The Effect of Government Spending Innovations on the Ethiopian Economy:
A Disaggregate Structural Vector autoregressive Analysis

Abstract
The main purpose of this study is to estimate the size of government spending components’ multipliers for the Ethiopian economy over the sample period of 2001Q1 up to 2017Q4. The effects of government spending shocks are analyzed by applying short-run contemporaneous restrictions for the identification of shocks in an SVAR in order to estimate multipliers for the small open economy. Accordingly, recursive identification scheme is used in this study. From the impulse response functions, we found that aggregate government spending is less effective in stimulating the economy for the study period as evidenced by almost zero multipliers. This can be due to many structural and conjunctural factors that tend to lower the multiplier effects. At a disaggregate level, real GDP responds negatively to capital spending while its effect on recurrent spending is positive and insignificant on impact. The variation to real GDP is best explained by the variation in capital spending as compared to recurrent spending.

Keywords: Government spending, recurrent spending, capital spending, SVAR, Ethiopian economy
1. Introduction

Outlook on fiscal policy as an instrument for macroeconomic stabilization has moved back and forth since the time of Keynesian school of thought. Active usage of the tools reached its peak in the 1960s and 1970s (Alan, 2005). In the early 1980s, however, faced serious criticisms when it failed to save countries from the oil price shock and eventually led to high deficit and huge debt crisis (Beetsma, 2009).

So as to produce substantial national output and sustain economic development, any country’s economy demands a huge capital. In Sub-Saharan Africa, by and large, still government officials are the most prominent source of fund for infrastructural investment. On average, governments in Sub-Saharan Africa (SSA) spend between 6-12% of their GDP on infrastructure each year. Countries such as Ethiopia, Cape Verde, and Namibia spend above 10% of their GDP on infrastructure annually (Jerome, 2011).

Growth and Transformation Plan I (GTP I), a five year plan, was introduced by the government of Ethiopia in July 2010 for economic development, and couple of years ago GTP II (which spans 2014/15–2019/20) was announced as its successor. Accordingly, to finance public investment, the government issued US$75-79 billion over the five years. In fact, the government spent US$30billion over the five years to restructure the economy. Since the plan was announced, many controversies have arisen due to the over ambitiousness of the plan and the threat of the crowding out of private investment (Solomon, 2013).

In its three years of accomplishment, GTP I (2011-2013) showed that government spending has on average been birr 125.5 billion birr per annum, of which on average 58% has been spent on capital investments while the remaining 42% accounts for recurrent spending. By the general government 153.9 billion birr has been spent, of which 59% was devoted on capital expenditure the rest 41% covered by recurrent spending, which is consistent with stated objective and policy prioritizing capital spending (MoFEC, 2013).

Besides, in the three years, the total spending on growth oriented pro-poor sectors amounted to birr 258 billion. This indicates that every year on average 69% of the total spending has been on these priority sectors. In 2012/13 alone the spending on these sectors accounted for over 70 percent of the general government spending. This allocation and spending pattern of the government budget shows the dedication and commitment of the country towards eradicating poverty (MoFEC, 2014).

The recent world financial downturn refocused the attention of economists and policy makers onto fiscal policy as a potentially strong and sound tool in stimulating economic growth. Although there was a tendency in relaying on automatic stabilizers for fiscal stabilization, rather than following discretionary fiscal policy for a few decades, government and other institutions were opted for large fiscal stimulus during the latest economic downturn (Jacopo et al., 2011).

Stiff debate arose regarding the effect of fiscal policy shocks on output, as neither empirical nor theoretical researches have reached a consensus on either the quantitative or qualitative properties of such effects. The effectiveness of a fiscal policy in waking the real economy up is an ongoing intellectual debate in prominent academic journals (Franta and Gaber, 2012/2013). Besides from the point of view of the policy makers, the effects of fiscal policy on the macro-economy are of an ongoing interest. Although there are frequent calls for fiscal policy actions, stylized facts on the macroeconomic impact of fiscal policy have not been established (Tenhofen et al., 2010).

Two contradicting views exist regarding the effectiveness of increased government expenditure in stimulating economic growth. The traditional schools of thought argue that the effect of increment in government expenditure crowds out private investment. The non-traditional schools see government as the best actor to play in the economy through the policy instruments. Hence they argue government spending stimulates investment or it has a crowding-in effect in private investment. The crowding in of investment occurs when the economy’s resources are either
unemployed or underemployed. That may arise in many developing countries where, for example, government expenditure on infrastructure can induce private investment (Ford, 2016).

The federal government of Ethiopia has opted to raise the level of expenditure from year to year at a higher rate, though with no guarantee of its effectiveness. Starting from 2008/09, total expenditure as percentage of GDP has risen substantially till 2015/16 (NBE report, 2017). Hence this increase in the public spending from time to time has the connotation of how crucial it is for growth.

Though almost none in number, research has been conducted in Ethiopia related with the effect of government spending on output by Tamiru (2017), but this research deviates from the previous study by introducing a new methodology which is SVAR with cholesky decomposition. The previous study, however, used Bayesian VAR. Besides to that, using cholesky identification scheme, government spending is decomposed in to recurrent and capital spending to see the effect of government spending components on output and government spending multipliers are also computed both at an aggregate and disaggregate level.

2. Review of related literature
Fiscal multipliers measure the short-term impact of discretionary fiscal policy on output. They are usually defined as the ratio of a change in output to an exogenous change in the fiscal deficit with respect to their respective baselines. Fiscal multipliers can be measured in several ways. Generally, they are defined as the ratio of a change in output ($\Delta Y$) to a discretionary change in government spending or tax revenue ($\Delta G$ or $\Delta T$) (Spilimbergo et al., 2009). Thus, the fiscal multiplier measures the effect of a $1 change in spending or a $1 change in tax revenue on the level of GDP. Two multipliers are commonly used (focusing on expenditure): impact multiplier=$\Delta Y(t)/(\Delta G(t))$; multiplier at horizon $i=(\Delta Y(t+i))/(\Delta G(t))$ where $t$ can be a quarter or a year depending on the frequency of the data that is used in the study. The “overall” multiplier describes the output response to an unspecified fiscal shock, while the “revenue” (“spending”) multiplier relates output to a discretionary change in revenue (spending). Multipliers are important elements to take into consideration in policy advice and design. They are only one of the many factors that need to be considered in setting fiscal policy.

Most scholars define fiscal policy shock as a sudden alteration of fiscal policy (government spending or tax levels). Unfortunately, there is no such thing as a fiscal policy shock per second, because the authorized body, particularly the government, keeps everybody posted about the fiscal policy change before they are made. Fiscal policy incorporates a wide variety of policies such as revenue policy at which tax rules can be altered to affect income of the government, and government spending policy, where changes can occur so as to affect the spending level (Pettinger, 2017).

When policy makers think they should intervene in the economy, they use either monetary policy or fiscal policy. Within the two policies they can use either a contractionary fiscal and monetary policy or expansionary fiscal and monetary policy. The first tool of fiscal policy is the revenue side of the government budget which is taxation. And the second tool of fiscal policy is government spending which represents expenditure side of the government’s budget. Fiscal policy can have long run and short run impact on the economy. In the long run, fiscal policy can affect output by affecting either the labor force or other input factors or the total factor productivity, whereas, in the short run, fiscal policy can move the output from its potential level through affecting the demand of goods and services (Barro, 1991).

The effectiveness of fiscal policy to stabilize business cycles at a macro level is determined by the weight of its effect on output. However, when we try to visualize the theoretical effect of fiscal policy on the real world by undertaking researches, it becomes inconsistent. Because of that vague effect of fiscal policy, the literature is categorized along two major schools of economic thought. More specifically, the effect of fiscal policy on aggregate demand can be described in two opposite ways, either in the non-Keynesians (classical economists) or the Keynesians.
Standing from their assumptions classical economists believes that a change in the government spending and the tax level will not result in a change in national output. When the government increases its spending, it has to borrow from the private sector to finance the increase. This would increase the interest rate and thus, would decrease the consumption and investment of private sector. An increase in government spending with money supply constant will not lead to an increase in income but will only substitute private business investments with the public programs (Halkos and Paizanos, 2015). This is to mean that, having vertical and inelastic supply curve, every one dollar increase in government spending will be cancelled out by a one-dollar decrease in private spending, therefore, the crowding out effect is complete (Dornbusch et al., 1998). Government spending is seen as the destabilizing force in the growth of the economy of a country rather than the driving force of economic growth from the point of view of the classical economists.

Whereas Keynesians argue aggregate demand can possibly affect output and employment level. An increase in government spending and/or tax cut would increase private income and investment and thereby increases the level of output, though total effect of fiscal policy depends on the magnitude of fiscal multiplier and the crowding out effect (Mankiw, 2000). Keynes believes that government should have bigger role in the economy, because of that he recommended for the government to pull the economy out of recession. Government can implement some policies that can positively affect the economy, waiting for eventual recovery is fruitless because in the long run we all are dead.

Various empirical studies were conducted to investigate the effect of government spending shock on output, using different data, time periods and methods of analysis. There are studies that reported a positive relationship between government spending and output, which confirms Keynesian view point. To the contrary there are group of researchers which show a negative relationship between government spending and output and confirm the classical school of thought.

Most of the empirical researches on the macroeconomic effects of fiscal policy have originated in the developed countries mainly USA, EU, and Australia. Blanchard and Perotti (2002), Fatás and Milho (2001), Fatás (2003), Ramey and Shapiro (1998) and Mountford and Ulhig (2002) used VARs to identify fiscal policy shocks and quantify their consequences (Swati Yadav et al., 2012).

Engen and Skinner (1992) found that a balanced-budget increase-in government spending reduces output growth rate, using data from 107 countries for the period 1970-1995. In contrast, Eastley and Rebelo (1993) found a strong and positive impact of investment in transportation and communication on aggregate demand and output using cross-section data of 100 countries.

Alsharani and Alsadiq (2014) examined the effects of different kinds of government spending on economic growth by applying vector error correction model and using annual time series data for the period 1969-2010. The study found that both private and public investment as well as government spending in healthcare pursues the growth in the long run while trade openness and spending in housing sector stimulate the growth in the short run.

Akpan (2015) assessed the macroeconomic effects of fiscal policy shock in Nigeria using a Structural Vector autoregressive (SVAR) on a quarterly data for the period 1980:1-2010:4. From his findings a positive shock of government spending were found to have a positive and significant effect on real output and private consumption. The research entirely supports the Keynesian view that fiscal policy is effective in stimulating the output level through expenditure expansion on effective sectors.

Mansouri (2008) selected three North African countries (Egypt, Tunisia, and Morocco) using annual data for the period 1975-2002 for Egypt, 1972-2002 for Tunisia, and 1975-2002 for Morocco and examined the fiscal shocks on economic growth. Accordingly, only in the short run public investment has a significant effect for Morocco, whereas, a positive effect on economic growth in the long run for Egypt and Tunisia. The study found that consumption expenditure has
a negative effect on economic growth in short and long-run in Morocco and Tunisia. However, this impact is only in the short-run in Egypt.

A cross-country study was undertaken by Cameron (1982) for the period 1960-1979. The study found that a negative relationship between government spending and long run real growth rate. In contrast, Ram (1986) found a positive influence of government spending size on economic growth in a cross-section study of 115 countries by using a two-sector model for the period 1960-1980.

Abdel Fattah (2016) investigated the relationship between fiscal space and economic growth using VAR model and annual data over the period 1982-2015. The results showed that economic growth responds positively to shocks from government investment spending and fiscal space. However, it responds negatively to a shock from government consumption spending.

Tamiru (2017) using a Bayesian VAR model examined the effect of fiscal policy on economic growth in Ethiopia, taking quarterly data over the period of 2000Q1 up to 2016Q4. Though it was too small, government spending has been found to have positive impact on output. Recurrent expenditure had a positive and persistent impact on real output, to the contrary capital expenditure was found to have an insignificant effect on output.

Different from the above mentioned local research, this paper employed a structural vector auto regressive model along with a cholesky decomposition method of identification. Beside to this, multipliers are estimated not only for government spending but also for its components (recurrent and capital expenditures).

3. Methodology of the study

3.1. Data type and sources

This study employs a quarterly data type on government spending, government revenue, real gross domestic product, recurrent spending and capital spending over the period of 2001Q1 up to 2017Q4, which covers 68 observations. Government spending is defined as the sum of government consumption plus government investment, and government revenue includes both direct and indirect taxes. Additionally, the relatively small number of observation in our sample dictates keeping the SVAR as small as possible. We limit the number of variables included in our SVAR model as much as possible in order to preserve degrees of freedom and keep the model as parsimonious as possible.

The reason to use quarterly data over annual data is that it makes the SVAR zero restrictions theoretically grounded. Because in a quarter data variables are less likely to respond for a given shocks, but had it been annual data, the restrictions might not be theoretical grounded. So, this allows capturing intra-year dynamics. Besides, it gives the possibility for larger sample so as to avoid the vanishing degrees of freedom in estimation (Pedro, 2011). The data are obtained from Ministry of Finance and Economic Development of Ethiopia and National Bank of Ethiopia.

3.2. Econometric model frame work

To assess the effects of fiscal policy, the SVAR methodology has been be used. The structural representation of a VAR model, ignoring deterministic components such as constant, tend, etc. for convenience is:

$$ A_\tau X_\tau = A(L) X_{\tau-1}^c + B_\varepsilon $$

Where $A_\tau$ is a matrix of contemporaneous influence between the variables, $X_\tau$ is an $n x 1$ vector of endogenous macroeconomic variables such as government recurrent spending (gr), government capital expenditures (gc), tax revenues (t) and real output (y). $A(L)$ is an $n x n$ matrix of lag length of $L$, representing impulse-response functions of the shocks to the elements of $X_\tau$. $B$ is an $n x n$ matrix that captures the linear relations between structural shocks and those in the reduced form, $\varepsilon_\tau$ is an $n x 1$ vector of structural shocks. The structural shocks are uncorrelated and identically normally distributed.
To estimate the SVAR model, the reduced form is determined by multiplying equation (1) by an inverse matrix $A_0^{-1}$.

$$X_t = C(L)X_{t-1} + u_t$$

Where $C(L) = A_0^{-1}A(L)$ and $u_t = A_0^{-1}Bx_t$. $u_t$ is nx1 vector of shocks in reduced form that are uncorrelated and normally distributed but contemporaneously correlated with each other. The relation between structural shocks and reduced form shocks is:

$$A_0 u_t = Bx_t$$

The identification scheme that would be used to identify the structural shocks (the government capital spending shock $e_{gc}$ and government recurrent expenditure shock $e_{tr}$), is cholesky decomposition of variance-covariance matrix of VAR residuals. To identify the relation, it is necessary to impose restrictions assuming that some structural shocks have no contemporaneous effects on some endogenous variables. According to cholesky decomposition, the matrix $A_0$ is identified as a lower triangular matrix and matrix B as n-dimensional identity matrix. The main disadvantage of this method is that we need to order the variables.

Sims (1980) suggested the use of cholesky decomposition (recursive ordering) to identify the VAR model. Silva et al. (2013) applied Sims method to a fiscal VAR model [Gc Gr Y T] to identify fiscal shocks by decomposing the government spending into recurrent and capital spending. Accordingly, we ordered the variables based on the ordering of Silva. Government consumption expenditures are ordered after government investment expenditures, as it is quite reasonable that investment generates current consumption (Gonzalez-Garcia et al., 2013). Hence, the first variable ordered in the system (government capital spending in the four variables VAR) responds only to its own exogenous shock. The next variable (government recurrent spending) responds to government capital spending contemporaneously and to its own shock whereas, the third variable responds to government capital and recurrent spending as well as to itself. The last variable, government revenue responds contemporaneously to all other variables (government capital spending, government recurrent spending and real output) and to its own shock. These assumptions define the relationships between reduced and structural shocks only in the first period, while later every shock can be affected by any other shock.

But before we present the disaggregated cholesky decomposition matrix form, we show the aggregate form first, following Fatas and Mihov (2001), to identify government spending shock in a VAR model. Accordingly, the first variable to be ordered is the government spending (responds only to its own exogenous shock), and the second variable is output (responds to government spending contemporaneously and to its own shock) and the third variable, tax which is ordered last responds contemporaneously to both the variables (government spending and output) and to its own shock within quarter.

In matrix form: Recursive approach (matrix form for G Y T):

$$
\begin{pmatrix}
1 & 0 & 0 \\
\alpha_{yg} & 1 & 0 \\
\alpha_{tg} & \alpha_{ty} & 1
\end{pmatrix} =
\begin{pmatrix}
1 & 0 & 0 \\
0 & 1 & 0 \\
0 & 0 & 1
\end{pmatrix}
$$

Following the same pattern, by decomposing the government spending in to capital spending and recurrent spending, we come up with the following matrix form (Silva et al., 2013):

$$
\begin{pmatrix}
1 & 0 & 0 & 0 \\
\alpha_{rgcg} & 1 & 0 & 0 \\
\alpha_{ycg} & \alpha_{yrg} & 1 & 0 \\
\alpha_{tcg} & \alpha_{trg} & \alpha_{ty} & 1
\end{pmatrix} =
\begin{pmatrix}
1 & 0 & 0 & 0 \\
0 & 1 & 0 & 0 \\
0 & 0 & 1 & 0 \\
0 & 0 & 0 & 1
\end{pmatrix}
$$
The restrictions in this identification scheme are imposed on the contemporaneous responses of the variables, but the variables are free to respond in all other periods. In this identification scheme, ordering of variables is extremely crucial for the results as outcome can change with the change in the ordering of the variables. So precaution is taken and some theoretical justifications are stated while deciding the ordering of the variables as it also defines the direction of causal relationship.

4. Results and discussions

Empirical results are presented for both the aggregate as well as disaggregate baseline VAR models. We use the Schwarz information criterion test for serial correlation in the VAR residuals in order to determine the VAR lag length. We consider up to four lags and find that one lag is chosen by the Schwarz criterion for both models. However, one lag leads us to serial correlation in the VAR residuals in both cases. Hence, we increase the lag length to two in order to avoid serial correlation in the VAR residuals. Both models also include a constant and trend.

4.1. Impulse Responses

Figures 4.1 and 4.2 present our benchmark results on the impulse responses of the endogenous variables to a positive government expenditure shock. Each shock is the size of one standard deviation and the confidence bands in the graphs are two standard errors wide, in other words they are approximately 95% confidence bands computed by Monte Carlo simulations based on 1000 replications, as in Stock and Watson (2001) and Giordano et al. (2007). The response of capital spending to its own shock is significant only for the first two quarters and not persistent. Within the same figure (figure 4.1), while the response of capital spending to recurrent spending shock is negative and insignificant, the response of recurrent spending to capital spending shock is negative and significant on impact. Again similar to the capital spending shock, the recurrent spending shock is not persistent.
In figure 4.1 above, real GDP responds negatively and insignificantly to capital spending throughout the whole period, whereas the effect of government recurrent spending shock on output is positive but still insignificant. But from this we can figure out one important thing, the effect of capital spending is larger though negative and insignificant as compared to the effect of recurrent spending shock. The last response variable, government revenue responds positively and insignificantly to capital spending shock while it responds positively and significantly to recurrent spending on impact.

In the figure below (figure 4.2), response of endogenous variables to a government spending shock starting from to its own shock at an aggregate level is plotted. Response of total spending to its own shock is short lived. The response of real GDP to a government spending shock is positive but insignificant. The government spending multipliers are almost zero on impact. This
indicates government spending is less effective in stimulating the economy over the study period. This result is consistent with the findings of Ilzetzki (2011) who finds small magnitudes for government spending multipliers in developing countries. The low multipliers can be due to expenditure inefficiencies, trade openness, high debt level, low degree of monetary accommodation to government spending shocks, significant composition of government consumption, flexible exchange rate, etc. The response of government revenue to total spending shock is significant and positive.

Finally, according to the objective of this study, the authors have estimated the spending multipliers using the formula given below from the impulse response functions:

\[ M = \frac{\Delta Y}{\Delta G} + \frac{\xi}{\gamma} \]

As we can see from the table 4.1 below, the highest level of total spending multiplier is achieved at the twelfth period (quarter 12). When we see the multiplier by disaggregating into capital spending and recurrent spending, there is a larger multiplier effect for capital spending shock than for recurrent spending shock.

<table>
<thead>
<tr>
<th>Period 2</th>
<th>Period 4</th>
<th>Period 6</th>
<th>Period 8</th>
<th>Period 10</th>
<th>Period 12</th>
<th>Peak periods</th>
</tr>
</thead>
<tbody>
<tr>
<td>total spending multiplier</td>
<td>0.080055</td>
<td>0.073986</td>
<td>0.035412</td>
<td>-0.04138</td>
<td>-0.14827</td>
<td>-0.24339</td>
</tr>
<tr>
<td>capital spending multiplier</td>
<td>-0.08226</td>
<td>-0.26362</td>
<td>-0.2984</td>
<td>-0.23062</td>
<td>-0.17191</td>
<td>-0.15006</td>
</tr>
<tr>
<td>recurrent spending multiplier</td>
<td>0.059302</td>
<td>0.060171</td>
<td>0.08819</td>
<td>0.153281</td>
<td>0.230094</td>
<td>0.27462</td>
</tr>
</tbody>
</table>

4.2. Variance decomposition

The forecast error variance decomposition (FEVD) of a variable shows the contribution of each shock to the forecast error variance of that variable. The table plotted below (Table 4.2) indicates the forecast error variance decomposition of a government spending shock at an aggregate level. All the variation in government spending is explained by shock to itself in the first quarter, and going down to the 12 quarter; it declines to 74.66%. The variation to real GDP is weakly (less
than one percent) explained by the shock to government spending; whereas, the movement to government revenue is explained by a shock to government spending by 14.40% at the twelfth quarter horizon.

Table 4.2: variance decomposition of total government spending shock

<table>
<thead>
<tr>
<th>Variables</th>
<th>1 quarter</th>
<th>4 quarters</th>
<th>8 quarters</th>
<th>12 quarters</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total spending</td>
<td>100</td>
<td>85.19620</td>
<td>77.16162</td>
<td>74.66118</td>
</tr>
<tr>
<td>Real GDP</td>
<td>0.418675</td>
<td>0.969989</td>
<td>0.696574</td>
<td>0.681793</td>
</tr>
<tr>
<td>Government revenue</td>
<td>15.15641</td>
<td>17.9198</td>
<td>15.02885</td>
<td>14.40513</td>
</tr>
</tbody>
</table>

Source: own computation using eviews 11

The second part of this model is the disaggregated model, which disaggregates total government spending into capital and recurrent spending. Table 4.3 reveals the variance decomposition of capital spending shock. The deviation of capital spending is explained by the shock to itself by 58.78% at the twelfth quarter period. The movement in recurrent spending is explained by 10.11% at the twelfth quarter by capital spending shock. Most importantly, the variation in real GDP is explained 21.08% by the shock to the capital spending at the twelfth quarter period. This shows the variation in real GDP is fairly attributed to a shock to capital spending. The movement in government revenue is explained by 10.06% due to capital spending shock at the twelfth quarter horizon.

Table 4.3: variance decomposition of capital spending shock

<table>
<thead>
<tr>
<th>Variables</th>
<th>1 quarter</th>
<th>4 quarters</th>
<th>8 quarters</th>
<th>12 quarters</th>
</tr>
</thead>
<tbody>
<tr>
<td>Capital spending</td>
<td>100</td>
<td>77.74366</td>
<td>64.72074</td>
<td>58.78761</td>
</tr>
<tr>
<td>Recurrent spending</td>
<td>8.423834</td>
<td>8.726116</td>
<td>8.704196</td>
<td>10.11335</td>
</tr>
<tr>
<td>Real GDP</td>
<td>1.55925</td>
<td>6.904374</td>
<td>18.50934</td>
<td>21.08586</td>
</tr>
<tr>
<td>Government Revenue</td>
<td>1.99694</td>
<td>4.731239</td>
<td>7.549597</td>
<td>10.06668</td>
</tr>
</tbody>
</table>

Source: own computation using eviews 11

Finally, the variance decomposition of recurrent spending shock is described in the table below (Table 4.4). Recurrent spending’s movement is explained by 80.76% from shock to itself at the twelfth quarter. The shock to recurrent spending explains 11.09% to the movement in capital spending at the last period. Most importantly, the movement in real GDP is explained by 7.19% to recurrent spending shock at the twelfth period. Lastly, 9.79% of variation in government revenue is explained by the shock to recurrent spending at the twelfth quarter horizon.

Table 4.4: variance decomposition of recurrent spending shock

<table>
<thead>
<tr>
<th>Variables</th>
<th>1 quarter</th>
<th>4 quarters</th>
<th>8 quarters</th>
<th>12 quarters</th>
</tr>
</thead>
<tbody>
<tr>
<td>Recurrent spending</td>
<td>91.57617</td>
<td>86.97274</td>
<td>85.38209</td>
<td>80.76162</td>
</tr>
<tr>
<td>Capital spending</td>
<td>0.0000</td>
<td>2.802059</td>
<td>8.394211</td>
<td>11.09008</td>
</tr>
<tr>
<td>Real GDP</td>
<td>1.899813</td>
<td>1.892342</td>
<td>3.721415</td>
<td>7.194028</td>
</tr>
</tbody>
</table>

Source: own computation using eviews 11

5. Conclusion and future research

Size of fiscal multipliers is always a great scrutiny for both policy makers and economists. This is because multipliers are among many factors that need to be considered in setting fiscal policy. In this context, this research work intends to contribute to the fiscal literature of the Ethiopian economy by using a structural VAR model relying on quarterly data spanning from 2001Q1-2017Q4.

Estimated results show that government spending shock has a positive but insignificant effect on output. The magnitude for the multipliers is almost zero as well. This signifies government spending shock is less effective in stimulating the economy over the study period. In relation to this point, one may raise a question in regard to the usefulness of GTP I and GTP II. However,
the following points can be an answer to the possible question. One, government spending multiplier depends on the study period. In our case, the sample starts from 2001Q1 while the GTPs start from 2010 onwards. Hence, as we fit a linear model, there may be a tendency to average the effects of government spending shock. Second, this can be also due to structural characteristics such as government inefficiencies in public expenditure management, high debt level, trade openness, flexible exchange rate regime, etc and conjunctural factors such as degree of monetary accommodation to government spending shocks, composition of fiscal adjustment, etc. Among the expenditures, capital spending is the main driving force for the variation in output and capital spending multiplier is greater by size than recurrent spending multipliers.

Finally, our empirical analysis could be strengthened along at least two lines. First, it would be relevant to investigate the interaction between government spending multipliers and monetary policy. Second, the effect of government spending shocks on different components of output could be analyzed.
References


