JURNAL STIE SEMARANG
VOL 17 No 1 Edisi Februari 2025
ISSN: 2085-5656, e-ISSN :2252-7826
DOI: 10.33747

DYNAMIC EFFECTS OF CHANGE IN GOVERNMENT EXPENDITURE IN THE NEPALESE ECONOMY

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ABSTRACT

One of the central tenets of macroeconomics is that fiscal policy can effectively stabilize the economy and achieve macroeconomic targets. In the last few decades, monetary policy tools have been widely used to achieve this goal. There has been, however, a renewed interest in using fiscal policy as a stabilizing tool since the onset of the recent Global Financial Crisis. This study analyses the effects of changes in government expenditure on aggregate economic activity and how these effects are transmitted in the case of Nepal for the period 1990–2023. To analyze the transmission mechanism of government spending innovations, the Vector Autoregressive Model (VAR) is estimated for the following five variables: government expenditure, real GDP, private consumption, debt-to-GDP ratio, interest rate, and real exchange rate. The consumption and output respond negatively to the innovation in government expenditure, consistent with the standard neoclassical model. The interest rates increase in the face of expansionary fiscal spending. As government debt, builds up with fiscal expansion, the rising risk of default or increasing inflation risk reinforces crowding out through interest rates. The real exchange rate tends to appreciate in response to a rise in government spending. This finding is based on open economy literature and conventional literature.

Key Words: Government Expenditure, Macroeconomy, VAR analysis, Impulse-Response, Variance Decomposition

INTRODUCTION

The change in government expenditure on macroeconomic activity and the mechanisms by which these effects are transferred have been the subject of investigation and discussion, as

various theories have been advanced to enlarge this topic. Developing appropriate and effective macroeconomic tools is the most crucial aspect of macroeconomics to achieve aims and economic stability. There is still much to learn about the macroeconomic implications of government spending, and this needs to be done through further investigation. There was a historic decline in output and a rise in government spending during the recent COVID-19 crisis and economic lockdown (Cevik & Miryugin, 2023). The significant reduction in economic activity has resulted in a record-breaking level of government borrowing, which was previously established during the financial crisis. Several considerations indicate that government spending is a key factor in increasing productivity. (Kang & Kim, 2021).

Hall (1980), Barro (1981, 1984), and Aschauer et al. (1984, 1985) developed a Neo-classical framework that focused on consumption and the inelastic supply of labor. This literature has focused on the effects of a permanent increase in government expenditure. The increase in national debt because of an increase in government expenditure contracts employment while it drives up the real interest rate. High government purchases of consumer goods, which are relatively capital intensive, push up employment while raising the real interest rate and reducing the wage rate. There is a positive impact on labor supply. Higher government purchases of capital goods reduce the real interest rate and raise the real wage rate; there is a positive impact on labor demand and labor supply.

According to Dufrénot (2023), the new classicalists view systematic monetary and economic policy's inefficiency as a strength rather than a weakness. While it may still be true that fiscal policy decisions have an impact on nominal GDP in the short or long term, new classicalists contend that the ultimate impact of a budget deficit changes as a result of the combined influence of several factors (Galbacks, 2015). A budget deficit, which can stem from a decrease in revenues or an increase in expenditures, boosts aggregate demand, which raises real national income. However, these benefits are somewhat countered by rising prices (Rochon et al., 2022). An additional adverse effect of the heightened aggregate demand could be an increase in the real interest rate (Sargent, 1986).

A rise in government spending, in Keynes' opinion,

multiplies the effects on output and aggregate demand. The Keynesian multiplier is more than one, rises in proportion to how sensitive current spending is to current income, and is greater in the case of an increase than a decrease in taxes. Investment is decreased by a fiscal expansion financed by increasing borrowing, which raises interest rates. The exchange rate may also contribute to crowding out in an open economy. An increase in interest rates draws capital inflows that cause currency currencies to strengthen. This worsening of the external current account counteracts the rise in domestic demand brought on by fiscal expansions (Kang & Kim, 2021).

By incorporating customers who do not save or borrow and who spend their disposable income every period, Galı, Lopez-Salido, and Valles (2007) expand the scope of the New Keynesian model and prevent consumers from cutting down on their spending in the event of a positive shock to government expenditure. The oligopolistic pricing and monopolistic competition taking rising returns government spending modeling [Rotemberg and Woodford (1992), Devereux, Head, and Lapham (1996)] demonstrates how raising government expenditure can boost wages, productivity, and private consumption. The research suggests that increasing military spending enhances rather than decreases real wages because it increases output more than hours worked. Nonetheless, the result defies the neoclassical model's assumptions.

Nepal has struggled for a long time to regulate state spending and deal with fiscal imbalances. The government is not even close to being able to pay salaries because of the difficulties in collecting taxes, which make up a big portion of government income, and the large portion of revenues that are spent on domestic and foreign debt. In the 1990s, a period marked by political and economic instability, debt was used to fund budget deficits.

After 1980, the Nepalese economy experienced significant structural reforms and policy changes, and as a result of liberalization and openness policies, the economy became more integrated into the world markets. Nevertheless, due to the lack of proper legal, bureaucratic, and institutional infrastructure, the economy was deeply shaken by shocks. To get out of the crises that stemmed from financial markets and then rapidly spread to the whole economy, fiscal policy tools were mainly used. Following 1980, the Nepalese economy underwent substantial policy and structural reforms, leading to increased

economic integration with global markets through liberalization and openness policies. Nevertheless, shocks caused the economy to be severely rattled since there was an inadequate institutional, legal, and bureaucratic framework. Fiscal policy instruments were mostly utilized to escape the financial market-based crises that quickly extended to the entire economy.

By constructing a Vector Autoregressive model, the current study examines how government spending affects macroeconomic variables. To analyze the transmission mechanism for the variables—government spending, real GDP, private consumption, debt to GDP ratio, interest rate, and real exchange rate—impulse response functions are presented. When examining the effects of fiscal shocks, one must monitor the dynamics of debt that emerge after a fiscal shock, such as an increase in government expenditure, and take into account the likelihood that taxes, spending, and interest rates may change in response to the debt's level as it changes over time. The current study characterizes the dynamic consequences of shocks in government expenditure for a developing economy, adding to the body of empirical literature already in existence. To get precise answers to the dynamic consequences of fiscal shocks as they are addressed in conventional economics, the debt-to-GDP ratio is incorporated as feedback.

METHODS and MATERIALS

For the identification of fiscal shocks and the empirical characterization of fiscal policy transmission, three distinct approaches have been widely employed in the literature. Blanchard and Perotti (2002) apply a structural VAR approach; government spending is assumed to be predetermined within the quarter, and identification is achieved by restricting the contemporaneous relationships between the fiscal and other variables included in the VAR. Under this assumption, the reduced-form residuals from a regression of government spending on the lags of all other variables in the VAR are identified as structural government spending shocks. Ramey and Shapiro (1998) identify the dates at which the relevant military initiatives were first announced and trace the dynamic response of the economy to these announcements using dummy variables, arguing that such events are truly exogenous sources of variation in government spending. Mountford and Uhlig (2009), Romer and Romer (2010), and Enders et al. (2008) have used a

narrative approach that is based on sign restrictions to identify shocks.

The VAR model includes six variables; the first three are government expenditure, real GDP, and private spending, all in log terms. The study also includes a measure of the log of interest rate and the log of exchange rate; the next variable is the ratio of debt to GDP. Favero and Giavazzi (2012) provide evidence suggesting that the omission of debt from the VAR model may lead to substantial bias in the estimated dynamics of fiscal policy shocks (Rainone, 2023).

The study estimated the VAR model on annual time series data covering the period from 1990-2023. While the choice of the sample period is chiefly determined by the data availability (in particular, data on the interest rate), it also has the advantage of focusing the analysis on the period in which the policy framework has arguably been fairly stable, especially as regards privatization policy.

Following Blanchard and Perotti (2002), Favero (2007), and Corsetti, et al. (2009), the present study adopts unrestricted VAR analysis. Let Y_t be a vector of macro variables: aggregate output and private consumption, both in logs and per-capita terms; a measure of the ex-ante long-term real interest rate; and the log of the real exchange rate; the public debt scaled by GDP. The following model is estimated. The study of the dynamic response of macroeconomic variables to shifts in fiscal policy is typically carried out by estimating a VAR of the following form:

$$Y_t = \sum_{i=1}^{k} C_i Y_{t-i} + u_t \dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots (1)$$

Where Y_t = (ge_t, $pcon_t$, int_t, er_t, $debt_t$) is a six-dimensional vector in the logarithm of government expenditure (ge_t), private consumption ($pcon_t$), real interest rate (int_t), real exchange rate (ex_t) and debt to GDP ratio ($debt_t$). The ordering of the variables is very important in VAR models. Government spending is ordered first as it does not react contemporaneously to shocks to other variables in the system. The changes in government spending, unlike changes in taxes, are largely unrelated to the business cycle. Therefore, it seems plausible to assume that government spending is not affected contemporaneously by shocks originating in the private sector. Private consumption does not react contemporaneously to the

shocks in tax, interest rate, and exchange rate, but it is affected contemporaneously by spending shocks. Taxes do not react contemporaneously to interest rate shocks but are affected contemporaneously by government spending and private consumption. shocks and the interest rate and exchange rate are affected contemporaneously by all shocks in the system. Ordering the debt to GDP comes last can be justified because debt is set as a function of all variables in the vector of variables (Infante et al., 2024).

The data series for this study are extracted from the Quarterly Economic Bulletin (QEB 2023 July) issued by Nepal Rastra Bank, Economic Survey (Various Issues). The data set includes government expenditure, private consumption, real GDP, real interest rate, and real exchange rate; tax and public debt scaled by GDP for the period 1990–2023. All data series are converted into the year 2014/15 rupees.

RESULTS and DISCUSSION

To analyze the macroeconomic effect of government spending changes, the methodology suggested by Favero (2007) and Perotti (2007) is adopted using Nepal's' data for the period 1990–2023. The systematic relationship between government spending and macroeconomic variables is estimated by an unrestricted Vector Autoregressive Model (VAR) model of how government spending innovations are transmitted to private consumption, real GDP, real interest rate, real exchange rate, and debt to GDP ratio. The advantage of this methodology is that it only requires the estimation of a relatively small number of parameters, and it does not impose any restrictions on the economy. The VAR models are characterized with no a priori distinction between endogenous and exogenous variables, and forecast performance is better than the one obtained by the simultaneous equation model.

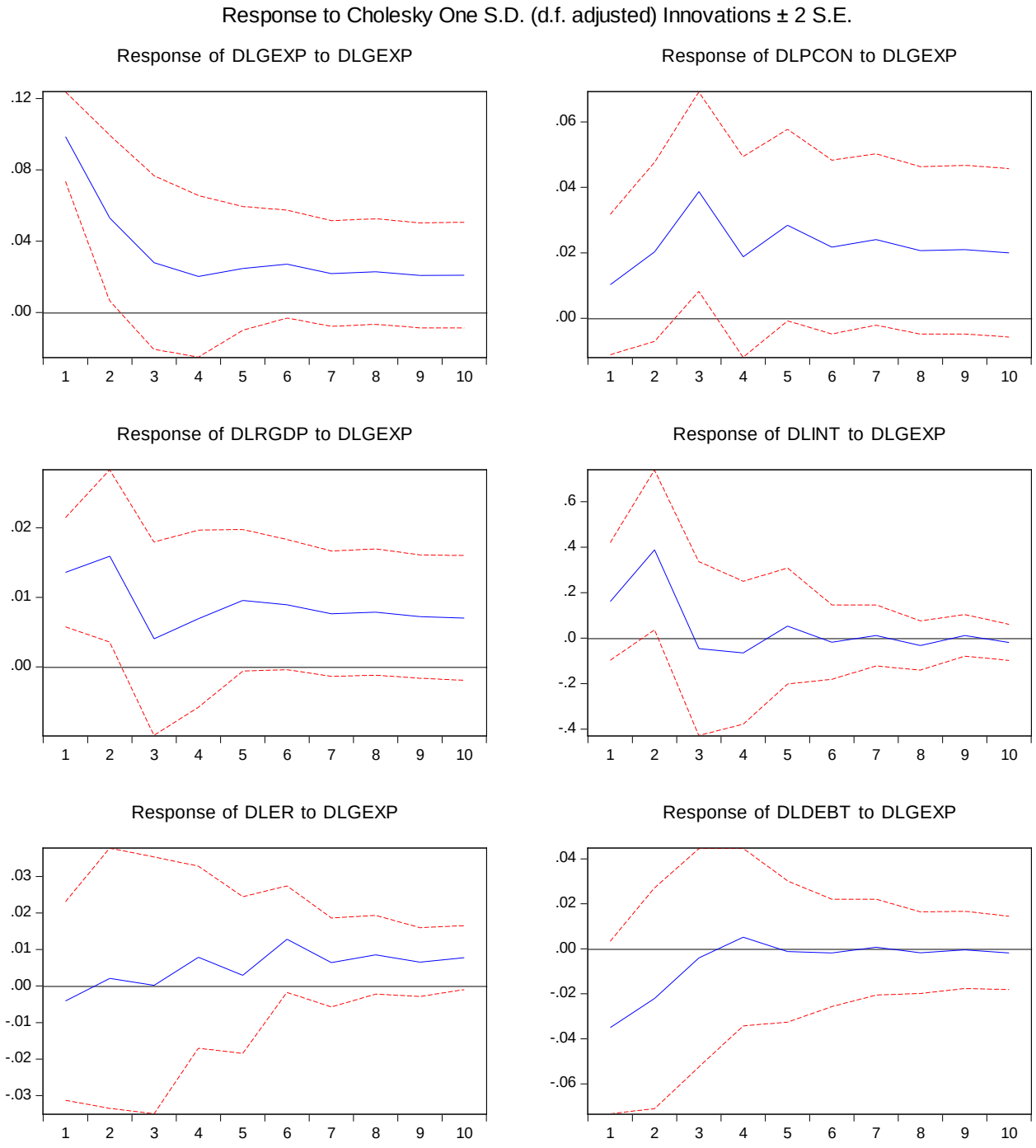
For estimation, the first step is to test the stationarity of each variable. The Augmented Dickey-Fuller (ADF) unit root test is applied to government expenditure, private consumption, debt to GDP, real interest rate, and real exchange rate with a constant and a trend. The ADF test results show the acceptance of the unit root in all series, that is, all the series are non-stationary. at level, which is indicative of the I(1) process, and therefore all the variables are taken in first difference for further analysis.

The VAR model includes six variables: government

expenditure, real GDP, and private consumption, all in log terms; the log of the real interest rate, the real exchange rate; and the debt-to-GDP ratio following Chung and Leeper (2007), Favero (2007), Coretti et al. (2008). The one-year lags are selected for VAR model estimation based on the Akikia Information Criteria, as the data is an annual time series. The VAR allows us to identify how the government expenditure shock influences macroeconomic variables by estimating the impulse response functions and variance decomposition. The two sets of impulse responses are used in model one, considering the debt to finance the deficit in the face of rising government expenditure and other omitting debt because the VAR methodology reveals possible differences in the results.

Figure 1

Impulse response function for government expenditure



Source: Authors computation using E-views 10

Figure 1 shows government expenditure has a negative impact on consumption, real GDP, and the interest rate. The government expenditure reacts strongly negatively and persistently to its shock, as the result is the same as Blanchard and Perotti (2002). The results suggest that the impulse response of consumption to government expenditure shock increased for three years but both declined thereafter and we can say that the standard neo-classical model can account well for the effects of fiscal policy shock in the Nepalese economy during 1990-2023. In those models, an increase in government expenditures creates a negative wealth effect for the households, reduces consumption, and increases labor supply. The increased labor supply induces real wages to decrease and interest rates to increase. The consumers may anticipate a future increase in taxes if government spending is financed by increasing debt, as the Ricardian case suggests. Hence, private consumption may decrease, offsetting the positive effect of an increase in government spending on aggregate demand. Similarly, an increase in government spending that is financed by debt increases the demand for domestic credit, raising the interest rate. The higher the public debt, the higher the risk premium in interest rates. In addition, financing government spending by borrowing from domestic financial institutions decreases available credit for the private sector. Accordingly, higher government spending is bound to crowd out private investment.

An expansion in government spending leads to a rise in the real interest rate and an immediate increase in consumption and output. In the long run, there is a permanently lower interest rate, and a lower capital stock, employment, and output. A higher interest rate crowds out private investment and moderates the effect of government spending on aggregate demand in the short run in the case of the Nepalese economy. In the long run, this moderating effect has a negative impact on the interest rate. The empirical evidence suggests that in a short period, there is the stimulating effect of expansionary fiscal policy; it is only one side that correctly describes that deficit financing can raise the level of demand in part of the economy and ignores government borrowing to finance deficit spending that automatically reduces demand. elsewhere (Foster, 2007). Cagon et al. (2009) find the impact of the first year of spending expansion is very small and the multiplier is less than one as consumption and investment crowd

out. An unexpected increase in government spending, beyond what would occur through an automatic stabilizer, weakly stimulates the economy; that is 1 percent increase in government spending increases output by 1.3 percent after one year. Moutford and Uhlig (2002). Many factors underlie the crowding-out effect in the face of fiscal spending. Higher interest sensitivity of investment demand increases crowding out. An accommodating monetary policy would offset the tendency of the interest rate to rise following an increase in government spending and reduce the possibility of crowding out. Corsetti, et al. (2009) confirm our finding by showing that hours worked go up, investment shortly enlarges, whereas real wages and consumption decline, hence implying that the standard neoclassic model can report plausibly well for the consequences of unanticipated changes in fiscal policy. Blanchard and Perotti (2002), Ramey and Shapiro (1998), and several other subsequent studies find contradictory results suggesting that fiscal expansion boosts private consumption and output, which is consistent with Keynesian analysis and contradicts the neoclassical as well as standard new Keynesian analysis.

The result of impulse response indicates the real exchange rate tends to appreciate in response to a rise in government spending. This finding is according to recent open economy literature but also to the conventional literature Mundell-Fleming model of Dornbush (1980). This finding is the opposite of some studies; for example, Kim and Roubini (2008), Monachilli and Perotti (2006), and Raven, Schmitt-Grohe, and Uribe (2007) document depreciation of real exchange rate as a result of fiscal expansionary shock. Furthermore, to finance the deficit in the face of rising government spending by debt, in the short run debt to GDP declines, whereas in the long run stabilization effect of debt occurs and the debt to GDP ratio starts rising (Favero, 2007). The interest rates increase in the face of expansionary fiscal spending, as government debt builds up with fiscal expansion, the rising risk of default or increasing inflation risk further reinforces crowding out through interest rates. Therefore, interest rates are likely to be more flexible to adjust upward in the face of expansionary shocks to government spending for three years. An increase in government spending that is financed by domestic borrowing is expected to result in, however, a smaller multiplier. The borrowing increases the demand for the limited pool of

available credit, increasing pressure on the interest rate. Higher interest sensitivity of investment demand increases crowding out. An open economy permits the government to finance its deficit by importing savings, if in turn not matched by an increase in the imports of goods and services to preserve the balance of payments. Therefore, the increase in domestic demand due to deficit spending is fully offset by the reduction in demand arising from an increase in exports. Foster (2009).

In the empirical literature, there are other explanations for the negative effect of expansionary government spending on consumption and output. Bailey (1971) indicated that there might be a degree of substitutability between government spending and private consumption. Barro (1981) incorporated it into a general model to examine the direct effect of government purchases of goods and services on consumption utility.

Table 1

Variance Decomposition

Period	S.E.	DLGEXP	DLPCON	DLRGDP	DLINT	DLER	DLDEBT
1	0.098712	100.0000	0.000000	0.000000	0.000000	0.000000	0.000000
2	0.115366	94.31880	2.258150	0.100245	0.548568	0.838517	1.935722
3	0.120725	91.51545	5.004354	0.092089	0.777654	0.836458	1.773993
4	0.125978	86.64563	10.10660	0.088917	0.731519	0.798112	1.629224
5	0.130173	84.77165	11.43699	0.434977	0.790695	0.970247	1.595438
6	0.134719	83.19910	12.60114	0.589666	0.847885	1.079012	1.683196
7	0.137687	82.18241	13.59992	0.651361	0.814659	1.139423	1.612236
8	0.140993	81.02258	14.76259	0.696214	0.820477	1.146098	1.552042
9	0.143553	80.26875	15.49183	0.730523	0.799926	1.201630	1.507340
10	0.146097	79.55277	16.14246	0.782218	0.811450	1.237950	1.473148
Cholesky Ordering: DLGEXP DLPCON DLRGDP DLINT DLER DLDEBT							

Source: Authors Calculation Using E Views 10

Table 1 presents the breakdown of the variability in government spending. The findings indicate that, in the case of Nepal, the majority of the variability can be attributed to consumption and the debt-to-GDP ratio, which suggests that when government expenditure grows and is funded by debt, there will be greater demand for domestic credit, which would drive up interest rates. If rising debt is used to pay government spending, consumers may expect more taxes in the future. As a result, a rise in government spending may have the opposite effect on aggregate demand if private consumption

declines. Similar to this, when government expenditure rises and is funded by debt, there is a greater demand for domestic credit, which drives up interest rates. Government expenditure causes consumption to rise in the first year and then decline, whereas output shows a persistently negative trend.

CONCLUSION

There is no consensus on a fundamental question in macroeconomics: how changes in government spending affect overall economic activity and how these impacts propagate. The premise that fiscal spending expansion is expansionary from 1990 to 2023 is dynamically analyzed in the current study. The impulse response functions for the following five variables are reported: government expenditure, real GDP, private consumption, debt-to-GDP ratio, interest rate, and real exchange rate. This allows for the analysis of the transmission mechanism of innovations in government spending. This study uses the unrestricted VAR approach to empirically analyze the impact of government expenditure on a collection of macroeconomic variables in the context of Nepal.

A shock to public spending has a favorable impact on the exchange rate but a negative impact on consumption, interest rates, and real GDP, according to an examination of the impulse-response functions. The shock to government spending appears to have had a significant detrimental effect on its stock. However, given that these impacts are marginal and only hold temporarily, the results suggest that the macroeconomic structure would only be slightly affected by the tools available to fiscal policymakers. These findings support the applicability of the Keynesian paradigm in Nepal in part. The empirical study shows that depending on the funding source, government spending has different effects. In the near term, debt to GDP declines as a means of financing deficits in the face of increased government spending; nevertheless, over time, the stabilizing effect of debt causes the debt to GDP ratio to rise (Favero, 2007). The expansionary shock's favorable impact on taxes and its detrimental effect on debt appear to be signs of Recardian behavior. A rise in tax income creates a positive wealth effect since it indicates a decrease in future government liabilities. Conversely, a rise in public debt results in a decrease in the present value of future earnings, hence lowering current spending.

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