

LONG RUN IMPACT OF GOVERNMENT EXPENDITURE AND TAX ON LIQUIDITY AND EMPLOYMENT IN IRAN ECONOMY

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ABSTRACT

This paper studies the impact of fiscal policy on money supply in Iran's economy. The trend of the main variables in this paper during the covered period are presented and analyzed. In order to study the main factors of on employment of labor and, Vector Auto regressive model (VAR) and Vector Error Connection (VECM) as well as co-integration test of Johansen Co-integration Test during 1976-2009 is used to find out the relation and also to evaluate the model.

Results showed that the effect of government expenditure on the both of the employment and liquidity is positive but the effect of tax on the employment is negative. The coefficients of the tax and government expenditure on liquidity are 0.44 and 0.07.

The coefficients of the tax and government expenditure on employment are -0.17 and 0.15.

Key words: *Liquidity, Employment, Tax, Government Expenditure, VAR*

JEL classification: E40, E24, E62, H50, C22

1. INTRODUCTION

Fiscal policies are a set of decisions and actions which are used by governmental authorities for impressing economical activities. These policies are usually planned for regulating and controlling the aggregate demand, production and employment.

Applying Fiscal policies including changes in government expenditures and taxes are one of the most important issues in economy. Therefore, for evaluation of applied Fiscal policies, it is important to study the effect of these policies on key variables of economy such as money and job. Many studies have been done in the field of effect of Fiscal policies on employment, but affect of its vibrations on offer of money and job has been less considered. Therefore, in this essay, money and job have been studied by time series analysis method.

2. THEORETICAL AND EMPIRICAL ISSUES

Fiscal and Monetary policies of government are considered as "demand management policies", because these policies study management and control of demand. The main purposes of fiscal and monetary policies are to promote production, employment and fix prices level in economy. Meanwhile, to provide more demand causes an increasing the inflation rate while the lack of demand causes temporary unemployment. Fiscal policy includes two instruments such as tax and governmental expenditures. In other words, it can be defined as set of plans which cause to use fiscal instruments by government to reach special economical goals. It is also related to budget of government. Therefore, government can play more active role in economy in the case of inflation or recession. In other words, the main objectives of fiscal policy are to stabilize the economy and effect on employments.

In recent decades several empirical studies have focused the impacts of fiscal policies on the level of money supply and employment in Iran and other countries by researchers.

Edlberg [4] in an article "understand the effect of shock on government's expenditures. In order to assess the effects of shock on government's expenditures they have employed VAR method. This paper investigates the consequences of an exogenous increase in U.S. government purchases. They find that in response to such a shock, employment, output, and nonresidential investment rise, while real wages, residential investment and consumption expenditures fall. The paper argues that a simple variant of the neoclassical growth model which distinguishes between non-residential investments is consistent with this evidence.

Balanchard O. and Perotti [2] have revealed a positive government spending shocks as having a positive effect on output, and positive tax shocks as having a negative effect. The multipliers for both spending and tax shocks are typically small. Turning to the effects of taxes and spending on the components of GDP, one of the results has a

distinctly non-standard flavor: Both increases in taxes and increases in government spending have a strong negative effect on investment spending.

Hjelm [6] has studied how the US budget responds to shocks in taxes, spending and output. In particular, they consider the dynamic adjustment of the two budgets Components (taxes and spending) to such shocks. The recently developed Generalized Impulse Response Function, which takes the historical distribution of the Residuals into account, is applied. They select the 'correct' specification, estimate two VAR and two VEC models and compare the results. Their chosen specification suggests that tax; spending and output shocks generate deficits in the long run while the tax and output shocks generate a surplus in the short run. Moreover, model Specification matters indeed.

Jahangard and farhani [7] in their essay by using the model of VAR & VEC State that the government expenditure shock raises short-term budget deficits. They have also revealed that, the impact of these shocks on the budget have affected a volatility in the short and medium term in Iranian economy.

Taghvaei and Rezaei [13] have shown that the influence of government's expenditures and taxes on employments and consumption in Iran. They have estimated the pattern of Iran's economy by using VAR method. The results have shown that a positive shock in government's expenditure increases employment rate and consumption, while the negative shock reduces the consumption and the rate of employment.

Gali and et all [5] in an investigation with the title "understand the effects of government's spending". And investigated the contemporaneous reaction of production, consumption and investment in relative to positive shock of government's expenses in a frame work to find the best in a middle of time. A fundamental result of this study shows the private consumption but reaction of private investment than government's expenses shows the negative aspect.

Aghaei [1] has studied the effect of fiscal policies on inflation and employment. This study has revealed that taxes have a negative effect on employment. Noomand Robei [9] in an article with the title "dynamic effects of Fiscal shocks on a small open economy" describe the effects of Fiscal policy on economy. They have applied VAR method in this article. The results of estimation show that there is positive relationship between consumption, exports, imports and government's public expenditures.

2.1. Fiscal Policy and Employment

Expansionary fiscal policy by increasing government expenditure generally applies. Iran's economy through higher government's expenditure and borrowing from the central bank to increase the supply of money that ultimately increase jobs opportunity in a short term. Historical experience has confirmed that, this type of fiscal policy cannot impact on employment in long term. The most notable example of this was seen in the last few years. In 2006, both money and government expenditure has increased simultaneously, As a result of this policy, a million jobs was recorded. But that was not the end of the story. As discussed above, the increase in government spending and the money created an artificial boom, inflation was recorded about 30 per cent [10].

2.2. Process of Employment in Iran

According to census of housing and population of Iran, six millions jobs have been developed in Iran from 1976 to 1996. During third five year development plan (2000-2004), 6800000 jobs have been developed meanly. In fact, in this period 3400000 jobs have been created. After that the number of created job decreased to 400000 in 2005. This process was continued and only 280000 jobs were developed in 2007. Totally, during fourth five year development plan (2005-2009), 330000 jobs have been developed per year meanly. In this period 1650000 new jobs have been created and the number of employment reaches to more than 2100000 employees [11].

2.3. The Studying of liquidity of Money in Iran

The Studying process of liquidity is one of the most important indicators of monetary policy. According to theoretical bases, changes of liquidity and money supply have significant effect on real economical variables such as production and employment in short term, but in middle term and long term, growth changes of liquidity can effect on inflation as well.

In Iran, the supply of money is controlled by central bank but it is issues under monetary policy by government. In fact, central bank's policies depend on economic situation and government authorities. On the other hand when crude oil price decreases budget deficit increases as well. As a result liquidity significantly rises up and we witness at about 18% growth rate of liquidity in this period [12].

Considering severe reduction in economic growth and occurrence of global Fiscal crisis, the growth rate of liquidity was again increased by increase in government expenditure and achieved 25 percent in late 2009 [12]. So, it can be concluded that changes trend of liquidity growth was somehow accompanied by trend of government expenditure, this fact is indicative of dominant role of Fiscal policy over monetary policy in iron economic. Ultimately,

considering long term and short term influences of changes in liquidity growth on economic performance it seems that stabilizing and limiting the liquidity growth can play an effective role in controlling inflation as well as economic stabilization.

3. DATA AND METHODOLOGY

Research methodology in this study is the method of chronological series based on convergence technique, so it is tried to investigate the existence of long term relations among government expenditure, taxes, employment level and real money supply. At first, discussed chronological series are put under static test to identify the behavior of momentums entering to these variables. Then, order of convergence is determined and performs Johansson convergence test for determining convergence vectors, Long term equation of variables is mainly determined in this step which the influence of independent variables on dependant variable can be identified. Then, adjustment coefficient is determined by error correction model.

Before estimating equations and conducting related tests, it is required to introduce applied variables in the pattern:

LG: Logarithm of governmental Expenditure at constant price, base year 1997

L Tax: Logarithm of government tax income at constant price, base year 1997

LM: Logarithm of liquidity at constant price, base year 1997

LE: Logarithm of employment, Labor force

First-order differential of each variable which is investigated in estimated model is indicated in the form of letter D before the name of variable.

1. Statistics related to liquidity, government expenditure and tax income and production level and gross national income. From national accounts and central bank [12] balance statement for various years has been extracted (in the form of time series)
2. Data related to labor force is extracted from Statistical Center of Iran from 1981 to 2009 [11]. In order to estimate the model, variable logarithm has been applied which is indicated in the form of LG, LTAX, LM, and LE. So, the coefficient will be indicated in the form of extension as well as in the model.

4. RESULT AND ESTIMATION

In order to analysis of the stationary of the variables generalized Dickey Fuller '(ADF) is applied. As table 1 has shown, based on generalized test of Dickey Fuller and Phillips Peron, the model variables are non-stationary and integrated. By taking first difference for variables, they become stationary.

Table1. Augmented- Dickey Fuller (ADF) Test.

variable	ADF		Critical Value	
	(Level)	(1 st difference)	Critical level 10%	Critical level 5%
LG	1.417228	-3.921285	-2.627420	-2.976263
LTAX	0.09479	-3.771718	-2.627420	-2.976263
LM	-0.050323	-2.95	-2.627420	-2.976263
LE	-0.012982	-4.76	-2.627420	-2.976263

Source: Research findings

4.1 Estimations

First step to estimate the long run relationship between the variables with use of the VAR (vector Auto regressive) model is testing the unit root for each variable. After this test it is possible to run the VAR model. The results of vector autoregressive (VAR), show that each variable is function of its values and the values of all other variables considered in the model. This approach can impose restrictions on the data (especially in relation to the number of

variables used, the length of delay and sometimes restrictions on the coefficients of the equation) but these restrictions are generally less restrictive than the traditional approach.

Since it is difficult to interpret the estimated coefficients of a regression vector, so often their conclusions related to a regression vector, the Impulse response function are briefly discussed below.

4.2 The result of Impulse Response Function

An impulse response function represents a response that varies endogenously to shocks arising from residuals of the equations. Therefore, this measure shows that how this model is stationary and if a shocks from independent variables entered so it can solve and vanish this shock. It takes a time to remove the shock and then model goes back to the stability situation. This matter has shown in appendices. Expression for the impulse response of the system is that once the shock has been logged. Impulse response analyses shows that this model is stationary and after the shocks dependent variable goes back to the first position and estimated variable can solve the shocks and can be remained stable. After this test in order to find and determine the long run and stable relationship between variables in two equations Johansen test must be used. In this test two criteria (maximum eigenvalue and trace statistic) will use to determine the number of long run relationship between the variables.

Based on the results of the Trace and the maximum eigenvalue test which is reported in tables below, at least 1 co-integrated equation is available between the variables of each models. The estimated functions (Co-integration Vector in the model) are significant and reliable. Therefore it can be used for planning and policy making.

Then we test co-integration relationship between variables that in which they use to estimate the liquidity equation.

Tables 2 and 3 have shown the co-integration tests. Trace statistics and maximum eigenvalue show that how many of co-integrated vectors are available between these variables.

Table 2. Testing result of co-integration vectors determination

Zero assumption	Reciprocal assumption	Trace testing statistic	Critical level 5%	Prob
$r=0$	$r>1$	44.6247	42.9152	0.0334
$r<1$	$r>2$	12.8432	25.8721	0.7503
$r<2$	$r>3$	3.9726	12.5179	0.7461

Source: Research findings

Table3. Testing result of co-integration vectors determination

Zero assumption	Reciprocal assumption	Testing statistic of maximum eigenvalue	Critical level 5%	Prob
$r=0$	$r>1$	31.7814	25.8232	0.0072
$r<1$	$r>2$	8.8706	19.3870	0.07377
$r<2$	$r>3$	3.9726	12.5179	0.7461

Source: Research findings

According to value of trace test in table 2 and the maximum eigenvalue in table 3, at 5% level there is at least 1 co-integration vector that confirmed. Therefore, it can be interpreted a long-run equilibrium relationship between these variables.

Tables 4 and 5 have shown the result of the trace and maximum eigenvalue tests for employment equation. According to this test for employment equation at level of 5% one co-integration vector is confirmed. Therefore, long-term equilibrium relationship between these variables exists. consequently, it can be interpreted as a "long-run equilibrium relationship between these variables".

Table4. Testing result of co-integration vectors

Zero assumption	Reciprocal assumption	Trace testing statistic	Critical level 5%	Prob
r=0	r>1	43.1328	42.9152	0.0412
r<1	r>2	11.6286	25.8721	0.0836
r<2	r>3	4.3642	12.5179	0.689

Source: Research findings

Table 5. Testing result of co-integration vectors determination

Zero assumption	Reciprocal assumption	Testing statistic of maximal eigenvalue	Critical level 5%	Prob
r=0	r>1	28.5042	25.8232	0.0215
r<1	r>2	7.2643	19.38704	0.8820
r<2	r>3	4.3642	12.5179	0.6890

Source: Research findings

After this tests it is possible to use the VECM model to estimate long run and co-integrated relationship between the variables of two models (liquidity and employment) .

4.3 Liquidity Equation and Analyses:

$$\begin{array}{l}
 \text{LM}=24.84648+ 0.439320\text{LTAX}+0.078703\text{LG}+0.098023\text{TREND} \quad (1) \\
 (\text{SE}) \quad \quad (0.04367) \quad \quad (0.09051) \quad \quad (0.01038) \\
 (\text{t-value}) \quad \quad (+10.0610) \quad \quad (+86959) \quad \quad (9.44001)
 \end{array}$$

This Equation presents the long-run co-integrated relationship between the variables of model. The value in the brackets under every coefficient indicates the standard error (SE) and the value of t-statistics respectively. As a result the Coefficients are statistically significant and they can be interpreted as elasticity. In equation 1 there is co-integrated relationship between fiscal variables (Tax and Government Expenditure) and Liquidity. So there is a positive relationship between tax and liquidity

We know that the IS-LM framework to analyses the relationship between the interest rate (r) and GDP (y) is measured increase the tax rate itself is a contractionary fiscal policy appears to have had a negative effect on money but the analysis shows is another issue. When the tax rate increases, the IS curve will be pushed back. IS curve

pushed to back means that the interest rate and reduced production. Iran's economic policy in several periods, emphasizing stability or decrease in market interest rates have however, the high production potential of the country and without being a big part of the investment and low efficiency in the production the country's economic planners have tended to increase the production level that will always be fixed interest rates to maintain and increase production to achieve this goal, or the IS curve, the LM curve to the right place or it (IS) will be moved back. IS curve back to the place or to increase government spending or transfer payments to grow or reduce taxes. the third option is ruled out, but the first two options is associated with a sharp increase in interest rate thus increasing productivity and keeping a constant rate of monetary policy with fiscal policy can be used. Monetary policy in order to increase the volume of money. LM curve is shifted to the right to increase the amount of money that can make the interest rate reduction and increased productivity. This is the problem with both lower interest rates and increased productivity are answered. The huge increase in government spending in recent years, causing Rising interest rates tend to be severe and lead to budget deficits. We are printing money and lowering interest rates makes the deficit of the state budget to compensate. Government economic policy in recent years has been to reduce dependence on oil fund most of its funds through taxation to provide the taxes have increased consistently over time. The lateral size of government is growing by the day, according to official statistics and fractions formed to provide funds or to borrow from the central bank to print money. Therefore, these two phenomena have been rising over time as the expected result is our the estimates and economic analysis, and statistical correlation between these variables is positive. This coefficient is large because of the increase over time is very similar to one another and Both have grown strongly over time should be positive and large.

The coefficient of the variables in this equation shows the attraction. The elasticity of liquidity in proportion to the tax is 0.43. It means that one percent rise of tax increases the liquidity to 0.44 percent. Therefore the hypothesis of positive effect of tax income on the liquidity can be admitted.

The elasticity of liquidity in proportion to government expenditure is 0.07 every one percent of rise in government expenditure results in 0.07 percent rise in the liquidity.

4.4 Employment Equation and Analyses

$$LE = -0.176746 LTAX + 0.157167 LG \quad (2)$$

(SE)	(0.07567)	(0.00944)
(t-value)	(2.07702)	(18.7198)

In equation 2, there is co-integrated relationship between fiscal variables (Tax and Government Expenditure) and employment. The Johansen co-integration test and Schwarz criteria determined that this relation must be without intercept and trend. Then we will get the equilibrium relation between these variables.

Effect of tax on employment is negative and tax elasticity on employment is about 0.17. the interpretation of this coefficient is that Iran economy 1 percent increase in tax decreases employment about %0.17. This result supported by literature that exists in this scope. Increase in Government expenditure have positive relation with employment and 1 percent increase in Government expenditure lead to 0.15 percent in employment. In other word expenditure elasticity on employment is %0.15. Increase in Government expenditure as a positive financial policy shock increase total demand of Iran's economy and this lead to increase in total supply and then employment increases.

5. CONCLUSION

In this study we have tried to find the long run effect of the fiscal policy instruments (government expenditure and tax) on the liquidity and employment in the Iran's economy. Liquidity and employment are the most important variables that each government is eager to know the how these variables will be affected by changes in their variables.

Government as a policy maker in the fiscal scope of economic must know the long run relations between its actions variables and the key variables. One of the most important issues for each government is to understand the effect of fiscal policy on macroeconomic variables. To do this we have applied the VAR and VECM models that are appropriate models to estimate long ran relationship between the variables. Johansen test shows that the long run and the co-integrated relation between the variables of two models are available and the vector of co-integrated relation is as follows:

The effect of government expenditure on the both employment and liquidity are positive but the effect of tax on the liquidity is positive and on the employment is negative. The coefficients of the tax and government expenditure on liquidity are 0.44 and 0.07.

The coefficients of the tax and government expenditure on employment are -0.17 and 0.15. Because the variables have log forms then this coefficient must be interpreted as elasticity.

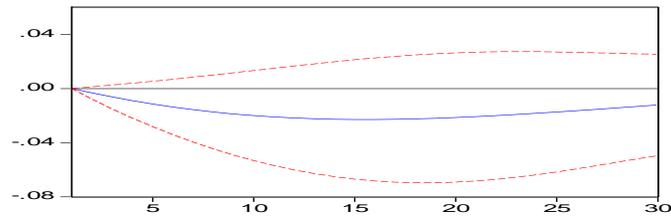
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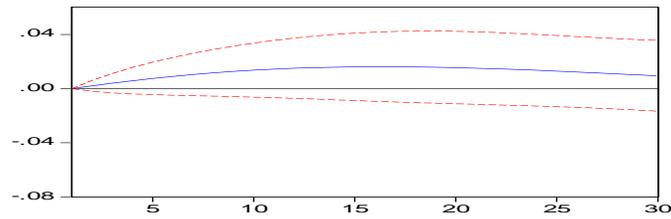
Attachments

Response to Cholesky One S.D. Innovations ± 2 S.E.

Response of LE to LG

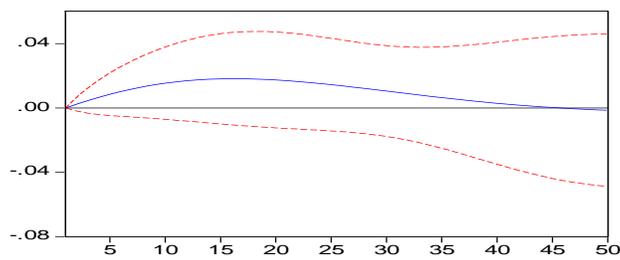


Response of LE to LTAX



Response to Cholesky One S.D. Innovations ± 2 S.E.

Response of LE to LTAX



Response of LE to LG

