Applying monetary policies in Iran's economy has no real effects and increase in cash does not lead to real production growth.

Applying financial policies in Iran's economy has real effects and the growth in the government's expenses leads to the growth of real production

Taking into account the unanticipated and anticipated monetary policies not being significant, the rational expectations hypothesis is not approved for Iran's economy. On the basis of the obtained results for policy making we can point to the issue that in order to excite production in Iran's economy we can only seek help from financial policies and applying monetary policies has no role in exciting production.

References

Attfield, D., & Demery. (1980). Unaticipated monetary growth, output and the price level: UK.1946-77. *European Economic Review, 16.*

Barro, R.J. (1976). Rational expectations and the role of monetary policy, *Journal of Monetary Economics, 2,* 11-14.

Clifford, A., David, D., & Nigel, D. (1991). Rational Expectations in Macroeconomics, 2nd Edition.

Edner, W. (1995). Applied Econometrics Time Series, 228-234.

Gochoco, M. S. (1986). Tests of Monetary Neutrality and Rationality Hypotheses : The Case of Japan 1973-1985, *Journal of Money, Credit and Banking*, 18(4), 34-42.

Gorji, E. (1997). Evaluating the most important macro economy schools of thought. 10-11.

Gorji, E., & Mirpasi, A. (2002). Theoretic investigation of trading cycles and their appearance factors in Iran's economy, trading researches and studies institute, (1st ed.).

Honari, B. (1997). Rational expectations in macro economy (introducing the hypothesis and presenting evidences). 1, 48- 56.

Iran's Economy. (2000). *Insurance and Economic Magazine (Quarterly), 3*(1).

Islamic Republic of Iran's Central Bank, studying the changes in the economy of the country during the years 1982-1990.

Islamic Republic of Iran's Central Bank, economic report and the balance sheet of the bank in various years.

Jalali, N. S. (2000). Monetary policy, rational expectation from production and sanction- third foreign currency and monetary policies seminar, 49- 84.

Jefferson, P.N. (1997). On the neutrality of inside money and outside money. *Economica*, 64, 567-86.

Jha, R., & Ksaitija. (2002). The real effect of anticipated and unanticipated money. *The Indian Economic Journal, 49,* 21-30.

Kamijani, M. (n.d.). Monetary illusion test on the basis of rational expectations in Iran's economy. Sixth foreign currency and monetary policies seminar, 83 – 107.

Khatayi, D. (1995). The effect of monetary growth expected and unexpected on the total product (study case: Iran's economy during the years 1350- 69), fourth foreign currency and monetary policies seminar. 103 – 127.

Makin, J. H. (1981). Anticipated Money, Inflation Uncertainty and Real Economic Activity, Review of Economics and Statistics.

Mehrara, M. (1998). Interaction between real and monetary section in Iran's economy. *Economic researches magazine, 53*: 44-61.

Mc Gee, R., & Stasiak, R. (1985). Does Anticipated Monetary Policy Matter? Another Look, *Journal of Money, Credit and Banking, 17*, 16-27.

Mishkin, FS. (1982). Does anticipated monetary policy matter, Journal of political economy, 22-55.

Moosa, Imad A. (1997). Testing the long run neutrality of money in a developing economy; the case of India. *Journal of Development Economics*, 53,139-155.

Pesaran, M.H. (1982). A critique of the proposed tests of the natural rate - rational expectations hypothesis, *The Economic Journal, 92*, 529-54.

Plosser, C. (1989). Understanding Real Business Cycles, *Journal of Economic Perspectives, 3* (3).

Sarig, O., & Micheal Kahn, S.K. (1998). The real effects of central bank monetary policy.

Saunders, Peter J. (2003). Effects of monetary changes on the U.S economy in the short run and long run, *The Indian Economic Journal, 1*, 21-25.

Shafiee, A. (2000). Is money really neutral? (A case study in Iran), MA thesis, economy faculty of Tehran University.

Snowdon, B.H., Vane., & Wynareczyk, P. (1994). A Modern Guide to Macroeconomics: An Introduction to Competing Schools of Thought. Edward Elgar.

TAshkini, A. (2003). Is sanction a monetary phenomenon? (Iran's case), MA thesis, economy faculty of Tehran University.

Yamak, R., & Yakup, K. (1998). Anticipated Versus Unanticipated Money In Turkey , Yapi Kredi Economic Review, 9(1),15-25.

Yavari, K., & Asgharpoor, H. (2002). Production gaps, monetary policies and prices being dynamic. Economic Research Magazine. 60, 209- 233.