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The Effects of Fiscal Policy on Macroeconomic Variables of Iran

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ABSTRACT: Fiscal policy influences the real economy through changes of its variables. Fiscal policy shocks are important for policy makers, because of their crucial effects on macroeconomic variables. So, in this study the response of macroeconomic variables to fiscal policy shocks in the Iran's economy is investigated. The Vector Autoregressive model (VAR) is applied for this investigation utilizing the quarterly time series data during 1990-2008. The results of this study revealed that: 1- The response of money supply to government revenues and current expenditures is positive and this response to constructive expenditures in is negative, 2- The response of the monetary base to tax revenues and current expenditures is positive and to oil revenue and constructive expenditures is positive at first and then is negative, 3- The response of the exchange rate to tax revenue and constructive expenditures shocks is negative and is on balanced in the long run. But, the response of exchange rate to oil revenue and current expenditures is on balanced in the short run. 4- The response of gross domestic product to tax revenues and constructive expenditures is negative and is on a certain distance of balance position. This response to oil revenue and current expenditures is positive in short run and negative in long run. 5- The response of private consumption to tax revenues was positive and is on balanced in the long run. While, the response of private consumption is negative to the oil revenue and constructive expenditures and is placed in a certain distance of balance in long run. Also, the results of variance decomposition illustrated that fiscal policy hasn't considerable effect in the short run variations of these variables.

KEYWORDS: Fiscal Policy Shocks, VAR Model, Government Revenue, Government Expenditures.

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1. INTRODUCTION

Fiscal policy referred to the handling and maintaining of the budget by the government. Budget which had decided by the government were fiscal policy guides two components: spending and revenue. Fiscal policy is a tool of government revenue collection and spending to influence the economy. Fiscal policy shocks are important for policy makers, because of they affect variables crucial in macroeconomic. Given their high importance to the policy makers, it is surprising that there is no consensus about the quantitative, or even qualitative, properties of most effects of fiscal policy shocks. The effects of fiscal policy shocks are still a subject of lively debate, as neither theoretical nor empirical studies have reached a consensus on either the qualitative or quantitative properties of such effects.

The macroeconomic effects of changes in fiscal policy became of central importance to economic policy-making across the world during the writing of this paper. Recently, however, fiscal arguments have developed, both in the political world and among academic economists, about the effectiveness of a fiscal stimulus and, eventually, about the consequences of fiscal consolidation. Yet when examining the literature on the macroeconomic effects of fiscal policy it is striking that there is no unanimous about it. Fiscal shocks in an economic union, especially those in big countries, may also cause important spill-over effects. It is also important to keep in mind that fiscal policy has important supply side effects through infrastructure expenditures, spending aimed at human capital enhancement, and taxes that directly affect the returns to labour and capital. Fiscal policy is the means by which a government adjusts its spending levels and tax rates to monitor and influence a nation's economy. Also, it is the manipulation of aggregate demand using taxation and or government spending. The government tends to make most of its fiscal decisions in the annual budget, usually announced each year. Many aspects of fiscal policy have a delayed effect on aggregate demand. Changing the fiscal stance can take some time to achieve. By using a mix of monetary and fiscal policies, governments are able to control economic phenomena. Even if one would subscribe to Friedman's view of an eventually self-stabilizing economy, the question of whether reliance on self-stabilizing forces alone generates economic fluctuations of politically and economically acceptable magnitudes remains open. From a purely economic viewpoint, the optimal degree of stabilization depends on whether observed macroeconomic fluctuations constitute efficient responses of the economy to shocks or whether these fluctuations are partly due to economic frictions, to be addressed with the tools of stabilization policy. Fiscal policy can promote macroeconomic stability by sustaining aggregate demand and private sector incomes during an economic downturn and by moderating economic activity during periods of strong growth.

An important stabilizing function of fiscal policy operates through the so called automatic fiscal stabilizers. These work through the impact of economic fluctuations on the government budget and do not require any short-term decisions by policy makers. The size of tax collections and transfer payments, for example, are directly linked to the cyclical position of the economy and adjust in a way that helps stabilizing aggregate demand and private sector incomes. Fiscal policy is assessed to have significant effects both on micro decisions of economic agents as well as on aggregate economic activity. However, compared to the large empirical evidence on the effects of monetary policy, research on fiscal policy effects has received much less attention. In many ways this is due to its political dependence but also because of its complexity and distributional dimension. Consequently the knowledge on the effects of fiscal policy remains limited. Furthermore, researchers views on both the short-run and long-run effects of fiscal policy remain rather mixed. There are both theoretical and empirical controversies regarding the effect of fiscal policy. Fiscal policy is a demand management policy. Changes in aggregate demand will affect variables in the product and money markets. Knowing the impact of fiscal policy on the macroeconomic variables will have benefits in terms of planning fiscal policy.

However, there is a large set of possible policies since changes in fiscal policy could, for example, be about changing the tax debt mix for financing a given stream of government spending, or about changing the level of spending for a given level of debt. In this paper we

view fiscal policy shocks as existing in a two dimensional space spanned by two basic impulse vectors, a government revenue shock and a government spending shock. In general, in Iran government obtains via taxation, oil revenue and etc and government spending includes current and development expenditures.
The aim of this study is to estimate the macroeconomic effects of fiscal policy shocks for the Iran economy. For that purpose we estimate a Vector Autoregressive (VAR) model and identify fiscal shocks using various approaches. This paper uses quarterly data during 1990 to 2008 on Iran fiscal policy variables such as current and development expenditures and tax and oil revenue to identify unexpected their shocks on macroeconomic variables in a structural VAR set up. A substantial part of the empirical literature investigates the impact of shocks to monetary policy on macroeconomic variables using VAR models.
On the other hand, there is no intensive investigation of the impact of shocks to fiscal policy on monetary base, money supply, gross domestic product, interest rates and private consumption expenditures. Therefore, this paper thus analyses the dynamic effects and responses of fiscal policy on macroeconomic variables in Iran in basis of VAR model.

2. LITERATURE REVIEW

This paper therefore contributes to the recent and growing literature of employing VAR to analyze the impact of fiscal policy shocks. Most of the previous literature has identified fiscal shocks either by making assumptions about the sluggish reaction of some variables to fiscal policy shocks, see for example Blanchard and Perotti (2002), Fatas and Mihov (2001) or by using additional information such as the timing of wars, detailed institutional information about the tax system and detailed historical study of policy decisions or elections, see for example Burnside et al, (2003) and Eichenbaum and Fisher (2004). By contrast this paper relies on macroeconomic time series data alone for shock identification and does not rely on assumptions about the sluggish reaction of some variables to macroeconomic shocks. Indeed it imposes no restrictions on the signs of the responses of the key variables of monetary base, money supply, gross domestic product, interest rates and private consumption expenditures to fiscal policy shocks.

Until now, several studies have examined the effects of fiscal policy on macroeconomic variables. Burnside et al, (2003) investigated the response of hours worked and real wages to fiscal policy shocks in the U.S. these shocks lead to a persistent increase in government purchases and tax rates on capital and labour income, and a persistent rise in aggregate hours worked as well as declines in real wages. They stated that standard neoclassical models can account for the consequences of a fiscal policy shock. Caldara and Kamps (2008) expressed that in response to such shocks real GDP, real private consumption and the real wage all significantly increase following a hump-shaped pattern, while private employment does not react. In contrast, they find strongly diverging results as regards the effects of tax shocks. Abunuri et al, (2010) investigated effects of tax revenues, current expenditures and constructive expenditures as tools of fiscal policy on macroeconomic variables such as GDP, total investment, private consumption and inflation in Iran. Their results showed that the tax revenue, current and constructive expenditures have positive effects, and real interest rate has negative effect on GDP. Also, according to the large share of current expenditure and tax revenue in GDP volatility, the use of constructive expenditures as a lever of policy making are suggested.

Kamal (2010) examined fiscal policy shocks in the UK through using a Bayesian Vector Auto regression (BVAR) model with the impact of three fiscal policy as deficit-financed spending increase (DFSI), the deficit financed tax cut (DFTC), and the balanced budget spending increase (BBSI). The results of this study showed that, the policy conclusion differs according to the period under investigation. Michal (2012) analysed the macroeconomic effects of fiscal policy

shocks in the Czech Republic. He used different approaches such as a small-scale VAR and Bayesian techniques for investigating fiscal variables effects. The estimation results suggest that the some fiscal policy transmission mechanisms in the Czech Republic such as a rise in GDP and inflation after unexpected government spending and an increase in government is spending after a positive shock to government revenues.

Kihaule (2012) examined the outcomes of the fiscal adjustment policies adopted on economic shocks GDP growth, public spending in Tanzania. He found out that economic policy shocks would result in structural changes in output growth and public spending instability in Tanzania. Specifically, the policy shocks led to changes in macroeconomic conditions, which restricted effectiveness of fiscal adjustment policies in improving budget position. Mencinger et al (2013) investigated Fiscal Policy Stance in the European Union with cyclical stabilization objectives. They compared the dynamic evaluation of the cyclically adjusted balance and output gap. Namely, changes of the cyclically adjusted balance in consecutive years have indicated the orientation of fiscal policy, i.e. the fiscal impulse. Finally, they proposed that the response of fiscal authorities to cyclical conditions in the economy depends on whether good or bad times are prevailing.

However, the number of contributions regarding the impacts of fiscal policy shocks for Iran economy is limited. In this literature review, it discusses about the aspect of fiscal policy on economy and with the relationship with different variables that have significant impact on the economy. Some of studies investigated the effects of fiscal policy shocks in Iran, have examined the effects of only one kind of fiscal policy tools on the economy, such as the effect of budget (e.g. Jafari Samimi et al, 2006). Also, some of them have investigated the effect of total type of fiscal policy tools (e.g. Samadi et al, 2008). Some studies have focused on the effect of fiscal policy tools on an economics component such as output (e.g. Borumand et al, 2006; Hristov, 2013).

Jafari Samimi et al, (2006) considered economic growth as the dependent variable and government deficit spending, development expenditures, private sector investment, inflation and labour force as the independent variable. The results indicated the existence of a negative long-run relationship between budget deficits and economic growth in long run equilibrium relationship between development expenditures and private sector investment expenditures with economic growth and a negative relationship between inflation. Dadgar et al, (2009) attempted to reveal the relationship between fiscal policy and fuel price shocks on income and welfare distribution in Iran. Based on the results, they concluded that fiscal policy is the cause of reducing inequity.

Delangizan and Khozair (2012) investigated asymmetric effects of fiscal policy shocks on economic growth and the money supply growth. They found out that positive and negative shocks to financial policy of the government fully have asymmetric effects only in field development budgets. This means that that negative shocks have reducing effects and greater than positive shocks of fiscal policy on economic growth. Molaei and Golkhandan (2013) investigated the relationship between long-term and short-term deficit spending and economic growth in Iran. The results showed that the ratio of budget deficit to GDP to economic growth is negative and significant in the long term and positive and significant in the short term. Also, in the long-term effects of foreign debt on economic growth is negative and significant and effect of public investment on economic growth is positive and significant, but there is no significant effect on economic growth. Mohamadi and Baratzadeh (2013) investigated reduction of oil revenues shocks on government spending and liquidity using the VAR model. The results revealed that the shock of oil revenues on development expenditures, current expenditures and liquidity are affected. Nevertheless, we think that a deep investigation of effects of fiscal policy

shocks in the economy of our country is needed. Therefore, this study carries out in order to precise investigations in terms of VAR model.

3. METHODOLOGY

This section will briefly explain the applied econometric of Vector Autoregressive (VAR) method. Alternative approaches to the identification of fiscal shocks in the context of VAR studies have been proposed (e.g by Caldara and Kamps, 2008; Mountford and Uhlig, 2009). In this paper are presented a VAR model of the short run and long run effects of fiscal policy in Iran. Then, the Johansen technique are used for cointegration between variables (Johansen, 1988), which have carried out in a context of a VAR for estimating cointegration relationships between non-stationary variables using a maximum likelihood procedure. This technique tests for the number of distinct cointegrating vectors in a multivariate setting and estimates the parameters of these cointegrating relationships. For our application here, this consists of the following VAR model:

$$Y_t = A_0 + A_1 Y_{t-1} + A_2 Y_{t-2} + ... + A_p Y_{t-p} + \varepsilon_t \quad (1)$$

Where square matrices A_1 to A_p are coefficients, Y_t is variables vector, p is lag lengths and ε_t is error terms vector. The VAR model, originally advocated by Sims (1980) as an alternative to simultaneous equation models, carries many advantages. After Sims (1980) proposed simultaneous equation models, according to it, if there is true some simultaneity among a set of variables, they should all be treated on an equal footings; there should not be any a priori distinction between endogenous and exogenous variables. It is in this sprit that Sims developed VAR models. It is worth noting that its major drawback is the large number of parameters to be estimated, which may severely limit degrees of freedom. VARs have been used primarily in forecasting, testing Granger causality, and studying the effects of policy through impulse response characteristics (Greene, 2003).

The structural approach to simultaneous equations modelling uses economic theory to describe the relationships between several variables of interest. The resulting model is then estimated, and used to test the empirical relevance of the theory. Unfortunately, economic theory is often not rich enough to provide a tight specification of the dynamic relationship among variables. These problems lead to alternative, non structural, approaches to modelling the relationship between several variables. Here we describe the estimation and analysis of VAR. The reduced form VAR is defined by the following dynamic equation:

$$X_t = B(L)X_{t-1} + U_t$$

where X_t is the vector of variables, B(L) is an autoregressive lag polynomial in the operator L and U_t is the vector of reduced-form innovations. The model can be included a constant and a linear time trend. The choice of the number of lags is made on the basis of the autocorrelation function of the reduced form VAR residuals and the likelihood ratio tests. The optimal number of lags must be estimated. In these models, it is essential to choose the correct number of lags, because if the lag number is small, the model has specification error and if the lag number is too large, the degree of freedom is reduced. Similar univariate models, a model is chosen that the lowest AIC and SBC statistics. To ensure an accurate comparison, it is necessary to have the same number of observations used.

In order to examine how long the impacts of variables will remain effective, can be used the impulse response function and variance decomposition analyses. Impulse response analysis is a useful tool to examine the effect of a shock over time on the various variables in a system. To better illustrate this, consider the following model:

$$Y_t = \alpha_{10} + \alpha_{11}\, Y_{t-1} + \alpha_{12}\, Y_{t-2} + \alpha_{13}\, X_{t-1} + \alpha_{14} X_{t-2} + \varepsilon_1 \quad (2)$$

$$X_t = \alpha_{20} + \alpha_{21}\, Y_{t-1} + \alpha_{22}\, Y_{t-2} + \alpha_{23}\, X_{t-1} + \alpha_{24}\, X_{t-2} + \varepsilon_2 \quad (3)$$

If we introduce a one period shock to E by increasing ε_1 by one standard deviation at time t=0 (see equation 2), we can observe how this impulse will affect Y immediately and several periods later. However, if the errors are correlated as is usually the case, we cannot associate a shock with any one particular variable. In that case and in order to be able to isolate the effects of any specific shock, researchers have used orthogonalized impulses based on the Cholesky decomposition. A shock to a stationary time series is known to be transitory. In other words, for an I(0) series the impact of a shock will disappear after some time period when the series will revert to its mean value.

To isolate the impact of one shock from the effect of other shocks in the system, orthogonalized impulse responses are applied. Orthogonalization can be achieved through Cholesky factorization, which is not invariant to the ordering of the variables in the VAR. The first variable in the ordering is the one which is the least influenced by other variables in the model, similar to an exogenous variable. The variable that is influenced by other variables the most is chosen as the last variable in the ordering. If error terms ε1 and ε2 are uncorrelated, ε_1 illustrate immediately variations of Y_t and ε_2 illustrate immediately variations of X_t. In this case, the response function to changes in ε_2, are showed the effect of shock in the size of a deviation in X_t on current and future values. Variance decomposition is a method to analyze the dynamic interactions of shocks is created. The variance decomposition is used to aid in the interpretation of a VAR model once it has been fitted. The variance decomposition indicates the amount of information each variable contributes to the other variables in the autoregression. It determines how much of the forecast error variance of each of the variables can be explained by exogenous shocks to the other variables.

3.1. Unit Root Test

Typically, the first step in any time series study is to check the order of integration of the variables in question. For this purpose in this study, Augmented Dicky Fuller (ADF) test was used. The ADF based on equation 4 in which the null hypothesis is H_0: $\gamma = 0$, i.e. y_t has a unit root, and the alternative hypothesis is H_1: $\gamma < 0$, but the test statistics are calculated differently (Enders, 2004).

$$\Delta y_t = \alpha + \gamma y_{t-1} + \theta t + \sum_{i=1}^{p} \varphi_i \Delta y_{t-i} + \varepsilon_t \quad (4)$$

Where ε_t is assumed to be a Gaussian white noise error, *t* is a time trend, and the number of lags *p* is selected by the Akaike information criterion. The distribution of γ does not follow the conventional *t* distribution, and hence the appropriate critical values are taken from MacKinnon (1996). If the unit root tests confirm that at least some of the variables are I(1), then the next step would be to test if they are cointegrated, i.e. if they are bound by a long run relationship. The cointegration exists between a set of non stationary variables when a certain linear relationship of the series is stationary. To test for cointegration Johansen's (1988, 1991) approach will be used. If cointegration is found then the remaining analysis should be performed using a VECM, otherwise the I(1) variables are differenced and a simple unrestricted VAR can be used. According to table 1, private consumption expenditures, oil revenue and gross domestic product are trend stationary in level and others are not stationary in level but are stationary in first difference.

3.2. Dataset

In this study used from quarterly time series data that published by Central Bank of Iran during 1990-2008. In the paper we refer to a number of variables that we are interested in regard to VAR model. The macroeconomics variables include monetary base, money supply, gross domestic product, interest rates and private consumption expenditures. Fiscal policy also is included current expenditures, development expenditures, tax revenue and oil revenue. All of them collected from Central Bank of Iran. Total data were realized at base year 1997 and was used from natural logarithm of variables because of achieving for better result. All the calculations in this study were performed using Eviews6 Software.

4. RESULT AND DISCUSSION

Based on table 1, private consumption expenditures, oil revenue and gross domestic product variable stationary in level and other variable are I(1).

Table1. Unit Root Test.

variable	ADF test					intercept and trend
	level	c.v			First differences	
	t student	1%	5%	10%	t student	
LnBJ	-0.88	(-3.52)	(-2.90)	(-2.58)	-10.13 ***	I
LnBO	0.82	(-2.59)	(-1.94)	(-1.61)	4.75 ***	I
LnYT	1.53	(-2.59)	(-1.94)	(-1.61)	4.19 ***	I
LnS	0.23	(-2.59)	(-1.94)	(-1.61)	-8.77 ***	I
LnM	0.96	(-2.59)	(-1.94)	(-1.61)	-2.25 ***	I
LnP	-0.61	(-4.08)	(-3.47)	(-3.16)	-7.12 ***	I+T
LnC	-2.53 **	(-2.59)	(-1.94)	(-1.61)	-	I
LnYO	-7.68 **	(-4.08)	(-3.47)	(-3.16)	-	I+T
LnGDP	-2.46 **	(-2.59)	(-1.94)	(-1.61)	-	I

Notes: 1. I denotes intercept and I+T denotes intercept and trend.
2. ***, ** and * denote significance at 1%, 5% and 10% respectively.
3. C.v denotes critical value for the ADF test and is denoted in parentheses.
4. For the ADF test the lags were based on the SBC.

4.1. Determine the Optimal Number of Lags

Before estimating the models, it is necessary that recognize the lag lengths in the model, to ensure that the error terms have classical assumptions. To determine the most appropriate lag lengths are Akaike Information Criterion (AIC) and Schwarz's Bayesian Criterion (SBC). In the study, according to low sample volume the SBC was used. With regard to table 2 the appropriate order of lag lengths determines.

Table2. Lag Selection Criteria.

lag length	variable									
	LnS		LnM		LnP		LnC		LnGDP	
	AIC	SBC	AIC	SBC	AIC	SBC	AIC	SBC	AIC	SBC
1	2.04	2.96	-2.56	-1.64	-1.58	-0.66	-1.05	-0.117	0.034	0.97
2	1.78	3.49	-2.87	-1.16	-2.14	-0.43	-1.45	0.28	-0.48	1.25
3	1.98	4.49	-3.19	0.68	-2.05	0.45	-1.028	0.72	-1.52	1.02
4	1.44	4.76	-3.61	0.29	-2.75	0.56	-2.15	1.22	-2.33	1.04

4.2. Determine the Number of Cointegration Vectors

After determine lag length, must act toward to identification of existence of trend and intercept in short run and long run. Here simultaneously Johansen cointegration approach must be used based on Trace test (λ_{trace}) for identifying error correction model form and number of cointegration vectors. According to this method, five different state can be predict for error correction model that include most constrain state (first model) and no constrain state (five model). The models follow it:

1. Intercept and trend don't exist in any of short run and long run relations.

2. Only long run relations constrain to have intercept.

3. In short run model, trend doesn't exist and only intercept exist. The intercept cause that long run relations include the trend.

4. In short run model, trend doesn't exist, but long run relations include trend.

5. Trend exists in short run model, and so long run relations include quadratic trend.

Since in practice, probability of happening of first model and fifth model in any of short run and long run is improbable, we investigate second to fourth models.

In first, these three models are estimated and hypothesis of existence of no cointegration vector (r=0) instead of one cointegration vector (r=1) from second to fourth models respectively tests. If null hypothesis doesn't reject for any model, that model choice as appropriate error correction model form and then determine the number of optimal vectors. Otherwise, r=1 hypothesis tests instead of r=2 for each three model respectively. Consequently, both the form of the model and the number of cointegration vectors determine. For performing cointegration test, considered fiscal policy on monetary base, money supply, gross domestic product, interest rates and private consumption expenditures in Iran in the following models:

$$LnM = g(YO,YT,BO,BJ) \quad (5)$$
$$LnGDP = g(YO,YT,BO,BJ) \quad (6)$$
$$LnC = g(YO,YT,BO,BJ) \quad (7)$$
$$LnP = g(YO,YT,BO,BJ) \quad (8)$$
$$LnS = g(YO,YT,BO,BJ) \quad (9)$$

4.3. The Response of Money Supply

The results were obtained from Johansen cointegration test have provided in table 3. Based on the results, value of the trace test statistic is more than of the critical value in row corresponding to r=0 and r=1 hypothesis. Therefore, null hypothesis rejects, but in third model corresponding to $r \leq 2$ hypotheses value of the trace test is smaller than critical value in 95 percent confidence level. So, third model would choice and existence of two cointegration vectors confirm. The normalized form of it is followed:

$$LnM = 1.30^{*}\ LnBO - 1.10^{*}\ LnYO + 0.22^{*}\ LnYT$$
$$(0.241) \qquad (0.175) \qquad (0.197)$$
$$LnBJ = 0.44^{*}\ LnBO + 0.20^{*}\ LnYO + 0.54^{*}\ LnYT$$
$$(0.058) \qquad (0.042) \qquad (0.047)$$

Table3. The results for Johansen cointegration test for LnM equation.

Hypothesis		**Model 2**		**Model 3**		**Model 4**	
H_0	H_1	Trace statistic	CV[a]	Trace statistic	CV[a]	Trace statistic	CV[a]
r = 0	r >= 1	134.12	76.97	117.29	96.81	139.41	88.80
r <= 1	r >= 2	80.53	54.07	65.86	47.85	84.19	63.87
r <= 2	r >= 3	40.28	35.19	25.62	29.79	37.25	42.91
r <= 3	r >= 4	19.74	20.26	11.63	15.49	15.91	25.87
r <= 4	r >= 5	6.43	9.16	6.35	3.84	4.24	12.51

[a] CV denotes critical value for rejection of the null hypothesis at the 5% level.

Figure1. Impulse response function of LnM to fiscal policy variables shocks.

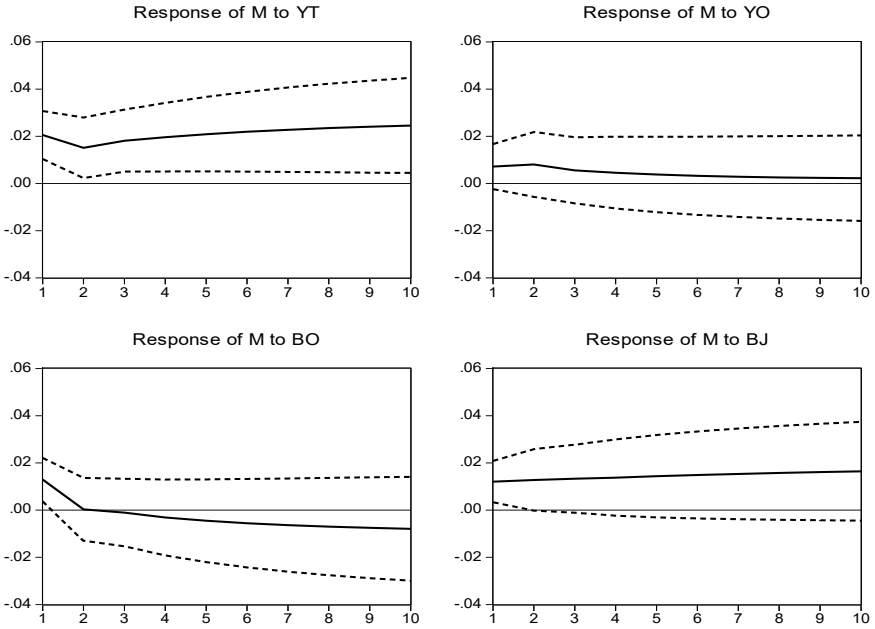


Figure 1 represents the response and reaction of real money supply toward to current and development expenditures shocks and oil and tax revenue shocks during a 10 years period. According to it, response of money supply toward to tax revenue shocks is positive and it is statistically significant. Likewise, money supply response toward to oil revenue and current expenditures is positive, but are not significant and it imbalance toward oil revenue in long run. Also, money supply response toward to development expenditures is positive in short run and it became negative in long run that it is not statistically significant.

Table4. The results of variance decomposition analysis of LnM.

Variable / Period	BO	BJ	YO	YT	M
1	0	0	0	0	100.00
3	4.60	1.00	0.05	0.21	94.12
5	7.31	1.31	0.12	0.22	91.03
7	9.37	1.45	0.23	0.39	88.55
9	10.94	1.50	0.32	0.61	86.61
10	11.58	1.51	0.36	0.72	85.80

The results of decomposition variance corresponding to money supply are represented in table 4. The results showed that the most variations relates to self money supply. Though, the share of it was reduced from 100 percent to 85 percent in 10 years period. Among of fiscal policy variables, development expenditure has the most shares in expression of money supply and the other variables are trifle. All variables related to fiscal policy have rising trend with increasing the period.

4.4. The Response of Monetary Base

The results were obtained from Johansen cointegration test are represented in table 5. According to the table can see that value of the trace test statistic is less than of the critical value corresponding to $r \leq 2$ null hypotheses in third model in 95 percent confidence level. Therefore, existence of two cointegration vectors confirms in equation related to monetary base, as the normalized form of it is followed:

$$\begin{matrix} LnP = 0.12^{*}\ LnBJ - 0.73^{*}\ LnYO + 0.68^{*}\ LnBO \\ \quad (0.142) \quad (0.090) \quad (0.143) \\ LnYT = -\ 0.46^{*}\ LnBO - 0.62^{*}\ LnYO + 1.63^{*}\ LnBJ \\ \quad (0.100) \quad (0.067) \quad (0.099) \end{matrix}$$

Table5. The results for Johansen cointegration test for LnP equation.

Hypothesis		**Model 2**		**Model 3**		**Model 4**	
H_0	H_1	Trace statistic	CV[a]	Trace statistic	CV[a]	Trace statistic	CV[a]
r = 0	r >= 1	137.83	76.97	129.58	96.81	151.10	88.80
r <= 1	r >= 2	84.48	54.07	76.79	47.85	90.44	63.87
r <= 2	r >= 3	35.36	35.19	27.78	29.79	38.88	42.91
r <= 3	r >= 4	18.12	20.26	10.60	15.49	18.37	25.87
r <= 4	r >= 5	5.72	16.19	0.29	3.84	8.01	12.51

[a] CV denotes critical value for rejection of the null hypothesis at the 5% level.

The results of decomposition variance of monetary base are represented in table 6. According to the table, the most shares of variations relates to monetary base and this variations decrease from 100 percent in 1 period to 78 percent after 10 periods. The other of fiscal policy variables, have not considerable effects on the macroeconomics variables, but with increasing the period their shares rise. As, the share of development expenditures and tax revenue receive to 11 and 5 percent respectively.

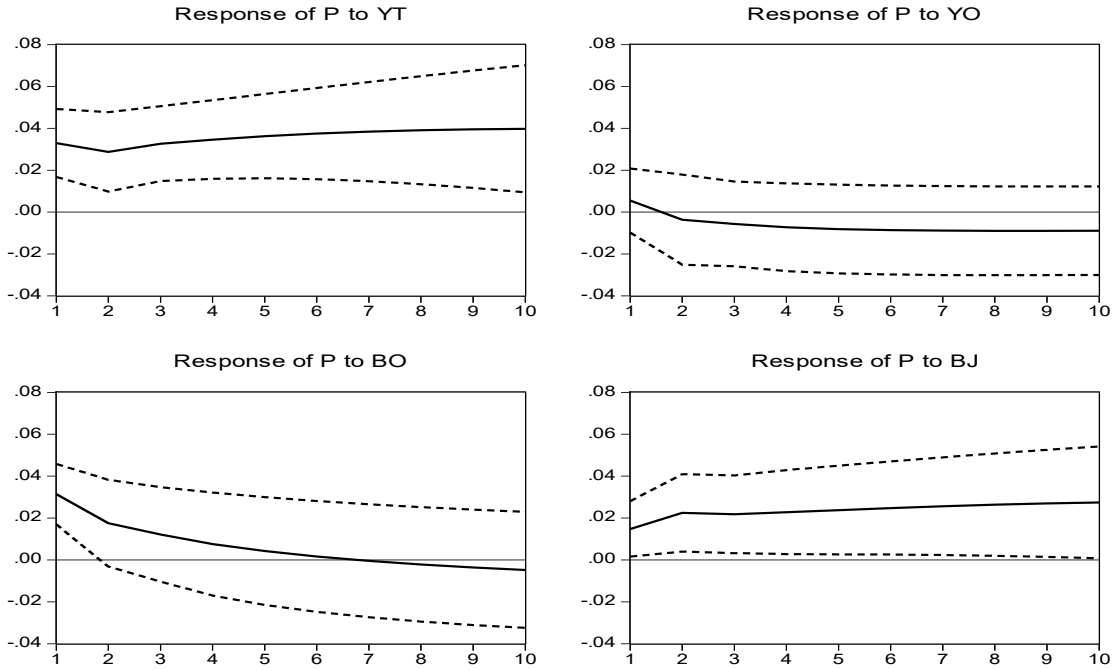
Table6.The results of variance decomposition analysis for LnP.

Variable / Period	BO	BJ	YO	YT	P
1	0	0	0	0	100.00
3	3.38	0.05	1.22	0.29	95.05
5	6.27	0.07	2.00	1.53	90.12
7	8.88	0.15	2.48	3.22	85.25
9	11.13	0.31	2.76	5.04	80.75
10	12.13	0.41	2.85	5.93	78.66

The response of monetary base toward to fiscal policy shocks current and development expenditures and oil and tax revenue represents in figure 2 during a 10 years period. According to it, response of monetary base toward to tax revenue and current expenditures shocks is

positive and it is statistically significant. Also, this variable response toward to oil revenue is positive (until second period) and then will become negative in long run, but it is not significant. The response of monetary base toward to development expenditures until seventh period is positive and then will become negative in long run, but it is not significant.

Figure 2. Impulse response function of LnP to fiscal policy variables shocks.



4.5. The Response of Gross Domestic Product

The table 5 represents the results of Johansen cointegration test for gross domestic product. According to the table, that value of the trace test statistic corresponding to $r \leq 2$ hypotheses is less than is less than of the critical value in second model in 95 percent confidence level. Therefore, existence of two cointegration vectors confirms in equation related to gross domestic product, that the normalized form of it is followed:

$$\begin{aligned} LnGDP &= 16.51 - 1.14^{*}\, LnYO - 2.58^{*}\, LnBJ + 2.13^{*}\, LnBO \\ &\quad (0.981) \quad (0.219) \qquad (0.340) \qquad (0.375) \\ LnYT &= -0.06 - 0.35^{*}\, LnYO + 1.70^{*}\, LnBJ + 1.63^{*}\, LnBO \\ &\quad (0.328) \quad (0.073) \qquad (0.114) \qquad (0.120) \end{aligned}$$

Table7. The results for Johansen cointegration test for LnGDP equation.

Hypothesis		**Model 2**		**Model 3**		**Model 4**	
H_0	H_1	Trace statistic	CV[a]	Trace statistic	CV[a]	Trace statistic	CV[a]
r = 0	r >= 1	136.25	76.97	121.57	96.81	142.23	88.80
r <= 1	r >= 2	70.60	54.07	57.07	47.85	77.45	63.87
r <= 2	r >= 3	32.81	35.19	19.31	29.79	32.50	42.91
r <= 3	r >= 4	16.80	20.26	9.05	15.49	17.06	25.87
r <= 4	r >= 5	6.68	16.19	1.31	3.84	7.71	12.51

[a] CV denotes critical value for rejection of the null hypothesis at the 5% level.

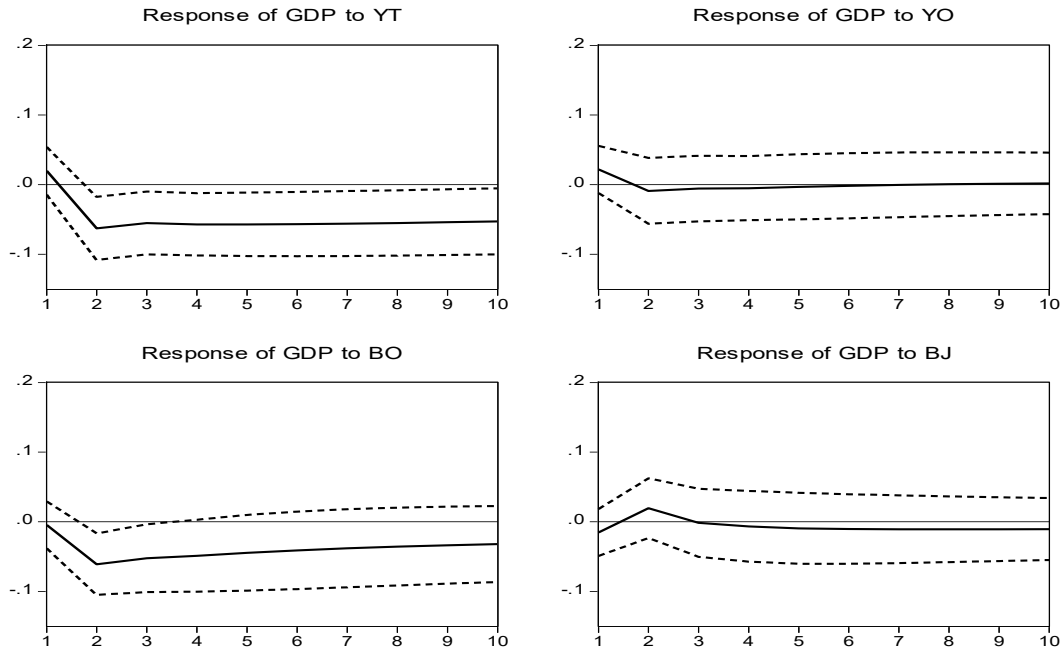
The results of decomposition variance of gross domestic product are represented in table 8. As, gross domestic product have the most shares of variations in the table 8. After that, tax revenue has the most effect in the decomposition variance table. The other of fiscal policy variables, have not considerable effects on the macroeconomics variables. Also, with increasing the period the share of gross domestic product and oil revenue will decrease and the share of development expenditures and tax revenue will increase.

Table8.The results of variance decomposition analysis for LnGDP.

Variable / Period	BO	BJ	YO	YT	GDP
1	0	0	0	0	100.00
3	0.79	0.80	2.02	17.10	70.40
5	1.66	1.67	2.17	21.46	65.60
7	2.08	2.08	2.07	24.15	63.30
9	2.28	2.28	1.95	26.01	61.92
10	2.35	2.35	1.90	26.72	61.43

The response of gross domestic product toward to fiscal policy shocks as current and development expenditures and oil and tax revenue represents in figure 3 during a 10 years period. According to the figure, gross domestic product has negative response toward to fiscal policy shocks in long run. Gross domestic product responds to oil revenue as positively and significant from second period to next. Also, its response to development expenditures is significant from 3 periods in short run, but toward to other variables has not statistically value. The response of gross domestic product toward to government expenditures turns to balance in long run and toward to oil revenue turns to balance in sixth period. As well, the response to current expenditures receives to balance at more than 10 periods.

Figure3. Impulse response function of LnGDP to fiscal policy variables shocks.



4.6. The Response of Interest Rate

The results of interest rate were obtained from Johansen cointegration test are represented in table 9. According to the table 9, that value of the trace test statistic is less than of the critical value corresponding to $r \leq 2$ hypotheses in third model in 95 percent confidence level. Therefore, fourth model selected, because of existence of two cointegration vectors. The normalized form of it is followed:

$$\begin{array}{l} LnS = 1.96^{*}\ LnYO + 15.37^{*}\ LnBJ - 6.02^{*}\ LnBO - 0.24^{*}\ T \\ \quad\quad (0.646) \quad\quad (2.728) \quad\quad (1.042) \quad\quad (0.050) \\ LnYT = -\ 0.56\ ^{*}\ LnYO + 1.77^{*}\ LnBJ - 0.63^{*}\ LnBO - 0.001\ ^{*}\ T \\ \quad\quad (0.075) \quad\quad (0.320) \quad\quad (0.122) \quad\quad (0.006) \end{array}$$

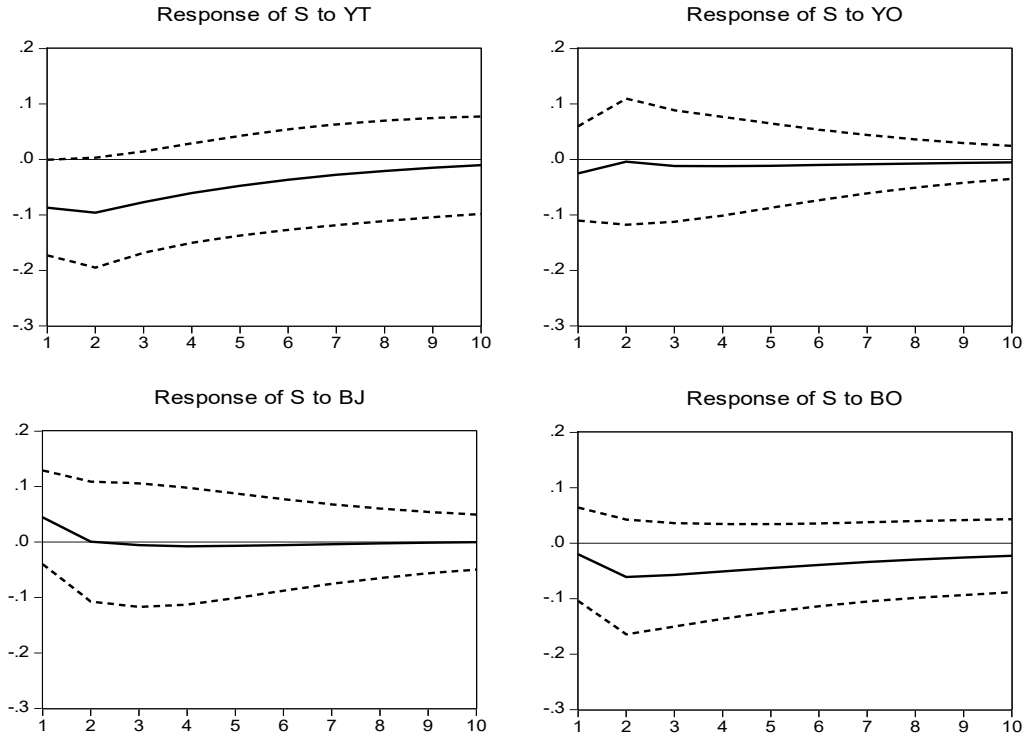
Table9. The results for Johansen cointegration test for LnS equation.

Hypothesis		**Model 2**		**Model 3**		**Model 4**	
H_0	H_1	Trace statistic	CV[a]	Trace statistic	CV[a]	Trace statistic	CV[a]
r = 0	r >= 1	128.70	76.97	121.03	69.81	144.84	88.80
r <= 1	r >= 2	76.46	54.07	69.32	47.85	88.14	63.87
r <= 2	r >= 3	37.07	35.19	29.97	29.79	40.36	42.92
r <= 3	r >= 4	15.90	20.26	9.41	15.49	51.19	25.87
r <= 4	r >= 5	4.50	16.19	0.60	3.84	8.45	12.51

[a] CV denotes critical value for rejection of the null hypothesis at the 5% level.

The response of interest rate toward to fiscal policy shocks as current and development expenditures and oil and tax revenue represents in figure 4 during a 10 years period. According to the figure, interest rate has negative response toward to development expenditures and tax revenue that they turn to balance in long run. But, current expenditures and oil revenue turn to balance in short run. Though, any of them have been had positive.

Figure4. Impulse response function of LnS to fiscal policy variables shocks.



The results of decomposition variance of interest rate are represented in table 10. The founding of it shows that interest rate has the most shares of variations and this variations decrease from 100 percent in 1 period to 96 percent after 10 periods. The other of fiscal policy variables, have not considerable effects on the macroeconomics variables.

Table10.The results of variance decomposition analysis for LnS.

Variable / Period	BO	BJ	YO	YT	S
1	0	0	0	0	100.00
3	0.10	0.86	0.10	0.19	97.74
5	1.50	1.15	0.08	0.17	97.08
7	1.73	1.24	0.07	0.15	96.80
9	1.87	1.26	0.07	0.15	96.62
10	1.93	1.26	0.07	0.16	96.56

4.7. The Response of Private Consumption Expenditures

The results were obtained from Johansen cointegration test have provided in table 11. Base on the results, value of the trace test statistic is less than of the critical value in row corresponding to $r \leq 2$ hypotheses and null hypothesis and third model is rejected. So, existence of two cointegration vectors is confirmed. The normalized form of it is followed:

$$LnC = -1.21^{*} LnYO + 2.44^{*} LnBJ - 2.65^{*} LnBO$$
$$(0.239) \qquad (0.360) \qquad (0.385)$$
$$LnYT = -0.42^{*} LnYO - 0.70^{*} LnBJ + 1.71^{*} LnBO$$
$$(0.075) \qquad (0.320) \qquad (0.122)$$

Table11. The results for Johansen cointegration test for LnC equation.

Hypothesis		**Model 2**		**Model 3**		**Model 4**	
H_0	H_1	Trace statistic	CV[a]	Trace statistic	CV[a]	Trace statistic	CV[a]
r = 0	r >= 1	144.18	76.97	120.80	69.81	139.14	88.80
r <= 1	r >= 2	84.75	54.07	62.68	47.85	79.51	63.87
r <= 2	r >= 3	40.78	35.19	18.74	29.79	31.30	42.91
r <= 3	r >= 4	15.01	20.26	6.44	15.49	15.60	25.87
r <= 4	r >= 5	3.57	16.19	2.60	3.84	3.83	12.51

[a] CV denotes critical value for rejection of the null hypothesis at the 5% level.

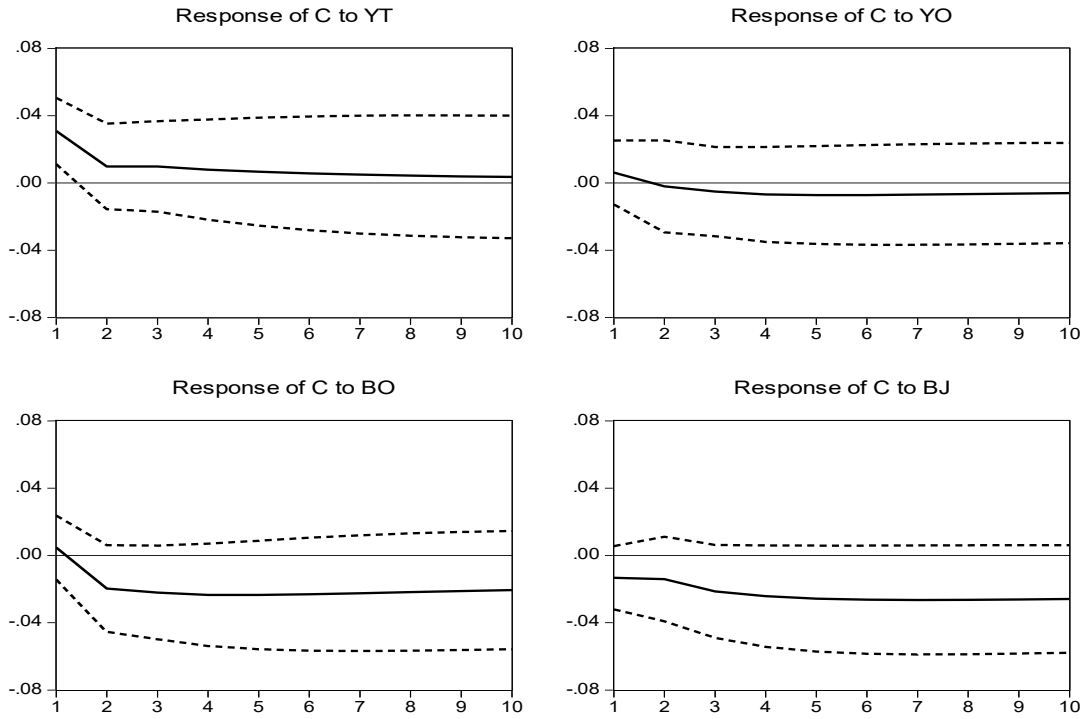
The results of decomposition variance of private consumption expenditures are showed in table 12. Based on it, private consumption expenditure has the most shares of variations. After that, respectively current expenditures and tax revenue have the most shares of variations.

Table12.The results of variance decomposition analysis for LnC.

Variable / Period	BO	BJ	YO	YT	C
1	0	0	0	0	100.00
3	2.97	3.71	0.86	2.95	89.48
5	3.17	6.73	1.50	3.89	84.70
7	3.09	8.50	1.78	4.55	83.06
9	2.97	9.56	4.91	5.05	80.50
10	2.92	9.94	1.94	5.25	79.93

In figure 5, the response of private consumption expenditures toward to fiscal policy shocks represents during a 10 years period. According to the figure, the response of private consumption expenditures toward to government expenditures and oil revenue shocks is negative in long run. However, the response toward to tax revenue is positive. These responses toward to government revenue turn to balance in long run and toward to government expenditures turn to specific position of balance. Also, any of them are not statistically significant.

Figure5. Impulse response function of LnC to fiscal policy variables shocks.



5. DISCUSSION AND COMPARISON

In the case of money supply, in base of the results of this study, the response of this variable to government revenues and current expenditures has been positive that it is correspond with study of Emami Meybodi and Daei Karimzadeh (2013). They showed that rise of government expenditures has direct effect on money supply.

In this study the negative relation between exchange rate response with tax revenue and constructive expenditures was earned. As, the shocks of exchange rate were offset to tax revenue and constructive expenditures in long run and to oil revenue and current expenditures in short run. The inverse relation among exchange rate and spending deficit was supported in study of Tahmasebi et al, (2013).

In this study private consumption showed negative relation with tax revenue. But, it showed positive relation than oil income and government expenditures. This issue was recognized by Taghavi and Rezaei (2004). They found significant long run relation between private consumption and fiscal policy variables. As, increasing in government expenditures cause to increasing in private consumption and increasing in tax revenue cause to increasing in private consumption in short run. Also, Ashrafipur (2013) verified the negative relation of tax revenue and the positive relation of government expenditures on private consumption. Arabmazar and Chalak (2010) represented that total detail of aggregate demand such as private consumption response to current and constructive expenditures fluctuates. Abunuri et al, (2010) resulted that current expenditures has negative effect on private consumption.

In this study the response of GDP to tax revenue and constructive expenditure shocks were negative and to oil revenue and current expenditure shocks were positive in short run and were negative in long run. The relation between fiscal policy tools and GDP investigated in some researches. Such as, Arabmazar and Chalak (2010) showed that constructive and current

expenditures cause to increase economic growth. While, they believed that the effect of constructive expenditures on economic growth is more than current expenditures. Jafari Samimi et al, (2006) found the equilibrium positive relation between constructive expenditures and GDP growth. Then, they recognized that it could be complement of private investment. Samadi and Oujimehr (2012) resulted that increasing in oil revenue has long run relation on economic growth and fiscal policies in Iran usually have pro-cyclical behavior that oil revenue and expenditures government have been from reasons of fluctuates pro-cyclical of fiscal policies. Shafiei et al, (2007) represented that constructive expenditures has positive effect and tax revenue has negative effect on GDP. Although, current expenditure has not significant effect on economic growth and in among of current and constructive expenditure and tax revenue, constructive expenditures has the most effect on economic growth. Delangizan and Khazir (2012) found direct effect on current and constructive expenditures shocks effect on economic growth, and then they stated that tax revenue shocks have negative effect on economic growth. Rahbar et al, (2013) revealed that current expenditures and tax revenue cause to decrease in economic growth both in short run and long run. Abunuri et al, (2010) found significant and positive relation between tax revenue, current and constructive expenditures on economic growth. Then, they stated that the share of current expenditures and tax revenue in GDP shocks are more than constructive expenditures. Samadi et al, (2008) found positive effect of constructive expenditures and weak effect of current expenditures on economic growth. Also, Emami Meybodi and Daei Karimzadeh (2013) resulted that spending deficit has significant relation with economic growth.

6. CONCLUSIONS

1. In this study, for investigating variables stationary was used from Augmented Dicky Fuller (ADF) test. With regard it, gross domestic product, private consumption expenditures and oil revenue station in level and other variables stationed with once differentiating.

2. For determining the number of optimal lag in order to estimate models Schwarz's Bayesian Criterion (SBC) was used, then the optimal lag of all models selected base on the least value of this statistic.

3. The results of the Trace test of Johansen method showed that in the all models two cointegration vectors exist.

4. According to the results of the impulse response functions, the response of money supply than the shocks of current expenditures, oil revenue and tax revenue is positive and then the response than development expenditures is positive in short run and negative in long run. While, only the response of money supply than tax revenue is statistically significant.

5. The response of monetary base than tax revenues and current expenditures shocks is positive and statistically is significant. The response of it than oil revenue and development expenditures is positive in beginning and has not statistical value, but only the response of it than tax revenues is statistically significant after the second period.

6. The response of exchange rate shocks than tax revenues and development expenditures is negative and in the long-run is reached to balance. Although, the response of exchange rate than oil revenue and current expenditures turn to balance in short rum.

7. The response of gross domestic product toward to tax revenues and development expenditures shocks is negative and is placed at a certain distance from the balance point. The response of it than oil revenue and current expenditures is positive in short run and negative in long run.

8. The response of private consumption expenditures than tax revenue shocks is positive and is received in long run, though it toward to oil revenue and government expenditures shocks is negative and in the long run is placed at a certain distance of balance.

9. The results of variance decomposition suggests that own variables has the most share of variations and the fiscal policy variables have no significant impact on short run movements in these variables.

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ETHICAL CONSIDERATION

Authenticity of the texts, honesty and fidelity has been observed.

AUTHOR CONTRIBUTIONS

Planning and writing of the manuscript was done by the authors.

CONFLICT OF INTEREST

Author/s confirmed no conflict of interest.

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